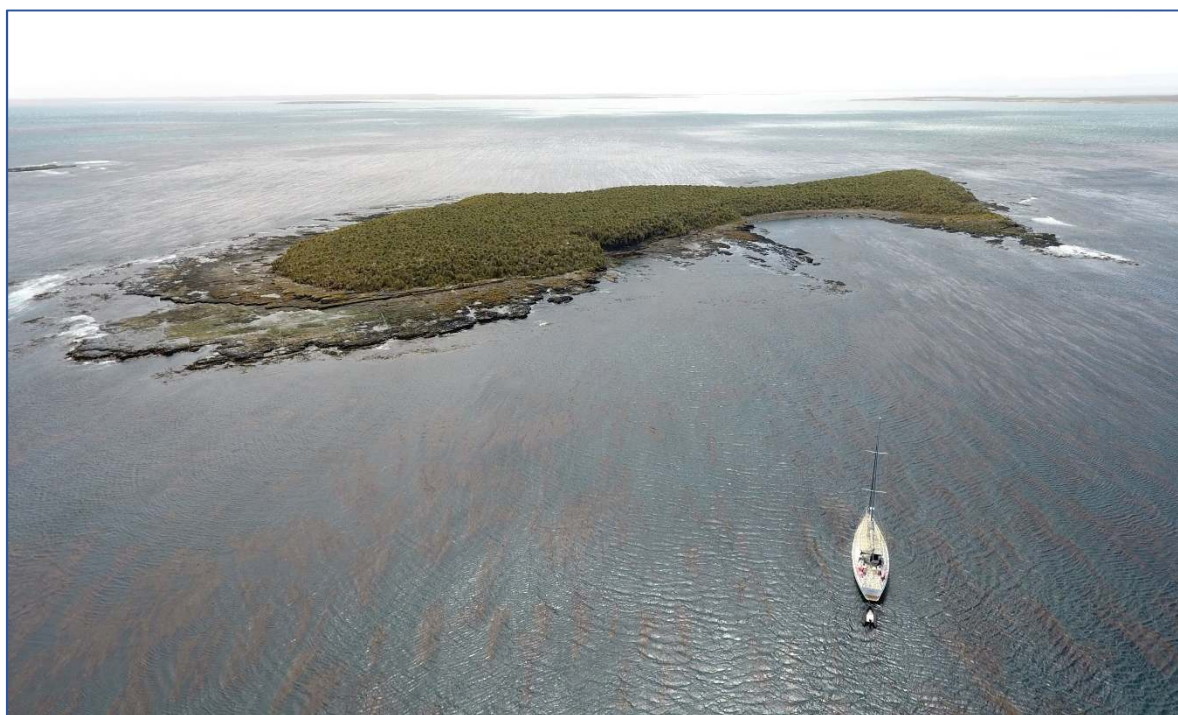




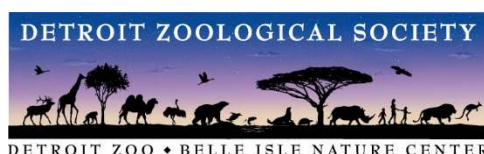
## Report on a visit to Falklands Conservation owned Centre, Motley, Sal, Middle and Pyramid Islands, Pyramid Island Islet and Little Motley/The Mot

February 2018

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Supported by



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## Summary

A trip was undertaken on the 10-14 December 2017 to Falklands Conservation (FC) owned Centre, Pyramid, Sal, Motley, and Middle Islands, Little Motley/The Mot and Pyramid Island Islet.

The purpose of the trip was to gather further baseline data on the Islands, which are rarely visited, in order to *feed into* the development of management proposals for each site. The intention is that the management considerations and information provided within this document will be used in the production of a site information sheet and a table of management actions for each Island. Consequently, this report and its content should be considered a *supporting document* and not a management planning document for the sites.

Motley Island has previously been identified as important for both plants and habitats in its designation as an Important Plant Area (Motley Island IPA), for birds in its designation as part of Lively Group Important Bird Areas (IBA), and more recently for overall biodiversity as part of Lively Island Group Key Biodiversity Area (KBA). The current surveys confirm that it continues to have considerable conservation significance in supporting 'threatened habitats' – bluegrass (*Poa alopecurus*) acid grassland and bluegrass dune grassland and rare and/or endemic plants such as hairy daisy (*Erigeron incertus*) and fuegian foxtail (*Alopecurus magellanicus*). Surveys show that the site supports possibly the second largest population globally of hairy daisy (minimum 290 plants). The site is generally species rich for plants with three further new native species recorded bringing the site total to 70. All three endemic bird species plus a notable assemblage of songbirds were recorded, and the Island may be of increasing significance for pinnipeds. Previously identified threats are erosion, introduction of alien species, and fire. These continue to be the main risks for the key features at the site, which appear in favourable status currently. Biosecurity is critical to prevent further introductions whilst control of some smaller populations of non-native species may be possible for established non-natives. Erosion is a significant problem and monitoring its spread as well as planting to prevent expansion are further priorities. Monitoring needs to occur so that any changes to key features can be acted upon.

Centre Island, Sal Island and Little Motley/The Mot are good examples of rodent free tussac islands supporting endemic Cobb's wren (*Troglodytes cobbi*) and tussacbird (*Cinclodes antarcticus*). All support Magellanic penguins (*Spheniscus magellanicus*) and a range of coastal birds species and are used to varying extents by pinnipeds. Notably Little Motley/The Mot appears to support a sooty shearwater (*Ardenna grisea*) colony and all could support populations of smaller petrels, such as grey-backed storm petrel (*Garrodea nereis*). They provide important undisturbed refuges for a range of fauna in the Choiseul Sound/Lively Sound area. Biosecurity remains the primary consideration for these sites with monitoring to identify any newly occurring threats.

Pyramid Island and Pyramid Island Islet are perhaps surprisingly rodent free and have provided new records for breeding Cobb's wren. Whilst supporting tussac habitat, they both have more open areas which currently have good populations of native violet (*Viola maculata* var. *maculata*). Biosecurity remains the primary consideration for these sites with monitoring to identify any newly occurring threats.

Middle Island, as Motley Island, has previously been identified as important for both plants and habitats in its designation as an Important Plant Area (Motley Island IPA), for birds in

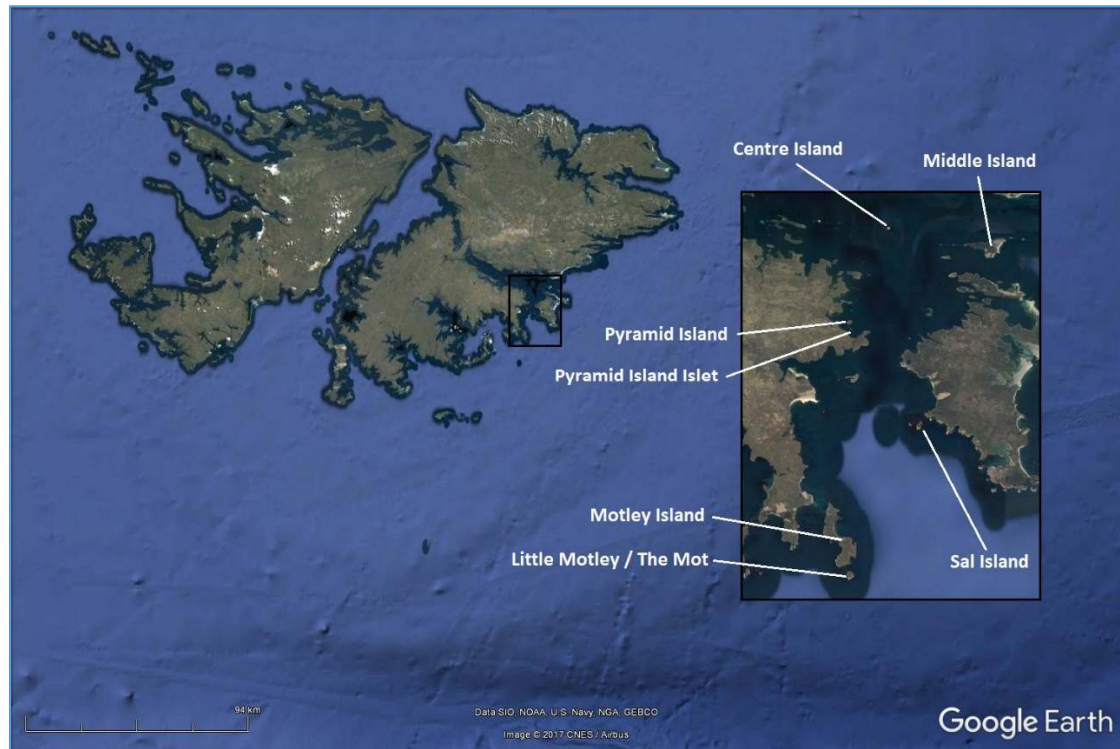
its designation as part of Lively Group IBA, and more recently for overall biodiversity as part of Lively Island Group Key Biodiversity Area (KBA). The brief surveys indicate a stable population of endemic Falkland rock-cress (*Phlebotobium maclovanum*), though under pressure from disease and a potentially reducing population of fuegian foxtail. Satellite imagery indicates significant loss of vegetation from expanding historic burns, which needs action. Other key features could not be assessed.

The trip highlighted a number of repeated management considerations across FC Island reserves, which are:

- rodent surveillance
- biosecurity measures
- monitoring pinnipeds and seabirds
- monitoring large-scale changes in vegetation and erosion
- re-vegetating eroded areas/halting erosion.

## Introduction

A trip was undertaken on the 10-14 December 2017 to Falklands Conservation (FC) owned Centre, Pyramid, Sal, Motley, and Middle Islands, Little Motley/The Mot and Pyramid Island Islet (**Figure 1**). FC staff comprised Frin Ross, Andy Stanworth, Esther Bertram and David Spivack. Paul Buzzard attended from Detroit Zoological Society. The boat *Le Sourire* was skippered and crewed by Hugues and Marie-Paul Delignieres.



**Figure 1.** Site locations within the Falkland Islands

The purpose of the trip was to gather further baseline data on the Islands, which are rarely visited, in order to *feed into* the development of management proposals for each site. The intention is that the management considerations and information provided within this document will be used in the production of a site information sheet and a table of management actions for each Island. Consequently, this report and its content should be considered a *supporting document* and not a management planning document for the sites.

Developing management plans for these sites would support objectives in the Falkland Islands Biodiversity Framework 2016-2030 and the Falklands Conservation Strategy 2015-2019.

The group landed at:

Centre Island (10 Dec.)  
Motley Island (11 and 12 Dec.)  
Little Motley/The Mot (12 Dec.)  
Sal Island (13 Dec.)  
Pyramid Island (13 Dec.)  
Pyramid Island Islet (14 Dec.)  
Middle Island (14 Dec.).



## Methods

A five day trip is not sufficient time to gather comprehensive data on the Islands. Each of the different Islands have different challenges in terms of access and movement. Given the time restrictions the main aims were to gather as much general information about the habitats and species present on each Island, including both native and non-native, as possible. This was done through circumnavigation of the Islands and boat-based photography, drone use for aerial photography, and shore visits. Lists and counts of fauna and flora observed were made for smaller numbers of species, photos of larger colonies were taken.

Plant species abundance were recorded using the DAFOR scale: **D**ominant, **A**bundant, **F**requent, **O**ccasional, and **R**are.

Bird Surveys were conducted by accumulating counts of individuals observed on transects/survey routes at the site. This usually involved walking the coastline and at least one other route bisecting the islands. Colonies of birds were logged using GPS. The likely status of each species recorded was categorised as either Breeding, Probable Breeder, Possible Breeder or Non-breeder.

Transects were conducted to survey for Magellanic penguin burrows and provide a breeding pair estimate for some sites (Sal Island  $n=20$ , Pyramid Island  $n=16$ , Motley Island  $n=33$ ). Approximately 50m long, two metre wide transects were conducted at random in tussac, with all burrows within each transect recorded. Based on the transect area and number of burrows a simple density estimate was derived and extrapolated to the tussac area of the Island (FIDB). This was corrected by the occupancy estimate derived from Motley Island (occupancy 34.7%,  $n=95$  - confirmed using a burrowscope) to derive a breeding pair estimate.

Aerial video of the sites was taken using a DJI Phantom 4 drone at Centre Island, Little Motley/The Mot, Sal Island, Pyramid Island, Pyramid Island Islet and Middle Island (incomplete).

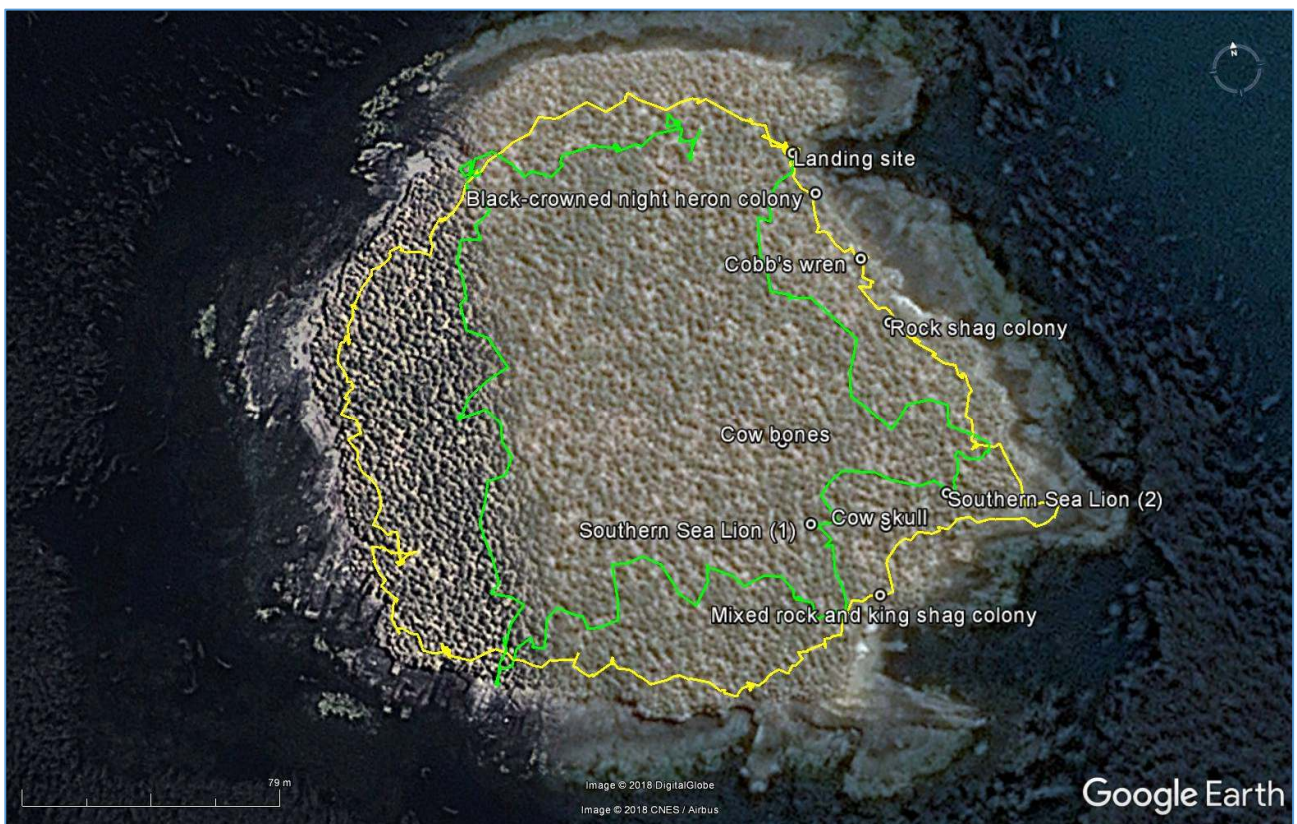
Landing sites and access considerations were recorded for future planning.

## Results

### Centre Island



**Figure 2.** Centre Island (drone image).



**Figure 3.** Centre Island survey tracks and features (Google Earth image).



### Access

A narrow sheltered cobble-beach on the north-eastern side of the Island provides good landing (**Figure 3**). A number of black-crowned night heron (*Nycticorax nycticorax falklandicus*) are nesting on both sides of the beach.



**Figure 3.** Landing site, Centre Island.

### Habitats and Flora

The Island supports a good example of tussac habitat dominated by tussac grass (*Poa flabellata*) (**Figure 4**), with many small tussac plants: no other species found (**Table 1**).



**Figure 4.** Tussac habitat, Centre Island.



| Species               | Abundance | Notes   |
|-----------------------|-----------|---|
| <b>Coastal fringe</b> |           |   |
| Tussac                | D         | Healthy stands with mature bogs and small plants. |

**Table 1.** Plant species recorded at Centre Island.

## Fauna

A small number of female southern sea lion (*Otaria byronia*) were utilising the south-eastern quarter of the island (3 visible), though sea lion faeces was present in other areas indicating wider use of the island. A single bull was present on the northern shore line. There was no evidence of breeding.

The bird assemblage was broadly comparable to previous observations (Passfield and Poncet 2009). Two rock shag (*Phalacrocorax magellanicus*) colonies were located along the south-eastern and eastern low-cliffs (see **Figure 3** and **Figure 5**). The total of seven nests is lower than the 20-30 pairs recorded by Passfield and Poncet 2009; however the overall number of individuals is comparable. The remains of three grey-backed storm petrel (*Garrodia nereis*) were found during the survey and is consistent with Passfield and Poncet's observations of remains of this species in 2009. This tussac-nesting species may be difficult to detect without focussed studies, but could certainly be breeding on the Island. The number of breeding black-crowned night heron was also comparable to that reported in 2009 (**Figure 6**).



**Figure 5.** Rock shags and king shags (*Phalacrocorax atriceps albiventer*), Centre Island.



**Figure 6.** Black-crowned night heron chicks, Centre Island.

A summary of bird species and counts made during the visit are shown below in **Table 2**.

| Species  | Number of individuals observed (unless stated) | Status            | Notes (ad – adult, y – young) |
|--|--|-------------------|-------------------------------|
| Tussacbird<br>( <i>Cinclodes antarcticus</i> )                   | 16   | Probably Breeding |                               |
| Snowy sheathbill<br>( <i>Chionis albus</i> )                     | 2  | Non-breeding      |                               |
| Grey-backed storm petrel   | unknown  | Possibly breeding | 3 sets of remains found.      |
| Magellanic penguin<br>( <i>Spheniscus magellanicus</i> )         | Estimate of 40-80 pairs                        | Breeding          |                               |
| Falklands steamer duck<br>( <i>Tachyeres brachypterus</i> )      | 12   | Breeding          | 6 ad, 6 y                     |
| Turkey vulture<br>( <i>Cathartes aura jota</i> )                 | 3  | Probably Breeding |                               |
| Rock shag  | 65   | Breeding          | 2 groups, 7 nests in total    |
| King shag  | 7  | Non-breeding      |                               |
| Black-crowned night heron  | 12   | Breeding          | 2 nests with young            |
| Kelp goose ( <i>Chloephaga hybrid malvinarum</i> )               | 9  | Breeding          | 4 ad, 5 y                     |
| Crested duck ( <i>Lophonetta specularioides specularioides</i> ) | 11   | Breeding          | 2 y                           |
| Blackish oystercatcher<br>( <i>Haematopus ater</i> )             | 2  | Probably Breeding |                               |
| Short-eared owl ( <i>Asio flammeus</i> )                         | 1  | Probably Breeding |                               |

|   |   |                      |            |
|---|---|----------------------|------------|
| Falklands thrush<br>( <i>Turdus falcklandii falcklandii</i> ) | 7 | Probably<br>Breeding | All adults |
| Dolphin gull<br>( <i>Larus scorsebiei</i> )                   | 4 | Non-<br>breeding     |            |
| Cobb's wren<br>( <i>Troglodytes cobbi</i> )                   | 3 | Probably<br>Breeding |            |

**Table 2.** Bird species recorded on Centre Island.

No evidence of rats or mice was noted during the visit and the presence of Cobb's wren and tussacbird further suggests the island continues to be rodent free.

### *Management Considerations*

#### Access

Access is good and tussac is relatively open providing relatively easy movement.

- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

#### Habitats and Flora

The existing tussac habitat appears in good state and no habitat degradation or erosion was evident. No non-natives were recorded.

- *No habitat restoration is necessary. General monitoring should track potential changes.*

#### Fauna

Survey findings provide no indication that any specific management action is necessary.

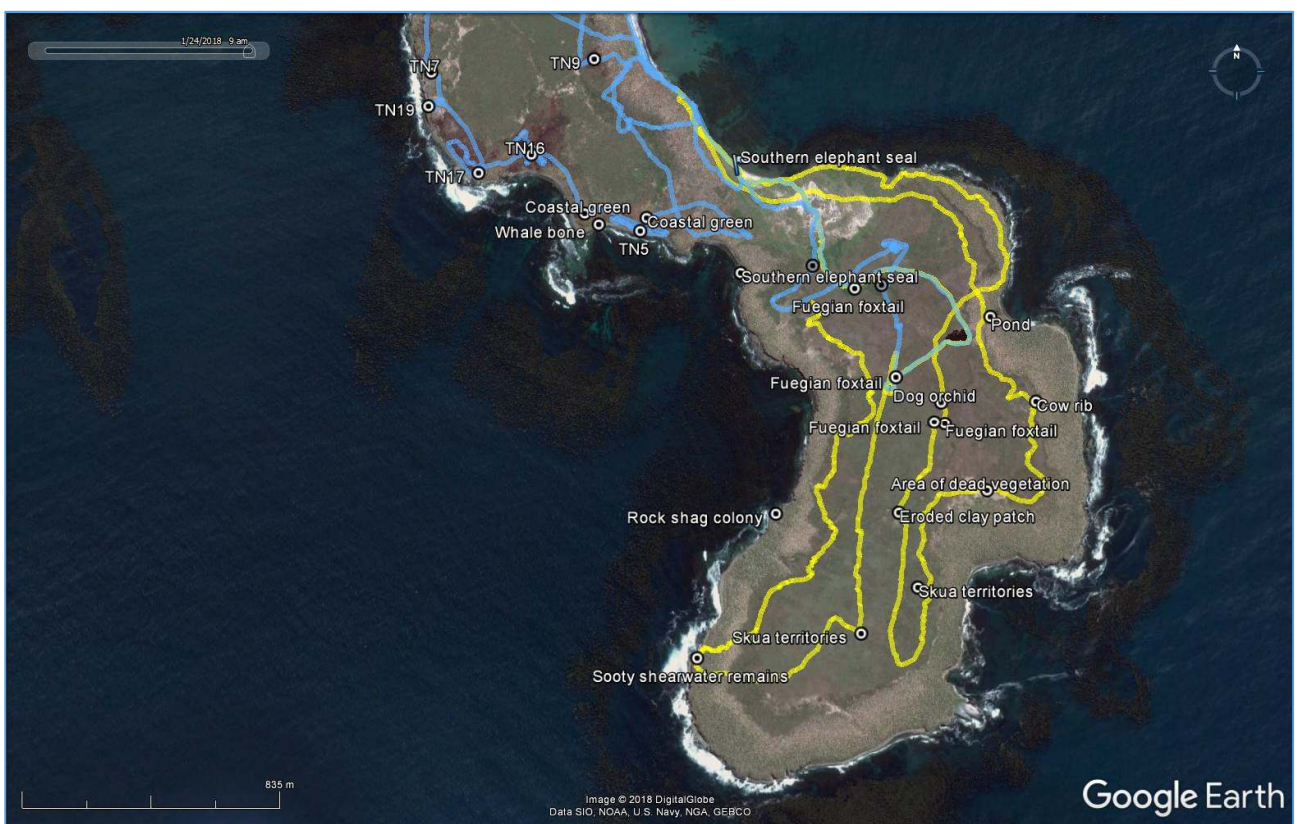
- *General monitoring should track potential changes.*
- *Observations on probable rodent free status are not conclusive - explore improved options for rodent surveillance.*



## Motley Island



**Figure 7.** Motley Island north survey tracks and features (Google Earth image).



**Figure 8.** Motley Island south survey tracks and features (Google Earth image). The track around the coastline of this part of the island was corrupted and is not shown.

## Access

There are several landing opportunities on sandy beaches or rocky platforms along the coast, sheltered from prevailing winds.



**Figure 9.** Landing site, Motley Island

## Habitats and flora

The island was found to support a wide variety of habitats with excellent examples of bluegrass grassland (**Figure 10**) and species-rich acid grassland/dry dwarf shrub heath in the southern section where notable plant populations were also recorded. In the northern section bluegrass and tussac habitats are still extensive; however, they are associated with much species-poorer acid grassland/dry dwarf shrub heath habitats. The central section of Motley was far less diverse than others, being dominated by diddle-dee heath and eroded areas (see below). Much of the island has a fringe of tussac habitat (**Figure 11**), some previously described as regenerating (Upson and Woods 2010). At the narrowest point of the island tussac now spreads across the whole width of the island, with good growth of small plants indicating that regeneration is continuing. A number of non-native or invasive plant species were also recorded.





**Figure 10.** Bluegrass acid grassland, Motley Island.



**Figure 11.** Fringing tussac habitat, Motley Island.

Key features of this island were coastal fringing and dune areas of tall, lush bluegrass and celery (*Apium austral*), much over 1m high (example at TN1 on **Figure 7**) (**Figure 12**), tussac and sword grass (*Carex trifida*) were common in wetter areas.





**Figure 12.** Bluegrass and wild celery on sand dunes, Motley Island.

#### Plants

Hairy daisy populations appeared very healthy and many plants were flowering (**Figure 14**). Survey tracks across the island recorded hairy daisy locations and number, producing a count of 290 individual plants, which is a considerable increase on the previous count of 70 (Upson 2012). Hairy daisy was only recorded in the southern section of the Island. Given the extent of the Island covered by the tracks this could only be presumed to be a lower number than the actual population size. This would mean that Motley Island supported the second largest population of this species globally.



**Figure 13.** Hairy Daisy, Motley Island.





**Figure 14.** Survey tracks showing hairy daisy locations on Motley Island (icons: white – less than 10 plants, yellow - 10 to 49 plants, orange between 52 plants, red 108 plants).

Yellow orchid (*Gavilea littoralis*) were recorded during surveys, again only in the southern half of the Island. A number of locations were recorded (**Figure 15**); however other records, though on the survey routes in the southern part of the Island, were not. The total number of yellow orchids recorded was 240 plants including flowering and non-flowering plants.



**Figure 15.** Survey tracks showing yellow orchid locations on Motley Island (icons: white – 0 to 5 plants, yellow – 6 to 10 plants, orange – 11 to 15 plants and red 15-20 plants).



Four patches of the nationally 'rare' and National Red List 'Vulnerable' fuegian foxtail (*Alopecurus magellanicus*) (Upson and Lewis 2014) were recorded (**Figure 16**). Smaller patches to the south and centre of the island did not appear to be in good condition but the larger patch to the north appeared fine.



**Figure 16.** Fuegian foxtail, Motley Island.

Species lists in **Table 3** below are for areas distinguished in the Motley Island draft Management Plan 2010-2019 (Upson et al 2010). Note that these areas were based on Google Earth images and thus were not always precisely delineated or described. Target Notes (TN) in this section refer to those on **Figures 7 and 8**. A full species list is provided in **Appendix 1**.

| Species  | Abundance | Notes  |
|--|-----------|--|
| <b>Southern Area of Bluegrass Grassland / Sand dunes (included small patches tending towards neutral and marshy grassland)</b> |           |  |
| Pigvine ( <i>Gunnera magellanica</i> )   | O         |  |
| Wild celery ( <i>Apium austral</i> )   | O         | Very tall and dominant in dune areas                               |
| Bluegrass ( <i>Poa alopecurus</i> )  | F         | Mountain and coastal varieties, tall coastal variety in dune areas |
| Mountain berry ( <i>Gaultheriapumila</i> )   | R         |  |
| Native yarrow ( <i>Acaena lucida</i> )   | R         |  |
| Prickly burr ( <i>Acaena magellanica</i> )   | O         | May be other species of <i>Acaena</i> which were not distinguished |
| Festuca sp.  | R         |  |
| Emerald-bog ( <i>Colobanthus subulatus</i> )   | R         |  |
| Falklands cudweed ( <i>Gamochaeta malvinensis</i> )  | R         |  |



|   |   |                   |
|---|---|-------------------|
| Native Woodrush ( <i>Luzula alopecurus</i> )        | R |                   |
| Sea cabbage ( <i>Senecio candidans</i> )            | R |                   |
| Christmas Bush ( <i>Baccharis magellanica</i> )     | R |                   |
| Sheep's Sorrel ( <i>Rumex acetosella</i> )          | R | Non-native        |
| Groundsel ( <i>Senecio sp.</i> )                    | R | Non-native        |
| Daisy ( <i>Bellis perennis</i> )                    | O | Non-native        |
| Stinging nettle ( <i>Urtica dioica</i> )            | R | Non-native        |
| Lesser Swine-cress ( <i>Coronopus didymus</i> )     | R |                   |
| <b>Southerly area of Bluegrass Acid Grassland</b>   |   |                   |
| Mountain bluegrass ( <i>Poa alopecurus</i> )        | D |                   |
| Small fern ( <i>Blechnum penna-marina</i> )         | R |                   |
| Scurvy Grass ( <i>Oxalis enneaphylla</i> )          | R |                   |
| Prickly burr ( <i>Acaena magellanica</i> )          | R |                   |
| Falklands smooth daisy ( <i>Senecio vaginatus</i> ) | R |                   |
| Vanilla daisy ( <i>Leucheria suaveolens</i> )       | R |                   |
| Mountain berry ( <i>Gaultheria pumila</i> )         | R |                   |
| Christmas Bush ( <i>Baccharis magellanica</i> )     | R |                   |
| Wild celery ( <i>Apium austral</i> )                | R |                   |
| Native Woodrush ( <i>Luzula alopecurus</i> )        | R |                   |
| Antarctic bedstraw ( <i>Galium antarcticum</i> )    | R |                   |
| Balsam bog ( <i>Bolax gummifera</i> )               | R |                   |
| Land tussac ( <i>Festuca contracta</i> )            | R |                   |
| Almond flower ( <i>Luzuriaga marginata</i> )        | R |                   |
| Native rush ( <i>Juncus scheuchzerioides</i> )      | R |                   |
| Vanilla daisy ( <i>Leucheria suaveolens</i> )       | R |                   |
| Dandelion / Hawkweed                                | R | May be non-native |
| <b>Small Fern Bed / Heath</b>                       |   |                   |
| Field mouse-ear ( <i>Cerastium arvense</i> )        | R |                   |
| Native rush ( <i>Juncus scheuchzerioides</i> )      | R |                   |

|  |     |                                |
|--|-----|--------------------------------|
| Diddle-dee ( <i>Empetrum rubrum</i> )  | F   |                                |
| Small fern ( <i>Blechnum penna-marina</i> )  | A   |                                |
| Mountain bluegrass ( <i>Poa alopecurus</i> )   | O   |                                |
| Scurvy Grass ( <i>Oxalis enneaphylla</i> )   | R   |                                |
| Antarctic bedstraw ( <i>Galium antarcticum</i> )   | R   |                                |
| Balsam bog ( <i>Bolax gummifera</i> )  | R   |                                |
| Native Woodrush ( <i>Luzula alopecurus</i> )   | R   |                                |
| Fuegian fescue ( <i>Festuca magellanica</i> )  | R   |                                |
| <b>Marshy grassland (some patches were dry at time of visiting, despite recent rain)</b> |     |                                |
| Fuegian couch ( <i>Elymus magellanicus</i> )   | F   | Dominated in some patches      |
| Fuegian foxtail ( <i>Alopecurus magellanicus</i> )                                       | O   |                                |
| Bluegrass ( <i>Poa alopecurus</i> )  | O   | Mountain and coastal varieties |
| Wild celery ( <i>Apium austral</i> )   | O   |                                |
| Cinnamon grass ( <i>Hierolchloe redolens</i> )   | O   |                                |
| Prickly burr ( <i>Acaena magellanica</i> )   | O   |                                |
| <b>Southerly Coastal Dwarf Shrub Heath</b>   |     |                                |
| Hairy daisy ( <i>Erigeron incertus</i> )   | R   |                                |
| Small fern ( <i>Blechnum penna-marina</i> )  | D   |                                |
| Falkland lavender ( <i>Perezia recurvate</i> )   | F   |                                |
| Mountain bluegrass ( <i>Poa alopecurus</i> )   | O   |                                |
| Fuegian fescue ( <i>Festuca magellanica</i> )  | R   |                                |
| Mountain berry ( <i>Gaultheria pumila</i> )  | R   |                                |
| Christmas bush ( <i>Baccharis magellanica</i> )  | O   |                                |
| Diddle-dee ( <i>Empetrum rubrum</i> )  | R/O | Patchy                         |
| Balsam bog ( <i>Bolax gummifera</i> )  | R   |                                |
| Native woodrush ( <i>Luzula alopecurus</i> )   | R   |                                |
| Teaberry ( <i>Myrteola nummularia</i> )  | R   |                                |
| Wiry azurella ( <i>Azorella</i>  | F   |                                |

|  |   |            |
|--|---|------------|
| <i>filamentosa</i> )                                       |   |            |
| Dusty miller ( <i>Primula magellanica</i> )                | R |            |
| Vanilla daisy ( <i>Leucheria suaveolens</i> )              | R |            |
| Native fog ( <i>Trisetum phleoides</i> )                   | R |            |
| <b>Wet Dwarf Shrub Heath (TN2)</b>                         |   |            |
| Arrow-leaved marigold ( <i>Caltha sagittata</i> )          | F |            |
| Prickly burr ( <i>Acaena magellanica</i> )                 | R |            |
| Mountain bluegrass ( <i>Poa alopecurus</i> )               | O |            |
| Fuegian couch ( <i>Elymus magellanicus</i> )               | R |            |
| Wild celery ( <i>Apium austral</i> )                       | R |            |
| Native rush ( <i>Juncus scheuchzerioides</i> )             | O |            |
| Sword grass ( <i>Carex trifida</i> )                       | R |            |
| Marsh daisy ( <i>Aster vahlii</i> )                        | R |            |
| <b>Pond Margins</b>  |   |            |
| <i>Sagina</i> sp.  | R |            |
| Lileaopsis ( <i>Lilaeopsis macloviana</i> )                | R |            |
| Wavy-hair grass ( <i>Deschampsia flexuosa</i> )            | R |            |
| Tussac ( <i>Poa annua</i> )                                | A |            |
| Wild celery ( <i>Apium austral</i> )                       | A |            |
| Sword grass ( <i>Carex trifida</i> )                       | R |            |
| Prickly burr ( <i>Acaena magellanica</i> )                 | F |            |
| <b>Dense Tussac Coastal Fringe</b>                         |   |            |
| Tussac ( <i>Poa annua</i> )                                | A |            |
| Wild celery ( <i>Apium austral</i> )                       | O |            |
| Sword grass ( <i>Carex trifida</i> )                       | R |            |
| Bluegrass ( <i>Poa alopecurus</i> )                        | A |            |
| Pimpernel ( <i>Anagallis alternifolia</i> )                | R |            |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> ) | R | Non-native |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                 | O | Non-native |
| Pineapple weed ( <i>Matricaria matricarioides</i> )        | R | Non-native |
| Daisy ( <i>Bellis perennis</i> )                           | R | Non-native |
| Annual stinging nettle ( <i>Urtica urens</i> )             | R | Non-native |
| Lesser swine-cress ( <i>Coronopus didymus</i> )            | R |            |



| Regenerating tussac across centre of island                 |     |  |
|---|-----|--|
| Tussac ( <i>Poa annua</i> )                                 | F   |  |
| Diddle-dee ( <i>Empetrum rubrum</i> )                       | O   |  |
| Mountain berry ( <i>Gaultheria pumila</i> )                 | R   |  |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                  | R   | Non-native   |
| Northerly Area of Acid Grassland / Dwarf Shrub Heath Mosaic |     |  |
| Pale maiden ( <i>Olsynium filifolium</i> )                  | R   |  |
| Small fern ( <i>Blechnum penna-marina</i> )                 | R-O |  |
| Falkland lavender ( <i>Perezia recurvata</i> )              | R   |  |
| Mountain bluegrass ( <i>Poa alopecurus</i> )                | O-A | Patchy distribution, in some areas bluegrass had died and was dislodged, lying like clumps of hay on surface of the ground. It was not clear what had caused this die back but possible causes include grass grub (found in the soil). |
| Fuegian fescue ( <i>Festuca magellanica</i> )               | R   |  |
| Mountain berry ( <i>Gaultheria pumila</i> )                 | O   |  |
| Christmas bush ( <i>Baccharis magellanica</i> )             | R   |  |
| Diddle-dee ( <i>Empetrum rubrum</i> )                       | D   |  |
| Balsam bog ( <i>Bolax gummiifera</i> )                      | R   |  |
| Native woodrush ( <i>Luzula alopecurus</i> )                | R   |  |
| White grass ( <i>Cortaderia pilosa</i> )                    | R   |  |
| Vanilla daisy ( <i>Leucheria suaveolens</i> )               | R   |  |
| Scurvy grass ( <i>Oxalis enneaphylla</i> )                  | R   |  |
| Wavy-hair grass ( <i>Deschampsia flexuosa</i> )             | R   |  |
| Wild celery ( <i>Apium austral</i> )                        | R   |  |
| Prickly burr ( <i>Acaena magellanica</i> )                  | R   |  |
| Native yarrow ( <i>Acaena lucida</i> )                      | R   |  |
| Native rush ( <i>Juncus scheuchzerioides</i> )              | R   |  |
| Falkland strawberry ( <i>Rubus geoides</i> )                | R   |  |
| Groundsel ( <i>Senecio vulgaris</i> )                       | R   | Non-native   |

|   |     |   |
|---|-----|---|
| <i>ssp. Vulgaris</i> )  |     |   |
| Mouse ear ( <i>Cerastium</i> sp.)   | R   | Non-native  |
| <b>Neutral Grassland (Coastal greens) and wet flushes, not previously mapped but common along west coast e.g. TN3, TN4, TN5 and TN6</b> |     |   |
| Buttonweed ( <i>Leptinella scariosa</i> )   | O   |   |
| Prickly burr ( <i>Acaena magellanica</i> )  | O-F |   |
| Bluegrass ( <i>Poa alopecurus</i> )   | O   |   |
| Arrow-leaved marigold ( <i>Caltha sagittata</i> )   | F   |   |
| Wild celery ( <i>Apium austral</i> )  | O   |   |
| Pigvine ( <i>Gunnera magellanica</i> )  | O-D |   |
| Tussac ( <i>Poa flabellata</i> )  | R   |   |
| Native rush ( <i>Juncus scheuchzerioides</i> )  | R-O |   |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> .)   | O-F | Non-native  |
| Sheep's sorrel ( <i>Rumex acetosella</i> )  | O-F | Non-native  |
| Daisy ( <i>Bellis perennis</i> )  | R   | Non-native  |
| Pineappleweed ( <i>Matricaria matricariodes</i> )   | O   | Non-native  |
| Annual stinging nettle ( <i>Urtica urens</i> )  | O   | Non-native  |
| Non native grasses  | R-D | Non-native. Dominate at largest coastal green area with sheep sorrel and groundsel (TN6). |
| <b>Northerly Area of Bluegrass Acid Grassland</b>   |     |   |
| Mountain bluegrass ( <i>Poa alopecurus</i> )  | D   |   |
| Small fern ( <i>Blechnum penna-marina</i> )   | F   |   |
| Prickly burr ( <i>Acaena magellanica</i> )  | O   |   |
| Wild celery ( <i>Apium austral</i> )  | R   |   |
| Non native grasses  | O   | Non-native  |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> )  | O   | Non-native  |
| <b>Northerly Coastal Dwarf Shrub Heath (not previously mapped, small patches between regenerating tussac (e.g. TN7))</b>                |     |   |
| Mountain bluegrass ( <i>Poa alopecurus</i> )  | F   |   |
| Fuegian couch ( <i>Elymus magellanicus</i> )  | R   |   |
| Buttonweed ( <i>Leptinella scariosa</i> )   | O   |   |
| Wiry azurella ( <i>Azorella filamentosa</i> )   | R   |   |
| Native rush ( <i>Juncus</i>   | R   |   |



|  |   |            |
|--|---|------------|
| <i>scheuchzerioides</i> )                                  |   |            |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> ) | R | Non-native |

**Table 3.** Plant species recorded on Motley Island, by habitat.

Liverworts (primarily *Marchantia barbatina*) were found in dense patches across the island.

### Erosion

There are significant areas of erosion on the northern section of Motley Island (from the narrowest point); it is not clear if these are expanding. Many eroded areas showed layers of orange soil – a sign of fire in the past.

Eroded patches of various sizes were a feature of the centre of the island (likely due to grazing and burning in the past). During this visit the eroded patches were very dry and it was impossible to know how successful traditional revegetation by tiller planting would be. It was also difficult to assess whether eroded areas were spreading. TN8 is a distinctive large tussac bog with some erosion around. Panorama photographs were taken including this bog for future reference with regard to changes in vegetation.

On the east coast eroded patches are relatively small and often associated with Magellanic penguin burrows:

- TN9 and TN10-11: Areas with small-scale erosion, and Magellanic penguin burrows with sheep's sorrel. The erosion does not appear to be rapidly spreading and there is some slow inward creep of native rush. Close to TN9 is an example of an area of dead bluegrass (photos on file).
- Small, very dry, areas of erosion (up to 10m wide) track the landward extent of the east coast tussac fringe to the north of TN11 to TN12. The area around TN12 is dry and may need replanting, concentrating first on the western side of the eroded areas so that seed is blown across them.

On the windward, west coast there are a large number of small eroded patches (not mapped) and some larger eroded areas which are dry and actively eroding:

- There is a significant area of erosion around TN13, this area could be replanted with bluegrass, though Magellanic penguins may hamper its establishment. Windblown peat is smothering some vegetation along the edge of this area, though there is spread of native rush from the edges of the area.
- At TN14 there is a small amount of erosion which should be replanted with tussac as a priority.
- At TN15 the ground is eroded down to clay, with some inward spread of native rush around the edges. Revegetation options include replanting with bluegrass (perhaps adding mulch and fertilizer in clay areas) or seeding with mulch.
- TN5, TN16 and TN17 indicate small areas of erosion to peat (and some down to clay at TN16) which could be replanted with tussac outside the Magellanic penguin nesting period. Combinations of bluegrass or tussac and buttonweed, sheep's sorrel and native rush are often recolonising the edges of these areas.

- TN18 Is an eroded area of tussac peat and Magellanic penguin burrows colonised around the edges by annual stinging-nettle, groundsel and pineappleweed. There is evidence of historic burn here (an orange layer in the soil). Planting would be beneficial but is not a priority.
- TN19 is a small steep eroded area with evidence of historic burns, there is some recolonisation with sorrel and tussac. This area is not a priority for replanting due to its small size.
- TN20 is a large (and steep) eroded area of peat and sand with bluegrass growing on the landward side and tussac along the coast. There are many Magellanic penguins and the ground is very dry. Coastal bluegrass is colonising some of the edges and it may be best to trial this species if revegetation is attempted.

### Test tiller plant

The windward edge of a small peaty eroded area at TN21 was planted with coastal bluegrass (3 tiller bundles) and tussac (26 tiller bundles). Because planting was carried out in the summer, old eroded bogs were placed on-top of tillers in an attempt to provide shade and trap moisture. The top 2cm of the peat were very dry but there was some moisture in underlying layers.

### Non-native and invasive plants

A number of non-native species are present as indicated below. Most are concentrated in the northern section of the island (from the narrowest point) and were often most common around Magellanic burrows where the soil is disturbed and enriched. Coastal green areas with non-native species (e.g. TN3) appeared to be maintained by geese and were relatively common in gullies along the central west coast of the island. TN6 is a large coastal green area, dominated by non-native grasses and forbs.

A small area of lyme grass was found (TN22) and uprooted by hand (this took 2 person hours). This year's seed heads had not yet matured. However some plants will regenerate from roots that were missed and a seed bank may remain in the soil.

Marram grass has been mentioned in previous reports but its location is not recorded. We did not locate any marram grass during the surveys.

### Fauna

A total of 34 southern elephant seals (*Mirounga leonina*) were recorded during the surveys on Motley Island. The majority of these were found on two beaches either side of the narrower centre section (**Figures 8 and 17**). Thirteen and 15 seals were found on the western and eastern beaches respectively, a number with identification tags (**Appendix 2**). Most of the individuals (a range of ages and sexes) were moulting and there was no sign that this is currently a breeding location; however, none of the previously documented survey visits record this species. As such a visible and notable species it is likely that this represents a new presence on Motley.



**Figure 17.** Southern elephant seal, Motley Island.

A group of southern sea lion were occupying the tussac at the northern end of Motley Island (**Figure 7**). The group comprised a single male and six females. Motley has previously been recorded as a breeding site for this species on five previous visits in 1995, 1997, 2003, 2006 and 2013 (Falkland Islands Biodiversity Database. Version7 (FIBD)). Earlier counts suggest a breeding population of 80 or so individuals or around 30-40 pups; with some animals to the northern and some to the southern ends of the Island. A visit in 2013 found only 11 pups and the current survey may point to a further reduction in numbers. This visit did not comprehensively cover the potential area for this species and given the timing it could predate the arrival of females and pupping therefore reducing the visibility of the species.

A range of topographical features, varying, good-quality native habitats and apparent lack of rodents is likely to contribute to the quality of the bird assemblage, which was particularly notable for its seeming abundance of passerines (**Table 4**). This may provide foraging opportunities for short eared-owl (**Figure 18**) which has been recorded as breeding on previous survey occasions.





**Figure 18.** Short-eared owl, Motley Island.

| Species  | Number of individuals observed unless otherwise stated | Status            | Notes (ad – adult, y – young)           |
|--|--|-------------------|---|
| Falkland steamer duck  | 148  | Breeding          | North 85 ad, 17 y<br>South 22 ad, 24 y  |
| Dolphin gull   | 27   | Non-breeding      | South 25 ad 2 y                         |
| Snowy sheathbill   | 21   | Non-breeding      | South 21                                |
| Falklands thrush   | 25   | Probably Breeding | South 12 North 13                       |
| Tussacbird   | 294  | Probably Breeding | South 196, North 98                     |
| Kelp goose   | 111  | Breeding          | South 28 ad, 41 y,<br>North 16 ad, 26 y |
| White-bridled finch  | 66   | Probably Breeding | North 43, South 23                      |
| Cobb's wren  | 57   | Breeding          | South 34, North 23                      |
| Black-crowned night heron  | 11   | Possibly breeding | North 2, South 9                        |
| Turkey vulture   | 17   | Probably Breeding | South 11, North 6                       |
| Rock shag  | 155 pairs  | Breeding          | South 85 pairs,<br>North 70 pairs       |
| Dark-faced ground tyrant<br>( <i>Muscisaxicola maclovianus maclovianus</i> ) | 32   | Probably Breeding | North 8, South 24                       |
| King shag  | 37   | Breeding          | South 37                                |
| Short-eared owl  | 1  | Probably Breeding | South                                   |
| Crested duck ( <i>Lophonetta specularioides</i> )                            | 49   | Breeding          | South 23 ad 5 y,<br>North 19 ad 2 y     |

|  |              |                                 |  |
|--|--------------|---------------------------------|--|
| <i>specularioides</i> )  |              |                                 |  |
| Upland goose<br>( <i>Chloephaga hybrid malvinarum</i> )          | 99           | Breeding                        | South 5 ad, 3 y,<br>North 91 ad                      |
| Magellanic oystercatcher<br>( <i>Haematopus leucopodus</i> )     | 16           | Probably<br>breeding            | North 9, South 7                                     |
| Black-chinned siskin<br>( <i>Carduelis barbata</i> )             |              | Unknown                         | South 8 North 3                                      |
| Magellanic snipe<br>( <i>Gallinago paraguaiae magellanica</i> )  | 38           | Probably<br>breeding            | North 15 South 23                                    |
| Long-tailed meadowlark<br>( <i>Sturnella loyca falklandica</i> ) | 10           |                                 | North 10, South 7                                    |
| Brown skua ( <i>Catharacta Antarctica</i> )                      |              |                                 | South 36 (mostly<br>paired), North 22                |
| Kelp gull ( <i>Larus dominicanus</i> )                           | 30           | Breeding (1 pair<br>copulating) | South 14 north 10<br>ad 6 y                          |
| Blackish oystercatcher   |              |                                 | North 6, South 2                                     |
| Variable hawk ( <i>Buteo polyosoma</i> )                         | 1            |                                 | South 1  |
| Striated caracara<br>( <i>Phalcoboenus australis</i> )           | 1            |                                 | South 1  |
| Grass wren ( <i>Cistothorus platensis falklandicus</i> )         | 10           |                                 | north 5, south 5                                     |
| Southern caracara<br>( <i>Caracara plancus</i> )                 | 1 pair       |                                 | North 2  |
| Speckled teal ( <i>Anas flavirostris</i> )                       | 4            |                                 |  |
| Magellanic penguin   | 12,442 pairs | Breeding                        | Estimate based on<br>burrow density and<br>occupancy |

**Table 4.** Bird species recorded on Motley Island.

The remains of four sooty shearwaters (*Ardenna griseus*) were found in tussac at the southern end of the island. A very limited search was conducted of the area, but no burrows (apart from those of Magellanic penguins) were found. Given the high likelihood of a colony of this species on Little Motley/The Mot (see below) these birds could be predated at sea, or at the colony, but brought back to Motley for consumption. Given its rodent free status, mature tussac fringe and nearby colony, it is possible that sooty shearwaters may use Motley Island, though at a distance, no birds were seen swarming over the southwestern end of the island whilst they were doing so over Little Motley/The Mot.

Woods and Woods (1997) estimated between 101-1000 breeding pairs of Magellanic penguin for the island. The current estimate based on burrow density and occupancy is significantly larger. Whilst there are a number of ways an overestimate could occur, the comparable densities with Motley and other islands may indicate that, given the size of Motley and the amount of tussac, there has been a tendency to underestimate the Magellanic penguin population. Populations also fluctuate making comparisons difficult. Although possibly not an order of magnitude larger, it is likely that the population on Motley considerably exceeds the previous estimate.

There was no direct evidence of rodents being present on the island. The presence of Cobb's wren and tussacbird also indirectly point towards the island being rodent free.

### *Management Considerations*

#### Access

Fairly reliable access at a range of landing sites.

- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

#### Habitats and Flora

Motley is botanically very significant for both the Falklands and globally with a wealth of habitats and species, and notably its population of hairy daisy. This is reflected in its IPA designation (IPA12, Upson 2012). The IPA key features certainly need management consideration.

- *Monitor hairy daisy population. Access to the island is likely to be every few years at best with current resource. The area occupied by hairy daisy is large and complete coverage would be very difficult. The limited information on the ecology of this species reduces the certainty of success of monitoring proposals; however, a limited number of fixed or random quadrats in the area may be appropriate. High priority.*
- *Monitor bluegrass extents. This could be achieved by drone or satellite imagery at several year intervals. High priority.*
- *Investigate the possibility of satellite mapping to identify areas where erosion is increasing and prioritise these for revegetation trials, though vegetative assessments using aerial photography may also allow monitoring of the development of any erosion. High priority.*
- *Replant eroded areas. Many of the eroded areas will be challenging to replant due to the presence of Magellanic penguins and the dry soil (often eroded down to clay or including mobile sand), it may therefore be worthwhile carrying out small winter test-plants with tussac and bluegrass in a range of areas to identify the most beneficial locations and species for large plant-outs. Alternatively, visits in the winter could be made to plant significant eroded areas with bluegrass and tussac (it would be likely to take a small team 1-2 weeks to replant these areas with tillers collected on the island). In the absence of better information, prioritise largest peat and clay areas on east (windward) coast (see circular tracks on map around significant eroded areas). The eroded areas are well spread out and would probably take a couple of weeks to replant with a team of 6-8 people, collecting tillers from the island. Magellanic penguins live close to many of the eroded areas and so planting would be best carried out in very early winter, giving plants some chance to establish before nesting time. Military assistance may be available as the site is relatively accessible from Mare Harbour and this could help with larger areas of planting.*
- *Spray any remaining lyme grass (Leymus arenarius) following advice from*



*Department of Agriculture, Falkland Islands Government (this is best done in the spring but can be trialled at other times of year) and monitor the area for surviving plants. High priority.*

- *Marram grass was recorded in an earlier habitat survey but has not been relocated, visitors should be briefed about the appearance of marram grass and be vigilant for it. If it is found it should be mapped and eradicated as a priority (because of its potential to compete with native bluegrass and tussac, and its ability to spread rapidly). High priority.*
- *Monitor broad changes in central area of island (i.e. recovery from diddle-dee dominated heath to a more diverse community, likely dominated by bluegrass) and eroded areas.*
- *Consider use of high resolution satellite imagery for monitoring broad changes and more clearly defining habitat types for future surveys.*
- *Investigate previous grazing and fire history to better understand general recovery process. This learning could help restoration plans and priorities in other grazed areas.*

#### Fauna

Motley is a large rodent free island in close proximity to sites of potential value for a range of burrowing petrel species. It has stands of mature tussac that would provide suitable nesting habitat. Whilst no clear signs were evident of the presence of such species, a much more thorough search/survey would be necessary to rule it out.

- *A more structured assessment of the possibility of the Island supporting burrowing seabird populations would provide useful baseline information for site management planning and Lively Group Important Bird Area (IBA).*

The island appears to be developing as a site used by southern elephant seal; however, use of the site by southern sea lion *may* be declining.

- *It would be beneficial to collect information on pinniped numbers at the site on any subsequent visits, and also monitor breeding status and potentially productivity.*

There was no direct evidence of rodents being present on the island. The presence of numerous Cobb's Wren and Tussacbird also indirectly point towards the island being rodent free.

- *These observations are not conclusive. Explore options for improved incursion surveillance for rodents.*

## Little Motley/The Mot



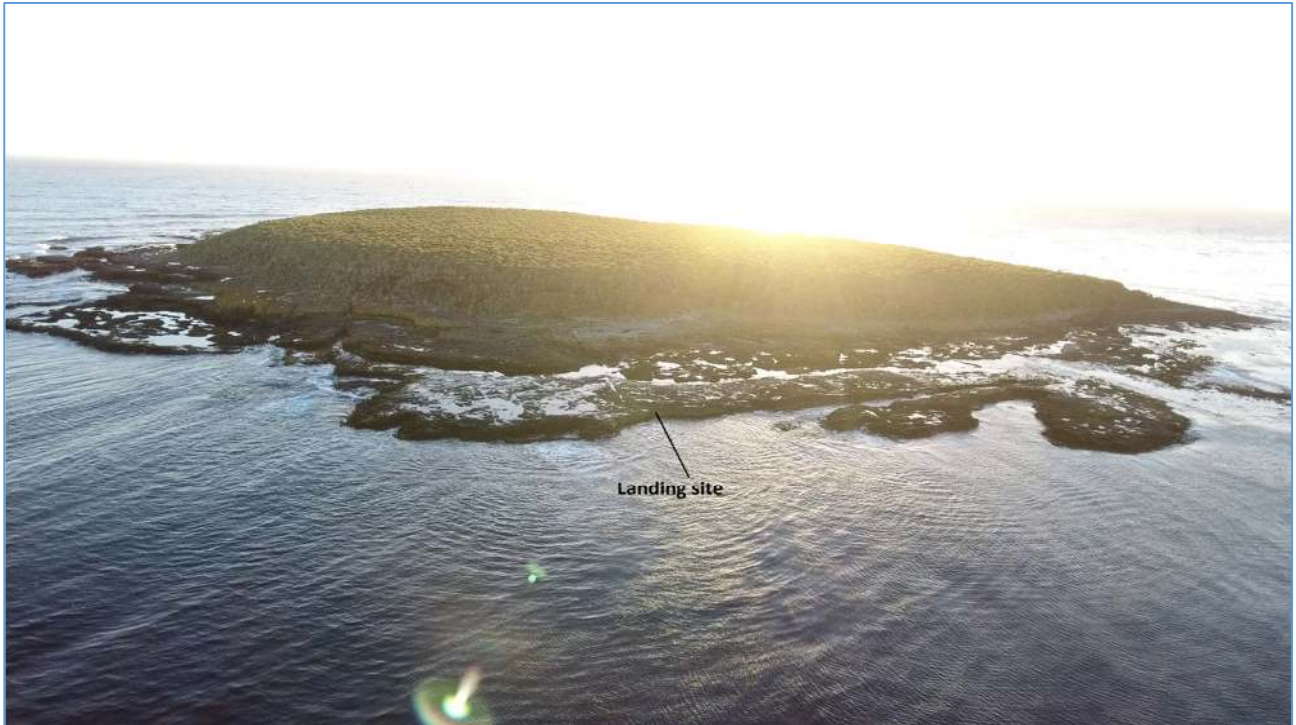
**Figure 19.** Little Motley/The Mot (drone image).



**Figure 20.** Little Motley/The Mot (Google Earth image).

## Access

Access is extremely challenging with extensive kelp beds, and much water movement over wave-cut platforms. Any swell makes getting ashore safely a significant risk and landing should not be attempted. Landing took place on a falling tide onto the southern end of the rocky platform, avoiding the northern section where a deep gully with rushing tide prevents access to the main island.



**Figure 21.** Landing site, Little Motley/The Mot.

Limited opportunities for access by several survey personnel and time limitations due to sea conditions meant that a full survey of the island was not conducted and approximately 1hr was spent by A. Stanworth covering as much ground as possible. The southwestern section of the island was not reached.

## Habitats and flora

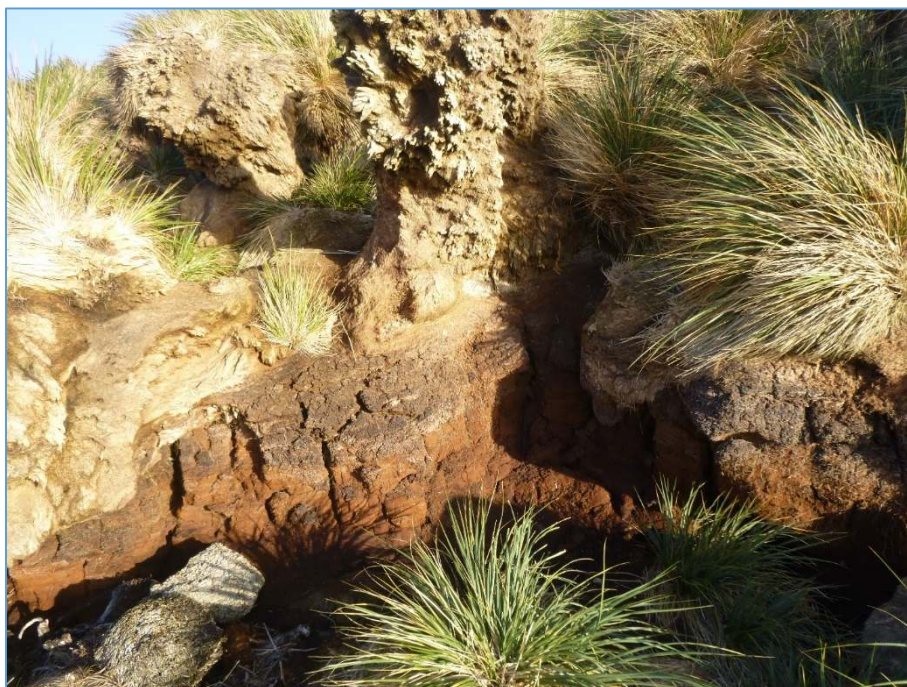
The island supports a good example of tussac habitat dominated by tussac grass (**Figure 22**) with a single record of lesser swine-cress being the only other native plant recorded. Non-native sheep's sorrel and groundsel were both also present.





**Figure 22.** Dense tussac on Little Motley/The Mot.

There was evidence of previous burning through ‘burnt clay’ showing on the coast (**Figure 23**) as reported by Woods and Morrison 1998; however, there was little evidence of ‘charred sides of large bogs’ as also described by them and the tussac would not now be described as ‘fairly open’, indicating signs of recovery.



**Figure 23.** Burnt soil horizon, Little Motley/The Mot.

### *Fauna*

A total of 19 southern elephant seal were hauled out on a cobble beach on the east side of the island. Five male and five female southern sea lion were distributed throughout the tussac and shoreline. A record from 1998 by R. Woods and M. Morrison (FIBD) simply states the presence of elephant seals.



**Figure 24.** Southern elephant seals on Little Motley/The Mot. Motley Island in the background.

Immediately following the visit several hundred sooty shearwater were observed rafting to the east southeast of the island. Between 2150 and 2230hrs the rafting birds swarmed over the southwest corner of the island and were seen to land, the numbers of birds swarming lessening during this period. It is considered very unlikely that rafting, swarming and landing on the island would occur without a breeding colony, and, as such, there is high confidence that a breeding colony is present on Little Motley/The Mot. This would have to be confirmed by the direct observation of breeding birds in burrows.

Those bird species recorded opportunistically during the period ashore are shown in **Table 5** below.

| <b>Species</b>         | <b>Number of individuals observed unless stated</b> | <b>Status</b>     | <b>Notes</b>   |
|------------------------|---|-------------------|--|
| Falklands steamer duck | 85  | Breeding          | Gathered on wave-cut platform/landing area                                     |
| Magellanic penguins    | High 10s to low 100s                                | Breeding          |  |
| Sooty shearwater       | High 100s to low 1000s                              | Probably breeding | Rafting and swarming activity observed. Birds landing on the island at sunset. |
| Blackish oystercatcher | 2   | Probably breeding |  |
| Rock shag              | 7 pairs   | Breeding          | Count from drone video   |



|                           |     |                   |               |
|---------------------------|-----|-------------------|---------------|
| Crested duck              | 1   | Possibly breeding |               |
| Tussacbird                | 20+ | Probably breeding |               |
| Kelp goose                | 7   | Breeding          | Young present |
| Striated caracara         | 2   | Breeding          | Nest located  |
| Black-crowned night heron | 2   | Possibly breeding |               |
| Cobb's wren               | 2   | Probably breeding |               |
| Snowy Sheathbill          | 4   | Non-breeding      |               |

**Table 5.** Birds recorded on Little Motley/The Mot.

There was no direct evidence of rodents being present on the island. The presence of Cobb's wren and tussacbird also indirectly point towards the island being rodent free.

### *Management Considerations*

#### Access

Access is difficult and comes with associated risks of injury, immersion and stranding.

- *Landing should only occur by able bodied personnel with suitable safety and communications equipment. No-one should be put ashore in anything but predictable good conditions were being able to leave the Island is assured, unless overnight stays are planned and provisioned for.*
- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

#### Habitats and Flora

Habitats appear to be in favourable conditions, having apparently recovered from a previous fire. The two non-native species recorded would be incredibly difficult to eradicate and pose no risk to the tussac habitat.

- *No habitat restoration is necessary. Monitoring should be used to track potential changes.*

#### Fauna

There appear to be no imminent threats to the fauna at the site itself. There was insufficient time to make a thorough survey of the site.

- *Monitoring should be used to track potential changes.*
- *Specifically, it would be useful to confirm breeding for sooty shearwaters, and potentially other burrowing seabirds and derive breeding pair estimates to inform future assessments of the Lively Island Group IBA.*
- *Observations on probable rodent free status are not conclusive. Explore improved options for rodent surveillance.*



## Sal Island



**Figure 25.** Sal Island (drone image).



**Figure 26.** Sal Island survey tracks and features (Google Earth image).

### Access

Fairly sheltered access from prevailing winds and swell is located on a rock plateau to the east of the island.



**Figure 27.** Landing site, Sal Island.

#### *Habitats and Flora*

The Island supports a good example of tussac habitat dominated by tussac grass (**Figures 28 and 29**): the coastal fringe had low species diversity and few introduced species (**Table 5**). A low lying coastal section to the northeast supported more open tussac habitat with stonecrop (*Crassula moschata*).

| Species   | Abundance | Notes      |
|---|-----------|------------|
| <b>Coastal fringe</b>   |           |            |
| Tussac ( <i>Poa flabellata</i> )                                  | D         |            |
| Buttonweed ( <i>Leptinella scariosa</i> )                         | R         |            |
| Wild celery ( <i>Apium austral</i> )                              | R         |            |
| Stonecrop   | O         |            |
| Thrift plantain ( <i>Plantago barbata</i> ssp. <i>monanthos</i> ) | R         |            |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> )        | R         | Non-native |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                        | R         | Non-native |

**Table 5.** Plant species recorded on Sal Island.





**Figure 28.** Sal Island showing coastal fringe dominated by tussac grass.



**Figure 29.** Mature tussac habitat on Sal Island.





**Figure 30.** Open tussac habitat in the splash zone where stonecrop is abundant, Sal Island.

### *Fauna*

A total of 16 bull southern sea lion were hauled out on a cobble beach on the east side of the island. No other sea lions were recorded. This is a significant reduction from 146 individuals (confirmed breeding) reported by Thompson 2003 and 47 juveniles reported in 2008 (FIDB).



**Figure 31.** Haul out for bull southern sea lions on Sal Island.

Five separate remains of small petrel were found along the survey tracks, with some

identified as grey-backed storm petrel. As with Centre Island, the presence of several remains may indicate the presence of this species; however, this species could be caught over water by peregrine falcon (*Falco peregrinus cassini*) or short-eared owl and brought to the island for consumption. A number of smaller burrows were checked using a burrowscope; however, no evidence of any other burrowing seabird species was found.

There is no previous extensive survey of birds for the island (FIBD). A summary of bird observations made during the survey is provided in **Table 6** below. The assemblage could be considered 'typical' of a small rodent free, tussac-dominated island in East Falkland.

| Species                   | Number of individuals observed unless stated | Status            | Notes (ad – adult, y – young)                            |
|---------------------------|--|-------------------|--|
| Magellanic penguin        | 1217 pairs                                   | Breeding          | Based on simple density estimate corrected for occupancy |
| Grey-backed storm petrel  | unknown                                      | Possibly breeding | Remains of 5 separate individuals were found             |
| Falklands steamer duck    | 19   | Breeding          | 6 ad 13 y  |
| Blackish oystercatcher    | 4  | Breeding          | 2 nests found  |
| Rock shag                 | 51   | Probably breeding | Colony on map  |
| King shag                 | 7  | Probably breeding |  |
| Tussacbird                | 38+  | Probably breeding |  |
| Kelp goose                |  | Breeding          | 18 ad 16 y   |
| Crested duck              | 38   | Breeding          | 30 ad 8 y  |
| Magellanic oystercatcher  | 29   | Breeding          |  |
| White-rumped sandpiper    | 2  | Non-breeding      |  |
| Dark-faced ground tyrant  | 7  | Probably breeding |  |
| Black-crowned night heron | 5  | Possibly breeding |  |
| Cobb's wren               | 10   | Breeding          |  |
| White-bridled finch       | 11   | Probably breeding |  |
| Turkey vulture            | 6  | Probably breeding |  |
| Crested caracara          | 1  | Possibly breeding |  |
| Snowy sheathbill          | 4  | Non-breeding      |  |
| Dolphin gull              | 5  | Non-breeding      |  |
| Black-throated siskin     | 2  | Probably breeding |  |
| Falklands thrush          | 2  | Probably breeding |  |
| Upland goose              | 1 pair                                       | Probably Breeding |  |

**Table 6.** Birds recorded on Sal Island.

On departing Sal Island 180 South American terns (*Sterna hirundinacea*) were observed on the unnamed rock to the west of the island.

There was no direct evidence of rodents being present on the island. The presence of Cobb's wren and tussacbird also indirectly point towards the island being rodent free.

### *Management Considerations*

#### Access

Fairly reliable and safe access under appropriate conditions.

- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

#### Habitats and Flora

Habitats appear to be in favourable condition. The two non-native species recorded would be incredibly difficult to eradicate and pose no risk to the tussac habitat.

- *No habitat restoration is necessary. Monitoring should be used to track potential changes.*

#### Fauna

There appear to be no imminent threats to the fauna at the site itself. The apparent significant reduction in southern sea lions at the site and possible cessation of breeding may be a genuine decline or late arrival of breeding females. It may prove to be temporary.

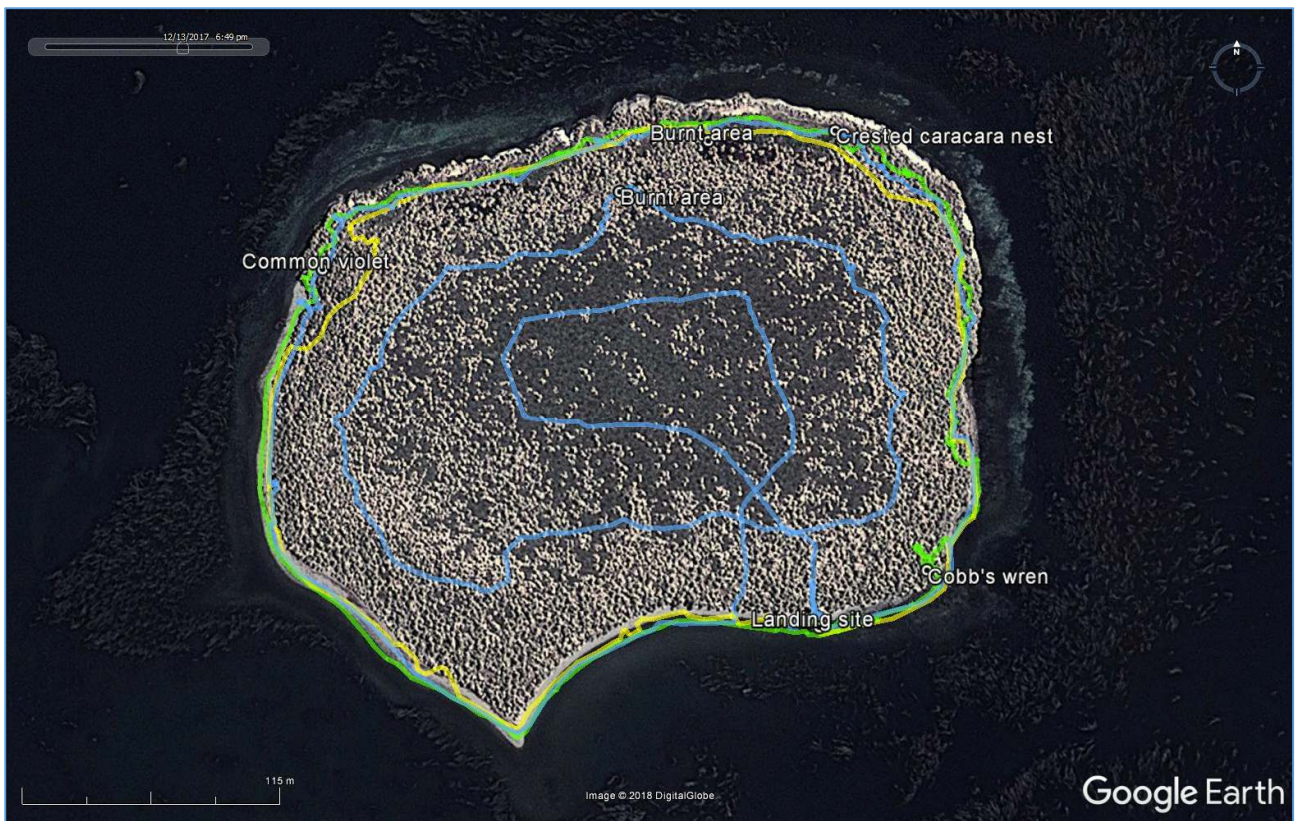
- *Monitoring should be used to track potential changes.*
- *Specifically it would be useful to establish possible breeding for grey-backed storm petrel, to inform future assessments of the Lively Island Group IBA.*
- *Observations on probable rodent free status are not conclusive. Explore improved options for rodent surveillance.*



## Pyramid Island



**Figure 32.** Pyramid Island (drone Image).



**Figure 33.** Pyramid Island (Google Earth Image) showing survey tracks and features.



## Access

A gently shelving shingle beach on the south of the island provided easy access; however, sea state conditions were favourable. Access along the sheltered eastern side in strong prevailing winds may prove difficult due to surrounding kelp, rocky shore and low cliffs.



**Figure 34.** Pyramid Island, landing site.

## Habitats and Flora

The island supports a tussac grass dominated coastal fringe (**Figure 35**), with patches of a heath/neutral grassland mosaic (**Figure 36**). In the central areas of the island some large tussac bogs were dying back or completely dried out (**Figure 37**), however there were significant numbers of small tussac plants and it appeared that they could compete favourably with the diddle-dee heath. Non-native species were common in neutral grassland patches but a notable feature of these patches was the unusually high abundance of common violets (**Figure 38**). There were no signs of Queen of the Falklands Fritillary (*Yramea cytheris*) butterflies or caterpillars for which the violet is a food plant. Mosses and liverworts (primarily *Marchantia barbatina*) were found in patches around the coast and there were a small number of puffball mushrooms (species unknown).

Tussac peat did not appear deep on this island compared to the others we visited and along the coast were occasional small patches of erosion (**Figure 39**) some with orange soil suggesting a historic burn (**Figure 40**).



**Figure 35.** Low-lying coastal fringe habitat dominated by tussock grass, Pyramid Island.



**Figure 36.** Neutral grassland/heath mosaic, Pyramid Island.





**Figure 37.** Die-back of large tussock grass bogs, Pyramid Island.



**Figure 38.** Large patch of common violet, Pyramid Island.





**Figure 39.** Bare ground in a previously burnt area, Pyramid Island.



**Figure 40.** Previously burnt soil, Pyramid Island.

A summary of habitats and plant species recorded during the survey on Pyramid Island is given in **Table 7** below.

| Species  | Abundance | Notes                                   |
|--|-----------|---|
| <b>Coastal fringe – tussac dominated areas</b> |           |   |
| Tussac ( <i>Poa flabellata</i> )               | D         | Small plants were well grazed by geese. |
| Buttonweed ( <i>Leptinella scariosa</i> )      | R         |   |
| Sea cabbage ( <i>Senecio</i>                   | R         |   |

|  |   |   |
|--|---|---|
| <i>candidans</i> )   |   |   |
| Mountain berry ( <i>Gaultheria pumila</i> )                | R |   |
| Prickly burr ( <i>Acaena magellanica</i> )                 | R |   |
| Callitriche ( <i>Callitriche Antarctica</i> )              | R |   |
| Goosefoot ( <i>Chenopodium macrospermum</i> )              | R |   |
| Thrift plantain ( <i>Plantago barbata</i> )                | R |   |
| <i>Sagina</i> sp.  | R | Non-Native                              |
| Daisy ( <i>Bellis perennis</i> )                           | O | Non-native                              |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                 | O | Non-native                              |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> ) | R | Non-native                              |
| <b>Heath – neutral grassland patches</b>                   |   |   |
| Diddle-dee ( <i>Empetrum rubrum</i> )                      | A | Small plants were well grazed by geese. |
| Buttonweed ( <i>Leptinella scariosa</i> )                  | O |   |
| Christmas bush ( <i>Baccharis magellanica</i> )            | O |   |
| Mountain berry ( <i>Gaultheria pumila</i> )                | O |   |
| Prickly burr ( <i>Acaena magellanica</i> )                 | O |   |
| Common violet ( <i>Viola maculata</i> )                    | R |   |
| Native yarrow ( <i>Acaena lucida</i> )                     | O |   |
| Small fern ( <i>Blechnum penna-marina</i> )                | R |   |
| Non-native short grasses                                   | O | Non-Native                              |
| Daisy ( <i>Bellis perennis</i> )                           | F | Non-native                              |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                 | R | Non-native                              |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> ) | R | Non-native                              |

**Table 7.** Plants species recorded on Pyramid Island.

## Fauna

Three female southern sea lion were resting in tussac habitat on the northern side of the island (**Figure 41**).





**Figure 41.** Southern sea lion, Pyramid Island.

The most significant record for the site was the first recording of Cobb's wren (**Figure 42**) which has not previously been recorded, though tussacbird was observed in 1993 and 2010 (FIBD). It is a good indication of its rodent free status, despite its proximity to the East Falkland mainland. During the survey three individuals were sighted.



**Figure 42.** Cobb's wren, a first record for Pyramid Island.

The site was recorded as a breeding location for crested caracara in 2008 (FIDB) and a single pair of nesting crested caracara were reported on the current survey. Potentially this has been a breeding site for this species (perhaps a single pair, given the size of the island) for around 10 years.

A summary of bird observations made during the survey is provided in **Table 8** below. Again the assemblage could be considered ‘typical’ of a small rodent free, tussac-dominated island in East Falkland.

| Species                  | Number of individuals observed unless stated | Status            | Notes (ad – adult, y – young)                  |
|--------------------------|--|-------------------|--|
| Falkland steamer duck    | 13   | Breeding          | 5 ad, 8 y                                      |
| Falklands thrush         | 12   | Probably breeding |  |
| Tussacbird               | 24   | Probably breeding |  |
| Kelp goose               | 8  | Breeding          | 2 ad, 6 y                                      |
| Cobb’s wren              | 3  | Breeding          | First record                                   |
| Dark-faced ground tyrant | 3  | Probably breeding |  |
| Crested duck             | 7  | Probably breeding |  |
| Upland goose             | 4  | Probably breeding |  |
| Black-throated siskin    | 5  | Possibly breeding |  |
| Brown-hooded gull        | 2  | Non-breeding      |  |
| Kelp gull                | 1  | Non-breeding      |  |
| Blackish oystercatcher   | 3  | Possibly breeding |  |
| Crested caracara         | 1  | Breeding          |  |
| Magellanic penguin       | 364 pairs                                    | Breeding          | Estimate based on burrow density and occupancy |

**Table 8.** Bird species recorded on Pyramid Island.

There was no direct evidence of rodents being present on the island. The presence of Cobb’s wren and tussacbird also indirectly point towards the island being rodent free.

### *Management Considerations*

#### Access

Fairly reliable and safe access under appropriate conditions.

- *It is important to ensure that biosecurity elements of FC’s Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

#### Habitats and Flora

Despite a small area of bare ground due to an historic burn and some die-back in older tussac bogs, overall habitats appear to be in favourable condition. There are indications of regrowth. The non-native species present would be incredibly difficult to eradicate and pose no significant risk to the tussac habitat.

- *No high priority habitat restoration is necessary. Monitoring should be used to track*

*potential changes and could record tussac re-establishment using drone footage and check small eroded areas (drone and on ground) for any signs of new active erosion. Winter visits to replant with tussac could be undertaken if there are any signs of erosion.*

## Fauna

There appear to be no imminent threats to the fauna at the site itself.

- *Monitoring should be used to track potential changes.*
- *Observations on probable rodent free status are not conclusive. Explore improved options for rodent surveillance.*



## Pyramid Island Islet



**Figure 43.** Pyramid Island Islet (foreground) (drone image)



**Figure 44.** Pyramid Island Islet (Google Earth image) with survey tracks and features.

## Access

Shallow water and extensive kelp prevented a landing attempt from the north side of the islet. A shingle beach on the southern side provided good access (**Figure 44**).



**Figure 45.** Landing Site on Pyramid Island Islet.

## Habitats and Flora

A tussac-dominated islet, with similarities to Pyramid Island in that the site had a central patch of neutral grassland with a few introduced species and common violets (**Figure 46 and 47**).

A summary of habitats and plant species recorded during the survey on Pyramid Island Islet is given in **Table 9** below.

| Species                                    | Abundance | Notes                                  |
|--|-----------|--|
| <b>Whole area</b>                          |           |  |
| Tussac ( <i>Poa flabellata</i> )           | D         | Small plants were well grazed by geese |
| Sea cabbage ( <i>Senecio candidans</i> )   | R         |  |
| Prickly burr ( <i>Acaena magellanica</i> ) | O         |  |



|  |   |                   |
|--|---|-------------------|
| Daisy ( <i>Bellis perennis</i> )                           | R | Non-native        |
| Sheep's sorrel ( <i>Rumex acetosella</i> )                 | R | Non-native        |
| Groundsel ( <i>Senecio vulgaris</i> ssp. <i>vulgaris</i> ) | R | Non-native        |
| Diddle-dee ( <i>Empetrum rubrum</i> )                      | R |                   |
| Common violet ( <i>Viola maculata</i> )                    | R |                   |
| Native yarrow ( <i>Acaena lucida</i> )                     | O |                   |
| Small fern ( <i>Blechnum penna-marina</i> )                | R |                   |
| Non-native short grasses                                   | R | Non-Native        |
| Southern mudwort ( <i>Limosella australis</i> )            | R | Nationally 'rare' |

**Table 9.** Plant species recorded on Pyramid Island Islet



**Figure 46.** Tussac and neutral grassland habitats, Pyramid Island Islet.





**Figure 47.** Patch of native violet, Pyramid Island Islet.

### *Fauna*

The limited size of the islet is likely to prevent a significant faunal assemblage; however, the visit provided the first record for the site for Cobb's wren (**Figure 48**), which must support a very small population, and three South American tern nests with eggs (**Figure 49**).



**Figure 48.** Cobb's wren, a first record for Pyramid Island Islet.



**Figure 49.** Nesting South American terns on Pyramid Island Islet

A summary of bird observations made during the survey is provided in **Table 10** below.

| Species                  | Number of individuals observed unless stated | Status            | Notes (ad- adult, y – young) |
|--------------------------|--|-------------------|------------------------------|
| Falklands steamer duck   | 5  | Breeding          | 4 ad 1 y                     |
| Blackish oystercatcher   | 4  | Breeding          | Nest observed                |
| Magellanic oystercatcher | 2  | Probably breeding |                              |
| Tussacbird               | 6  | Probably Breeding |                              |
| South American tern      | 12   | Breeding          | 3 nests observed             |
| Brown-hooded gulls       | 8  | Non-breeding      |                              |
| Kelp gulls               | 10   | Non-breeding      |                              |
| Brown skua               | 2  | Non-breeding      |                              |
| Falkland's thrush        | 2  | Probably breeding |                              |
| Two-banded plover        | 2  | Possibly Breeding |                              |
| Crested duck             | 4  | Possibly Breeding |                              |
| Cobb's wren              | 2  | Breeding          | First record                 |
| Dolphin gull             | 2  | Non-breeding      |                              |
| White-rumped sandpiper   | 2  | Non-breeding      |                              |

**Table 10.** Bird species recorded on Pyramid Island Islet.

There was no direct evidence of rodents being present on the islet. The presence of Cobb's wren and tussacbird also indirectly point towards the islet being rodent free.

## *Management Considerations*

Fairly reliable and safe access under appropriate conditions.

- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

Habitats appear to be in favourable condition. The two non-native species would be incredibly difficult to eradicate and pose no risk to the tussac habitat.

- *No habitat restoration is necessary. Monitoring should be used to track potential changes.*

## **Fauna**

There appear to be no imminent threats to the fauna at the site itself.

- *Monitoring should be used to track potential changes.*
- *Observations on probable rodent free status are not conclusive. Explore improved options for rodent surveillance.*



## Middle Island

Middle Island was visited opportunistically whilst returning from the planned trip. There was no systematic survey coverage of either fauna or flora.

A brief visit to a known location for Falkland rock-cress and fuegian foxtail (approx. Lat. -51.956456° Long. -58.462889°) occurred (noted in Upson and Woods 2010). 23 individual plants were recorded, although the search was not extensive. Most of the plants were found to be diseased/infected, though this had not seemingly affected flowering or seed setting.



**Figure 50.** Falkland rock-cress, showing disease, Middle Island.

The area of fuegian foxtail was difficult to assess, being amongst other grasses; however, the stand would not cover an area of 25 x 10m as reported in Upson and Woods (2010).



**Figure 51.** Area of fuegian foxtail, Middle Island

Comparison of Google Earth satellite images between 2006, 2013 and 2016 shows the expansion of wind-blown peat across vegetation from previous burns on the north coast. A significant loss of vegetation that will likely erode.



**Figure 52.** Loss of vegetation, Middle Island. Lines show receding edge of green vegetation visible from satellite imagery (Google Earth) over a 10 year period.

Bird species observed during the brief landing were;

- Magellanic penguin
- tussacbird
- brown skua
- Magellanic oystercatcher

- kelp goose
- falkland thrush
- falkland steamer duck
- dark-faced ground-tyrant
- white-bridled finch
- Magellanic snipe

### *Management Considerations*

Fairly reliable and safe access under appropriate conditions.

- *It is important to ensure that biosecurity elements of FC's Field-working Standard Operating Procedure remain appropriate for visits to the Island.*

Habitats appear to be degrading as a result of covering by wind-blown peat from historic burns.

- *Satellite imagery should be used to monitor erosion and vegetation loss.*
- *Action needs to be taken to reduce rates of vegetation loss and revegetate areas.*



## Conclusions

Motley Island has previously been identified as important for both plants and habitats in its designation as an Important Plant Area (Motley Island IPA), for birds in its designation as part of Lively Group IBA, and more recently for overall biodiversity as part of Lively Island Group KBA. The current surveys confirm that it continues to have considerable conservation significance in supporting 'threatened habitats' – bluegrass acid grassland and bluegrass dune grassland and rare and/or endemic plants such as hairy daisy and fuegian foxtail. Surveys show that the site supports possibly the second largest population globally of hairy daisy (290 plants). The site is generally species rich for plants with three further new native species recorded bringing the total to 70. All three endemic bird species plus a notable assemblage of songbirds were recorded and the island may be of increasing significance for pinnipeds. Previously identified threats are erosion (Upson 2012), and introduction of alien species and fire (Birdlife International 2018). These continue to be the main risks for the key features at the site, which appear in favourable status currently. Biosecurity is critical to prevent further introductions whilst control of some smaller populations of non-native species such as lyme grass and marram grass may be possible for established non-natives. Erosion is a significant problem and monitoring its spread as well as planting to prevent expansion are further priorities. Monitoring needs to occur so that any changes to key features can be acted upon.

Centre Island, Sal Island and Little Motley/The Mot are good examples of rodent free tussac islands supporting endemic Cobb's wren and tussacbird. All support Magellanic penguins and a range of coastal birds species and are used to varying extents by pinnipeds. Notably Little Motley/The Mot appears to support a sooty shearwater colony and all could support populations of smaller petrels such as grey-backed storm petrel. They provide important undisturbed refuges for a range of fauna in the Choiseul Sound/Lively Sound area. Biosecurity remains the primary consideration for these sites with monitoring to identify any newly occurring threats.

Pyramid Island and Pyramid Island Islet are perhaps surprisingly rodent free and have provided new records for breeding Cobb's wren. Whilst supporting tussac habitat, they both have more open areas which currently have good populations of native violet. Biosecurity remains the primary consideration for these sites with monitoring to identify any newly occurring threats.

Middle Island, as Motley Island, has previously been identified as important for both plants and habitats in its designation as an Important Plant Area (Motley Island IPA), for birds in its designation as part of Lively Group IBA, and more recently for overall biodiversity as part of Lively Island Group Key Biodiversity Area (KBA). The brief surveys indicate a stable population of endemic Falkland rock-cress, though under pressure from disease and a potentially reducing population of fuegian foxtail. Satellite imagery indicates significant loss of vegetation from expanding historic burns, which needs action. Other key features could not be assessed.

The trip highlighted a number of repeated management considerations across FC Island reserves, which are:

- rodent surveillance
- biosecurity measures
- monitoring pinnipeds and seabirds
- monitoring large-scale changes in vegetation and erosion
- Re-vegetating eroded areas/halting erosion.

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## Appendix 1

### Motley Island Plant Species List

| English name          | Scientific name                               |
|-----------------------|---|
| Native Yarrow         | <i>Acaena lucida</i>                          |
| Prickly-burr          | <i>Acaena magellanica</i>                     |
| Creeping Bent         | <i>Agrostis stolonifera</i>                   |
| Early Hair-grass      | <i>Aira praecox</i>                           |
| Fuegian Foxtail       | <i>Alopecurus magellanicus</i>                |
| Pimpernel             | <i>Anagallis alternifolia</i>                 |
| Wild celery           | <i>Apium australe</i>                         |
| Marsh Daisy           | <i>Aster vahlii</i>                           |
| Christmas-bush        | <i>Baccharis magellanica</i>                  |
| Daisy                 | <i>Bellis perennis</i>                        |
| Small-fern            | <i>Blechnum penna-marina</i>                  |
| Balsam-bog            | <i>Bolax gummifera</i>                        |
| Lady's Slipper        | <i>Calceolaria fothergillii</i>               |
| Water-starwort        | <i>Callitriche antarctica</i>                 |
| Arrow-leaved Marigold | <i>Caltha sagittata</i>                       |
| Sword-grass           | <i>Carex trifida</i>                          |
| Field Mouse-ear       | <i>Cerastium arvense</i>                      |
| Common Mouse-ear      | <i>Cerastium fontanum</i> ssp. <i>Vulgare</i> |
| Emerald-bog           | <i>Colobanthus subulatus</i>                  |
| Lesser Swine-cress    | <i>Coronopus didymus</i>                      |
| Whitegrass            | <i>Cortaderia pilosa</i>                      |
| Wavy Hair-grass       | <i>Deschampsia flexuosa</i>                   |
| Fuegian Couch         | <i>Elymus glaucescens</i>                     |
| Diddle-dee            | <i>Empetrum rubrum</i>                        |
| Hairy Daisy           | <i>Erigeron incertus</i>                      |
| Land-tussac           | <i>Festuca contracta</i>                      |
| Antartic bedstraw     | <i>Galium antarcticum</i>                     |
| Falkland Cudweed      | <i>Gamochaeta malvinensis</i>                 |
| Mountain Berry        | <i>Gaultheria pumila</i>                      |
| Yellow Orchid         | <i>Gavilea littoralis</i>                     |
| Pigvine               | <i>Gunnera magellanica</i>                    |
| Cinnamon-grass        | <i>Hierochloa redolens</i>                    |
| Native Rush           | <i>Juncus scheuchzerioides</i>                |
| Buttonweed            | <i>Leptinella scariosa</i>                    |
| Vanilla Daisy         | <i>Leucheria suaveolens</i>                   |
| Lilaeopsis            | <i>Lilaeopsis macloviana</i>                  |
| Native Wood-rush      | <i>Luzula alopecurus</i>                      |
| Almond-flower         | <i>Luzuriaga marginata</i>                    |
| Pineappleweed         | <i>Matricaria discoidea</i>                   |
| Teaberry              | <i>Myrteola nummularia</i>                    |
| Coastal Nassauvia     | <i>Nassauvia gaudichaudii</i>                 |
| Scurvygrass           | <i>Oxalis enneaphylla</i>                     |



|                       |   |
|-----------------------|---|
| Falkland Lavender     | <i>Perezia recurvata</i>                      |
| Bluegrass             | <i>Poa alopecurus</i>                         |
| Annual Meadow-grass   | <i>Poa annua</i>                              |
| Tussac                | <i>Poa flabellata</i>                         |
| Berry-lobelia         | <i>Pratia repens</i>                          |
| Dusty Miller          | <i>Primula magellanica</i>                    |
| Falkland Strawberry   | <i>Rubus geoides</i>                          |
| Sheep's Sorrel        | <i>Rumex acetosella</i>                       |
| Procumbent Pearlwort  | <i>Sagina procumbens</i>                      |
| Sea Cabbage           | <i>Senecio candidans</i>                      |
| Falkland Smooth Daisy | <i>Senecio vaginatus</i>                      |
| Groundsel             | <i>Senecio vulgaris</i> spp. <i>vulgaris</i>  |
| Gillies' Dandelion    | <i>Taraxacum gilliesii</i>                    |
| Spiked Oat-grass      | <i>Trisetum phleoides</i>                     |
| Pale maiden           | <i>Olsynium filifolium</i>                    |
| Wiry Azorella         | <i>Azorella filamentosa</i>                   |
| Prickly Sow-thistle   | <i>Sonchus asper</i>                          |
| Small Nettle          | <i>Urtica urens</i>                           |
| Gaudichaud's Orchid   | <i>Chloraea fonckii</i>                       |
| Dandelion             | <i>Taraxacum officinale</i> agg.              |
| Dog Orchid            | <i>Codonorchis lessonii</i>                   |
| Field Forget-me-not   | <i>Myosotis arvensis</i> ssp. <i>arvensis</i> |

## Appendix 2

Southern Elephant Seal tags recorded on Motley Island.

11<sup>th</sup> December 2017:

Left flipper – yellow tag 9960, right flipper yellow tag 1472

Blue tag - Q80

Yellow tag - 0748

Yellow tag - 1443

Yellow tag – 1797, plus orange tag no number

Yellow tag - 4021

Yellow tag - 3512 and yellow tag - 3990

12th December 2017:

Purple tag W20