

# On the Vegetation of Heimaey, Iceland

## II

By

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### ABSTRACT

The island Heimaey, which is the largest member in the group named Westman Islands south of Iceland has been formed in a similar way to Surtsey, i.e., by a submarine volcanic eruption. The northernmost part, however, seems to have been built up by an eruption under a glacier that stretched southwards from the mainland. The island is extremely rocky and fringed on most sides by steep cliffs. The declivity is mostly outwards from the island, so that water does not collect to any extent. Whereas the soil is largely dry and sandy, some parts are rich in manure because of the droppings of the numerous birds on the island. The climate is relatively warm and there is a good deal of precipitation, which is distributed evenly throughout the year.

Vegetation on the island is here divided into eight communities: dry meadowland, the herb slope, heath, gravelly flat, puffin colony, sand beach, cliff and bog communities.

The vascular species found on the island number somewhat over one hundred, and the vegetation of the island shows very little variability. The same species occur in dissimilar communities, beach and alpine plants growing side by side. The poverty of species is due both to difficulties of dispersal from the mainland as well as to the fact that the habitats are very specific and the communities already existing on the island have reached stability although the gravel vegetation seems to be an exception and is in continual succession.

### INTRODUCTION

This study of the vegetation of Heimaey was begun in the summer of 1969 (Fridriksson et al. 1971). The vegetation had previously been stud-

ied by Baldur Johnsen in 1939, but some time has since elapsed, and it was interesting to compare this vegetation now with that on Surtsey. Thus it was decided to try to make a fairly accurate vegetation map of the island. During the first summer preliminary measurements were made on all the plant-communities, but weather that summer was extraordinarily unfavourable, so that less was accomplished than intended. In the summer of 1970 investigation and sketching of the communities was completed from which the map was prepared. The results of the measurements from the first summer have been revised, particularly the classification of the dry meadowland societies.

### METHOD OF RESEARCH

In the summer of 1970 most of the island was investigated. Aerial photographs of the area were used in the field and compared on the site while the vegetation was measured. The distribution of every community was then marked on the photos.

The sociological measurements were in both years performed according to Hult-Sernander-Du Rietz. A quadrat of 1 m<sup>2</sup> was laid out 5 to 10 times at each locality. All plants present were listed and the coverage of each one estimated

every time. The average cover of each plant was then calculated by adding the coverage estimates of all the quadrats and dividing by number of observations. These estimates fall into six cover classes:

Cover class	Coverage	Average coverage
5	½ or more	24/32
4	½–¼	12/32
3	¼–⅛	6/32
2	⅛–1/16	3/32
1	less than 1/16	1/32
+	1–2 specimen	0

As an example part of measurements from observation place 16 is cited:

<i>Anthoxanthum odoratum</i>	4	3	2	2	3	100—3
<i>Luzula multiflora</i>	2	1	2	1	1	100—1
<i>Pinguicula vulgaris</i>	1		1		1	40—1

The first five figures following species names are cover class numbers of the five quadrats observed, then comes the frequency as percentage of quadrats in which the species occurs and behind the hyphen is the average number of cover classes.

After the measurements had been carried out, the communities were grouped and identification letters allocated for relevant communities. It should be mentioned that a closer study proved it was very difficult to classify some of the areas into communities, as they were not clearly defined. The boundaries between the communities are therefore in some cases rather arbitrary.

## TOPOGRAPHY

As already stated, the island has been formed

by volcanic eruptions at the end of the last Ice Age and subsequently. The volcano Helgafell is situated to the southeast of the town. The island is fringed on most sides with steep cliffs, but there is a sand beach on the isthmus between Heimaklettur and Háin and between Stórhöfði and the main part of the island, known as Klaufin. In some places the cliffs rise high and form shapely and striking mountains, such as Yzti-klettur, Midklettur and Heimaklettur. South of Threalaedi are Háin, Klifid and Dalfjall. South of Helgafell the ground is flat, but south of the airfield is Saefell, which traverses the island southwards. A large part of the island is covered with lava on which there is a good deal of vegetation. Some shelter is found in Herjólfsdalur and there is a grassy dell near Saefell, but otherwise the ground is rather barren.

The landscape has in many places been affected by man and animals. For instance, roads have been laid across the island, and road-building material has been taken from the eastern slopes of Helgafell.

## CLIMATE

The effects of weather are very noticeable. Heimaey is situated south of the mainland, where the climate is extremely oceanic, with mild winters and much precipitation. It is very windy, so that sea spray greatly affects the composition of the vegetation. A weather reporting station is located on Stórhöfði at the southern extremity of the island. The following records are obtained from there, supplied by the courtesy of the Icelandic Meteorological Office:

Only at six other stations in Iceland have annual mean precipitation recordings been higher, the maximum is at Vík in Mýrdal, 2256 mm. The annual mean temperature is the third highest, showing a maximum of 5.7°C. At Heimaey are fewer days of frost in summer than on the mainland, the temperature fluctuations are fairly small, and there are by far the most days with fog for the whole of Iceland.

Month	The Whole Year											
	J	F	M	A	M	J	J	A	S	O	N	D
Amount of precipitation (mm), mean for 1931–1960 . . . . .	138	104	109	97	81	81	84	108	132	166	141	156
Mean temperature °C 1931–1960 . . . . .	1.4	1.6	2.7	3.7	6.2	8.5	10.3	10.2	8.4	5.6	3.8	2.5
Mean number of days when frost occurred 1951–1960 . . . . .	14	13	11	6	3	0	0	0	0.6	3	6	13
Temperature °C, 1931–1960:												
Mean daily minimum . . . . .	-0.6	-0.5	0.8	1.7	4.6	7.0	8.8	8.7	7.0	4.1	2.8	0.5
Mean daily maximum . . . . .	3.5	3.8	4.6	5.9	8.7	11.1	12.8	12.6	10.5	7.4	5.6	4.6
Number of days with fog, mean for 1931–1960 . . . . .	2.4	2.4	3.6	4.5	7.0	8.7	10.0	9.2	8.3	5.4	4.7	3.0
												69.2



North-eastern slopes of Helgafell. Dry meadowland and gravelly flat communities. ( $A_1$  and  $C_2$ .) (Photo by S. Magnússon.)



The dry meadowland. ( $A_3$ .) The eastern slopes of Heimaklettur. (Photo by Á. H. Bjarnason.)

## VEGETATION

The vegetation is in our study divided into eight communities: the dry meadowland, the herb slope, the puffin ground, the gravelly flat, the heath, the sand beach, the bog and the cliff community. The dry meadowland covers the largest area of land and is dominated by grasses.

The herb slope has the greatest variety of species, which is indicated in the table.

The puffin ground shows very little variety of species but excellent growth. This community is usually found on slopes.

Gravelly flat communities are rather widespread, and until recently there has been considerable erosion in this area, probably because of the encroachment of sheep. There are many species, but typical gravel plants are the most common.

The heath community is mostly found in the dry lava fields.

There is little coastal vegetation as such, for the island is largely fringed with steep cliffs, so that the vegetation merges with cliff vegetation. There is, however, a sand beach with *Minuartia peploides*, *Mertensia maritima* and *Elymus arenarius* on Thraelaeidi and Klaufin.

There are two boggy patches in Herjólfssdalur, where some species, not found elsewhere on the island, are growing but this community seems to be deteriorating.

There is much cliff vegetation, especially in and near the breeding areas of the fulmar and kittiwake.

On the following pages are tables listing species which were found growing in the various societies. The distribution of the societies and the areal of the various communities can be seen on the accompanying map. The  $\times$  mark means that the plant was found growing in the society but did not happen to be in any of the quadrats.

## THE DRY MEADOWLAND COMMUNITY

The community of the dry meadowland being the most widespread may be subdivided into four societies according to the predominant types and the composition of the species A1–4.

A1 *Agrostis tenuis* — *Anthoxanthum odoratum* society and A4 *Festuca vivipara* — *Anthoxanthum odoratum* society are fairly similar, but the former develops better and is on moister soil. A2 *Festuca rubra* society and A3 *Festuca rubra* — *Poa pratensis* are also very similar on similar soil.

## A DRY MEADOWLAND

### A1: *Agrostis* — *Anthoxanthum* society

	65	58	43	48
<i>Achillea millefolium</i> .....	40–2	100–1	$\times$	$\times$
<i>Agrostis tenuis</i> .....	100–4	100–2	100–2	100–3
<i>Alchemilla vestita</i> .....	..	60–3	40–1	$\times$
<i>Anthoxanthum odoratum</i> ..	100–2	100–2	100–2	100–2
<i>Angelica archangelica</i> .....	..	$\times$	..	..
<i>Botrychium lunaria</i> .....	..	60–1	$\times$	80–1
<i>Cardamine pratensis</i> .....	..	..	20–1	..
<i>Carex flacca</i> .....	..	20–1	$\times$	60–1
<i>Cerastium fontanum</i> .....	..	40–1	..	..
<i>Empetrum hermafroditum</i> ..	..	..	$\times$	..
<i>Equisetum arvense</i> .....	..	..	100–1	..
<i>Equisetum pratense</i> .....	60–2	..	100–2	100–2
<i>Erigeron boreale</i> .....	..	$\times$	..	..
<i>Euphrasia frigida</i> .....	..	80–1	..	..
<i>Festuca rubra</i> .....	80–2	100–1	100–1	100–2
<i>Festuca vivipara</i> .....	..	..	$\times$	100–1
<i>Galium Normanii</i> .....	..	..	$\times$	..
<i>Galium verum</i> .....	..	80–2	100–1	100–2
<i>Gentianella amarella</i> .....	..	20+	..	..
<i>Gentianella aurea</i> .....	..	$\times$	..	$\times$
<i>Gentianella campestris</i> .....	..	$\times$	..	$\times$
<i>Lathyrus pratensis</i> .....	100–3	..	..	..
<i>Leontodon autumnalis</i> .....	..	80–2	20–1	..
<i>Luzula multiflora</i> .....	80–1	100–1	80–1	100–1
<i>Myosotis arvensis</i> .....	..	100–1	..	$\times$
<i>Plantago lanceolata</i> .....	..	60–1	..	..
<i>Poa pratensis</i> .....	100–1	40–1	100–1	100–1
<i>Plantago maritima</i> .....	..	$\times$	..	..
<i>Polygonum viviparum</i> .....	..	..	$\times$	..
<i>Potentilla anserina</i> .....	..	$\times$	..	..
<i>Prunella vulgaris</i> .....	..	$\times$	..	..
<i>Puccinellia retroflexa</i> .....	..	40–1	..	..
<i>Ranunculus acris</i> .....	..	100–2	$\times$	60–1
<i>Rhinanthus minor</i> .....	..	40–1	..	..
<i>Rumex acetosa</i> .....	60–1	40–1	60–1	$\times$
<i>Sagina nodosa</i> .....	..	$\times$	..	..
<i>Salix herbacea</i> .....	..	..	$\times$	..
<i>Selaginella selaginoides</i> .....	..	..	20–1	..
<i>Stellaria media</i> .....	..	..	$\times$	..
<i>Succisa pratensis</i> .....	..	20–1	..	..
<i>Taraxacum</i> sp. .....	..	60–2	20–1	40–1
<i>Trifolium repens</i> .....	..	$\times$	$\times$	80–2
<i>Thymus Drucei</i> .....	..	40–1	..	$\times$
<i>Veronica officinalis</i> .....	..	..	$\times$	$\times$
<i>Vicia cracca</i> .....	..	$\times$	..	..

<i>A2: Festuca rubra society</i>	34	30	12	32	44	10	4	2	69	9	8
<i>Achillea millefolium</i>	...	...	...	...	...	...	...	60-1	100-2	...	...
<i>Agrostis stolonifera</i>	...	...	...	100-1	...	...	...	...	...	×	...
<i>Agrostis tenuis</i>	...	...	...	...	20-1	...	40-1	...	...	...	...
<i>Alchemilla vestita</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Anthoxanthum odoratum</i>	...	100-1	...	...	...	...	...	80-3	...	...	...
<i>Armeria maritima</i>	80-1	...	40-1	×	60-1	...	100-1	×	...	...	40-1
<i>Botrychium lunaria</i>	...	...	...	×	...	...	...	...	...	...	...
<i>Cardaminopsis petrea</i>	...	...	...	...	×	...	...	...	...	...	...
<i>Carex flacca</i>	...	...	...	...	...	...	...	20-1	...	...	...
<i>Cerastium alpinum</i>	...	...	...	...	40-1	...	...	...	...	...	...
<i>Cerastium fontanum</i>	100-1	20-1	40-1	100-1	...	100-2	100-1	20-1	80-1	80-1	...
<i>Coeloglossum viride</i>	...	×	...	...	...	...	...	...	...	...	...
<i>Cystopteris fragilis</i>	...	...	...	...	20-1	...	...	...	...	...	...
<i>Draba incana</i>	...	...	...	...	...	...	...	×	...	...	...
<i>Elymus arenarius</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Empetrum hermafroditum</i>	...	60-1	...	...	×	...	60-1	...	...	...	...
<i>Equisetum arvense</i>	100-2	100-2	...	×	100-1	100-3	...	100-1	...	...	...
<i>Equisetum pratense</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Euphrasia frigida</i>	...	...	...	...	...	...	...	...	...	40-2	...
<i>Festuca rubra</i>	100-3	100-3	100-4	100-5	100-1	100-3	100-2	100-3	100-4	100-5	100-5
<i>Festuca vivipara</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Galium Normanii</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Galium verum</i>	...	100-1	...	100-1	60-1	100-2	...	80-1	100-2	40-1	...
<i>Gentianella aurea</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Lathyrus maritimus</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Lathyrus pratensis</i>	...	100-3	...	...	...	...	...	...	...	...	...
<i>Leontodon autumnalis</i>	...	...	×	...	...	...	...	...	...	...	...
<i>Luzula multiflora</i>	...	80-1	80-1	80-1	...	60-1	...	60+	...	...	...
<i>Luzula spicata</i>	...	...	...	...	...	80-1	20-1	60-1	...	...	...
<i>Myosotis arvensis</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Oxyria digyna</i>	...	...	...	...	60-1	...	...	...	...	...	...
<i>Pinguicula vulgaris</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Plantago lanceolata</i>	...	...	...	...	...	...	...	...	...	60-1	...
<i>Plantago major</i>	...	20-1	...	...	...	...	...	...	...	...	...
<i>Plantago maritima</i>	...	...	20-1	...	...	20-1	80-1	60-1	...	20-1	...
<i>Poa pratensis</i>	...	...	40-1	...	...	40-1	...	...	...	80-1	...
<i>Polygonum viviparum</i>	...	100-1	...	...	100-1	...	...	100-1	...	...	...
<i>Potentilla anserina</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Ranunculus acris</i>	...	...	...	...	...	...	...	...	...	60-1	...
<i>Rhinanthus minor</i>	...	20-1	...	...	...	...	...	...	...	...	...
<i>Rumex acetosa</i>	20-1	...	...	...	...	60-1	...	...	60-1	...	...
<i>Salix herbacea</i>	...	80-1	...	...	...	80-2	...	20-1	60-2	...	...
<i>Saxifraga caespitosa</i>	...	...	...	...	...	40-1	...	...	...	...	...
<i>Silene acaulis</i>	...	...	...	...	...	40-1	...	80-1	...	...	...
<i>Silene maritima</i>	...	...	...	...	...	...	...	...	...	80-1	...
<i>Stellaria media</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Succisa pratensis</i>	...	...	...	...	...	...	...	...	...	...	...
<i>Taraxacum</i> sp.	...	...	...	...	...	...	...	...	...	20-1	...
<i>Thymus Drucei</i>	...	60-1	100-2	...	100-1	60-1	100-2	40-1	80-2	...	...
<i>Thalictrum alpinum</i>	...	...	...	...	...	...	...	80-1	...	...	...
<i>Trifolium repens</i>	...	20-1	...	...	...	...	...	...	...	...	...

A3: *Festuca — Poa pratensis* society

	2	6	14	15	21	23	38	39	40	47	60	62	71	70—3
<i>Achillea millefolium</i>	...	...	...	×	40—1	...	20—1	20—1	...	...	...	100—2	100—1	100—2
<i>Agrostis stolonifera</i>	...	...	...	...	...	...	...	...	...	...	...	60—1	...	100—1
<i>Agrostis tenuis</i>	...	...	...	...	...	...	...	...	...	80—1	100—3	...	100—2	...
<i>Alchemilla vestita</i>	...	...	...	...	...	...	60—1	60—1	...	...	...	40—2	...	...
<i>Angelica archangelica</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	×
<i>Anthoxanthum odoratum</i>	...	80—1	100—2	100—2	...	100—2	100—2	100—2	100—4	100—2	...	60—1	60—1	40—2
<i>Armeria maritima</i>	...	...	...	...	...	×	...	...	...	40—1	...	...	...	...
<i>Botrychium lunaria</i>	...	...	...	20—+	20—1	...	20—1	20—1	40—1	100—1	...	...	...	...
<i>Cardamine pratensis</i>	...	...	...	...	...	...	100—2	100—2	...	...	...	...	...	40—1
<i>Carex flacca</i>	...	...	...	...	...	...	60—1	60—1	100—1	...	...	...	...	...
<i>Cerastium alpinum</i>	...	...	...	...	...	...	...	...	100—1	...	...	...	20—1	...
<i>Cerastium fontanum</i>	...	40—1	100—1	40—1	80—1	100—2	101—1	...	...	100—1	...	...	100—1	100—1
<i>Draba incana</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Deschampsia caespitosa</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Erigeron boreale</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Equisetum arvense</i>	...	100—2	...	100—4	100—2	100—2	80—1	80—1	100—2	100—1	...	100—2	...	100—1
<i>Equisetum pratense</i>	...	...	...	...	...	100—3	100—3	...	...	100—2	...	...	...	...
<i>Euphrasia frigida</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	20—1
<i>Festuca rubra</i>	...	100—3	100—2	100—2	...	100—2	100—3	100—1	100—1	100—2	100—2	100—1	100—2	100—4
<i>Festuca vivipara</i>	...	40—1	...	...	...	...	...	100—2	100—2	...	80—1	...	20—1	...
<i>Filipendula ulmaria</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	40—1
<i>Galium Normanii</i>	...	80—1	...	60—1	...	40—1	...	...	...	...	...	...	...	...
<i>Galium verum</i>	...	100—1	60—1	80—1	80—1	60—1	100—1	20—1	20—1	80—1	100—1	20—1	...	100—1
<i>Kobresia myosuroides</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Leontodon autumnalis</i>	...	...	...	...	...	20—1	40—1	...	...	80—1	20—1	100—3	...	...
<i>Luzula multiflora</i>	...	80—1	40—1	100—1	80—1	80—1	100—1	100—1	100—1	100—1	100—1	40—1	60—1	...
<i>Luzula spicata</i>	...	...	...	...	...	...	...	20—1	...	...	...	...	...	...
<i>Myosotis arvensis</i>	...	...	...	...	...	...	...	...	...	60—1	...	...	80—1	100—1
<i>Parnassia palustris</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Pinguicula vulgaris</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Plantago lanceolata</i>	...	...	...	...	...	...	...	...	40—1	...	...	...	...	...
<i>Poa pratensis</i>	...	100—2	100—3	100—2	100—2	100—3	100—3	100—2	100—2	100—1	100—1	100—2	100—2	100—1
<i>Polygonum viviparum</i>	...	...	...	...	...	20—1	80—1	...	...	100—1	...	...	...	...
<i>Ranunculus acris</i>	...	100—1	...	...	20—1	...	80—1	...	...	...	...	40—1	...	100—1
<i>Rhinanthus minor</i>	...	...	...	...	...	20—1	100—1	...	...	...	...	...	...	...
<i>Rumex acetosa</i>	...	100—1	20—1	100—1	40—1	100—1	...	...	20—1	60—1	40—1	80—1	...	100—1
<i>Rumex longifolius</i>	...	...	...	...	...	...	...	...	...	...	...	...	20—1	...
<i>Sagina procumbens</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Saxifraga caespitosa</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Saxifraga hypnoides</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	20—1
<i>Silene acaulis</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Stellaria media</i>	...	...	...	...	...	40—1	...	...	...	...	...	...	...	...
<i>Taraxacum</i> sp.	...	...	...	...	...	20—1	...	...	...	...	...	40—1	...	40—1
<i>Thymus Drucei</i>	...	80—1	...	80—1	...	60—1	...	...	80—1	100—2	...	...	...	...
<i>Trifolium repens</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...

A4: *Festuca vivipara* — *Anthoxanthum odoratum* society

	16	22	35	41	50	53	64	55
<i>Achillea millefolium</i>	..	..	..	40—1	..	..	..	..
<i>Agrostis stolonifera</i>	..	..	..	..	100—2	100—1	60—1	..
<i>Agrostis tenuis</i>	..	..	..	100—1	..	..	..	100—1
<i>Alchemilla vestita</i>	..	..	×	80—1	40—1	×	..	40—1
<i>Anthoxanthum odoratum</i>	100—3	100—1	40—1	100—2	100—2	100—1	100—2	100—2
<i>Armeria maritima</i>	20—1	..	×	..	40—1	..	..	×
<i>Botrychium lunaria</i>	..	20—1	80—1	20—1	20—1	20—1	..	..
<i>Calluna vulgaris</i>	..	..	..	..	..	..	..	60—1
<i>Cardamine pratensis</i>	..	..	×	..	..	..	..	..
<i>Cardaminopsis petrea</i>	..	..	..	..	..	..	..	×
<i>Carex flacca</i>	..	40—1	..	20—1	..	80—1	×	80—1
<i>Cerastium alpinum</i>	..	..	×	..	40—1	..	..	..
<i>Cerastium fontanum</i>	80—1	80—1	..	100—1	80—1	..	60—1	60—1
<i>Coeloglossum viride</i>	..	..	..	..	..	..	..	100—I
<i>Empetrum hermafroditum</i>	..	100—2	×	..	20—1	100—1	..	100—I
<i>Equisetum arvense</i>	100—1	100—1	100—2	100—1	60—1	100—1	..	..
<i>Equisetum pratense</i>	..	..	..	80—1	..	40—1	100—2	..
<i>Erigeron boreale</i>	..	..	×	×	..	..	..	20+
<i>Festuca rubra</i>	..	100—3	100—1	100—3	100—1	100—2	..	..
<i>Festuca vivipara</i>	100—1	100—3	100—4	100—1	100—2	100—2	100—2	100—2
<i>Galium Normanii</i>	80—1	80—1	80—1	..	..	..	..	×
<i>Galium verum</i>	..	100—1	100—1	100—2	100—1	100—1	100—1	100—I
<i>Gentianella campestris</i>	..	..	..	..	..	..	..	20—1
<i>Juncus trifidus</i>	..	..	..	..	40—1	..	..	..
<i>Lathyrus pratensis</i>	..	..	×	..	..	×	..	..
<i>Luzula multiflora</i>	100—1	100—1	100—1	100—1	100—1	80—1	100—2	100—I
<i>Luzula spicata</i>	20—I	20—I	..	..	80—1	..	20—I	..
<i>Myosotis arvensis</i>	..	..	..	20—+	..	..	20—I	..
<i>Pinguicula vulgaris</i>	40—I	..	×	..	..	..	..	..
<i>Plantago lanceolata</i>	..	..	×	60—I	..	..	..	..
<i>Plantago maritima</i>	..	..	..	×	80—I	..	..	..
<i>Poa pratensis</i>	..	100—I	..	60—I	60—I	100—I	40—I	..
<i>Polygonum viviparum</i>	100—I	80—I	100—I	60—I	..	20—I	..	100—I
<i>Prunella vulgaris</i>	..	..	×	×	..	..	..	..
<i>Ranunculus acris</i>	..	×	..	..	..	..	..	..
<i>Rhinanthus minor</i>	..	..	..	..	..	..	..	20—I
<i>Rumex acetosa</i>	60—I	×	×	..	40—I	..	..	..
<i>Sagina</i> sp.	..	40—I	..	..	..	..	..	..
<i>Salix herbacea</i>	100—I	100—I	100—I	..	..	60—I	..	40—I
<i>Selaginella selaginoides</i>	..	..	60—I	..	×	..	..	..
<i>Silene acaulis</i>	40—I	..	..	..	..	..	..	..
<i>Succisa pratensis</i>	..	..	..	20—I	..	..	×	×
<i>Taraxacum</i> sp.	..	×	..	100—I	20—I	..	..	×
<i>Thalictrum alpinum</i>	..	..	..	..	..	..	..	..
<i>Thymus Drucei</i>	100—I	80—I	100—I	60—I	100—I	20—I	100—3	100—I
<i>Trifolium repens</i>	..	..	×	..	..	..	60—I	..
<i>Trisetum spicatum</i>	..	..	..	..	..	..	40—I	..
<i>Veronica officinalis</i>	..	..	..	..	..	..	..	×



The puffin colony. The western slope of Heimaklettur. Photo by Á. H. Bjarnason.

<i>A5: Herb slope society</i>	67	57	66				
<i>Achillea millefolium</i>	100-2	100-1	100-2	<i>Kobresia myosuroides</i>	..	20-1	..
<i>Agrostis stolonifera</i>	80-1	..	100-3	<i>Leontodon autumnalis</i>	..	60-1	100-1
<i>Agrostis tenuis</i>	..	100-1	..	<i>Luzula multiflora</i>	100-1	100-1	..
<i>Alchemilla alpina</i>	20-1	×	..	<i>Luzula spicata</i>	20-1	..	..
<i>Alchemilla vestita</i>	80-1	20-1	20-2	<i>Myosotis arvensis</i>	..	40-1	..
<i>Angelica archangelica</i>	..	..	..	<i>Plantago lanceolata</i>	×	100-2	20-1
<i>Anthoxanthum odoratum</i>	100-1	..	100-2	<i>Plantago maritima</i>	100-2	60-1	..
<i>Botrychium lunaria</i>	..	×	..	<i>Poa pratensis</i>	80-1	100-1	..
<i>Carex flacca</i>	..	80-1	..	<i>Poa trivialis</i>	..	×	80-2
<i>Carex rariflora</i>	..	..	20-1	<i>Polygonum viviparum</i>	100-1	60-1	..
<i>Cerastium fontanum</i>	100-1	20-1	..	<i>Prunella vulgaris</i>	..	×	..
<i>Cystopteris fragilis</i>	..	×	..	<i>Ranunculus acris</i>	20-1	20-1	80-1
<i>Empetrum hermafroditum</i>	40-1	×	..	<i>Rhinanthus minor</i>	100-1	20-1	20-1
<i>Equisetum arvense</i>	×	60-1	..	<i>Rumex acetosa</i>	..	×	..
<i>Equisetum pratense</i>	..	60-1	100-2	<i>Sagina nodosa</i>	..	40-1	..
<i>Erigeron boreale</i>	20+	×	..	<i>Salix herbacea</i>	..	20-1	..
<i>Euphrasia frigida</i>	60-1	..	..	<i>Sieglungia decumbens</i>	..	100-1	..
<i>Festuca rubra</i>	100-1	100-1	80-1	<i>Succisa pratensis</i>	100-2	100-2	..
<i>Festuca vivipara</i>	40-1	40-1	..	<i>Taraxacum</i> sp.	..	60-1	100-2
<i>Filipendula ulmaria</i>	×	..	..	<i>Thymus Drucei</i>	100-2	80-1	..
<i>Galium verum</i>	100-1	100-1	×	<i>Trifolium repens</i>	..	×	60-2
<i>Gentianella amarella</i>	×	..	..	<i>Veronica officinalis</i>	..	×	..
<i>Gentianella campestris</i>	100-1	40-1	..	<i>Vicia sepium</i>	..	×	..
<i>Hieracium</i> sp.	..	×	..				

#### THE HERB SLOPE\*

A characteristic of this society is the great variety of species, and especially the herbs which are more numerous and widespread than in other societies, such as: *Achillea millefolium*, *Alchemilla vestita*, *Erigeron boreale*, *Filipendula ulmaria*, *Gentianella campestris*, *Plantago lanceolata*, *Ranunculus acris*, *Rhinanthus minor* and *Succisa pratensis*. Some of the most conspicuous are: *Achillea millefolium*, *Plantago lanceolata*, *Rhinanthus minor* and *Taraxacum* sp.

This society is found on dry, sandy slopes, often facing south. In such habitats the passage of sheep and people frequently disturbs the vegetation.

#### THE PUFFIN GROUND COMMUNITY

It is doubtful whether this kind of vegetation should be regarded as a separate community but although perhaps artificial this convenient classification is used. It is noteworthy that where the puffin starts to nest, the slopes retain to some extent their vegetation characteristics, i.e., the main grasses remain the same as before, but the large amount of manure makes the number of species fewer than otherwise, and individual species are more widespread than they are outside such habitats, e.g., *Stellaria media*, *Rumex*

*acetosa*. The most abundant species of the puffin slopes are: *Festuca rubra*, *Poa pratensis* and *Poa trivialis*.

#### THE GRAVELLY FLAT COMMUNITY

The gravelly flats are quite variable and the number of species does not give a true cross section. It is most abundant near the edges of a denser vegetation. Characteristic species are: *Armeria maritima*, *Cardaminopsis petrea*, *Cerastium alpinum*, *Cerastium fontanum*, *Silene acaulis* and *Silene maritima*. Also common are *Festuca rubra*, *Festuca vivipara*, *Luzula spicata*, *Plantago maritima* and *Thymus Drucei*. Characteristic features is the open soil with the low frequency and cover of plants. Some species have a clustered distribution, i.e., *Armeria maritima*, *Silene acaulis* and *Silene maritima*. Others have a more regular or random distribution. There is an obvious resemblance between the gravelly flat community and the cliff community, especially where there are bigger boulders among the gravel. The gravelly flats are open areas, which have lost the fertile top layer of soil through erosion. In areas where the erosion is recent the gravel is mixed with the remnants of the topsoil. In this "flag" type of soil *Cerastium fontanum* and *Sedum villosum* are found growing.

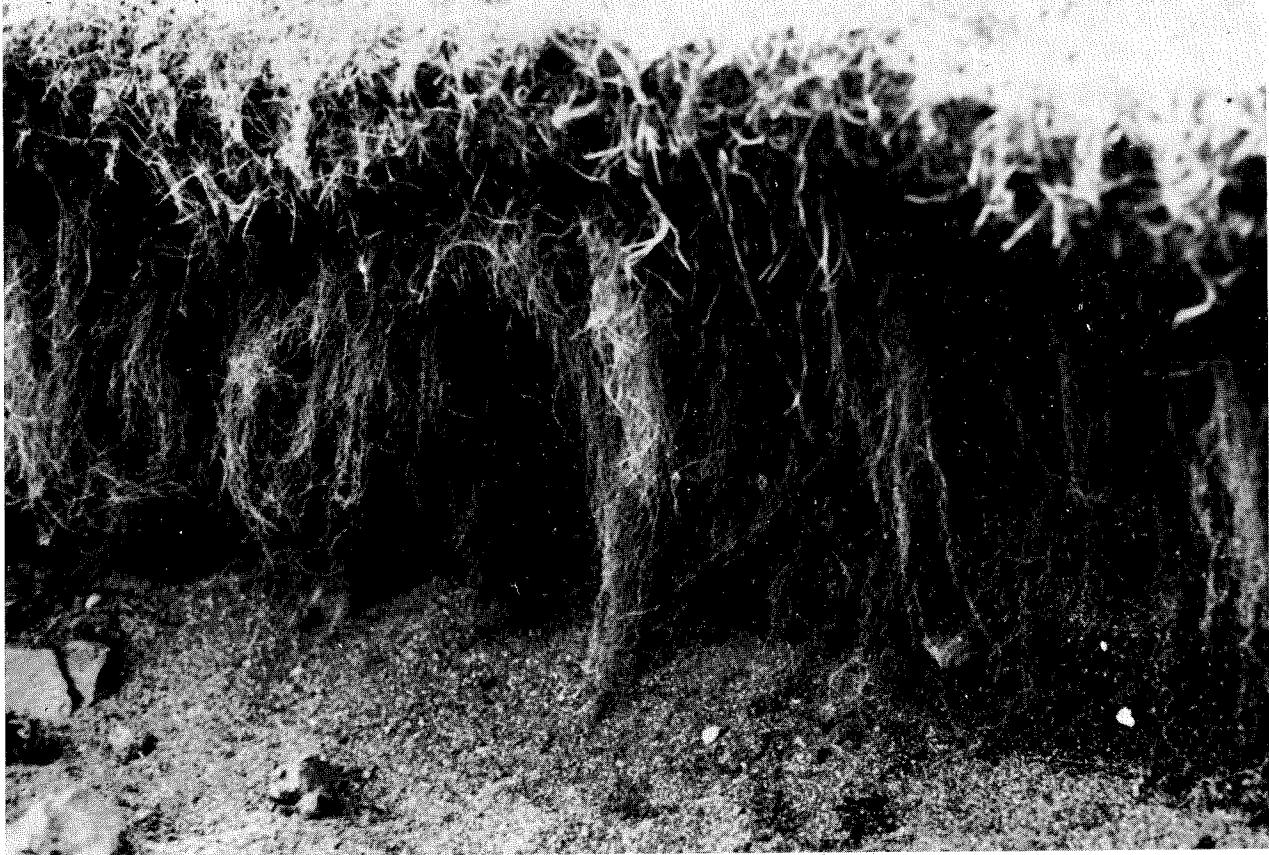
\* Marked Forbs on the map and A5 in the species list under dry meadowland community, but should possibly be regarded as a separate community.

#### B PUFFIN GROUND COMMUNITY

<i>B1 Puffin Ground society</i>	70	13	XVI	XIX	XX	XVII	XVIII
<i>Achillea millefolium</i>	20-1	×	100-1			×	
<i>Agrostis tenuis</i>	80-1		60-2		80-1	100-3	
<i>Angelica archangelica</i>			×			×	60-3
<i>Cerastium fontanum</i>	40-1	×	80-1			×	
<i>Euphrasia frigida</i>						×	
<i>Festuca rubra</i>	40-1	100-4				100-1	
<i>Leontodon autumnalis</i>						×	
<i>Luzula multiflora</i>						×	
<i>Myosotis arvensis</i>						×	
<i>Plantago lanceolata</i>						10-1	
<i>Poa pratensis</i>	100-2	100-1	100-4	100-4	100-2		100-3
<i>Poa trivialis</i>	100-1		60-2		80-1	90-1	
<i>Potentilla anserina</i>	100-4					×	×
<i>Ranunculus acris</i>		×				10-1	80-2
<i>Rumex acetosa</i>	100-2	×	100-3		100-3	10-1	100-2
<i>Sedum rosea</i>	×						
<i>Stellaria media</i>	100-3	100-1	80-3	100-3	100-3	20-3	100-3
<i>Taraxacum</i> sp.		×				10-2	
<i>Tripleurospermum maritima</i>			×	60-2			60-3

C GRAVELLY FLAT COMMUNITY

	1	3	19	82	72	92	46	54	63
<i>C1: Gravel with sparse vegetation</i>									
<i>Agrostis stolonifera</i>	..	..	..	..	..	..	×	100-1	60-1
<i>Agrostis tenuis</i>	..	..	..	..	..	..	..	..	..
<i>Alopecurus geniculatus</i>	..	40-1	80-1	..	..	..	..	..	0
<i>Anthoxanthum odoratum</i>	..	60-1	20-1	100-1	100-1	100-1	80-1	80-1	100-1
<i>Callunna vulgaris</i>	..	..	..	..	..	60-1	..	..	..
<i>Carex flacca</i>	..	..	..	..	..	×	..	..	..
<i>Cardaminopsis petrea</i>	100-1	..	20-1	..	20+	..	40-1	40-1	20-1
<i>Cerastium alpinum</i>	..	..	..	..	40-1	100-1	..	80-1	40-1
<i>Cerastium fontanum</i>	..	20-1	..	×	80-1	..	..	40-1	40-1
<i>Cystopteris fragilis</i>	..	..	..	..	..	..	..	..	..
<i>Empetrum hermafroditum</i>	..	..	..	..	..	80-2	..	..	..
<i>Epilobium collinum</i>	..	..	..	..	..	..	..	..	0
<i>Equisetum arvense</i>	..	..	..	..	..	..	..	20-1	80-1
<i>Equisetum pratense</i>	..	..	..	..	..	..	..	..	0
<i>Euphrasia frigida</i>	..	..	×	..	..	..	..	..	20+
<i>Festuca rubra</i>	100-1	60-1	40-1	100-1	100-1	100-1	40-1	60-1	60-1
<i>Festuca vivipara</i>	..	..	..	..	20-1	40-1	20-1	80-1	..
<i>Galium Normani</i>	..	×	..	×	..	..	40-1	..	..
<i>Galium verum</i>	..	..	..	..	..	..	40-1	..	..
<i>Juncus trifidus</i>	..	..	..	..	..	..	..	..	..
<i>Kobresia myosuroides</i>	..	..	..	..	..	..	..	..	0
<i>Koenigia islandica</i>	..	..	..	..	..	..	..	..	0
<i>Lathyrus pratensis</i>	..	..	..	..	..	..	..	..	..
<i>Luzula multiflora</i>	100-1	..	..	..	..	..	..	..	..
<i>Luzula spicata</i>	..	..	..	×	20-1	20-1	100-1	20-1	40-
<i>Myosotis arvensis</i>	..	×	..	..	..	..	..	..	..
<i>Nardus stricta</i>	..	20-1	..	..	..	..	..	..	..
<i>Oxyria digyna</i>	100-1	..	..	..	..	..	100-1	..	..
<i>Plantago lanceolata</i>	..	..	..	..	..	..	..	..	..
<i>Pinguicula vulgaris</i>	..	..	..	..	..	..	..	..	..
<i>Plantago maritima</i>	100-1	20-1	80-1	..	80-1	20-1	..	..	..
<i>Poa glauca</i>	20-1	..	..	..	..	..	..	20-1	..
<i>Poa pratensis</i>	60-1	..	..	..	..	..	..	..	..
<i>Polygonum viviparum</i>	..	..	..	..	..	..	..	..	0
<i>Ranunculus acris</i>	..	..	..	..	..	..	..	..	..
<i>Rhinanthus minor</i>	..	..	..	..	..	..	..	..	0
<i>Rumex acetosa</i>	100-1	20+	..	..	..	..	60-1	..	40-1
<i>Sagina nodosa</i>	..	..	..	20-1	..	20-1	..	..	..
<i>Salix herbacea</i>	..	..	..	..	..	20-1	..	..	..
<i>Saxifraga caespitosa</i>	60-1	..	..	..	..	..	20-1	..	..
<i>Saxifraga hypnoides</i>	..	..	..	..	..	..	..	..	..
<i>Sedum rosea</i>	..	..	..	..	..	..	40-1	..	..
<i>Sedum villosum</i>	..	..	..	..	..	..	..	..	..
<i>Sieglungia decumbens</i>	..	..	..	..	..	..	..	..	0
<i>Silene acaulis</i>	80-1	..	..	..	100-1	20-1	100-1	20-1	80-1
<i>Silene maritima</i>	..	80-1	60-1	100-1	100-1	..	20-1	30-1	100-1
<i>Stellaria media</i>	..	..	..	..	..	..	..	..	0
<i>Succisa pratensis</i>	..	..	..	..	..	..	..	..	0
<i>Taraxacum</i> sp.	..	..	..	..	..	..	..	..	0
<i>Thymus Drucei</i>	20-1	..	40-1	80-1	80-1	100-1	..	60-1	100-1
<i>Tripleurospermum maritima</i>	..	..	..	..	..	..	..	..	0



The gravelly flat community: Erosion of the dry meadowland. Height of the top layer about 60 cm. Photo by S. Magnússon.

C2	24	36	45	49	51					
<i>Achillea millefolium</i>	....	×	..	..	..	20-1	<i>Polygonum aviculare</i>	....	..	40-1
<i>Agrostis stolonifera</i>	....	..	80-1	100-1	100-1		<i>Polygonum viviparum</i>	..	100-1	100-1
<i>Anthoxanthum odoratum</i>	40-1	..	..	..	..		<i>Ranunculus acris</i>	.....	×	..
<i>Armeria maritima</i>	80-1	80-1	80-1	60-1	60-1		<i>Rhinanthus minor</i>	.....	20-1	..
<i>Cardaminopsis petrea</i>	....	×	..	40-1	..	..	<i>Rumex acetosa</i>	.....	80-1	80-1
<i>Carex flacca</i>	....	..	..	..	..	20-1	<i>Sagina nodosa</i>	.....	..	..
<i>Cerastium alpinum</i>	100-1	80-1	100-1	100-1	60-1		<i>Salix herbacea</i>	.....	100-2	20-1
<i>Cerastium fontanum</i>	60-1	..	..	60-1	60-1		<i>Saxifraga caespitosa</i>	.....	..	80-1
<i>Draba incana</i>	....	×	..	..	..		<i>Saxifraga hypnoides</i>	.....	60-1	..
<i>Empetrum hermafroditum</i>	....	×	..	..	40-1	40-1	<i>Sedum rosea</i>	.....	..	..
<i>Equisetum arvense</i>	....	..	80-1	..	..		<i>Sedum villosum</i>	.....	60-1	20-1
<i>Equisetum pratense</i>	....	..	..	..	80-1		<i>Selaginella selaginoides</i>	..	20-1	..
<i>Euphrasia frigida</i>	....	..	..	..	..		<i>Silene acaulis</i>	.....	60-1	..
<i>Festuca rubra</i>	....	..	..	20-1	..	60-1	<i>Silene maritima</i>	.....	..	..
<i>Festuca vivipara</i>	....	100-2	100-1	100-2	100-2	100-2	<i>Stellaria media</i>	.....	..	..
<i>Galium Normanii</i>	....	40-1	..	20-1	60-1	60-1	<i>Thalictrum alpinum</i>	....	..	20-1
<i>Kobresia myosuroides</i>	....	..	..	..	..	20-1	<i>Thymus Drucei</i>	.....	..	..
<i>Leontodon autumnalis</i>	....	×	..	..	..					
<i>Luzula multiflora</i>	....	60-1	..	..	..	20-1				
<i>Luzula spicata</i>	....	100-2	100-1	80-1	100-1	100-1				
<i>Oxyria digyna</i>	....	..	..	80-1	..	..				
<i>Parnassia palustris</i>	....	..	..	..	..	..				
<i>Pinguicula vulgaris</i>	....	40-1	..	..	..	..				
<i>Plantago maritima</i>	....	...	...	..	..	20-1				
<i>Poa pratensis</i>	....	..	..	40-1	..	..				

This society C2 seems to constitute a sort of intermediate stage between gravelly flat in its typical form as in C1 and the heath vegetation J1 and 2. Thus there are species occurring such as *Galium verum* and *Polygonum viviparum*, *Salix herbacea* and *Achillea millefolium*, which do not regularly grow on gravelly flats.

C3	7	25	31	33					
<i>Agrostis stolonifera</i>	100-2	100-1	80-1	100-1	<i>Calluna vulgaris</i>	..	100-2	..	..
<i>Armeria maritima</i>	100-1	100-1	60-1	100-1	<i>Cardaminopsis petrea</i>	..	..	X	..
<i>Cardaminopsis petrea</i>	..	..	..	..	<i>Carex capillaris</i>	..	..	..	X
<i>Cerastium alpinum</i>	..	..	..	60-1	<i>Carex flacca</i>	..	100-1	20-1	100-1
<i>Cerastium fontanum</i>	..	..	20-1	..	<i>Carex rariflora</i>	..	..	..	..
<i>Elymus arenarius</i>	..	..	..	..	<i>Cerastium alpinum</i>	..	..	X	..
<i>Equisetum arvense</i>	..	..	40-1	X	<i>Cerastium fontanum</i>	100-1	20-1	60-1	..
<i>Festuca rubra</i>	..	20-1	..	20-1	<i>Coeloglossum viride</i>	..	..	20-1	40-+
<i>Plantago lanceolata</i>	..	..	..	..	<i>Empetrum hermafroditum</i>	100-2	100-2	100-4	100-3
<i>Plantago maritima</i>	40-1	20-1	..	..	<i>Equisetum arvense</i>	..	80-1	..	..
<i>Rumex acetosa</i>	..	..	..	X	<i>Erigeron boreale</i>	..	..	X	60-1
<i>Sagina nodosa</i>	..	..	..	20-1	<i>Euphrasia frigida</i>	..	..	..	..
<i>Silene acaulis</i>	..	..	..	X	<i>Festuca rubra</i>	100-2	100-2	..	60-1
<i>Silene maritima</i>	..	60-1	20-1	X	<i>Festuca vivipara</i>	..	100-3	100-2	100-2
<i>Tripleurospermum maritima</i>	X	..	..	..	<i>Galium Normanii</i>	80-1	80-1	..	..

This society C3 seems to constitute a sort of intermediate stage between a grass community and a gravelly flat community, as in C1. The species are fewer, but the frequency and the cover of *Agrostis stolonifera* and *Armeria maritima* may be greater.

#### THE HEATH VEGETATION

Where the soil is very dry, the heath vegetation gradually takes over the dry meadowland. The heath vegetation can either be found in slopes or flat land. Mostly it is found in the old lava covering the mid-west part of the island and also on the top of the mountaines.

The characteristics of the heath vegetation are mainly: High coverage of *Empetrum hermafroditum* and/or *Salix herbacea* and the division between societies is partly based on that. Also characteristic is high coverage of mosses (*Racomitrium* sp. in the lava) and the existence of *Kobresia myosuroides* and *Luzula multiflora* and *L. spicata*.

J 1 *Empetrum hermafroditum* society and J 2 *Salix herbacea* society are in many ways similar, of like composition and, in fact, often merge into one another. *Salix herbacea*, however, is more to be found on flat land and its productivity is greater than in the *Empetrum* society, where the vegetation is frequently less dense.

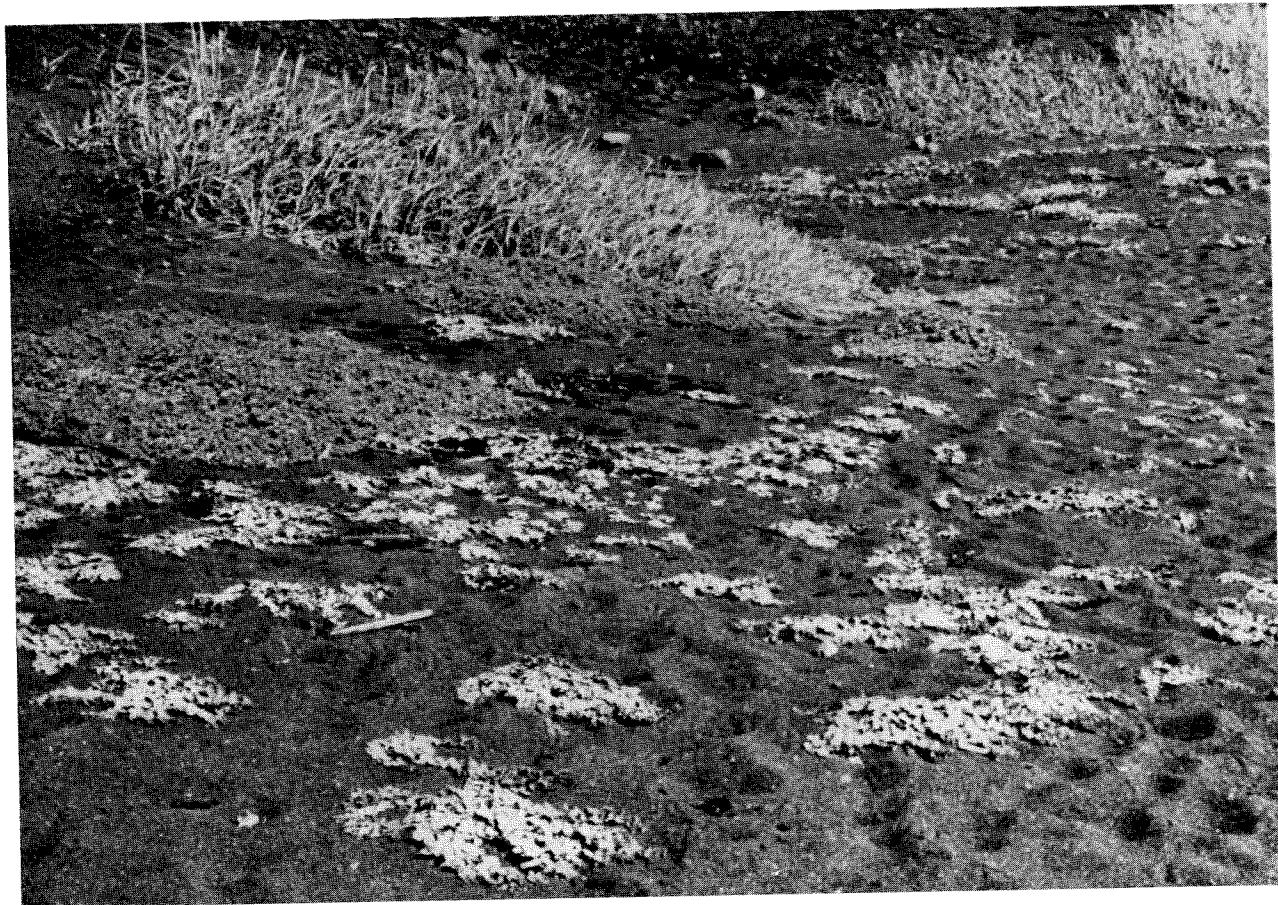
#### J HEATH VEGETATION

##### J1: *Empetrum hermafroditum* society

	17	26	55	61	64				
<i>Agrostis tenuis</i>	..	..	..	..	..				
<i>Agrostis stolonifera</i>	60-1	..	X	..	60-1				
<i>Alchemilla alpina</i>	..	..	..	..	..				
<i>Alchemilla vestita</i>	..	..	..	..	..				
<i>Anthoxanthum odoratum</i>	X	80-1	100-1	100-2	40-1				
<i>Armeria maritima</i>	..	X	X	..	..				
<i>Armeria vulgaris</i>	100-1	..	..	..	..				
<i>Botrychium lunaria</i>	..	20-1	..	X	X				

<i>Calluna vulgaris</i>	..	..	100-2	..	..				
<i>Cardaminopsis petrea</i>	..	..	..	X	..				
<i>Carex capillaris</i>	..	..	..	..	..				X
<i>Carex flacca</i>	..	100-1	20-1	100-1	..				
<i>Carex rariflora</i>	..	..	..	..	..				
<i>Cerastium alpinum</i>	..	..	..	X	X				
<i>Cerastium fontanum</i>	100-1	20-1	60-1	..	..				
<i>Coeloglossum viride</i>	..	..	20-1	40-+	40+				
<i>Empetrum hermafroditum</i>	100-2	100-2	100-4	100-3	100-3				
<i>Equisetum arvense</i>	..	80-1	..	..	..				
<i>Erigeron boreale</i>	..	..	..	X	60-1				
<i>Euphrasia frigida</i>	..	..	..	..	X				
<i>Festuca rubra</i>	100-2	100-2	..	..	..				
<i>Festuca vivipara</i>	..	100-3	100-2	100-2	100-2				
<i>Galium Normanii</i>	80-1	80-1	..	..	..				
<i>Galium verum</i>	..	80-1	100-1	20-1	20-1				
<i>Gentianella campestris</i>	..	..	..	80-1	60-+				
<i>Juncus bufonius</i>	..	..	..	..	X				
<i>Juncus trifidus</i>	..	..	..	X	..			40-1	
<i>Kobresia myosuroides</i>	..	..	..	..	..			20-1	
<i>Luzula multiflora</i>	100-1	100-1	100-1	100-1	100-1			20-1	
<i>Luzula spicata</i>	80-1	20-1	80-1	..	80-1				
<i>Myosotis arvensis</i>	..	..	..	X	..				
<i>Parnassia palustris</i>	..	..	..	..	40-1				
<i>Pinguicula vulgaris</i>	..	..	X	80-1	..			X	
<i>Plantago maritima</i>	80-1	60-1	20-1	..	..				
<i>Poa pratensis</i>	..	..	..	20-1	100-1				
<i>Polygonum viviparum</i>	100-1	80-1	100-1	100-1	100-1				
<i>Prunella vulgaris</i>	..	..	..	..	..				
<i>Ranunculus acris</i>	..	..	X	..	..				
<i>Rhinanthus minor</i>	X	20-1	20-1	..	..			X	
<i>Rubus saxatilis</i>	..	..	X	..	..			X	
<i>Salix herbacea</i>	100-1	60-1	20-1	60-1	100-1				
<i>Saxifraga caespitosa</i>	..	..	..	X	..				
<i>Selaginella selaginoides</i>	..	20-1	..	..	..			20-1	
<i>Silene acaulis</i>	80-1	..	X	X	..				
<i>Succisa pratensis</i>	..	..	..	..	..				
<i>Taraxacum</i> sp.	..	..	X	..	..				
<i>Thymus Drucei</i>	100-1	100-1	100-2	100-2	100-1				
<i>Trifolium repens</i>	..	..	20-1	..	..				
<i>Trisetum spicatum</i>	..	..	..	..	..				
<i>Veronica officinalis</i>	..	..	..	X	..				
<i>Filipendula ulmaria</i>	X	..	..	..	..				
<i>Rumex acetosa</i>	..	..	X	..	..				

<i>J2: Salix herbacea</i> society	52	74	80						
<i>Achillea millefolium</i>	..	..	40-1	..	..				
<i>Agrostis stolonifera</i>	..	100-1	60-1	..	..				
<i>Anthoxanthum odoratum</i>	..	60-1	..	..	80-1				
<i>Armeria maritima</i>	..	..	..	..	..				
<i>Botrychium lunaria</i>	..	..	..	..	..				
<i>Calluna vulgaris</i>	..	..	..	..	60-1				
<i>Carex flacca</i>	..	..	X	..	..				
<i>Cerastium alpinum</i>	..	..	..	..	40-1				
<i>Cerastium fontanum</i>	100-1	..	60-1	..	40-1				
<i>Empetrum hermafroditum</i>	100-1	..	80-1	..	..				
<i>Equisetum arvense</i>	100-2	..	..	..	..				
<i>Erigeron boreale</i>	..	..	..	40+	..				



Sand beach community: *Elymus arenarius*, *Minuartia peploides* and *Mertensia maritima*. Photo by S. Magnússon.

<i>Euphrasia frigida</i>	.....	×	20-1	..
<i>Festuca rubra</i>	.....	100-2	80-1	160-3
<i>Festuca vivipara</i>	.....	60-1	60-1	..
<i>Galium Normanii</i>	.....	..	60-1	..
<i>Galium verum</i>	.....	100-1	100-1	20-1
<i>Gentianella amarella</i>	.....	..	20-1	..
<i>Gentianella campestris</i>	.....	60-1	..	..
<i>Juncus trifidus</i>	.....	..	20-1	..
<i>Kobresia myosuroides</i>	.....	..	100-1	..
<i>Leontodon autumnalis</i>	.....	..	40-+	..
<i>Luzula multiflora</i>	.....	100-1	20-1	..
<i>Luzula spicata</i>	.....	..	..	80-1
<i>Myosotis arvensis</i>	.....	..	20-1	..
<i>Parnassia palustris</i>	.....	..	40-1	..
<i>Plantago maritima</i>	.....	..	60-1	60-1
<i>Poa pratensis</i>	.....	100-1	..	..
<i>Polygonum viviparum</i>	.....	100-1	100-1	100-2
<i>Ranunculus acris</i>	.....	..	60-1	40-1
<i>Rhinanthus minor</i>	.....	..	40-1	..
<i>Rumex acetosa</i>	.....	..	..	80-1
<i>Salix herbacea</i>	.....	100-2	100-3	100-2
<i>Selaginella selaginoides</i>	.....	..	60-3	..
<i>Silene acaulis</i>	.....	..	20-1	100-2
<i>Succisa pratensis</i>	.....	..	80-1	..
<i>Taraxacum</i> sp.	.....	..	60-1	..
<i>Thalictrum alpinum</i>	.....	..	80-1	..
<i>Thymus Drucei</i>	.....	100-1	100-1	40-1

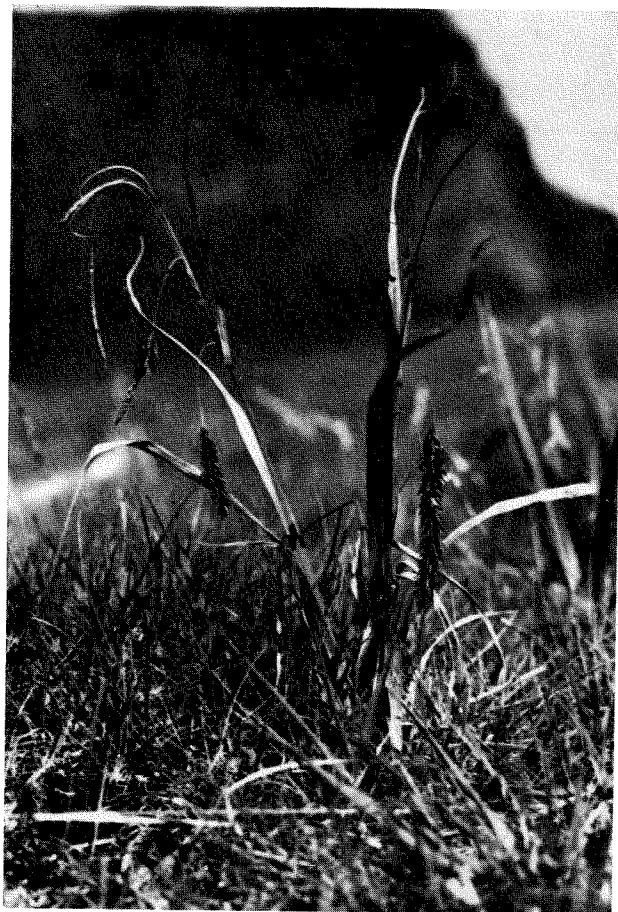
#### THE SAND BEACH COMMUNITY

It is difficult to use any normal measurements for the vegetation in these areas, because of the very uneven distribution of the plants. Near the sea, about 5 metres from high tide mark, may be seen the first wisps of *Minuartia peploides* and *Mertensia maritima*. *Minuartia* forms larger wisps than *Mertensia*, and in some place quite shapely hummocks. A little higher up, and among the hummocks, grows *Cakile maritima*. Still higher up are dunes, in which are found: *Elymus arenarius*, *Festuca rubra*, *Plantago maritima*, *Cakile maritima*, *Mertensia maritima*, *Angelica archangelica*, *Silene maritima*, *Potentilla anserina* and *Tripleurospermum maritima*.

Sand beach is found chiefly in two places, i.e., at Thraelaeidi en route to Heimaklettur, and at Klaufin beside the isthmus on Stórhöfði.

#### THE BOG COMMUNITY

Hardly any bogs are to be found in the Westman Islands. There are two small patches in Herjólfssdalur near the sea, where traces of bog can be discerned. It would seem that water collects here. It is difficult to estimate the size of this bog because it gradually merges with the sur-



Bog community: *Carex lyngbyei*. Photo by S. Magnússon.

rounding vegetation. The uppermost patch was more typical and larger, and the water level higher. The patches were quite separated from each other by a strip of grass.

The following Table shows that the composition of the vegetation of the patches varies considerably, and there is a bigger variety of species in the lower patch.

A cross section of the lower patch right across its middle was taken, and observations were made at 50 cm intervals. The transect reached into the grass on each side.

#### THE CLIFF COMMUNITY

Cliffs encircle most of the island. In the north are Heimaklettur, Midklettur and Yztiklettur. West of the town are Klifid, Háin and Dalfjall.

In all these cliffs, and in many other places, birds breed in great numbers, especially the fulmar and the kittiwake. In the nesting grounds and around it a large amount of bird droppings clearly have a great influence on the composition of the vegetation. Where there is little bird dropping, the following species grow:

E BOG VEGETATION	Upper	Lower
<i>Agrostis tenuis</i> .....	20.3	60.3
<i>Alopecurus aquatis</i> .....	..	100—2
<i>Anthoxanthum odoratum</i> .....	20—1	100—2
<i>Armeria maritima</i> .....	..	40—1
<i>Carex flacca</i> .....	..	60—1
<i>Carex Lyngbyei</i> .....	70—4	..
<i>Carex maritima</i> .....	..	20—1
<i>Carex nigra</i> .....	20—2	..
<i>Eleocharis uniglumis</i> .....	90—3	..
<i>Equisetum arvense</i> .....	70—1	40—2
<i>Equisetum palustris</i> .....	10—2	60—2
<i>Eriophorum angustifolium</i> .....	..	20—4
<i>Eriophorum Scheuchzeri</i> .....	..	×
<i>Euphrasia frigida</i> .....	..	20—1
<i>Festuca rubra</i> .....	..	80—1
<i>Juncus articulatus</i> .....	..	×
<i>Leontodon autumnalis</i> .....	30—1	40—1
<i>Parnassia palustris</i> .....	..	100—1
<i>Poa pratensis</i> .....	30—1	60—2
<i>Potentilla anserina</i> .....	50—1	..
<i>Puccinellia maritima</i> .....	..	×
<i>Puccinellia retroflexa</i> .....	..	×
<i>Ranunculus acris</i> .....	30—1	..
<i>Rhinanthus minor</i> .....	20—1	40—1
<i>Rumex acetosa</i> .....	30—1	..
<i>Taraxacum</i> sp. .....	20—2	..
<i>Triglochin palustre</i> .....	..	60—1

*Armeria maritima*, *Cerastium alpinum*, *Cerastium fontanum*, *Cochlearia officinalis*, *Cystopteris fragilis*, *Draba incana*, *Oxyria digyna*, *Polypodium vulgare*, *Sagina nodosa*, *Sedum rosea* and *Saxifraga caespitosa*.

There is a clear affinity here with the gravelly flat vegetation, where all the above-mentioned species also grow.

Beneath those areas in the cliffs where there is an inward slope or there are for other reasons no bird droppings, there is here and there quite a broad belt, about 1 meter, of *Atriplex glabriuscula*.

On the ledges and under the cliffs there is, as stated above, a large amount of bird droppings. In many of these habitats are found *Angelica archangelica*, together with *Festuca rubra*, *Festuca vivipara*, *Ranunculus acris*, *Rumex acetosa* and *Tripleurospermum maritima*. On the edges and in the clefts of the cliffs *Sedum rosea* is often found to be dominating species.

In other places, though not in any specific ones, the following species were also found: *Agrostis canina*, *Euphrasia frigida*, *Galium Normanii*,

*Hieracium* sp., *Plantago lanceolata*, *Poa glauca*,  
*Poa trivialis*, *Sagina procumbens*, *Sedum acre*,  
*Silene acaulis*, *Silene maritima*, *Stellaria media*,  
*Taraxacum* sp. and *Thymus Drucei*.

## DISCUSSION

The vegetation on Heimaey shows much sign of trampling and encroachment by animals, so that a natural composition of vegetation is hardly to be found except on the cliffs.

Many species, which have been found either on cultivated land or in the town, or where the ground cover has been disturbed by man, may not be listed in the tables describing the societies. These were, however, recorded and are listed in the following table.

In the town there are, for instance, patches of *Matricaria matricarioides*, *Poa annua*, *Lolium perenne* and other species. Above the Fridarhöfn was a large area mostly covered with *Urtica urens* and *Euphrasia frigida*. Various other plants were found in the vicinity of the harbour. Plants cultivated in gardens or which grew in rubbish dumps are not included in the lists of plants.

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Bog community: Cross section taken. Photo by S. Magnússon.

grant from the U.S. Atomic Energy Commission, Environmental Branch, under the contract No. AT (30-1)-3549.

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## A TRANSECT ACROSS THE LOWER BOG AT 50 CM INTERVALS FROM NW TO SE

## LIST OF PLANTS FROM HEIMAEY

(Nomenclature according to *Hylander, Nils* (1955).)

<i>Achillea millefolium</i>	<i>Erigeron boreale</i>	<i>Prunella vulgaris</i>
<i>Agrostis canina</i>	<i>Eriophorum angustifolium</i>	<i>Puccinellia maritima</i>
<i>Agrostis stolonifera</i>	<i>Eriophorum Scheuchzeri</i>	<i>Puccinellia retroflexa</i>
<i>Agrostis tenuis</i>	<i>Euphrasia frigida</i>	<i>Ranunculus acris</i>
<i>Alchemilla alpina</i>	<i>Festuca rubra</i>	<i>Ranunculus repens</i>
<i>Alchemilla sp.</i>	<i>Festuca vivipara</i>	* <i>Rhinanthus minor</i>
<i>Alopecurus aequalis</i>	<i>Filipendula ulmaria</i>	<i>Rubus saxatilis</i>
<i>Alopecurus geniculatus</i>	<i>Galium Normanii</i>	<i>Rumex acetosa</i>
<i>Angelica archangelica</i>	<i>Galium verum</i>	<i>Rumex acetosella</i>
<i>Anthoxanthum odoratum</i>	<i>Gentianella amarella</i>	<i>Rumex longifolius</i>
<i>Armeria maritima</i>	<i>Gentianella aurea</i>	<i>Sagina nodosa</i>
<i>Atriplex glabriuscula</i>	<i>Gentianella campestris</i>	<i>Sagina procumbens</i>
* <i>Avenochloa pubescens</i>	<i>Gnaphalium uliginosum</i>	<i>Salix herbacea</i>
<i>Bartsia alpina</i>	* <i>Hieracium</i> sp.	<i>Saxifraga caespitosa</i>
<i>Botrychium lunaria</i>	<i>Juncus articulatus</i>	<i>Saxifraga hypnoides</i>
* <i>Bromus inermis</i>	<i>Juncus bufonius</i>	<i>Saxifraga nivalis</i>
<i>Cakile maritima</i>	<i>Juncus trifidus</i>	<i>Sedum acre</i>
<i>Calluna vulgaris</i>	<i>Kobresia myosuroides</i>	<i>Sedum rosea</i>
<i>Capsella bursa-pastoris</i>	<i>Koenigia islandica</i>	<i>Sedum villosum</i>
<i>Cardamine hirsuta</i>	<i>Lathyrus maritimus</i>	<i>Selaginella selaginoides</i>
<i>Cardamine pratensis</i>	<i>Lathyrus pratensis</i>	<i>Senecio vulgaris</i>
<i>Cardaminopsis petrea</i>	<i>Leontodon autumnalis</i>	<i>Sieglungia decumbens</i>
<i>Carex capillaris</i>	<i>Linum catharticum</i>	<i>Silene acaulis</i>
<i>Carex flacca</i>	* <i>Lolium perenne</i>	<i>Silene maritima</i>
<i>Carex Lyngbyei</i>	<i>Luzula multiflora</i>	<i>Spergula arvensis</i>
<i>Carex maritima</i>	<i>Luzula spicata</i>	<i>Stellaria media</i>
<i>Carex nigra</i>	<i>Matricaria matricarioides</i>	<i>Succisa pratensis</i>
<i>Carex rariflora</i>	<i>Mertensia maritima</i>	<i>Taraxacum</i> sp.
<i>Cerastium alpinum</i>	<i>Minuartia peploides</i>	<i>Thalictrum alpinum</i>
<i>Cerastium cerastoides</i>	<i>Myosotis arvensis</i>	<i>Thymus Drucei</i>
<i>Cerastium fontanum</i>	<i>Oxyria digyna</i>	<i>Trifolium repens</i>
* <i>Chenopodium album</i>	<i>Parnassia palustris</i>	<i>Triglochin palustre</i>
<i>Cirsium arvense</i>	<i>Phleum pratense</i>	<i>Tripleurospermum maritima</i>
<i>Coeloglossum viride</i>	<i>Pinguicula vulgaris</i>	<i>Trisetum spicatum</i>
<i>Cystopteris fragilis</i>	<i>Plantago lanceolata</i>	<i>Urtica urens</i>
<i>Dactylis glomerata</i>	<i>Plantago maritima</i>	<i>Veronica officinalis</i>
<i>Draba incana</i>	<i>Poa annua</i>	<i>Vicia cracca</i>
<i>Deschampsia caespitosa</i>	<i>Poa glauca</i>	<i>Vicia sepium</i>
<i>Eleocharis uniglumis</i>	<i>Poa pratensis</i>	<i>Viola canina</i>
<i>Elymus arenarius</i>	<i>Poa trivialis</i>	
<i>Empetrum hermafroditum</i>	<i>Polygonum aviculare</i>	* <i>Löve, Åskell</i> (1970):
<i>Epilobium collinum</i>	<i>Polygonum viviparum</i>	Íslensk ferðaflóra,
<i>Equisetum arvense</i>	<i>Polypodium vulgare</i>	Reykjavík, 1970.
<i>Equisetum palustre</i>	<i>Potentilla anserina</i>	Two to three species of <i>Hieracium</i>
<i>Equisetum pratense</i>	<i>Potentilla crantzii</i>	were found with certainty.

