# The effect of competition on the plant community structure of a series of habitat islands on the Agulhas Plain.

Honours project
Martin CockS
1989

**Abstract**

The effect of competition between plant species belonging to the same guild on the community structure of a series habitat islands on the Agulhas Plain was studied. The hypothesis was tested that effects of competition between species on community structure should be greater on small islands due to the smaller population of species being more vulnerable to extinction. The plant communities on the habitat islands were sampled by placing a series of 1x1m plots down the length of six islands of two sizes in each of three habitats into which all six islands could be divided. A section of the mainland was also sampled. From this data the alpha diversity, beta diversity, Shannon-Wiener and Simpson's dominance indices were calculated and compared. It is argued that due to increased competitive effects these should all be lower on the small islands except for Simpson's dominance index which should be higher. No differences between the indices could, however, be found between the islands of different sizes. Examination of the data also showed that the species composition of the different islands' plant communities were very different from oneanother. These results suggest that competition is having little effect in the structuring of these communities. It is argued that the disturbance by frequent fires causes the communities to be in a continual state of flux and never reach a stable state where competition may have important effects on their structure.

## Introduction

On the Agulhas Plain a series of similarly shaped limestone outcrops effectively form habitat islands as there is a complete turnover in the plant communities' species composition between the islands and the surrounding acid sands. These islands thus form a very good natural laboratory in which to test island biogeography theory for plants. This study investigated the effects of competition between plants species which are members of a guild on the structure of the communities found on the islands.

The equilibrium theory of island biogeography of MacArthur & Wilson (1967) may help in the understanding of the composition of these communities. In its simplest form the theory states that the number of species on an island represents a dynamic equilibrium between the immigration of new species to the island and extinction of species already on the island. The rates of extinction and immigration are affected by the distance of the island from the mainland as well as the size of the island. Smaller islands contain smaller populations which are more likely to become extinct. Remote islands should contain fewer species because of their distance from the source of colonists. Such species area effects have been found for habitat islands in the fynbos (Bond *et al.* 1988). The equilibrium theory is surrounded by a great deal of controversy especially in its application to the design of nature reserves (Diamond 1975a) which may not be justified as there is not enough inequivocal evidence in the theories favour (Simberloff & Abele 1976a; 1976b; Gilbert 1980; Boecklen & Gotelli 1984).

In its simplest form the equilibrium theory treats species as separate entities, their success or failure on an island not being dependent on the number of species already present on the island. It is, however, possible that there is competition between the species and this has a major effect on the size and composition of the equilibrium which is reached on the islands. For instance increased competition between species may increase the rate at which species on an island become extinct and therefore the equilibrium in species number which is reached. Diamond (1975b) argued that most of the competition on islands is not direct leading to a checkerboard distribution of species on different islands but is diffuse competion i.e. the combined effects of species occupying the same guild. Diamond (1975b) discusses so called assembly rules for communities with permissible combinations of species which are seen in nature and forbidden combinations which are not seen in nature. Connor & Simberloff (1979) have re-examined these assembly rules and have found none of them to be justified.

In this study the hypothesis was tested that the competitive effects between species should be be greater between guild members on the smaller outcrops. This is because the species being out competed is unable to maintain a sufficiently large population for it to survive and easily becomes extinct. The competitively successful species should therefore occupy its habitat. On larger islands it is expected that different guild member species are able to survive occupying different habitats on the islands. in 1m² plots?

This being true the following are expected. 1.There should be more species on the larger islands (this is also predicted by equilibrium island biogeography theory). 2.Increased competitive effects should decrease the alpha diversity and diversity indices of the smaller islands. 3.Less species turnover or a lower beta turnover between habitats on the smaller islands due one species from a guild occupying all the habitats. 4.That species from the same guild that occupy different habitats on the larger islands or mainland should occupy all the habitats on the small islands.
same as 3 above?

## The study site

The study was conducted in the Hagelkraal area on the Agulhas Plain, Cape Province, South Africa (34 40'S 19 35'E). This area has a typical mediterranean type climate with 65-75% of the rainfall (500mm) falling in the winter months (May - October). The mean annual temperature is between 15°C and 16°C (Milewski 1979). The vegetation of the area falls within the Cape floristic region (Goldblatt 1978) and consists of fynbos shrublands of which compositional turnover is under strong edaphic influence (Thwaites & Cowling 1988).

At the study site limestone of the Bredasdorp Group has been eroded away leaving limestone outcrops of fairly similar shape yet differing in size. These outcrops have shallow well drained calcerous sands over limestone bedrock which support a proteoid fynbos community with dominant proteoid species *Protea obtusifolia* and *Leucadendron meridianum*. Surrounding the outcrops on the deep neutral sands is a structurally similar community with *Protea susannae* and *Leucadendron coniferum* as dominants! (Cowling *et al.* 1988). Outcrops of exposed bedrock which vegetation was entirely composed of *Protea obtusifolia-Leucadendron meridianum* community were sampled.

Surrounding the limestone outcrops are acid, highly leached, moderately to well drained sands of weathered Table Mountain Sandstone (Thwaites & Cowling 1988). These sands support an ericaceous fynbos with a high cover of restioids and ericaceous shrubs (Cowling *et al.* 1988) There is virtually a complete species turnover between the ericaceous fynbos of the acid sands and the proteoid fynbos of the limestone outcrops. The limestone outcrops therefore represent a series of islands in a sea of acid sand. The mainland or large area of limestone lies about 6 km to the north west.

## Methods

### Vegetation sampling

The approximate size of the islands was determined using an orthophoto of 1:10000 scale. The islands were divided into two groups; small islands of $100m^2$-$150m^2$ and medium islands of $350m^2$-$450m^2$. The islands which were sampled were all roughly eliptical with the long axis of the island orientated north-south and all sloped in a southerly direction. All the sampled islands contained three habitats which it was decided to sample i.e. a west slope, an east slope and a crest (top). Three small islands and three medium were sample (Table 1 give the islands' sizes in the order that they will be refered to throughout this study. Figure 1 shows the islands in relation to oneanother.) A nearby section of the mainland which also contained the required west slope, east slope and top was also sampled.

Table 1 The sizes of the islands which were included in the study.

| Size | Name |
|---|---|
| $100m^2$ | Small island 1 |
| $150m^2$ | Small island 2 |
| $150m^2$ | Small island 3 |
| $350m^2$ | Medium island 1 |
| $350m^2$ | Medium island 2 |
| $450m^2$ | Medium island 3 |
| $10km^2$ | Mainland |

The three habitats were sampled by placing 1mx1m plots down the length of the island in each of the three habitats. On the small islands five plots were placed in each habitat approximately 20m apart and on the medium islands seven plots were placed approximately 40m apart. The mainland was samled by placing eleven plots approximately 100m apart. At each plot the species present within the plot as well as their estimated percentage covers were recorded.

Patches of deep sand present on some of the islands were not sampled as species typical of the ericaceous fynbos of the acid sands tend to invade these areas. For this reason it was not possible to sample islands very much smaller than 100m. Islands of this size which were inspected tended to contain many species typical of the ericaceous fynbos of the acid sands.

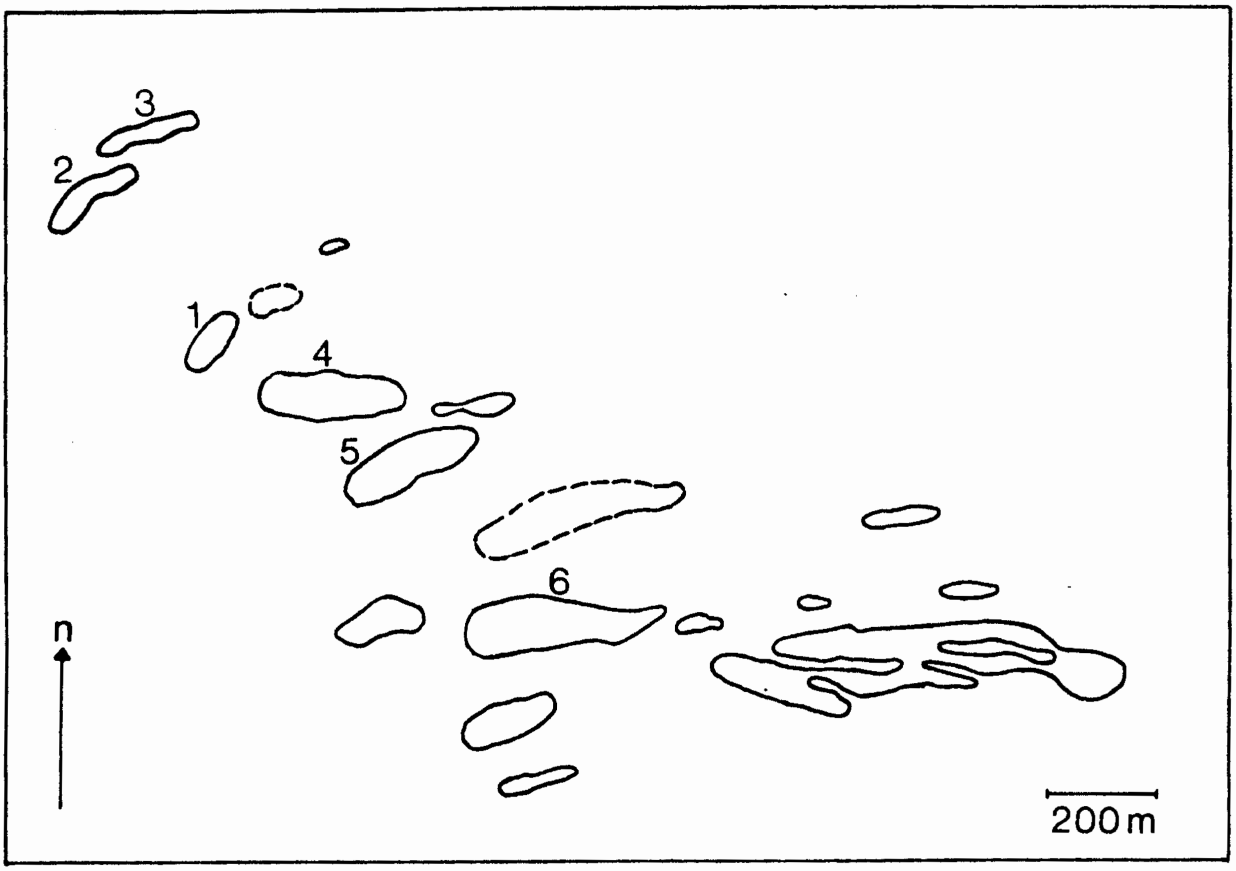


Figure 1. The position of the six islands that were sampled during the study. 1 2 3 - small islands(1-3). 4 5 6 - medium islands(1-3).

## Analysis of data

The average alpha diversity was obtained for each habitat of each island from the species present in each 1x1m plot. Simpson's dominance and Shannon-Wiener indices (Whittaker 1972) were calculated for each of the three habitats on the islands and the mainland.

Simpson's dominance index $D = \sum_{i=1}^{s} P^2_i$ where,

$P_i$ - proportion total individuals in $i^{th}$ species

s - total number of species in the community

Shannon-Wiener index $H = - \sum_{i=1}^{s} P^i \ln P^i$

The beta turnover was calculated for the six islands and the mainland for the west slope via the top to the east slope. Wilson & Shmida's (1984) measure of beta diversity ($\beta_T$) was used

$(\beta_T) = [g(H) + l(H)]/2\alpha$ where,

$g(H)$ - number of species gained along habitat gradient H

$l(H)$ - number of species lost along habitat gradient H

$\alpha$ - average sample richness

This was calculated for the first plot on the west slope, top and east slope then the second plot on west slope crest and east slope etc. Thus five beta turnovers were calculated for the small island, seven for the medium islands and eleven for the mainland.

The percentage similarities between the plots in the different habitats on all six islands and the mainland were calculated for the top and west, top and east and west and east habitats.

The alpha and beta diversities as well as simpson's dominance and Shannon Wiener's index of each of the different habitats were compared between the six islands and the mainland using a one way analysis of variance followed by Tukey's range test. The computer programme "statgraphics" (statistical graphics system by Statistical Graphic Corp. 1988) was used for these calculations.

The total percentage cover for all the species present on an island was calculated for the three habitats. These were then compared using Kendall coefficient of concordance (Siegal 1956). The species which were present in only one or only two of the habitats were also noted by sorting the species percentage cover at each plot for all six islands and the mainland (appendix B).

## Results

If the size of the island was important to the number of species it contains at size scale of these islands the medium island would be expected to contain more species than the small islands. There is little difference in the number of species found in the three habitats and the combined (total) number of species between the small and medium islands (figure 2). The mainland, however, contains more species in all three habitats as well as a greater total number of species.

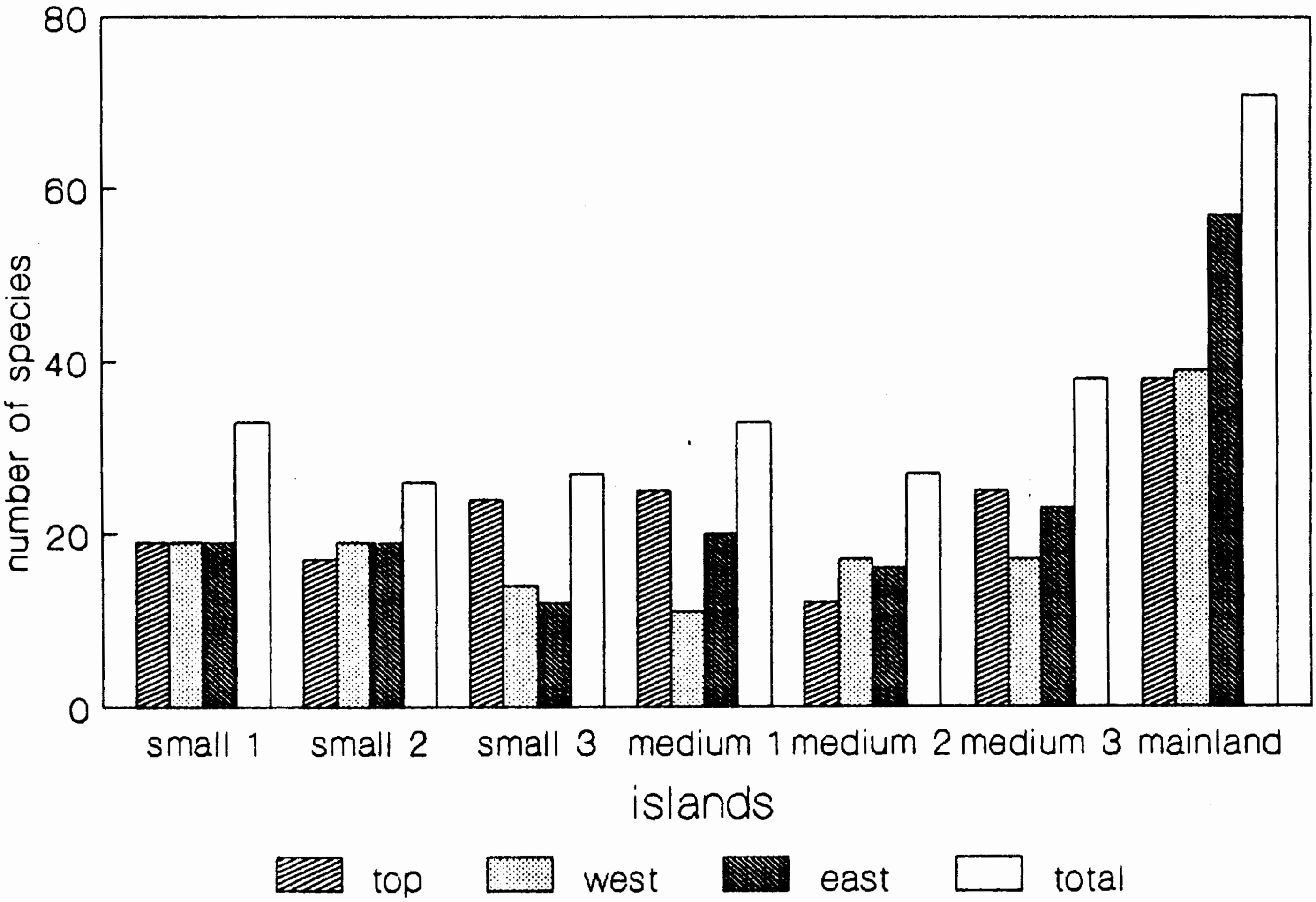


Figure 2 The number of species in the three habitats (top, west and east slopes) of the six islands and the mainland as well as the combined (total) number of species found on the island.

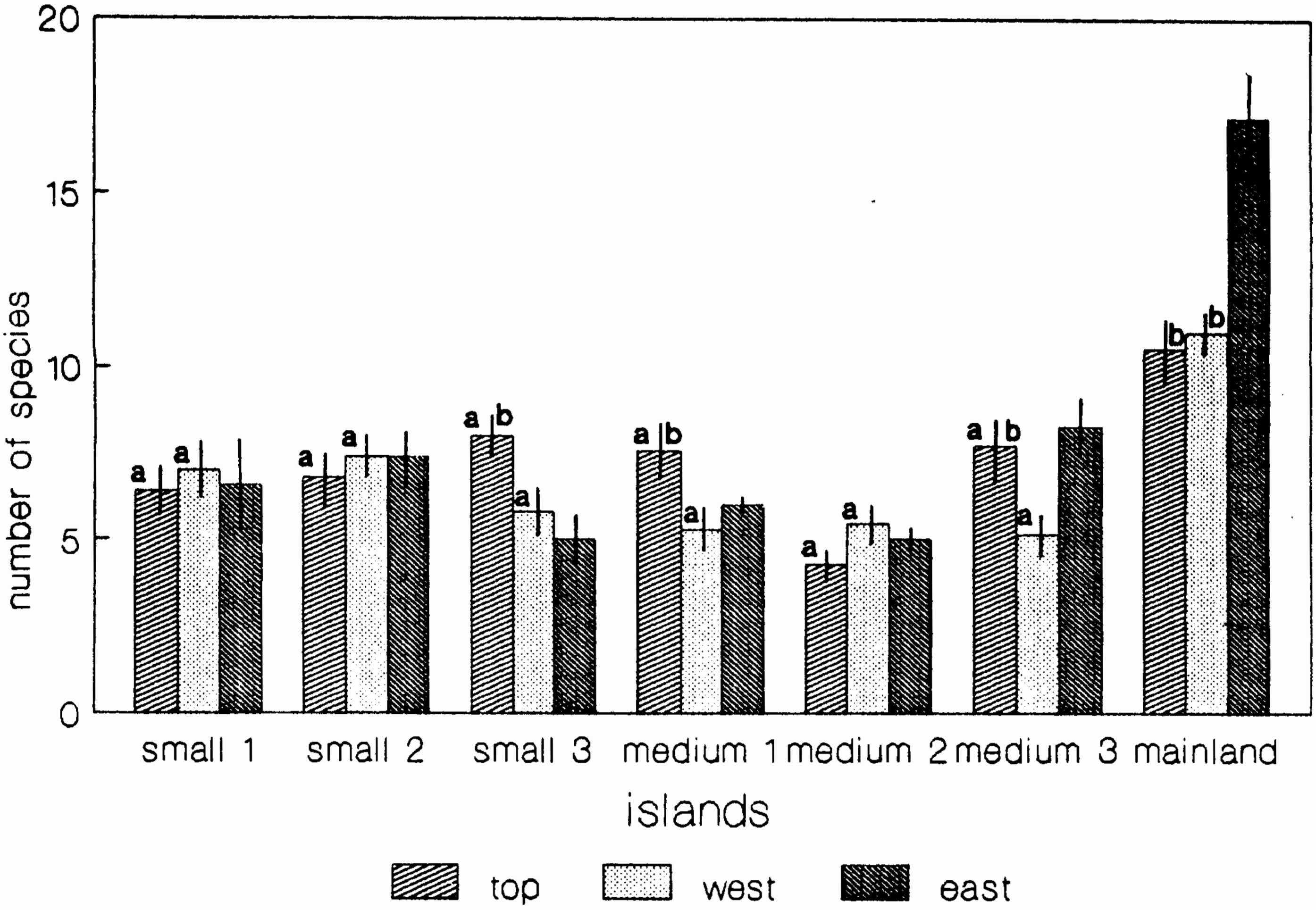


Figure 3 The average alpha diversity with standard error bars for the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland. The letters a and b represent the result of Tukey's multiple range test between the six islands and the mainland for the top and west habitat (east habitat was not tested). For each habitat islands sharing a letter are not significantly different from each other.

Increased competitive effects on the small islands should present themselves as a lowered alpha diversity in the different habitats (figure 3, the values are given in table 1 of appendix A). The one way ANOVA showed a significant difference between the six islands and the mainland for the top habitat (f-ratio=5.201, P<0.05) and the west habitat (f-ratio=13.879, p<0.05). The east habitat could not be test due a significant difference between the variances (Bartlett's test 2.176 = p<0.05). The results of

Tukey's multiple range test (figure 2) show that the difference in the average alpha diversities for the top habitat lie between three of the islands and the mainland. (The other three islands i.e. small island 3 and medium island 1 and 2 show similarities to both the other islands and the mainland.) In the case of the west habitat the difference clearly lie between the mainland and the six islands. This also appears to be true for the east habitat although it could not be tested statistically. Note that none of the difference lie between the medium and small islands.

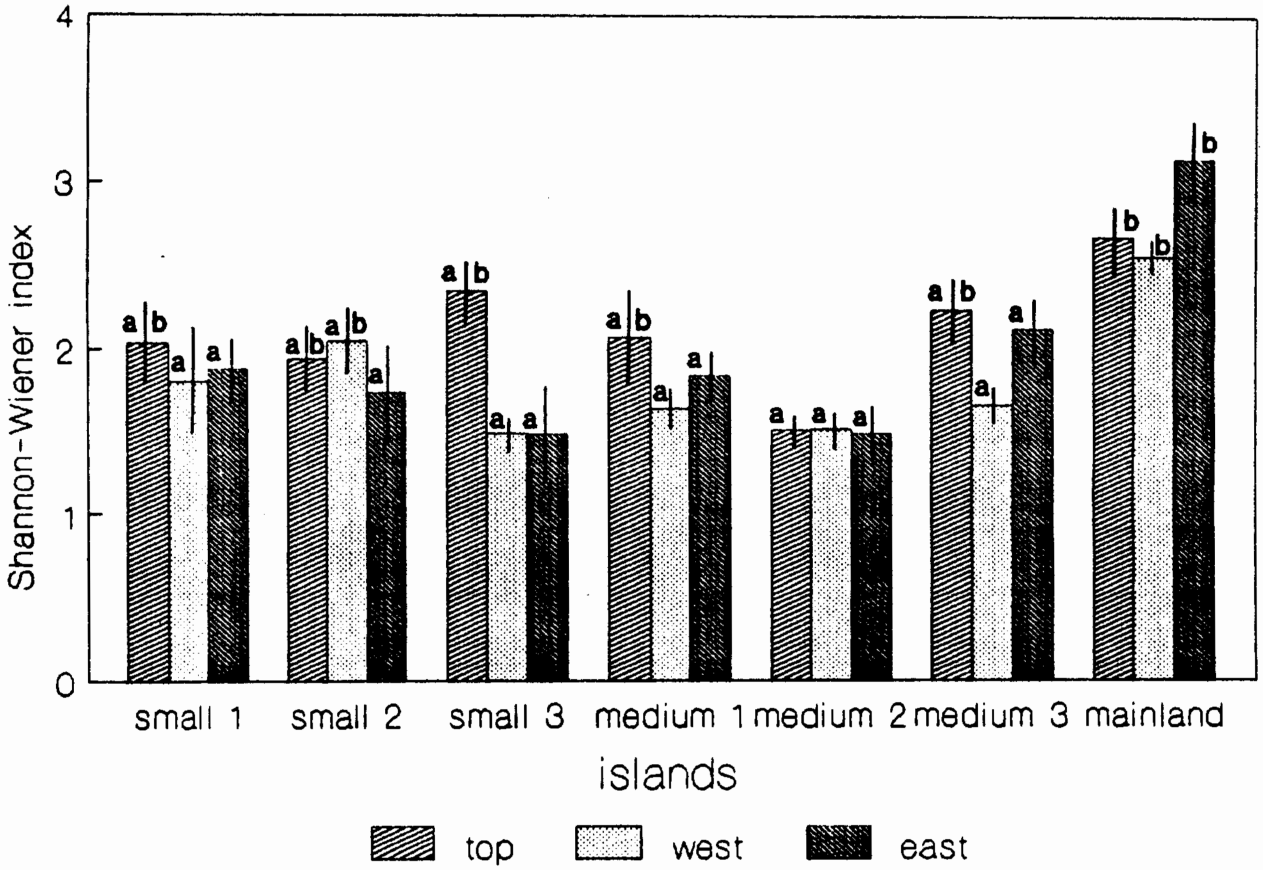


Figure 4 The Shannon-Wiener index with standard error bars for the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland. The letters a and b represent the result of Tukey's multiple range test between the six islands and the mainland for the top, west and east habitats. For each habitat, islands sharing a letter are not significantly different from each other.

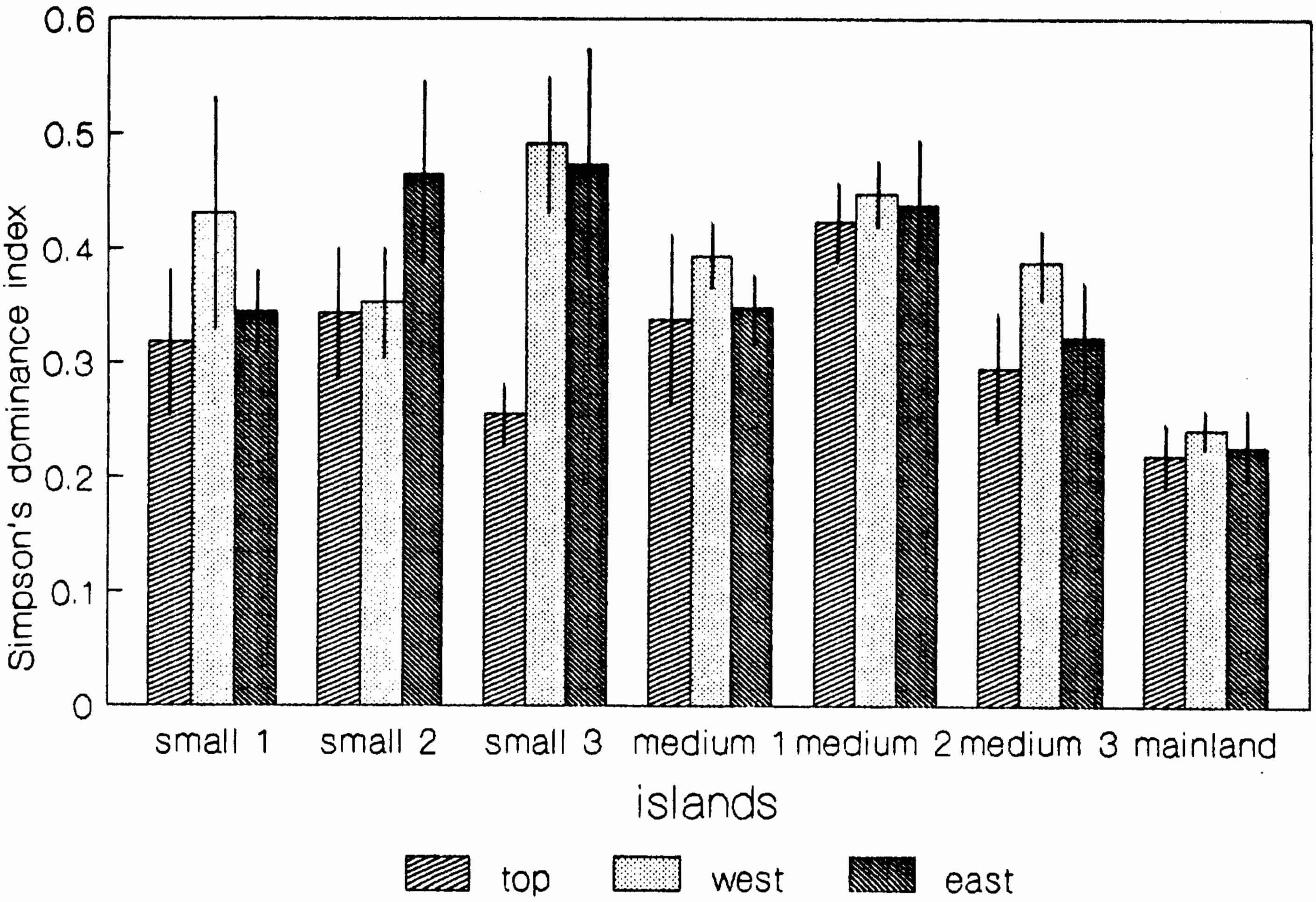


Figure 5 The Simpsons dominance index with standard error bars for the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland.

The increased competition between guild members on the small islands is expected to cause a decrease in the mean Shannon -Wiener diversity index (figure 4) and an increase in the mean Simpson's dominance index (figure 5). (The values and standard errors of these indices are given in table 2 and 3 appendix A). For the Shannon-Wiener index the one way analysis of variance showed a significant difference between the six islands and the mainland for the top habitat (f-ratio=3.299, $p<0.05$), west habitat (f-ratio=7.067, $p<0.05$) and east habitat (f-ratio=7.038, $P<0.05$). Tukey's multiple range test showed that the difference lies mainly between medium island 2 and the mainland in the case of the top habitat and between most of the islands and mainland in the case of the other three habitats. Thus none of the differences lay between the small and medium islands. The simpson's dominance index showed no significant differences between the six islands in the one way analysis of variance for the top (f-ratio=1.761) and east (f-ratio=2.260) habitats. The west habitat could not be tested due to significant differences in variance (Bartlett's test =1.471, $P<0.05$). This index, however, appeared to be lower for all three habitats on the mainland.

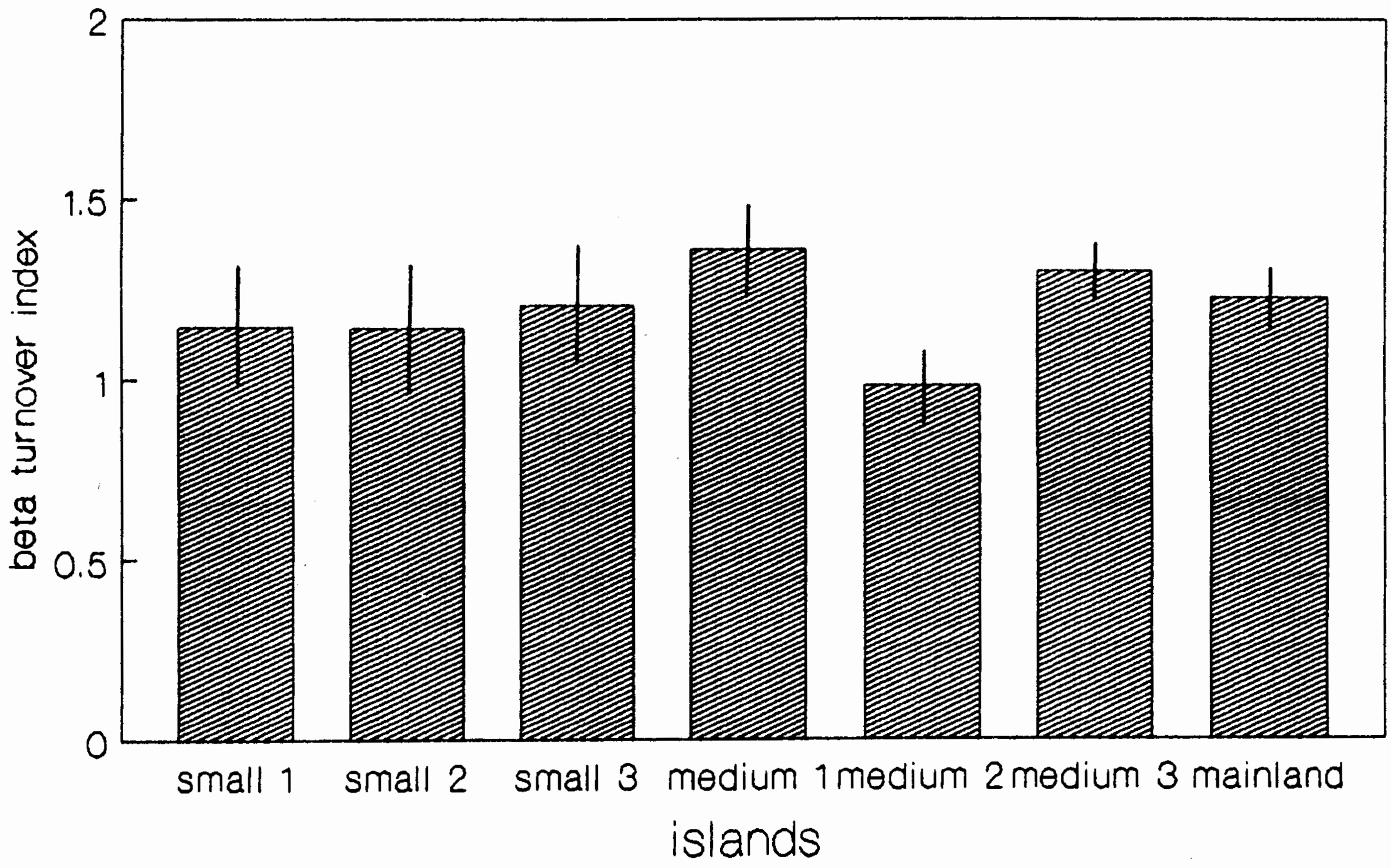


Figure 6 The mean beta turnover of species with standard error bars from west via top to east as measured by 1x1m plots on three small and three medium islands and mainland.

The beta turnover (Figure 6 values and standard errors in table 4 of appendix A) across the three habitats i.e. west slope via top to east slope should be lower on the small islands if these contain many species which occupy all three habitats i.e. species that have out competed other species of the same guild. No significant differences, however, could be found amongst the six islands and the mainland with a one way ANOVA (f-ratio=1.007).

The percentage similarities between the different plots on the the islands were also examined. This is a similar approach to that of beta turnover in other words it would be expected that ~~be expected that~~ the smaller islands would have greater similarities between the three habitats. The mean percentage similarities between the three combinations of habitats (top and west, top and east and west and east) are given in (table 5 appendix A). These could not be tested with a one way ANOVA due to significant difference between the variances. They, however, varied greatly between the islands and were not obviously larger for the smaller islands.

The prediction was also tested that the percentage covers of the species present should be significantly correlated on the smaller islands due to single species occupying all three habitats excluding other guild members. They should be not significantly correlated on the medium islands and mainland. This was tested using Kendall's coefficient and was found to be true for the islands (table 2). The significant result for the mainland was, however, not expected.

Table 2 Kendall coefficient of concordance analysis between the persentage cover of the species in the three habitats (top, west and east slope habitats) as measured with 1x1m plots on three small and three medium islands and mainland.

| | Test statistic | Degrees of freedom | significance level |
|---|---|---|---|
| Small island 1 | 0.899 | 32 | $p<0.05$ |
| Small island 2 | 1.528 | 25 | $p<0.05$ |
| Small island 3 | 0.637 | 26 | $p<0.05$ |
| Medium island 1 | 0.328 | 32 | n.s. |
| Medium island 2 | 0.479 | 26 | n.s. |
| Medium island 3 | 0.402 | 37 | n.s. |
| Mainland | 0.634 | 70 | $p<0.05$ |

The species list for the six islands and the mainland are given in appendix B. These have been divided into species occuring in two of the habitats followed by species occuring in one habitat and species which occured only once or twice with low percentage covers.

Generally the islands contain few species in common. The small islands have 54% of their species in common, the medium islands 37% and only 19% of the species were shared by the islands and the mainland. Few of the species occupied only one of the habitats and these were different on the different islands (Appendix B). The species pool for the small and the medium islands is 54 and only 25 of these species are found on both the small and the medium islands. Twelve of these species are found in all three habitats on at least one of the three habitats on at least one of the medium sized islands. Table 3 displays the twelve species with the habitats in which they were found on each of the islands and the mainland.

Table 3 Species found in all three habitats on at least one of the small or medium islands with the habitats which they occupy on all the islands. A - all habitats, W - west slope, E - east slope, l - present in very low abundance.

| Species | mainland | islands medium 3 | medium 2 | medium 1 | small 3 | small 2 | small 1 |
|---|---|---|---|---|---|---|---|
| *Leucadendron meridianum* | A | A | A | A | A | A | A |
| *Thamnocortus fraternus* | A | A | A | A | A | A | A |
| *Tetraria cuspidata* | A | A | A | A | A | A | A |
| *Indigofera brachystacha* | A | TW | Al | A | A | T | A |
| *Ficinia praemorsa* | A | A | TW | TW | A | TW | WE |
| *Anthospermum aethiopicum* | A | A | WE | A | Tl | Tl | A |
| *Struthiola striata* | A | Wl | | A | TWl | A | Tl |
| *Ischyrolepis leptocladis* | | TE | | El | | A | TW |
| *Roella compacta* | TE | A | | A | TE | A | WE |
| *Centella affinis* | | A | | | Al | | |
| *Ficinia lateralis* | TE | El | E | E | | A | A |
| *Erica propinqua* | | T | WE | TE | WE | A | Wl |

The four species generally found in all three habitats on the small islands i.e. *Leucadendron meridianum*, *Thamnocortus fraternus*, *Indigofera brachistacha* and *Tetraria cuspidata* were found in all three habitats on the mainland and the medium islands. *Ficinia lateralis* was the only species found in all three habitats on the small islands and restricted to the east slope on the medium islands. *Ischyrolepis leptocladis* also showed similar tendencies. Few species could thus be found which were restricted to certain habitats on the mainland or medium islands while being found as generalists on the small islands.

**Discussion**

From the data presented in this study it is not possible to decern a species area relationship. Cowling (pers. com.) has, however, shown that there is a strong relationship between the size of the islands and the number of species they contain. This says little, however, about the truth of the equilibrium theory of island biogeography (MacArthur & Wilson 1967). Gilbert (1980) has pointed out that for the theory to apply there must not only be a strong species-area relationship but also the number species on the island should remain constant while there is a non-zero level of turnover . From the data collected it is not possible to say whether there is a non zero level of species turnover on the islands or not. The number of species on these islands may not be affected by by the sizes of the islands included in the study i.e. the islands may be too similar in size for any differences to become obvious.

There have been conflicting results in studies which have examined insularisation effects on species number. Bond *et al.* (1988) for example found that habitat islands of fynbos surrounded by afromontane forest showed a strong species area relationship. Cody *et al.* (1986) also found evidence of the effect of size on the species number in the islands up to 3km² in the Sea of Cortez. Simberloff & Gotelli (1984), on the other hand, found little evidence of the effect of island size on species number in prairie remnants isolated for less than a hundred years, there was also no evidence that the species number had begun to relax after this time. Case & Cody (1986) point out that plants are good survivors and disperse well and therefore make good colonizers with a low extinction rates. This would lead to a dampening of insularisation on species number in certain cases.

None of the indices calculated from the data could show that competitive interactions were more important in determining the number of species found on the small islands compared to the medium islands. (i.e. alpha and beta diversity, Simpson's dominance and Shannon-Wiener indices). The lower alpha diversity of all the islands as well as the lower Shannon-Wiener diversity and the higher Simpson's dominance indices suggest that there may be competitive effect excluding species from both the medium and small islands. On closer examination of individual species, however, no species could be found that were more generalist on the islands while being habitat specialists on the mainland (table 3).

Although alpha diversity represents a measure of the biological interactions between species, the higher average alpha diversity on the mainland does not represent a lowered amount of biological interaction but is probably due to mass effect. Wilson & Shmida (1985) have stressed the importance of mass effect on community diversity, this happens when a species establishes from propagules from neighbouring habitats in sites where they cannot be self sustaining. Bond (1983) also noted the importance of the regional species pool on the alpha diversity of a community. The larger species pool of the mainland may thus lead to higher alpha diversities. This may also explain the significant similarity which was found between the species percentage covers found on the mainland. The greater number of species per plot on the mainland probably also increases the Shannon-Wiener diversity index and decreased the Simpson's dominance index if the species were evenly represented amongst the plots.

Wilson & Shmida's (1984) beta turnover measures the change in species composition along a habitat gradient They have argued (1985) that it is affected by habitat diversity. Mass effect may increase or decrease this turnover. In this case, however, it is possible that mass effect has decreased the beta turnover on the mainland to similar levels as that of the islands by reciprocal swopping of species between the three habitats.

In stead of representing stable communities, the island communities rather represent communities that are not able to reach stability due the fires which destroy them periodically. (By stability is meant that the community will return to equilibrium or a point where the species abundances remain constant. Note not where the number of species remain constant as in the equilibrium theory of island biogeography.(see Chesson and Case 1986)). If competitive exclusion is slow it will not have a major impact on community composition. The composition will rather be affected by the the species which are able to survive and recolonise the island after fire. It will be predictable only in the sense of the number of species able to recolonise the island.

This is not antagonistic to the equilibrium theory of island biogeography, which only predicts that an equilibrium in species number will be reached (with non zero turnover of species) rather than an equilibrium in species composition.

This idea is similar to that of Hubbell & Foster (1986) who argued that the spacial structure and dynamics of tropical forests suggest that chance and biological uncertainty play an important role in the structuring of these tree communities. Cowling (1987) maintains that fire is important in the maintenance of alpha diversity in Mediterranean shrublands enabling competing guild members to coexist due to the lowering of the competitive effects between these species.

The small amount of similarity in the composition of the communities on the islands (25 out of 56 species were found on at least one small and one medium island and only 11 of these species were found on all six islands) suggests that the chance event of colonisation play  have a major impact on community composition.

This study therefore emphasizes the ideas of Ricklefs (1987) who noted that not only interactions between species limit the number of coexisting species and effect the structure of a community. There are a large number of regional and historical processes as well as chance events which have a profound effect on community structure.

Appendix A

Table 1 The average alpha diversity of the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland. .pm0

| | TOP | | | WEST | | | EAST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots |
| Small island 1 | 6.4 | 0.74 | 5 | 7.0 | 0.84 | 5 | 6.6 | 1.36 | 5 |
| Small island 2 | 6.8 | 0.80 | 5 | 7.4 | 0.68 | 5 | 7.4 | 0.75 | 5 |
| Small island 3 | 8.0 | 0.44 | 5 | 5.8 | 0.74 | 5 | 5.0 | 0.71 | 5 |
| Medium island 1 | 7.6 | 0.84 | 7 | 5.3 | 0.64 | 7 | 6.0 | 0.22 | 7 |
| Medium island 2 | 4.3 | 0.52 | 7 | 5.4 | 0.57 | 7 | 5.0 | 0.31 | 7 |
| Medium island 3 | 7.7 | 0.92 | 7 | 5.1 | 0.46 | 7 | 8.3 | 0.81 | 7 |
| Mainland | 10.5 | 1.09 | 10 | 11.0 | 0.63 | 10 | 17.2 | 1.29 | 10 |

Table 2 The mean Shannon-Wiener index of the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland.

| | TOP | | | WEST | | | EAST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots |
| Small island 1 | 2.04 | 0.246 | 5 | 1.80 | 0.340 | 5 | 1.89 | 0.216 | 5 |
| Small island 2 | 1.94 | 0.200 | 5 | 2.05 | 0.183 | 5 | 1.74 | 0.322 | 5 |
| Small island 3 | 2.35 | 0.175 | 5 | 1.50 | 0.125 | 5 | 1.49 | 0.314 | 5 |
| Medium island 1 | 2.07 | 0.296 | 7 | 1.65 | 0.155 | 7 | 1.84 | 0.152 | 7 |
| Medium island 2 | 1.52 | 0.096 | 7 | 1.52 | 0.118 | 7 | 1.49 | 0.163 | 7 |
| Medium island 3 | 2.24 | 0.233 | 7 | 1.66 | 0.097 | 7 | 2.12 | 0.231 | 7 |
| Mainland | 2.67 | 0.184 | 10 | 2.55 | 0.117 | 10 | 3.14 | 0.257 | 10 |

Table 3 The Simpson's dominance index of the three habitats (top, west and east slope) as measured with 1x1m plots on three small and three medium islands and the mainland.

| | TOP | | | WEST | | | EAST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots |
| Small island 1 | 0.32 | 0.075 | 5 | 0.43 | 0.111 | 5 | 0.35 | 0.041 | 5 |
| Small island 2 | 0.34 | 0.062 | 5 | 0.35 | 0.056 | 5 | 0.47 | 0.096 | 5 |
| Small island 3 | 0.26 | 0.035 | 5 | 0.49 | 0.524 | 5 | 0.47 | 0.108 | 5 |
| Medium island 1 | 0.34 | 0.081 | 7 | 0.39 | 0.035 | 7 | 0.34 | 0.043 | 7 |
| Medium island 2 | 0.42 | 0.037 | 7 | 0.45 | 0.032 | 7 | 0.44 | 0.064 | 7 |
| Medium island 3 | 0.30 | 0.052 | 7 | 0.39 | 0.027 | 7 | 0.32 | 0.051 | 7 |
| Mainland | 0.22 | 0.030 | 10 | 0.24 | 0.024 | 10 | 0.23 | 0.045 | 10 |

**Table 4 The mean beta turnover of species from west via top to east habitat as measured by 1x1m plots on three small and three medium islands and the mainland.**

| | Mean | Standard error | Number of plots |
|---|---|---|---|
| Small island 1 | 1.147 | 0.174 | 5 |
| Small island 2 | 1.144 | 0.192 | 5 |
| Small island 3 | 1.204 | 0.168 | 5 |
| Medium island 1 | 1.359 | 0.136 | 7 |
| Medium island 2 | 0.982 | 0.101 | 7 |
| Medium island 3 | 1.296 | 0.077 | 7 |
| Mainland | 1.223 | 0.078 | 10 |

Table 5 The percentage similarities between the top and west, top and east and west and east habitats as measured with 1x1m plots on three small and three medium islands and the mainland.

| | TOP and WEST | | | TOP and EAST | | | WEST and EAST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots | Mean | Stand. error | Number plots |
| Small island 1 | 10.0 | 7.52 | 25 | 12.5 | 9.87 | 25 | 21.5 | 10.09 | 25 |
| Small island 2 | 18.2 | 9.47 | 25 | 20.3 | 11.47 | 25 | 14.5 | 10.09 | 25 |
| Small island 3 | 9.0 | 4.94 | 25 | 10.9 | 5.98 | 25 | 14.4 | 13.47 | 25 |
| Medium island 1 | 20.5 | 15.57 | 49 | 14.9 | 14.11 | 49 | 19.6 | 11.25 | 49 |
| Medium island 2 | 23.0 | 10.53 | 49 | 22.9 | 10.85 | 49 | 28.8 | 15.17 | 49 |
| Medium island 3 | 15.4 | 7.59 | 49 | 7.4 | 6.85 | 49 | 7.4 | 8.521 | 49 |
| Mainland | 8.6 | 5.40 | 100 | 7.5 | 4.88 | 100 | 8.2 | 5.77 | 100 |

## Appendix B

**Species list of the mainland, three small and three medium size islands showing the percentage cover for the different plots (small islands 5 plots, medium islands 7 plots and mainland 11 plots) in the three habitats . The species are arranged in the following order; species occupying all three habitats, two of the three habitats, one of the three habitats and finally species which only occur once or twice with low percentage covers.**

SMALL ISLAND 1

| SPECIES | TOP | | | | | WEST | | | | | EAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 0 | 0 | 5 | 10 | 5 | 30 | 70 | 20 | 10 | 1 | 20 | 15 | 10 | 50 | 20 |
| Tetaria cuspidata | 0 | 0 | 15 | 10 | 0 | 0 | 5 | 5 | 0 | 20 | 5 | 5 | 15 | 20 | 10 |
| Thamnc. fraternus | 2 | 30 | 15 | 5 | 0 | 0 | 5 | 5 | 5 | 0 | 30 | 2 | 1 | 0 | 0 |
| Protea obtusifolia | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 20 | 0 | 15 | 0 | 0 | 0 |
| Ficinia lateralis | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 30 | 0 |
| Anthos. aethiopicum | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 1 | 1 | 0 | 0 |
| Indig. brachystacha | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| Euclea racemosa | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| Ischyro. leptocladis | 0 | 0 | 0 | 2 | 10 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 |
| Ficinia praemorsa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 |
| Roella compacta | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| Indig. flabellata | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Metalasia muricata | 10 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Chondro. microcarpum | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pseudopent. macrantha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| Penta. eriostoma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Rhus glauca | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rhus laevigata | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Centella scabra | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Penta. curvifolia | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Linum africanum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Struthiola striata | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Helic. pandurifolium | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corymbium sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Hermannia trifoliata | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oxalis smithiana | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sutera hispida | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica propinqua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zygoph. flexuosum | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Clutia alaternoides | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Centella scabra | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ficinia ramosissima | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

SMALL ISLAND 2

| SPECIES | TOP | | | | | WEST | | | | | EAST | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 15 | 50 | 10 | 20 | 20 | 5 | 1 | 1 | 20 | 30 | 40 | 80 | 50 | 2 | 5 |
| Thamno. fraternus | 15 | 10 | 5 | 5 | 20 | 10 | 5 | 30 | 2 | 10 | 0 | 0 | 0 | 15 | 10 |
| Tetaria cuspidata | 0 | 0 | 0 | 3 | 1 | 5 | 0 | 1 | 5 | 1 | 5 | 5 | 10 | 5 | 1 |
| Ischyro. leptocladis | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| Roella compacta | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 0 |
| Struthiola strata | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 |
| Ficinia lateralis | 15 | 2 | 5 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Erica propinqua | 0 | 1 | 1 | 3 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| Metalasia muricata | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| Elegia juncea | 0 | 1 | 5 | 10 | 0 | 5 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chondro. microcarpum | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia praemorsa | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Restio triciteus | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Myrica quercifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 10 | 0 | 0 |
| Indig. brachystacha | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| Pseudpent. macrantha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 0 |
| Priestleya sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| Leucos. patersonii | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corymbium sp | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Phylica floribunda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| Disparago anomala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Pelar. betulinum | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Antos. aethiopicum | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amphithalea alba | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

SMALL ISLAND 3

| SPECIES | TOP | | | | | WEST | | | | | East | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 0 | 0 | 10 | 10 | 10 | 0 | 0 | 40 | 40 | 1 | 10 | 10 | 15 | 70 | 30 |
| Thamno. fraternus | 0 | 10 | 10 | 5 | 5 | 20 | 5 | 5 | 1 | 1 | 10 | 0 | 0 | 0 | 0 |
| Tetaria cuspidata | 1 | 5 | 2 | 0 | 5 | 0 | 5 | 2 | 5 | 2 | 10 | 5 | 10 | 5 | 10 |
| Ficinia praemorsa | 25 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| Indig. brachystacha | 2 | 2 | 1 | 0 | 0 | 12 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 0 |
| Restio triticeus | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 |
| Chondro. microcarpum | 20 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia lateralis | 1 | 0 | 0 | 5 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elegia juncea | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metalasia muricata | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Erica propinqua | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| Roella compacta | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 |
| Pelar. betulinum | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Centella affinis | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Leucos. patersonii | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Struthiola striata | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Psedopent. macrantha | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Myrica quercifolia | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Hermannia trifoliata | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Priestleya sp | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia tenuifolia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Anthos. aethiopicum | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diparago anomala | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica lineata | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Priestleya sericea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Phylica floribunda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

MEDIUM ISLAND 1

| SPECIES | TOP | | | | | | | WEST | | | | | | | EAST | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 0 | 0 | 0 | 1 | 20 | 40 | 30 | 30 | 40 | 35 | 20 | 5 | 25 | 0 | 5 | 40 | 0 | 20 | 60 | 30 | 10 |
| Thamno fraternus | 5 | 5 | 10 | 70 | 5 | 5 | 40 | 10 | 30 | 30 | 10 | 5 | 0 | 30 | 0 | 0 | 10 | 0 | 0 | 0 | 5 |
| Tetaria cuspdata | 0 | 3 | 0 | 0 | 10 | 0 | 10 | 5 | 2 | 2 | 10 | 0 | 0 | 10 | 10 | 5 | 15 | 25 | 30 | 10 | 5 |
| Roella compacta | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Indig. brachystacha | 5 | 0 | 5 | 1 | 2 | 1 | 5 | 5 | 0 | 1 | 0 | 5 | 2 | 1 | 0 | 5 | 1 | 0 | 0 | 1 | 2 |
| Protea obtusifolia | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Anthos. aethiopicum | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 5 | 0 | 1 | 0 | 0 | 0 | 1 |
| Struthiola striata | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Elegia juncea | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chondro. microcarpum | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disparago anomala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Psedopent. macrantha | 0 | 0 | 0 | 1 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 0 | 0 |
| Ficinia praemorsa | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica propinqua | 0 | 0 | 3 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Linum africanum | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 2 |
| Penta eriostoma | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Pelar betulinum | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hermannia trifoliata | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia lateralis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 25 | 0 | 0 | 0 |
| Corymbium sp | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Myrica quercifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Euclea racemosa | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia tenuifolia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peuced. ferulaceum | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Centella scabra | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rhus laevigata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Clutia alaternoides | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia ramosissima | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Priestleya gutheriei | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Helic. pandurifolium | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ischyro. leptocladis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Rhus glauca | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MEDIUM ISLAND 2

| SPECIES | TOP | | | | | | | WEST | | | | | | | EAST | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 15 | 5 | 25 | 40 | 20 | 20 | 15 | 20 | 1 | 15 | 30 | 50 | 40 | 30 | 40 | 30 | 20 | 40 | 30 | 20 | 1 |
| Tetaria cuspidata | 5 | 5 | 0 | 5 | 10 | 5 | 5 | 0 | 10 | 10 | 25 | 10 | 20 | 5 | 0 | 30 | 30 | 30 | 30 | 0 | 30 |
| Thamno. fraternus | 15 | 0 | 0 | 0 | 30 | 10 | 2 | 20 | 30 | 20 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Felar. betulinum | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia praemorsa | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Protea obtusifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 75 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| Rhus laevigata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Colpoon compressum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 |
| Pseudopent. macrantha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Erica propinqua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| Anthos. aethiopicum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| | | | | | | | | | | | | | | | | | | | | | |
| Penta. eriostoma | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Myrica quercifolia | 0 | 5 | 30 | 0 | 0 | 30 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 5 | 20 | 1 | 1 | 0 | 0 |
| Disparago anomala | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Ficinia lateralis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Helic. pandurifolium | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indig. brachystacha | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hebenstreitia sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bobartia indica | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Priestleya gutheriei | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Linum africanum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Ficinia tenuifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Euclea racemosa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Chondro. microcarpum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Roella compacta | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Priestleya sericea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leucos. patersonii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

MEDIUM ISLAND 3

| SPECIES | TOP | | | | | | | WEST | | | | | | | EAST | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leucad. meridianum | 0 | 0 | 10 | 10 | 30 | 0 | 10 | 30 | 0 | 15 | 10 | 10 | 0 | 30 | 1 | 1 | 10 | 0 | 50 | 40 | 1 |
| Thamno. fraternus | 10 | 10 | 10 | 1 | 10 | 10 | 20 | 30 | 20 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 1 | 3 | 0 | 0 | 0 |
| Tetaria cuspidata | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 25 | 5 | 3 | 5 | 30 | 1 |
| Ficinia praemorsa | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 15 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Anthos. aethiopicum | 2 | 2 | 1 | 1 | 1 | 5 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 0 |
| Roella compacta | 0 | 0 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 1 |
| Satyrium carneum | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| Centella affinis | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Chondro. microcarpum | 2 | 2 | 0 | 0 | 5 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indig. brachystache | 2 | 0 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Penta. curvifolia | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Protea obtusifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 1 | 0 | 0 |
| Colpoon compressum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Disparago anomala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Erica propinqua | 0 | 2 | 0 | 5 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Myrica quercifolia | 10 | 0 | 10 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 3 | 0 | 10 | 0 | 0 | 10 |
| Euclea racemosa | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Ischyro. leptocladis | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Knowlt. vesicatoria | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| | | | | | | | | | | | | | | | | | | | | | |
| Chascanum cernum | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agathosma geniculata | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica sp | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hebenstreitia sp | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pelar. betulinum | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Helic. pandurifolium | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Penta. eriostoma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 30 | 5 | 0 | 5 | 0 | 10 |
| Leucos. patersonii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 |
| Pseudopent. macrantha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Elegia juncea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| Metalasia muricata | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Struthiola striata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| unidentified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Corymbium sp | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ficinia lateralis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Watsonia cf pillansii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Clutia alaternoides | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Gnidia juniperifolia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MAINLAND

| SPECIES | TOP | | | | | | | | | | | WEST | | | | | | | | | | | EAST | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aspalathus salteri | 0 | 10 | 0 | 0 | 0 | 1 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 15 | 40 | 5 | 0 | 0 | 40 | 0 |
| Ficinia praemorsa | 0 | 2 | 2 | 15 | 5 | 1 | 5 | 5 | 5 | 5 | 0 | 10 | 1 | 1 | 1 | 10 | 5 | 5 | 5 | 0 | 0 | 3 | 0 | 5 | 0 | 10 | 2 | 3 | 3 | 3 | 15 | 0 | 1 |
| Leucad. meridianum | 1 | 1 | 1 | 0 | 5 | 1 | 2 | 1 | 0 | 10 | 0 | 0 | 5 | 20 | 10 | 1 | 1 | 0 | 1 | 1 | 20 | 0 | 2 | 1 | 30 | 10 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Thamno. fraternus | 5 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 2 | 5 | 0 | 10 | 20 | 10 | 5 | 0 | 0 | 0 | 1 | 0 | 20 | 20 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| Hypodiscus rigidus | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 15 | 1 | 10 | 5 | 10 | 1 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Anthos. aethiopicum | 0 | 0 | 5 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 10 | 1 | 0 | 1 | 1 | 2 | 0 | 5 | 2 | 1 | 2 | 1 | 2 | 0 | 5 | 1 |
| Pseudopen. macrantha | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 15 | 10 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| Indig. brachystacha | 1 | 5 | 0 | 0 | 5 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 10 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Ficinia tenuifolia | 0 | 0 | 0 | 0 | 1 | 10 | 5 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 5 | 1 | 0 | 2 | 0 | 1 | 1 | 1 |
| Centella sp | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 20 | 5 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 0 |
| Phylica sp nov | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Elegia juncea | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 10 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 0 |
| Tetaria cuspidata | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 |
| Disparago anomala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| Pelar. betulinum | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |
| Berkheya barbata | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| Muraltia collina | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Metalasia muricata | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Oedera imbricata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Gnidia galpinii | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Struthiola strata | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Hermannia trifoliata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Diosma gutherie | 5 | 0 | 30 | 15 | 0 | 1 | 1 | 2 | 5 | 20 | 0 | 10 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Euclea racemosa | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Protea obtusifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| Roella compacta | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Ficinia lateralis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Thesium capitatum | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| Priestleya sericea | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Corymbium sp | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chascanum cernum | 1 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| unidentified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| Satyrium carneum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| Wachen. paniculata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| Aspala. crassisepala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| Arctotis cf acaulis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Anthos. galioides | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| Chondro. microcarpum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Erica sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Agatho. serphyllacea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thesium sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Felicia aethiopica | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Chironia decumbens | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| Restio triticeus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Polygala affinis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Polygala myrtifolia | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Senecio arnicifolius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Indig. angustifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Linum africanum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| Mimetes saxitillis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Penta. curvifolia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sutera aspalathcides | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Watsonia cf pillansii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Agathosma eriantha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| Leucos. patersonii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Tetaria sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Lampanthus sp | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Helic. nudifolium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Olea exasperata | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diosma sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Myrsine africanus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Passerina sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica calcaeophila | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Centella scabra | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gladiolus bullatus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Scabiosa columbaria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Festuca scabra | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Metalasia sp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erica pulvinata | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

## Acknowledgements

I would like to thank Dr William Bond for his advice concerning the proposal of this project, Dr Richard Cowling for all his help with the study. Mr Penwill and Mr Ian Bell for allowing me collect the data on their farms.

## References

Bond, W.J., Midgley, J. & Vlok, J. 1988. When is an island not an island ? Insular effects and their causes in fynbos shrublands. *Oecologia* 77:515-521.

Bond, W. 1983. On alpha diversity and the richness of the Cape flora: a study in the southern Cape fynbos. In: Kruger, F.J., Mitchell, D.T. & Jarvis, J.U.M. (eds) Mediterranean type ecosystems: the role of nutrients.

Boecklen, W.J. & Gotelli, N.J. 1984. Island biogeographic theory and conservation practice : species-area or specious-area relationships *Biological conservation* 29:63-80.

Cowling, R.M. 1987. Fire and its role in the coexistence and speciation in Gondwana shrublands *S. Afr. J. Sci.* 83:106-112.

Cowling, R.M., Campbell, B.M., Mustard, P., McDonald, D.J., Jarman, M.L., & Moll, E.J. 1988. Vegetation classification in a floristically complex area: the Agulhas Plain. *S. Afr. J. Bot.* 54:290-300.

Cody, M.L., Moran, R. & Thompson, H. 1986. The plants. In: Case, T.J. & Cody, M.L. (eds) Island biogeography in the Sea of Cortez. University of California Press, Berkeley.

Connor, E.F. & Simberloff, D. 1979. The assembly of species communities : chance or competition ? *Ecology* 60:1132-1140.

Case, T.J. & Cody, M. 1986. Synthesis: pattern and processes in island biogeography. In: Case, T.J. & Cody, M.L. (eds) Island biogeography in the Sea of Cortez. University of California Press, Berkeley.

Chesson, P.L. & Case, T.J. 1986. Overview: Nonequilibrium community theories: chance, variabiliy, history, and coexistence. In: Diamond, J. & Case, T.J. (eds) Community ecology. Harper & Row, New York.

Diamond, J.M. 1975a The island dilemma: Lessons of modern biogeographic studies for the design of nature reserves *Biological conservation* 7:129-146.

Diamond, J.M. 1975b. Assembly of species communities. In: Cody, M.L. & Diamond, J.M. (eds) Ecology and evolution of communities. Belknap, Cambridge, Ma.

Hubbell, S.P. & Foster, R.B. 1986. Biology, chance and history and the structure of tropical rain forest tree communities. In Diamond, J. & Case, T.J. Community ecology. Harper & Row, New York.

Gilbert, F.S. 1980, The equilibrium theory of biogeography: fact or fiction. *Journal of biogeography* 7:209-235.

Goldblatt, P. 1978. An analysis of the flora of southern Africa: its characteristics, relationships and origins. *Ann. Missouri Bot Gar* 65:369-436.

MacArthur, R.H. & Wilson, E.O. 1967 The theory of island biogeography. Princeton University Press, Princeton.

Milewski, A.V. 1979. A climatic basis for the study of convergence of vegetation structure in Mediterranean Australia and southern Africa. *Journal of biogeography* 6:293-299.

Ricklefs, R.E. 1987. Community diversity : relative roles of local and regional processes. *Science* 235:167-171.

Siegal, S. 1956. Nonparametric statistics for the behavioural sciences. McGraw-Hill Kogakusha, Tokyo.

Simberloff, D.S. & Abele, L.G. 1976a Island biogeography theory and conservation practice. *Science* 191:285-286.

Simberloff, D.S. & Abele, L.G. 1976b. Reply to critics. *Science* 193:1032.

Simberloff, D. & Gotelli, N. 1984. Effects of insularisation on plant species richness in the prairie-forest ecotone. *Biological conservation* 29:27-46.

Thwaites, R.N. & Cowling, R.M. 1988. Soil vegetation relationships on the Agulhas Plain. *Cantena* 15:333-345.

Whittaker, R.H. 1972. Evolution and measurement of species diversity. *Taxon* 21:213-251.

Wilson, M.V. & Shmida, A. 1984. Measuring beta diversity with presence absence data. *J. Ecol.* 72:1055-1064.

Wilson, M.V. & Shmida, A. 1985. Biological determinants of species diversities. *J. Biogeography* 12:1-20.