

Island Visit Reports

Outer, Double and Harpoon Islands in Queen Charlotte Bay



**View to the south along the spine of Double Island, Falklands
Conservation Nature Reserve, October 1998**

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April 2008

Report on visits to Outer, Double and Harpoon Islands off Fox Island, West Falkland in 1998, 2001, 2002 and 2006

Introduction

The wildlife of these three islands was first described, albeit very briefly, in the Falkland Islands Foundation Project Report on tussac grass in the Falklands (Strange *et al* 1988). IJ Strange stated (p 39) that Outer and Double Island both '*have evidence of ground burrowing petrels but require thorough ground survey to verify species.*' He also noted that, '*Outer, Double [and] Harpoon ... Islands ... all appear to be examples of untouched tussock islands in an area where there are few such examples remaining. It is recommended that they be considered for reserve status.*' He did not record the presence of rats on all three islands nor did he note evidence of historic use of Outer Island for livestock.

All three islands were offered for sale in 1997 and were visited for FC by M Bingham, with Ron and Fiona Rozee and Ali and Kevin Marsh on 24 May 1997. MB reported that all the islands had rats but that they also had good tussac grass, particularly on Outer Island. Possibly following IJS' statement about burrowing petrels, MB claimed to have found evidence of Sooty Shearwaters breeding on Double I. and showed a photograph of a pair of blackish wings outside a small tunnel below dead tussac grass leaves. MB also reiterated the recommendation of IJS, supporting it by stating that Outer and Double Is. '*should be seriously considered for purchase*' for the Sea Lion population on Outer and the shearwaters on Double (Bingham 1997).

Falklands Conservation bought Outer and Double Islands from Ron Rozee of Spring Point in early 1998 with donations from generous members while Harpoon Island remained in private ownership. It was later decided that these three islands would be included in FC's first offshore island rat eradication exercise. This work was carried out in September 2001 by a team of specialists from New Zealand, led by Derek Brown who trained FC personnel and volunteers in the distribution of bait and monitoring procedures (Falklands Conservation 2002).

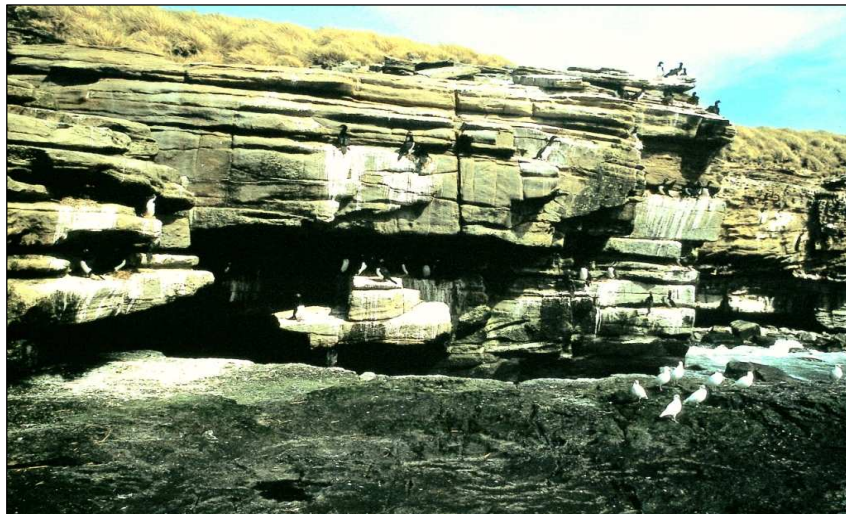
The islands were visited by R Woods with different teams of observers in 1998 (Outer and Double only), 2001 and 2006 and by Nic Huin in 2002.

Outer Island 51° 52'S 60° 31'W (area about 20ha) lies about 2km south of Harpoon Island and about 2km southwest of Fox Island and is by far the largest of the three surveyed. It is a slightly constricted lozenge shape oriented northeast to southwest with cliffs up to about 10m maximum along part of the northwest-facing coast. On the northern side and around the southern point, there is shelf rock uncovered at low tide. The island is somewhat domed, but has several deep slumped holes in the otherwise dense tussac grass that covers most of the ground above high-water mark. However, there are patches of pink ash near the northeastern point indicating that tussac has been burnt in the past, and in places the peat is exposed, probably where tussac has been eaten out through over-grazing. Some bones of a bullock including the skull show that the island was formerly used for fattening beef animals. A slight inlet on the northwestern coast provides rock shelves for a large Rock Shag colony and resting grounds for King Shags. Otherwise the shoreline is fairly easy to access, though walking is sometimes difficult.

Outer Island 51° 52'S 60° 31'W



Diddle-dee in a tussac clearing; view to Double Island, November 2006



Rock Shag colony on 10m (30 ft) cliffs near the northwestern point with Sheathbills in the foreground, October 1998



Slumped holes in tussac peat (probably from earlier fire damage), with regenerating tussac, November 2006

Double Island 51° 52' S 60° 30' W (area about 9ha) is about 500m east of Outer Island though at low tide the channel between them is about half that width. Double is L-shaped and almost half the size of Outer Island, with the broader part aligned north to south and the narrower half lying east to west, pointing towards Outer Island. It consists of two rocky hummocks, with some dense tussac up to at least 2m tall, which are joined by a low sandy ridge carrying Marram and Fuegian Couch grass. A very low rocky peninsula extends about 600m to the west from the northern point and there are low sedimentary cliffs (up to 3m) at the northeastern and southern points and a central white sand beach on the eastern coast. There is an extensive fringe of bedrock with pools visible, around the southern point at low tide and another long rocky reef extending from the northern point. Double I. is about 1.3km southwest of Fox Island.

Harpoon Island 51° 51' S 60° 32' W (area about 3ha) is only about one third the size of Double Island and about one sixth the size of Outer. It lies southwest of the western point of Fox Island in Queen Charlotte Bay, 4.5km southwest of Spring Point settlement on mainland West Falkland and about 2km north of Outer Island. Harpoon Island is a very low lying ridge with an extensive bedrock border that increases the surface area by about three times when the tide is low. The beaches are flat rock slabs with loose chunks that make walking difficult. Pink ash was found between small tussac plants near the southern point, showing that some of the vegetation had been burnt many years ago.

At times of high tide, Harpoon is distanced from Fox Island by about 1.25km of sea but during low spring tides, the shelf rock surrounding Harpoon Island is only separated from Fox Island rocks by about 250m of water. This was considered to be a distance that could theoretically be covered by swimming rats. Therefore any rat eradication work on Harpoon Island was seen as experimental to gain data on the swimming capabilities of rats in Falkland waters.

Monitoring Visits

1. During the Striated Caracara Survey of 1998, we visited two islands from the ketch *Penelope* before the rat eradication work had been arranged. M Morrison and R Woods landed on Double and Outer Islands on **30 October 1998** and records were made of all bird species detected and plants found. Harpoon Island was not visited in 1998. The team was on Double Island from 0930-1225 (3 hours) and Outer from 1245-1730 (4¾ hours). Southern Sea Lions were found at both islands, with apparently many more on Outer Island, but this visit was made primarily to obtain some baseline data on the bird population before any rat eradication work was carried out. At least an hour was spent watching from the *Penelope* anchored between the two islands around sunset for any returning petrels or shearwaters, but none was seen and no evidence of their presence was found during the surveys of these islands.

2. Surveying visits to the three islands took place on **22 & 23 December 2001**. These were made possible because the Royal Botanic Gardens, Kew had sponsored a survey from the *Penelope* to search for populations of the endemic Felton's Flower *Calandrinia feltonii* in the wild (Woods 2002 & 2007). The team of Jeannette Clarke, Jonathan Felton, Stacey Steen-Macdonald and Robin Woods had to pass the islands and the opportunity was taken to look for signs that rats might still be present, about three months after the eradication fieldwork. The group visited Harpoon Island from

Double Island 51° 52'S 60° 30'W



View over Marram and dunes from the southwest, with the *Condor* at anchor, November 2006



Looking northwards over washed-up kelp in the western bay, November 2006



View to the south along the eastern coast and sand bay, October 1998

0945-1050 (1 hour) and Outer Island 1240-1530 (2¾ hours) on 22 December and Double Island 0940-1140 (2 hours) on 23 December but there was no evidence of rats.

3. In **May 2002**, eight months after the eradication work, Nic Huin visited all three islands for Falklands Conservation (Huin 2002). He concentrated on the shorelines and found no clear signs of continuing rat presence. However, chew sticks left in September 2001 had mostly disappeared or been pecked (apparently by Striated Caracaras, of which he estimated 30 on Harpoon and about 70 on Outer Island).

4. On **3 November 2006**, the second Striated Caracara Survey team (Giselle Botha, Gavin Harrison, Mike Morrison and Robin Woods) visited all three islands briefly. More than five years had elapsed since the eradication of rats and it was hoped that there would be noticeable differences from the bird populations observed in 1998 and 2001. Records were made of birds and plants on Harpoon Island from 1115-1245 (1½hrs), Outer Island from 1400-1645 (2¾ hrs) and Double Island from 1715-1900 (1¾ hrs).

Vegetation

Appendix A contains lists of flowering plants identified during each visit.

Outer: during the three visits 21 flowering plant species were noted, with tussac being by far the most widespread. There were 14 native and seven introduced species. Endemic plants were apparently absent.

Double: in three visits, a total of 16 flowering plant species was identified, of which 9 were introduced, more than half of those present. This high proportion of introduced plants including Marram, indicates that people have visited the island over many years. No endemic species were seen.

Harpoon: above high-water mark the island is covered in dense native tussac grass. Eight other plants were found and of these, only Skottsberg's Buttercup and Lesser Swine-cress are known to be native to the Falklands. The other six species are all introduced, which suggests that Harpoon Island has been grazed by livestock in the past.

Birds

Appendix B contains lists of birds with their breeding status as recorded on or near the islands during the visits. Due to the lack of time for observations and some poor weather, the evidence for probable or confirmed breeding was not always obtained and these lists are likely to be incomplete. A judgment of probable breeding status has therefore been made, based on observations and experience.

October 1998

Outer Island: 24 species recorded, 15 breeding or probably breeding. Only three songbird (passerine) species were recorded; there were two pairs of Ground-tyrants, one each at the northern and southern points respectively, one male Grass Wren sang near the northeastern point and a single male Falkland Thrush sang and was seen chasing a Magellanic Oystercatcher. A single second-year immature Striated Caracara, followed us from Double Island, where it was first seen.

Harpoon Island 51° 51'S 60° 32'W



Survey team: Gavin Harrison, Mike Morrison and Giselle Botha at the northeastern point, November 2006



View to the south along the eastern coast; Jeannette Clarke and Jonathan Felton, December 2001



View to the west across shelf rock from the northeastern point, December 2001

Double Island: 22 species recorded, 12 breeding or probably breeding. Only two songbird species were found, Dark-faced Ground-tyrant and Grass Wren. A pair of Ground-tyrants was nesting near the northeastern point, sheltered below an overhanging low cliff. Two male Grass Wrens were singing from the widest areas of tussac, north and south of the central sandy ridge.

The restricted number of species and the very low populations of songbirds were most noticeable on both islands. No Black-throated Finches, Cobb's Wrens, Long-tailed Meadowlarks or Tussacbirds were seen on Outer or Double Island and only one singing Falkland Thrush noted on Outer Island.

December 2001

Outer Island: 12 species recorded of which 8 were breeding or probably breeding. Only two species of songbirds were seen: a family party of three Ground-tyrants and a single Thrush in flight.

Double Island: 16 species recorded, of which 13 were breeding or probably breeding. As above, only two songbird species were recorded: a single Ground-tyrant was seen in flight and one Grass Wren displayed in Marram near the southern point. A breeding colony with at least 60 pairs of Dolphin Gulls and adults sitting on eggs was found on the shoreline near the southwestern corner. Three nests of Magellanic Oystercatchers with eggs were found above the high water mark on the northern coast, the first c15m from the second and that was only c15m from the third.

Harpoon Island: 11 species recorded, of which 6 were breeding or probably breeding. Songbirds were almost absent, with the Dark-faced Ground-tyrant the only species found. Both species of oystercatcher were nesting.

There was no significant difference in the number of songbird species on Outer and Double Islands in December 2001 compared with October 1998. There were fewer species noted overall but time restrictions and inclement weather meant less coverage of the islands in 2001.

November 2006

Outer Island: 24 species recorded, of which 17 were breeding or probably breeding. Songbirds were represented by six of the nine native species, with four species singing. Numbers of these small birds had certainly increased over the five year interval, with a flock of at least 20 Black-chinned Siskins feeding on sorrel seeds and at least 10 thrushes seen. Two Grass Wrens were heard singing, but the most unusual observation made was of a single Grass Wren foraging among large beach boulders on the southeastern shore. No Cobb's Wrens or Tussacbirds were found.

Double Island: 18 species recorded of which 14 were breeding or probably breeding. Songbirds were again in evidence with five species found, of which three were singing. We noted Falkland Thrush, Black-throated Finch and Long-tailed Meadowlark for the first time, but Tussacbird, Cobb's Wren, Black-chinned Siskin and the pipit were absent as in 2001. The number of individual birds was greater than at our last visit in 2001, though we saw no Upland Geese or Chiloe Wigeon. An adult Grass Wren was seen foraging on a pile of dead kelp at the northern rocky coast and another on the west-facing beach of large pebbles with kelp.

Harpoon Island: 21 species recorded, of which 14 were breeding or probably breeding.

The difference between the number of species found in 2001 and 2006, clearly shown in Table 1 below, was very marked though it should be noted that the 2006 visit was longer and made by more experienced birders. The numbers of individual birds were also greater, with two or three Grass Wrens singing (none in 2001) and a single bird foraging on the western beach.

Table 1: Number of bird species recorded as present and as probable or confirmed breeding species during visits to Outer, Double & Harpoon Islands

Island	30 Oct. 1998		22/23 Dec. 2001		3 Nov. 2006	
	Present	Breeding	Present	Breeding.	Present	Breeding.
Outer	24	15	12	8	24	17
Double	22	12	16	13	18	14
Harpoon	--	--	11	6	22	15

Table 2: Total passerine species (songbirds) present or probably breeding

Island	30 Oct. 1998		22/23 Dec. 2001		3 Nov. 2006	
	Present	Breeding	Present	Breeding	Present	Breeding
Outer	3	3	2	2	6	6
Double	2	2	2	2	5	5
Harpoon	--	--	1	1	4	4

Table 3: Passerine species present (X) or absent (0)

	Outer 1998	Double 1998	Outer 2001	Double 2001	Harpoon 2001	Outer 2006	Double 2006	Harpoon 2006
Hours surveying	4¾	3	2¾	2	1	2¾	1¾	1½
Total observers	2	2	4	4	4	4	4	4
Tussacbird	0	0	0	0	0	0	0	0
Ground-tyrant	X	X	X	X	X	X	X	X
Falkland Pipit	0	0	0	0	0	0	0	0
F. Grass Wren	X	X	0	X	0	X	X	X
Cobb's Wren	0	0	0	0	0	0	0	0
Falkland Thrush	X	0	X	0	0	X	X	X
B-t. Finch	0	0	0	0	0	X	X	0
Long-tailed Meadowlark	0	0	0	0	0	X	X	0
Black-chinned Siskin	0	0	0	0	0	X	0	X
Total species	3	2	2	2	1	6	5	4

Rat eradication



Double Island: rat faeces below dense tussac, October 1998



Double Island: driftwood stick chewed by rats, October 1998



Outer Island: Jonathan Felton and untouched chew stick, December 2001

Rats

1998

Outer: many rat droppings were found beneath overhanging tussac skirts near the shore and more were seen by a tussac bog in an open area with Sheep's Sorrel and Chickweed near the highest part of the island. A large rat skull complete with the lower jaw was collected and later confirmed as a Norway Rat with abnormal tooth formation, at the Natural History Museum in London. Several limpet shells were found just inside a small burrow beneath a tussac bog and many rat faeces were littering runways below the tussac.

Double: rat presence was confirmed very quickly. On landing, many rat footprints were seen on the clean white sand and between low Marram grass. A 5cm (2 inch) diameter stick about 1m (3 feet) long lying above the beach was photographed and collected because it showed several heavily chewed sections on its length. Burrows with entrances much smaller than those made by Sooty Shearwaters on Kidney Island, off East Falkland, were found in sand and tussac peat.

2001

Outer: chew sticks had been left by the rat eradication team in September 2001 and eight were found, mostly part-hidden beneath overhanging tussac or rocks. None of these sticks had been gnawed. A large old rat skull was collected but no fresh signs of rats were seen.

Double: a large baulk of timber and a red pine plank were found; both had many tooth marks. The original red wood colour showed clearly on the plank. However, no fresh faeces were found.

Harpoon: a plank with many tooth marks was found on the beach and there were several pieces of gnawed driftwood but no fresh rat faeces were seen and it seemed that rats had been eradicated.

The evidence suggested that the rat populations of these three islands had been at least severely reduced, if not eradicated by the poison-baiting in the previous September. No noticeable effects on the bird populations were recorded.

2006

There were no signs of rats on **Outer, Double** or **Harpoon Islands**. All had higher numbers of individual birds than in 2001 and they also had representatives of several bird species not seen in 1998 or in 2001.

Other species of interest

Southern Sea Lions *Otaria flavescens*

30 October 1998: on **Outer Island**, many tussac bogs had been flattened by seals resting up but no seals were seen inland. At least four immatures were seen close inshore. A few Southern Sea Lions were seen on the sand beach and at the southern point of **Double Island**.

22/23 December 2001: a large bull with several females and a small male were seen on the east-facing rocky point of **Harpoon Island**. At **Double Island**, one old bull and female, two young males and two more mature males were seen mostly around the southern coast. A few were seen near the ridge of the northern hummock. The interior of **Outer Island** had obviously been well used by sea lions in the past.

3 November 2006: about five sea lions were on the rocky shelves of the northeastern point of **Harpoon Island**. At least 30 were on the **Double Island** sand beach, with

some others, apparently mostly immature animals, on the grassy ridge to the north. None was seen on **Outer Island**.

Implications for Conservation

The records obtained during these necessarily short visits provide very clear evidence of the paucity of passerine bird populations when the islands were infested by rats and shortly after clearance. There are only nine native passerine species in the Falklands and in the sixth breeding season since eradication, six species were present on Outer Island, five on Double Island and four on Harpoon Island. It is likely that two other species, Tussacbird and Cobb's Wren were resident many years ago before rats invaded, but they were absent in 1998 and had not re-colonised by November 2006. The third missing species, Falkland Pipit, would not be expected to occur on a tussac island as this is not a suitable habitat for pipits.

The most obvious explanation for the missing Tussacbirds and Cobb's Wrens, five years after eradication is the absence of strong and potentially expanding populations within easy flying distance. In comparison, Cobb's Wrens do not breed on West Point or New Island where rats and mice are present. Individual Cobb's Wrens (probably juveniles) are known to disperse in autumn and a few reach these two islands annually. The adjacent potential source populations of Cobb's Wren for each island respectively are Gibraltar Rock, 2.3km northwest of West Point, Coffin Island and Beef Island, only 900m east of New Island and Saddle Island 1.4km to the northwest. Cobb's Wrens were found on all four of these small islands in 1997 or 2001.

The nearest known populations of Cobb's Wrens and Tussacbirds to Outer and Double Islands are on Hummock and Middle Islands to the north-northeast, in King George Bay. They are both about 28km (17.5 miles) away in a direct line, which unfortunately crosses the central part of the Dunnose Head peninsula of West Falkland. Cobb's Wrens and Tussacbirds could theoretically reach the Outer/Double Island group from other known populations on Second Passage Island to the northwest. The shortest distance between these two sites is about 34km (21 miles) and it would be possible for birds to use this route without crossing the mainland. They could fly south-eastwards along the coastline of Dunnose Head but how would Tussacbirds or Cobb's Wrens know that Harpoon, Double and Outer Island were safe habitats without alien predators? Both are terrestrial littoral specialists and neither is migratory, so it is difficult to see how re-colonisation could occur naturally.

However, on about 40 offshore islands that have escaped invasion by rats of either species, there are viable populations of Cobb's Wrens and Tussacbirds. It therefore appears unnecessary at present to consider artificial relocation of these tiny birds from established populations to Outer, Double and Harpoon Islands. Given the complexities of such an operation in terms of necessary expertise, personnel and logistics and with the uncertainties of Falkland weather, it would prove very expensive without any guarantee of success and I could not support this as a feasible project. For the effort involved, carefully planned and completed eradications of alien mammals from offshore islands would be more beneficial for bird populations in general and for the recovery of damaged habitats (see Appendix C).

Appendix A Flowering Plants recorded

Outer Island plant lists from three visits

30 October 1998

Acaena lucida	Native Yarrow
Acaena ovalifolia	Oval-leaved Prickly Burr
*Aira praecox	Early Hair-grass
Azorella filamentosa	Wiry Azorella
Baccharis magellanica	Christmas Bush
Coronopus didymus	Lesser Swine-cress
Empetrum rubrum	Diddle-dee
Festuca magellanica	Fuegian Fescue
Gamochaeta malvinensis	Falkland Cudweed
Gunnera magellanica	Pig Vine
Poa flabellata	Tussac Grass
*Rumex acetosella	Sheep's Sorrel
*Sagina procumbens	Procumbent Pearlwort
Senecio candidans	Sea Cabbage
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

1998 Total: 16 species, of which 11 were native and 5* were introduced.

22 December 2001

Acaena lucida	Native Yarrow
Acaena ovalifolia	Oval-leaved Prickly Burr
*Aira praecox	Early Hair-grass
Callitriche antarctica	Antarctic Starwort
Empetrum rubrum	Diddle-dee
Gamochaeta spiciformis	Spiked Cudweed
Poa flabellata	Tussac Grass
*Rumex acetosella	Sheep's Sorrel
*Sagina procumbens	Procumbent Pearlwort
*Senecio viscosus	Sticky Groundsel
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

2001 Total: 12 species, of which 6 were native and 6* were introduced.

3 November 2006

Acaena lucida	Native Yarrow
Acaena ovalifolia	Oval-leaved Prickly Burr
*Aira praecox	Early Hair-grass
Empetrum rubrum	Diddle-dee
Gamochaeta spiciformis	Spiked Cudweed
Gaultheria pumila	Mountain Berry
Gunnera magellanica	Pig Vine
*Poa annua	Annual Meadow-grass
Poa flabellata	Tussac Grass
*Rumex acetosella	Sheep's Sorrel
*Sagina procumbens	Procumbent Pearlwort
Senecio candidans	Sea Cabbage
*Senecio viscosus	Sticky Groundsel
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

2006 Total: 15 species, of which 8 were native and 7* were introduced.

Total of species found in the three visits was 21, of which 14 were native to the Falklands and 7 were introduced. The two alien grasses and the other introduced species are very widespread in the Falklands. Sheep's Sorrel *Rumex acetosella* is particularly associated with overgrazed and partly denuded former tussac grass stands.

Double Island plant lists from three visits

30 October 1998

Acaena magellanica	Prickly Burr
Acaena lucida	Native Yarrow
*Aira praecox	Early Hair-grass
*Ammophila arenaria	Marram Grass
Cerastium arvense	Field Mouse-ear Chickweed
*Holcus lanatus	Yorkshire Fog
*Poa annua	Annual Meadow-grass
Poa flabellata	Tussac Grass
*Rumex acetosella	Sheep's Sorrel
*Sagina procumbens	Procumbent Pearlwort
Senecio candidans	Sea Cabbage
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

1998 Total: 13 species definitely identified, of which 5 were native and 8* were introduced. [A second Mouse-ear Chickweed *C. fontanum* (introduced) may have been present but identification was not confirmed.]

23 December 2001

Acaena lucida	Native Yarrow
*Ammophila arenaria	Marram Grass
*Poa annua	Annual Meadow-grass
Poa flabellata	Tussac Grass
Poa robusta	Shore Meadow-grass
*Rumex acetosella	Sheep's Sorrel
*Sagina procumbens	Procumbent Pearlwort
*Senecio viscosus	Sticky Groundsel
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

2001 Total: 10 species were found, of which 3 were native and 7* were introduced. The Sticky Groundsel was not recognised in the Falklands until about 2000 but was probably present on Double Island much earlier.

3 November 2006

Elymus glaucescens	Fuegian Couch-grass
*Stellaria media	Chickweed
*Poa annua	Annual Meadow-grass
Poa flabellata	Tussac Grass
*Senecio viscosus	Sticky Groundsel
*Senecio vulgaris	Groundsel
*Stellaria media	Chickweed

2006 Total: 7 species were found, of which 5* were introduced, including the two species of Groundsel identified in 2001.

Total species found in three visits was 16, of which 9* are introduced, which is more than half of the plant species occurring. This is strong evidence that the island was grazed in the past or, at least, visited by people over many years. Some of the introduced species may have reached Double Island as windborne seeds (e.g. the two Groundsels) whereas others (e.g. Sheep's Sorrel and the Pearlwort) are widespread on sheep farms and could have arrived on the fleeces of sheep or the boots of farm workers.

Harpoon Island plant lists from two visits

22 December 2001

* <i>Aira praecox</i>	Early Hair-grass
* <i>Capsella bursa-pastoris</i>	Shepherd's-purse
* <i>Poa annua</i>	Annual Meadow-grass
<i>Poa flabellata</i>	Tussac or Tussac Grass
<i>Ranunculus acaulis</i>	Skottsberg's Buttercup
* <i>Rumex acetosella</i>	Sheep's Sorrel
* <i>Senecio vulgaris</i>	Groundsel

2001 Total: 7 species were found, of which 2 were native and 5* were introduced.

3 November 2006

* <i>Capsella bursa-pastoris</i>	Shepherd's-purse
<i>Coronopus didymus</i>	Lesser Swine-cress
* <i>Poa annua</i>	Annual Meadow-grass
<i>Poa flabellata</i>	Tussac or Tussac Grass
<i>Ranunculus acaulis</i>	Skottsberg's Buttercup
* <i>Rumex acetosella</i>	Sheep's Sorrel
* <i>Senecio viscosus</i>	Sticky Groundsel

2006 Total: 7 species were found, of which 3 were native and 4* were introduced.

Total species identified in two visits was 9, of which 6* are known to be introduced and only three are native. The flora of Harpoon Island seems particularly sparse, perhaps because it is basically a small tussac island, without a central heathland habitat.

Appendix B Birds recorded

B = confirmed as breeding or likely to be breeding

Unmarked species present or passing, but no evidence of breeding

Outer Island 1998

	Gentoo Penguin	<i>Pygoscelis papua</i>	1 on beach
B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	1 on beach; tracks
	Southern Giant Petrel	<i>Macronectes giganteus</i>	overflying
	Thin-billed Prion	<i>Pachyptila belcheri</i>	few feathers only
B	Rock Shag	<i>Phalacrocorax magellanicus</i>	200+ pairs
	Imperial/King Shag	<i>Phalacrocorax atriceps</i>	150, mostly imms
B	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	at least 3
B	Upland Goose	<i>Chloephaga picta</i>	pr+4 goslings, pr
B	Kelp Goose	<i>Chloephaga hybrida</i>	several pairs
B	Ruddy-headed Goose	<i>Chloephaga rubidiceps</i>	2 males waiting off
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	several prs, no young
B	Crested Duck	<i>Lophonetta specularioides</i>	2 pairs
B	Turkey Vulture	<i>Cathartes aura</i>	14 overhead together
	Striated Caracara	<i>Phalcoboenus australis</i>	1 2 nd yr.
B	Southern Caracara	<i>Caracara plancus</i>	1 ad calling loudly
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	2 prs, nests+eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	pr. & 3 adults
	Pale-faced Sheathbill	<i>Chionis albus</i>	Several by shags
	Falkland Skua	<i>Catharacta antarcticus</i>	overflying
	Dolphin Gull	<i>Leucophaeus scoresbii</i>	25 on beach
	Kelp Gull	<i>Larus dominicanus</i>	few with Dolphin G's
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	2 prs at N & S cliffs
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	1 male singing
B	Falkland Thrush	<i>Turdus falcklandii</i>	1 male singing

Total 24, of which 15 were breeding or probably breeding.

Outer Island 2001

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	burrows
B	Rock Shag	<i>Phalacrocorax magellanicus</i>	50+ prs with eggs
	Imperial/King Shag	<i>Phalacrocorax atriceps</i>	resting on rock shelf
B	Kelp Goose	<i>Chloephaga hybrida</i>	pr+2 goslings
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	pr+8 ducklings
B	Crested Duck	<i>Lophonetta specularioides</i>	pairs + ducklings
B	Blackish Oystercatcher	<i>Haematopus ater</i>	pair displaying
	Pale-faced Sheathbill	<i>Chionis albus</i>	about 40
	Dolphin Gull	<i>Leucophaeus scoresbii</i>	10 imms
	Kelp Gull	<i>Larus dominicanus</i>	c70
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	family of 3
B	Falkland Thrush	<i>Turdus falcklandii</i>	1 in flight
Total 12, of which 8 were breeding or probably breeding			

Outer Island 2006

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	1+dead, burrows
	Southern Giant Petrel	<i>Macronectes giganteus</i>	flying past
B	Rock Shag	<i>Phalacrocorax magellanicus</i>	100+ nests
	Imperial/King Shag	<i>Phalacrocorax atriceps</i>	about 650 roosting
B	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	
B	Upland Goose	<i>Chloephaga picta</i>	2 prs; pr+young
B	Kelp Goose	<i>Chloephaga hybrida</i>	3 prs; 1nest+6 eggs
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	3 prs; male waiting off
B	Crested Duck	<i>Lophonetta specularioides</i>	pr
B	Turkey Vulture	<i>Cathartes aura</i>	nest+2 eggs
	Striated Caracara	<i>Phalcoboenus australis</i>	3 1 st yr, 1 2 nd yr imms
B	Southern Caracara	<i>Caracara plancus</i>	pr calling, W cliffs
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	nest+2 eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	nest+2 eggs
	Falkland Skua	<i>Catharacta antarcticus</i>	few flying past
	Dolphin Gull	<i>Leucophaeus scoresbii</i>	30+ at shag rookery
	Kelp Gull	<i>Larus dominicanus</i>	few adults
	South American Tern	<i>Sterna hirundinacea</i>	coasting flight
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	10+; ad with food
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	2 singing males
B	Falkland Thrush	<i>Turdus falcklandii</i>	song; probably 10+
B	Black-throated/C-w Finch	<i>Melanodera melanodera</i>	song; about 5 birds
B	Long-tailed Meadowlark	<i>Sturnella loyca</i>	pr + 1female
B	Black-chinned Siskin	<i>Carduelis barbata</i>	song; 20+ at sorrel
Total 24, of which 17 were breeding or probably breeding			

Double Island 1998

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	1 bird; few burrows
	Southern Giant Petrel	<i>Macronectes giganteus</i>	passing in flight
	Thin-billed Prion	<i>Pachyptila belcheri</i>	1 wing on beach
	Rock Shag	<i>Phalacrocorax magellanicus</i>	10+ in offshore kelp
	Imperial/King Shag	<i>Phalacrocorax atriceps</i>	few in kelp beds
B	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	1 ad+imm
B	Upland Goose	<i>Chloephaga picta</i>	2 males waiting, 1 fem
B	Kelp Goose	<i>Chloephaga hybrida</i>	nests 4 & 5 eggs
B	Ruddy-headed Goose	<i>Chloephaga rubidiceps</i>	pr fought Kelp goose
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	2 prs+ flock 34 imms
B	Crested Duck	<i>Lophonetta specularioides</i>	about 7 adults
B	Turkey Vulture	<i>Cathartes aura</i>	2 adults
	Striated Caracara	<i>Phalcoboenus australis</i>	1 2 nd year
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	4prs, 3 nests+eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	pr calling; nest 2 eggs
	Pale-faced Sheathbill	<i>Chionis albus</i>	25 on rocks
	Falkland Skua	<i>Catharacta antarcticus</i>	1 overhead
	Dolphin Gull	<i>Leucophaeus scoresbii</i>	70+ mostly imms

	Kelp Gull	<i>Larus dominicanus</i>	50+ on beach/reef
	Brown-hooded Gull	<i>Larus maculipennis</i>	5 ads at kelp bed
	South American Tern	<i>Sterna hirundinacea</i>	flock about 100 at reef
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	pr at nest on low cliff
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	2 males singing
Total 22, of which 12 were breeding or probably breeding			

Double Island 2001

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	20+ burrows & chicks
B	Upland Goose	<i>Chloephaga picta</i>	pr+2 goslings
B	Kelp Goose	<i>Chloephaga hybrida</i>	pr in territory
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	3 broods; flock c340
B	Crested Duck	<i>Lophonetta specularioides</i>	3 adults
B	Chiloe Wigeon	<i>Anas sibilatrix</i>	1 female on pool
B	Turkey Vulture	<i>Cathartes aura</i>	4 overflying
	Striated Caracara	<i>Phalcoboenus australis</i>	1 ad overflying
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	6 prs; nests+eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	2 prs; nest+eggs
	Pale-faced Sheathbill	<i>Chionis albus</i>	4 on beach
B	Dolphin Gull	<i>Leucophaeus scoresbii</i>	96; 61 nests+eggs
	Kelp Gull	<i>Larus dominicanus</i>	about 30 ads on beach
B	South American Tern	<i>Sterna hirundinacea</i>	pr calling over island
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	1 only
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	1 disp.in Marram
Total 16, of which 13 were breeding or probably breeding			

Double Island 2006

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	footprints
	Southern Giant Petrel	<i>Macronectes giganteus</i>	passing in flight
B	Kelp Goose	<i>Chloephaga hybrida</i>	3 pairs, nests+eggs
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	few prs, 7 chicks
B	Crested Duck	<i>Lophonetta specularioides</i>	3 prs; flock 18
B	Turkey Vulture	<i>Cathartes aura</i>	11 overhead
	Striated Caracara	<i>Phalcoboenus australis</i>	4 1 st yr, 1 dead, 1 2 nd yr
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	2 nests + eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	nests+eggs
	Pale-faced Sheathbill	<i>Chionis albus</i>	several on beach rocks
B	Dolphin Gull	<i>Leucophaeus scoresbii</i>	few pairs
	Kelp Gull	<i>Larus dominicanus</i>	10+
B	South American Tern	<i>Sterna hirundinacea</i>	about 100+ roost
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	several
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	song; 1 fed-kelp heap
B	Falkland Thrush	<i>Turdus falcklandii</i>	song; few
B	Black-throated/C-w Finch	<i>Melanodera melanodera</i>	2+seen
B	Long-tailed Meadowlark	<i>Sturnella loyca</i>	song; pr together
Total 18, of which 14 were breeding or probably breeding			

Harpoon Island 2001

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	several calling
	Rock Shag	<i>Phalacrocorax magellanicus</i>	few on eastern coast
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	pr+4 ducklings
B	Crested Duck	<i>Lophonetta specularioides</i>	pr in territory
B	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	ad on N-facing coast
	Striated Caracara	<i>Phalcoboenus australis</i>	1 1 st yr
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	2 prs nest+eggs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	2 prs; nest+eggs
	Pale-faced Sheathbill	<i>Chionis albus</i>	4 on beach rocks
	Kelp Gull	<i>Larus dominicanus</i>	about 8 resting
B	Dark-faced Ground-tyrant	<i>Muscisaxicola maclovianus</i>	1 only
Total 11, of which 6 were breeding or probably breeding			

Harpoon Island 2006

B	Magellanic Penguin	<i>Spheniscus magellanicus</i>	used burrow found
	Southern Giant Petrel	<i>Macronectes giganteus</i>	overflying
	Grey-backed Storm-Petrel	<i>Garrodia nereis</i>	feathers found
	Rock Shag	<i>Phalacrocorax magellanicus</i>	few
	Imperial/King Shag	<i>Phalacrocorax atriceps</i>	about 40 roosting
B	Upland Goose	<i>Chloephaga picta</i>	1 male waiting off
B	Kelp Goose	<i>Chloephaga hybrida</i>	2 nests+eggs
B	Ruddy-headed Goose	<i>Chloephaga rubidiceps</i>	1 male waiting off
B	Falkland Steamer Duck	<i>Tachyeres brachypterus</i>	2 males; 2 prs+young
B	Crested Duck	<i>Lophonetta specularioides</i>	4 pairs
B	Turkey Vulture	<i>Cathartes aura</i>	6+; nest+egg+chick
B	Striated Caracara	<i>Phalco boenus australis</i>	Used nest pad; 1 ad,
B	Magellanic Oystercatcher	<i>Haematopus leucopodus</i>	4 pairs
B	Blackish Oystercatcher	<i>Haematopus ater</i>	few
	Falkland Skua	<i>Catharacta antarcticus</i>	4 flying past
	Dolphin Gull	<i>Leucophaeus scoresbii</i>	few
	Kelp Gull	<i>Larus dominicanus</i>	few
B	South American Tern	<i>Sterna hirundinacea</i>	30-40 roosting
B	Falkland Grass Wren	<i>Cistothorus platensis</i>	2 or 3 singing
B	Falkland Thrush	<i>Turdus falcklandii</i>	4 adults
B	Black-chinned Siskin	<i>Carduelis barbata</i>	1 pair
Total 21, of which 14 were breeding or probably breeding			

Appendix C

Points to be considered following the Eradication of Mammalian Predators and Removal of Grazing Animals from Offshore Islands

- As a group, the nine native passerine species appear to be the best indicators to use when assessing recovery of islands after eradication as they are easy to detect, unlike small petrels.
- The effects of Norway rats and house mice on the nine resident Falkland passerine species vary considerably between these species (see Hall JR *et al* 2002).
- Cobb's Wren is the worst affected species. There are no known islands with rats and/or mice that still support a Cobb's Wren population.
- Tussacbirds are also badly affected by these rodents, but very small numbers can survive on infested islands, provided the island is sufficiently large.
- It is likely that the recolonisation of islands and recovery of vegetation after they have been cleared of mammalian predators and/or grazing animals will be a lengthy process, needing several years.
- If monitoring of cleared islands is carried out at regular intervals, valuable data would be obtained on the sequences in which species recolonise and the speed with which populations build.
- Contrary to statements about some passerines, (Falklands Conservation 2002) Grass Wrens are NOT indicators of rats/mice presence or absence. On all islands surveyed and on East and West Falkland where rodents are present, Grass Wrens occur in suitable habitat, whether tall rushes, grasses or shrubs.
- Dark-faced Ground-tyrants cannot be used as indicators of rats/mice presence. This species nests in rock crevices or small caves and has been found in small numbers on all rodent-infested islands surveyed.
- Falkland Pipits do not use tussac but can survive and occupy dwarf shrub heath where rats also breed, as on Keppel Island.

- The presence/absence of Falkland Thrush, Black-throated Finch, Black-chinned Siskin and Long-tailed Meadowlark is not in itself significant in assessing rat-infested or rat-free status. However, numbers of individuals of these species can be expected to be very low on islands with rats and are likely to increase following eradication.
- Larger birds such as Falkland Steamer Ducks, any of the three resident goose species, oystercatchers and gulls can and do survive and breed on small islands with resident rats.

References - in date order

Woods, RW:

1970 The avian ecology of a tussock island in the Falkland Islands. *Ibis* 112: 15-24.

1975 *The Birds of the Falkland Islands*. Anthony Nelson, Oswestry.

1984 *A census of breeding Falkland Islands passerine birds in tussac grass*. Report to The Royal Society of London, The Royal Geographical Society and the National Geographic Society.

1988 *Guide to Birds of the Falkland Islands*. Anthony Nelson, Oswestry.

Strange, IJ, Parry, CJ, Parry, MC & Woods, RW. 1988. Tussac Grass in the Falklands. Falkland Islands Foundation Project Report, in collaboration with the Falkland Islands Government.

Bingham, M. 1997. *Survey Report of Outer, Double & Harpoon Islands*. Falklands Conservation, Stanley.

Woods, RW & Woods, A 1997 *Atlas of Breeding Birds of the Falkland Islands*. Anthony Nelson, Oswestry.

Woods, RW. 2001 A survey of the number, size and distribution of islands in the Falklands archipelago. *The Falkland Islands Journal* 7(5):1-25

Woods, RW. 2002 Felton's Flower Survey: unexpected results. *Wildlife Conservation in the Falkland Islands*, 2:14-15.

Falklands Conservation. 2002. Rat Eradication. *Wildlife Conservation in the Falkland Islands*, 2:8-9. [author unknown]

Hall JR, Woods RW, Brooke M de L and Hilton GM. 2002. Factors affecting the distribution of landbirds on the Falkland Islands. *Bird Conservation International* 12:151-167.

Huin, N. 2002. Queen Charlotte Bay Islands Trip Report on 15 May 2002, unpublished report to Falklands Conservation.

Woods, RW. Felton's Flower is not a Falkland Endemic Plant. 2007. *Noticeboard in Wildlife Conservation in the Falkland Islands*, 8:15.