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SCOTTISH COASTAL SURVEY

ANNEX TO MAIN REPORT

Key to Vegetation Types

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INTRODUCTION

The instructions for the use of the key to vegetation types given below are taken from Section 7.8 of the Main Report. Further discussion of the use of both the vegetation and site keys may be found in Appendix 2 - Handbook of Field Methods (pages 1-5). The main emphasis here is on the need to adhere to the population definition and on the sampling techniques that must be employed for different purposes. Also in the Handbook of Field Methods, Appendices XII and XIII contain practical advice on the location of sample points and sampling. Finally, after the key, the hierarchical diagrams of the vegetation classification given in the Main Report (Figures 6, 6A, 6B and 6C) are reproduced and may be used in conjunction with the key to gain a more visual insight into what is happening in the keying-out process.

Use of the Vegetation Type Key

The key derives 28 vegetation types and is composed of 105 steps which are shown diagrammatically in Figures 6, 6A, 6B and 6C. The entries in the rectangular boxes are the numbers of quadrats out of 3,847 (or 3,677 when the 166 bare quadrats and the 4 which were unclassifiable have been removed) which took this route in the original classification, those in the oval boxes are the step numbers (same as the written key) and each termination is indicated by a vegetation type mnemonic beneath the rectangular box.

As already noted, use of the key to assign vegetation types is completely accurate in the sense that, when applied to the same sample of the population on which it is based, the result is identical in all respects to that produced in the computer analysis. Because the vegetation classification is based on such a large sample, its application to new individuals drawn from the same population is extremely unlikely to produce an unsatisfactory assignment. Indeed, such a result is almost certain to be caused by poor field recording or mistakes in the use of the key (see below).

Use of the key is simple, albeit somewhat laborious if a number of steps with a high number of indicators is involved. The number of steps required to determine a vegetation type varies between 2 and 10. Calculation of the indicator scores, i.e. the sum of negative and positive indicators present in a quadrat, and the correct transfer from one step to the the next require some care if mistakes are not to be made. It is good practice to record the keying-out process on paper and the following species list is used to illustrate one method by which this can be done.

<i>Carex panicea</i>	<i>Festuca rubra</i>
<i>Trifolium repens</i>	<i>Lotus corniculatus</i>
<i>Bellis perennis</i>	<i>Sieglingia decumbens</i>
<i>Linum catharticum</i>	<i>Plantago lanceolata</i>
<i>Thymus drucei</i>	<i>Koeleria cristata</i>
<i>Selaginella selaginoides</i>	<i>Euphrasia officinalis</i> agg.
<i>Prunella vulgaris</i>	<i>Centaurea nigra</i>
<i>Viola riviniana</i>	<i>Plantago maritima</i>
<i>Anthyllis vulneraria</i>	<i>Agrostis stolonifera</i>

Daucus carota
Festuca ovina
Leontodon taraxacoides
Succisa pratensis
Gentianella armarella
Juncus articulatus
Trifolium pratense

Carex arenaria
Achillea millefolium
Carex serotina
Hieracium pilosella
Coeloglossum viride
Senecio jacobaea
Erica tetralix

The steps in the key are examined as follows, noting the step number in brackets (), the sum of negative and positive indicators (- and +), the total score (=), the threshold value for the indicator score and the resulting step number to be taken (or vegetation type allocation if an outlet is reached).

In step 1 of the key only one of the two negative indicators is present (*Plantago lanceolata*), giving a score of -1 which, when compared with a threshold value of 0, leads to step 2. N.B. The convention that is used for the threshold score is that threshold or less goes negative and greater than threshold goes positive. This is clearly indicated in the key itself. The process of keying-out a species list may be summarized as follows:

(1) $-1=-1$ to be compared with a -ve threshold of 0, go to step 2

In step 2 there are three of the four negative indicators present (*Festuca rubra*, *Plantago lanceolata* and *Trifolium repens*) and no positive ones, giving a score of -3 which, when compared with a threshold of 0, leads to step 3 (this is now unlikely to be a maritime vegetation type, i.e. it cannot get into the part of the hierarchy shown in Figure 6C). Again, this may be summarized as follows:

(2) $-1-1-1=-3$ to be compared with a -ve threshold of 0, go to step 3

In step 3 there are two negative indicators present (*Festuca ovina* and *Succisa pratensis*) and one positive (*Senecio jacobaea*), giving a score of -1 which, when compared with a threshold of -1, leads to step 4 (this has now narrowly avoided going into the part of the hierarchy shown in Figure 6B and is thus not going to be assigned to one of the more base-rich Duneland types).

(3) $-1-1+1=-1$ to be compared with a -ve threshold of -1, go to step 4

In step 4 there are three negative indicators present (*Agrostis stolonifera*, *Prunella vulgaris* and *Trifolium repens*) and two positive (*Carex arenaria* and *Festuca ovina*), giving a score of -1 which, when compared with a threshold of -1, leads to step 5 (this means that the quadrat is now destined to be allocated to one of the more acid or bog types in Figure 6A).

(4) $-1-1-1+1+1=-1$ to be compared with a -ve threshold of -1, go to step 5.

In step 5 there are five negative indicators present (*Lotus corniculatus*, *Plantago lanceolata*, *Plantago maritima*, *Sieglingia decumbens* and *Thymus drucei*) and no positive ones, giving a score of -5 which, when compared with a threshold of 0, leads to step 7.

- (5) $-1-1-1-1-1=-5$ to be compared with a -ve threshold of 0, go to step 7

In step 7 there are three negative indicators present (*Euphrasia officinalis* agg., *Lotus corniculatus* and *Sieglingia decumbens*) and no positive ones, giving a score of -3 which, when compared with a threshold of -1, leads to step 11.

- (7) $-1-1-1=-3$ to be compared with a -ve threshold of -1, go to step 11

In step 11 there is one positive indicator present (*Bellis perennis*) and one negative (*Erica tetralix*), giving a score of 0 which, when compared with a threshold of 4, leads to step 17 (there have to be at least 5 positive indicators and no negative ones to get to the alternative step 18).

- (11) $-1+1=0$ to be compared with a -ve threshold of +4, go to step 17

In step 17 there are two negative indicators present (*Plantago lanceolata* and *Trifolium repens*) and one positive (*Erica tetralix*), giving a score of -1 which, when compared with a threshold of 1, leads to step 26.

- (17) $-1-1+1=-1$ to be compared with a -ve threshold of +1, go to step 26

In step 26 there are five negative indicators present (*Achillea millefolium*, *Koeleria cristata*, *Linum catharticum*, *Thymus drucei* and *Viola riviniana*) and one positive (*Juncus articulatus*), giving a score of -4 which, when compared with a threshold of -2, leads to step 35.

- (26) $-1-1-1-1-1+1=-4$ to be compared with a -ve threshold of -2, go to step 35

Finally, in step 35 there are no negative indicators (none are listed in the key) and one positive one (*Carex panicea*), giving a score of +1 which, when compared with a threshold of 1, causes the quadrat in question to be allocated to vegetation type G1 (slightly acid, damp grassland). One more positive indicator would put the quadrat in vegetation type G2 (acid, damp grassland).

- (35) $+1=+1$ to be compared with a -ve threshold of +1, allocated to vegetation type G1.

In the above example, only the abbreviated calculations, showing how the indicator scores were calculated, the threshold and the step numbers need be recorded to assist accuracy and checking. It is often useful to enter these directly on to the field sheet.

In fact, in the preparation of this example a mistake was made at step 4 in the key, where the presence of *Prunella vulgaris* was initially missed (but found in checking). This mistake resulted in an indicator score of 0 instead -1, leading to step 6 instead of 5. Following this new route through the key, the quadrat was eventually allocated to vegetation type G2 in step 30 which, as we have just seen, by the near miss in step 35, is quite a reasonable result. This demonstrates the inherent robustness of the key to minor mistakes in field recording and even, to some extent, in the use of the key itself. Nevertheless, as a considerable effort is usually expended in the collection of good field data, it is only appropriate that an equivalent amount of care

should be taken in the use of the key in order to ensure the most accurate results possible. The time taken to use the key and check the result is comparatively small compared with that usually devoted to recording the field data.

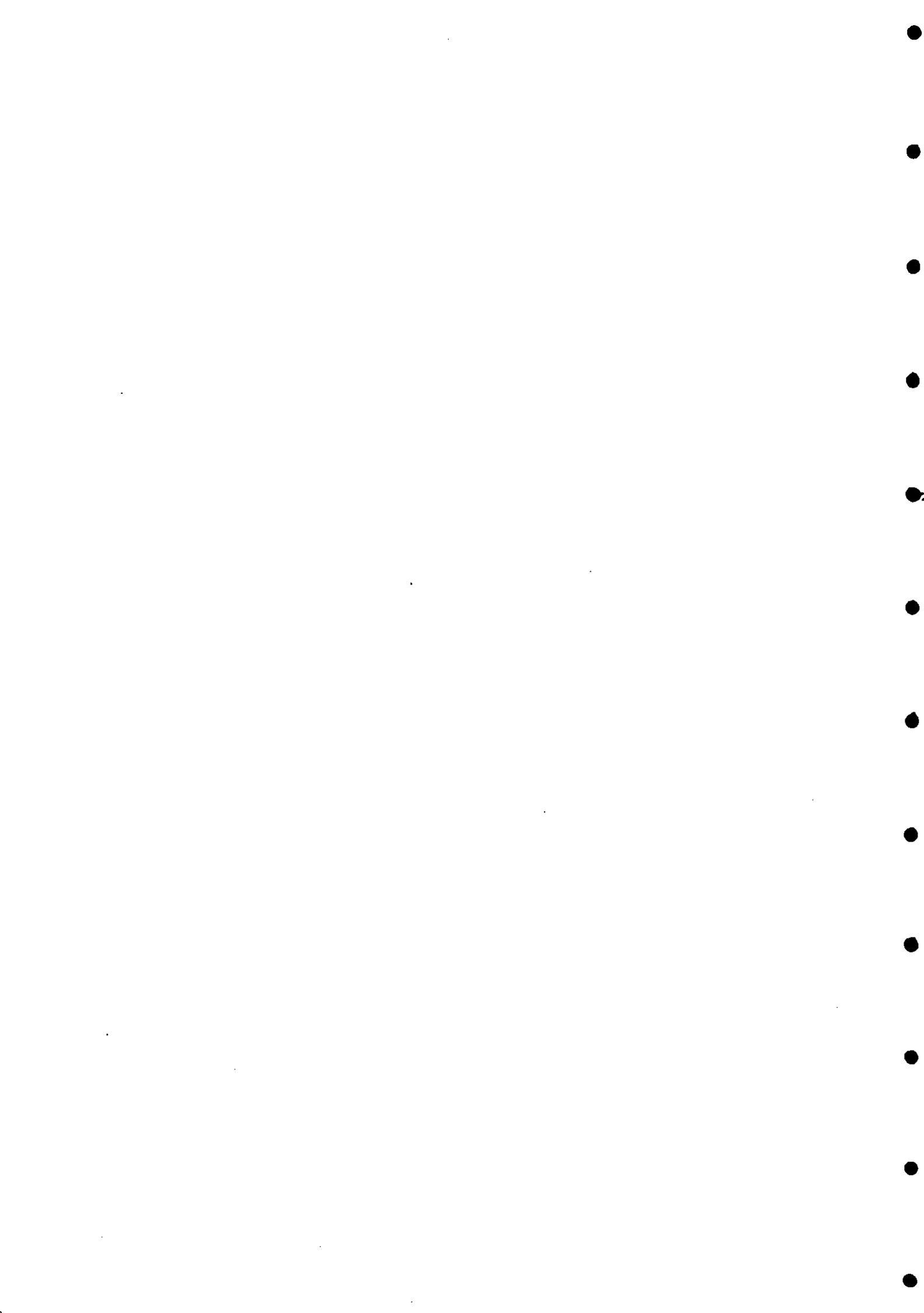
The above description only covers the procedure for using the vegetation type key. There are, however, some other important considerations, such as the population definition and the sampling methods which may be used to obtain data. These points are covered in some detail in the introduction to Appendix 2 of the Handbook of Field Methods (pages 1-5). The two main points to be noted are:

- (a) that the vegetation type key must only be applied to samples taken from the same population as that on which it is based, i.e. soft coast in Scotland, and
- (b) that, if site classification or the estimation of relative amounts of different vegetation types on a site is one of the aims of recording, then an objective sampling procedure must be employed.

Simple identification of the vegetation type occurring within a particular area of a site or the determination of vegetation type boundaries for mapping can freely utilize subjectively chosen samples.

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Vegetation Type Key



INDICATORS:-

NEGATIVE

Plantago lanceolata
Poa pratensis

POSITIVE

Armeria maritima
Glaux maritima
Puccinellia maritima

SCORE 0 or less-----Step No. 2
SCORE 1 or more-----Step No. 77

STEP NO.- 2

INDICATORS:-

NEGATIVE

Festuca rubra
Plantago lanceolata
Poa pratensis
Trifolium repens

POSITIVE

Salicornia spp.

SCORE 0 or less-----Step No. 3
SCORE 1 or more-----Veg. Type S1

STEP NO.- 3

INDICATORS:-

NEGATIVE

Agrostis tenuis
Anthoxanthum odoratum
Calluna vulgaris
Carex nigra
Festuca ovina
Potentilla erecta
Succisa pratensis

POSITIVE

Ammophila arenaria
Galium verum
Senecio jacobaea

SCORE -1 or less-----Step No. 4
SCORE 0 or more-----Step No. 42

INDICATORS:-

NEGATIVE

Agrostis stolonifera
 Carex nigra
 Leontodon autumnalis
 Prunella vulgaris
 Ranunculus acris
 Trifolium repens

POSITIVE

Agrostis tenuis
 Calluna vulgaris
 Carex arenaria
 Festuca ovina

SCORE -1 or less-----Step No. 5

SCORE 0 or more-----Step No. 6

INDICATORS:-

NEGATIVE

Lotus corniculatus
 Plantago lanceolata
 Plantago maritima
 Sieglingia decumbens
 Thymus drucei

POSITIVE

Caltha palustris
 Cardamine pratensis
 Galium palustre
 Hydrocotyle vulgaris
 Ranunculus flammula

SCORE 0 or less-----Step No. 7

SCORE 1 or more-----Step No. 8

INDICATORS:-

NEGATIVE

Agrostis tenuis
 Carex arenaria
 Poa pratensis

POSITIVE

Erica tetralix
 Molinia caerulea
 Potentilla erecta
 Succisa pratensis

SCORE 1 or less-----Step No. 9

SCORE 2 or more-----Step No. 10

INDICATORS:-

STEP NO.- 7

NEGATIVE

POSITIVE

Carex nigra
Euphrasia officinalis agg.
Lotus corniculatus
Sieglingia decumbens

Cirsium arvense
Dactylis glomerata

SCORE -1 or less-----Step No. 11
SCORE 0 or more-----Step No. 12

INDICATORS:-

STEP NO.- 8

NEGATIVE

POSITIVE

Caltha palustris
Cardamine pratensis
Lychnis flos-cuculi
Ranunculus acris

Cirsium palustre
Juncus effusus
Potentilla erecta
Viola palustris

SCORE 1 or less-----Step No. 13
SCORE 2 or more-----Veg. Type G7

INDICATORS:-

STEP NO.- 9

NEGATIVE

POSITIVE

Calluna vulgaris

Cerastium atrovirens
Myosotis arvensis
Potentilla anserina
Stellaria media

SCORE 1 or less-----Step No. 14
SCORE 2 or more-----Step No. 15

INDICATORS:-

NEGATIVE

POSITIVE

Euphrasia officinalis agg.
 Festuca ovina
 Lotus corniculatus
 Plantago lanceolata
 Sieglingia decumbens
 Thymus drucei
 Trifolium repens
 Viola riviniana

SCORE -2 or less-----Veg. Type P1
 SCORE -1 or more-----Step No. 16

INDICATORS:-

NEGATIVE

POSITIVE

Bellis perennis
 Poa pratensis

Calluna vulgaris
 Carex echinata
 Erica tetralix
 Eriophorum angustifolium
 Molinia caerulea
 Nardus stricta
 Potentilla erecta

SCORE 4 or less-----Step No. 17
 SCORE 5 or more-----Step No. 18

INDICATORS:-

NEGATIVE

POSITIVE

Festuca arundinacea
 Juncus gerardii
 Oenanthe crocata
 Sonchus arvensis
 Triglochin maritima

SCORE 2 or less-----Step No. 19
 SCORE 3 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE

Rumex acetosa

POSITIVE

Anagallis tenella
 Carex panicea
 Eriophorum angustifolium
 Molinia caerulea
 Ranunculus flammula

SCORE 1 or less-----Step No. 20

SCORE 2 or more-----Step No. 21

INDICATORS:-

NEGATIVE

Calluna vulgaris
 Carex arenaria
 Festuca ovina

POSITIVE

Arrhenatherum elatius
 Holcus lanatus
 Rubus fruticosus agg.

SCORE 1 or less-----Step No. 22

SCORE 2 or more-----Step No. 23

INDICATORS:-

NEGATIVE

POSITIVE

Agropyron repens
 Ammophila arenaria
 Arctium minus
 Chamaenerion angustifolium
 Cirsium arvense

SCORE 2 or less-----Veg. Type C

SCORE 3 or more-----Veg. Type S5

INDICATORS:-

NEGATIVE

Eriophorum angustifolium

POSITIVE

Cirsium palustre
 Dryopteris dilatata agg.
 Pteridium aquilinum
 Rumex acetosa

SCORE 0 or less-----Step No. 24
 SCORE 1 or more-----Step No. 25

INDICATORS:-

NEGATIVE

Plantago lanceolata
 Trifolium repens

POSITIVE

Erica tetralix
 Potentilla palustris
 Viola palustris

SCORE 1 or less-----Step No. 26
 SCORE 2 or more-----Veg. Type P3

INDICATORS:-

NEGATIVE

POSITIVE

Carex dioica
 Epilobium palustre
 Equisetum arvense
 Sagina procumbens
 Senecio aquaticus

SCORE 2 or less-----Veg. Type P1
 SCORE 3 or more-----Veg. Type G6

INDICATORS:-

NEGATIVE

Cerastium holosteoides
Cirsium arvense
Ranunculus acris

POSITIVE

Potentilla erecta
Succisa pratensis

SCORE 1 or less-----Step No. 27
SCORE 2 or more-----Veg. Type P1

INDICATORS:-

NEGATIVE

Hydrocotyle vulgaris
Mentha aquatica

POSITIVE

Agrostis tenuis
Anthoxanthum odoratum
Centaurea nigra
Festuca rubra
Juncus effusus
Leontodon autumnalis
Plantago lanceolata
Rumex acetosa

SCORE 2 or less-----Veg. Type M2
SCORE 3 or more-----Step No. 28

INDICATORS:-

NEGATIVE

Cardamine pratensis
Prunella vulgaris
Succisa pratensis

POSITIVE

Carex serotina
Eleocharis uniglumis

SCORE 0 or less-----Step No. 29
SCORE 1 or more-----Veg. Type G6

INDICATORS:-

NEGATIVE	POSITIVE
Bellis perennis	Galium saxatile
Cerastium holosteoides	
Euphrasia officinalis agg.	
Galium verum	
Lotus corniculatus	
Plantago lanceolata	
Plantago maritima	
Thymus drucei	
Trifolium repens	

SCORE -4 or less-----Step No. 30

SCORE -3 or more-----Step No. 31

INDICATORS:-

NEGATIVE	POSITIVE
Rubus fruticosus agg.	Centaurea nigra
	Dactylis glomerata
	Lathyrus pratensis
	Plantago lanceolata

SCORE 1 or less-----Step No. 32

SCORE 2 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE	POSITIVE
Drosera rotundifolia	Agrostis canina
Myrica gale	Anthoxanthum odoratum
Narthecium ossifragum	Empetrum nigrum
Succisa pratensis	

SCORE 0 or less-----Step No. 33

SCORE 1 or more-----Step No. 34

INDICATORS:-

NEGATIVE

Erica tetralix

POSITIVE

Cirsium palustre
Holcus lanatus
Rumex acetosa
Viola palustris

SCORE 0 or less-----Veg. Type P2

SCORE 1 or more-----Veg. Type P3

INDICATORS:-

NEGATIVE

Achillea millefolium
Galium verum
Koeleria cristata
Linum catharticum
Thymus drucei
Viola riviniana

POSITIVE

Juncus articulatus
Potentilla anserina
Ranunculus repens
Vicia cracca

SCORE -2 or less-----Step No. 35

SCORE -1 or more-----Veg. Type G1

INDICATORS:-

NEGATIVE

Cirsium arvense
Cynosurus cristatus
Prunella vulgaris
Ranunculus acris
Ranunculus repens
Rumex acetosa
Trifolium repens

POSITIVE

Aira praecox
Lepidium heterophyllum

SCORE -1 or less-----Veg. Type D5

SCORE 0 or more-----Veg. Type D6

INDICATORS:-

NEGATIVE

Cerastium holosteoides
Potentilla anserina

POSITIVE

Agrostis tenuis
Juncus bufonius
Polygonum persicaria

SCORE 1 or less-----Step No. 36
 SCORE 2 or more-----Veg. Type G7

INDICATORS:-

NEGATIVE

Caltha palustris

POSITIVE

Carex echinata
Carex pulicaris
Erica tetralix
Potentilla erecta

SCORE 1 or less-----Veg. Type G6
 SCORE 2 or more-----Step No. 37

INDICATORS:-

NEGATIVE

Carex arenaria
Poa pratensis

POSITIVE

Euphrasia officinalis agg.
Plantago maritima
Succisa pratensis

SCORE 0 or less-----Step No. 38
 SCORE 1 or more-----Veg. Type G2

INDICATORS:-

NEGATIVE	POSITIVE
<i>Anthoxanthum odoratum</i>	<i>Armeria maritima</i>
<i>Galium saxatile</i>	<i>Festuca rubra</i>
	<i>Plantago maritima</i>

SCORE 1 or less-----Step No. 39
 SCORE 2 or more-----Veg. Type S5

INDICATORS:-

NEGATIVE	POSITIVE
<i>Arrhenatherum elatius</i>	<i>Agrostis stolonifera</i>
<i>Cirsium palustre</i>	<i>Pteridium aquilinum</i>
	<i>Rumex acetosa</i>

SCORE 1 or less-----Step No. 40
 SCORE 2 or more-----Veg. Type D6

INDICATORS:-

NEGATIVE	POSITIVE
<i>Eriophorum angustifolium</i>	<i>Carex echinata</i>
	<i>Festuca vivipara</i>
	<i>Hydrocotyle vulgaris</i>
	<i>Nardus stricta</i>
	<i>Sieglingia decumbens</i>
	<i>Succisa pratensis</i>

SCORE 1 or less-----Veg. Type P2
 SCORE 2 or more-----Veg. Type P1

INDICATORS:-

NEGATIVE

Carex echinata
Erica tetralix
Juncus effusus
Nardus stricta

POSITIVE

Erica cinerea

SCORE -1 or less-----Step No. 41
SCORE 0 or more-----Veg. Type P2

INDICATORS:-

NEGATIVE

POSITIVE

Calluna vulgaris
Carex panicea
Carex pulicaris
Nardus stricta
Potentilla erecta

SCORE 1 or less-----Veg. Type G1
SCORE 2 or more-----Veg. Type G2

INDICATORS:-

NEGATIVE

POSITIVE

Centaurea nigra
Filipendula ulmaria
Juncus articulatus

Dactylorhiza spp.
Luzula campestris

SCORE -2 or less-----Veg. Type D5
SCORE -1 or more-----Veg. Type G6

INDICATORS:-

NEGATIVE

Anagallis tenella
Carex echinata

POSITIVE

Lotus corniculatus
Luzula campestris
Poa pratensis

SCORE 1 or less-----Veg. Type G6
SCORE 2 or more-----Veg. Type P1

INDICATORS:-

NEGATIVE

Anthoxanthum odoratum
Calluna vulgaris
Campanula rotundifolia
Linum catharticum
Thymus drucei
Viola riviniana

POSITIVE

SCORE -2 or less-----Veg. Type G3
SCORE -1 or more-----Veg. Type D2

INDICATORS:-

NEGATIVE

Erica cinerea

POSITIVE

Agrostis canina
Carex nigra
Juncus effusus
Nardus stricta
Potentilla erecta

SCORE 3 or less-----Veg. Type G3
SCORE 4 or more-----Veg. Type G4

INDICATORS:-

NEGATIVE	POSITIVE
Agrostis tenuis	Arrhenatherum elatius
Cirsium palustre	Deschampsia flexuosa
Festuca rubra	

SCORE -1 or less-----Veg. Type G7
 SCORE 0 or more-----Veg. Type M3

INDICATORS:-

NEGATIVE	POSITIVE
Carex panicea	Holcus mollis
Festuca vivipara	Potentilla palustris
Juncus squarrosus	

SCORE -1 or less-----Veg. Type P2
 SCORE 0 or more-----Veg. Type P3

INDICATORS:-

NEGATIVE	POSITIVE
Ammophila arenaria	Agrostis stolonifera
Festuca rubra	Littorella uniflora
Galium verum	Myriophyllum alterniflorum
Poa pratensis	

SCORE 0 or less-----Step No. 43
 SCORE 1 or more-----Step No. 44

INDICATORS:-

NEGATIVE

POSITIVE

Ammophila arenaria
Bellis perennis
Galium verum
Lotus corniculatus
Trifolium repens

SCORE -1 or less-----Step No. 45

SCORE 0 or more-----Step No. 46

INDICATORS:-

NEGATIVE

POSITIVE

Caltha palustris
Equisetum fluviatile
Galium palustre
Holcus lanatus
Juncus effusus

Bellis perennis
Lolium perenne agg.
Ranunculus repens
Rumex crispus
Trifolium repens

SCORE 0 or less-----Step No. 47

SCORE 1 or more-----Step No. 48

INDICATORS:-

NEGATIVE

POSITIVE

Bellis perennis
Cerastium holosteoides
Festuca rubra
Plantago lanceolata
Poa pratensis
Trifolium repens

SCORE -2 or less-----Step No. 49

SCORE -1 or more-----Step No. 50

INDICATORS:-

NEGATIVE	POSITIVE
Cirsium arvense	Agropyron junceiforme
Poa pratensis	Atriplex hastata
Urtica dioica	Honkenya peploides

SCORE 0 or less-----Step No. 51

SCORE 1 or more-----Step No. 52

INDICATORS:-

NEGATIVE	POSITIVE
Galium palustre	Littorella uniflora
Holcus lanatus	Myriophyllum alterniflorum
	Ranunculus trichophyllus

SCORE 0 or less-----Step No. 53

SCORE 1 or more-----Veg. Type M4

INDICATORS:-

NEGATIVE	POSITIVE
	Atriplex hastata
	Galium aparine
	Honkenya peploides
	Iris pseudacorus
	Triglochin maritima

SCORE 2 or less-----Step No. 54

SCORE 3 or more-----Veg. Type F1

INDICATORS:-

NEGATIVE

Agrostis stolonifera
Bellis perennis
Euphrasia officinalis agg.
Prunella vulgaris
Ranunculus acris
Trifolium pratense
Trifolium repens

POSITIVE

Ammophila arenaria
Veronica chamaedrys

SCORE -2 or less-----Step No. 55

SCORE -1 or more-----Step No. 56

INDICATORS:-

NEGATIVE

Agropyron junceiforme

POSITIVE

Agrostis tenuis
Carex arenaria
Festuca ovina
Galium verum
Holcus lanatus
Hypochoeris radicata
Lotus corniculatus
Thymus drucei
Viola riviniana

SCORE 1 or less-----Step No. 57

SCORE 2 or more-----Step No. 58

INDICATORS:-

NEGATIVE

Cirsium arvense
Festuca rubra
Poa pratensis
Urtica dioica

POSITIVE

Cakile maritima

SCORE 0 or less-----Step No. 59

SCORE 1 or more-----Veg. Type F1

INDICATORS:-

NEGATIVE	POSITIVE
Agropyron junceiforme	Atriplex hastata
Atriplex laciniata	Festuca rubra
Cakile maritima	Potentilla anserina
Elymus arenarius	
Honkenya peploides	

SCORE -1 or less-----Veg. Type F1
 SCORE 0 or more-----Step No. 60

INDICATORS:-

NEGATIVE	POSITIVE
Galium palustre	Cochlearia officinalis
Holcus lanatus	Stellaria media
	Tripleurospermum maritimum

SCORE 0 or less-----Step No. 61
 SCORE 1 or more-----Veg. Type F2

INDICATORS:-

NEGATIVE	POSITIVE
Capsella bursa-pastoris	Juncus articulatus
Heracleum sphondylium	Potentilla anserina
Lolium perenne agg.	

SCORE 0 or less-----Veg. Type M1
 SCORE 1 or more-----Step No. 62

INDICATORS:-

NEGATIVE	POSITIVE
<i>Ammophila arenaria</i>	<i>Agrostis stolonifera</i>
<i>Euphrasia officinalis</i> agg.	<i>Potentilla anserina</i>
<i>Galium verum</i>	<i>Ranunculus repens</i>
<i>Linum catharticum</i>	<i>Rumex crispus</i>
<i>Lotus corniculatus</i>	
<i>Luzula campestris</i>	

SCORE -1 or less-----Step No. 63

SCORE 0 or more-----Step No. 64

INDICATORS:-

NEGATIVE	POSITIVE
<i>Ammophila arenaria</i>	<i>Equisetum palustre</i>
	<i>Filipendula ulmaria</i>
	<i>Ranunculus repens</i>
	<i>Urtica dioica</i>

SCORE 1 or less-----Step No. 65

SCORE 2 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE	POSITIVE
<i>Agrostis stolonifera</i>	
<i>Chamaenerion angustifolium</i>	
<i>Cirsium arvense</i>	
<i>Festuca rubra</i>	
<i>Holcus lanatus</i>	
<i>Ranunculus repens</i>	
<i>Rumex crispus</i>	
<i>Senecio jacobaea</i>	

SCORE -4 or less-----Step No. 66

SCORE -3 or more-----Step No. 67

INDICATORS:-

NEGATIVE
Ammophila arenaria

POSITIVE
Agrostis stolonifera
Holcus lanatus
Ranunculus repens
Salix cinerea agg.

SCORE 1 or less-----Step No. 68
SCORE 2 or more-----Veg. Type M3

INDICATORS:-

NEGATIVE

POSITIVE

Angelica sylvestris
Cirsium palustre
Deschampsia cespitosa
Epilobium palustre
Galium palustre
Iris pseudacorus
Juncus effusus

SCORE 2 or less-----Step No. 69
SCORE 3 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE

POSITIVE

Atriplex hastata

Agropyron junceiforme
Agrostis stolonifera
Festuca rubra
Potentilla anserina

SCORE 0 or less-----Veg. Type F1
SCORE 1 or more-----Veg. Type S3

INDICATORS:-

NEGATIVE

POSITIVE

Anthoxanthum odoratum
 Cirsium arvense
 Holcus lanatus
 Senecio jacobaea
 Ulex europaeus

SCORE 2 or less-----Veg. Type M2
 SCORE 3 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE

POSITIVE

Caltha palustris
 Cardamine flexuosa
 Carex flacca
 Carex nigra
 Epilobium palustre

SCORE -3 or less-----Veg. Type M4
 SCORE -2 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE

POSITIVE

Achillea millefolium
 Linum catharticum
 Ranunculus acris
 Thalictrum minus

Agrostis tenuis
 Chamaenerion angustifolium
 Cirsium vulgare
 Hypochaeris radicata
 Rumex acetosella
 Veronica officinalis

SCORE 1 or less-----Step No. 70
 SCORE 2 or more-----Step No. 71

INDICATORS:-

NEGATIVE	POSITIVE
Bellis perennis	Carex flacca
Cerastium atrovirens	Carex nigra
Geranium molle	Holcus lanatus
Myosotis arvensis	Juncus articulatus
Viola tricolor	Potentilla anserina

SCORE 1 or less-----Step No. 72
 SCORE 2 or more-----Veg. Type D4

INDICATORS:-

NEGATIVE	POSITIVE
	Galium aparine
	Rumex crispus
	Rumex obtusifolius
	Stellaria media
	Urtica dioica

SCORE 3 or less-----Step No. 73
 SCORE 4 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE	POSITIVE
Ammophila arenaria	Agropyron repens
	Arrhenatherum elatius
	Dactylis glomerata
	Ranunculus repens

SCORE -1 or less-----Step No. 74
 SCORE 0 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE

Agropyron junceiforme

POSITIVE

Calluna vulgaris
 Carex arenaria
 Erica cinerea
 Poa pratensis

SCORE 0 or less-----Step No. 75

SCORE 1 or more-----Step No. 76

INDICATORS:-

NEGATIVE

POSITIVE

Agropyron repens
 Centaurea nigra
 Cirsium arvense
 Heracleum sphondylium
 Potentilla anserina

SCORE 1 or less-----Veg. Type C

SCORE 2 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE

Poa pratensis

POSITIVE

Carex maritima
 Glyceria fluitans
 Juncus articulatus
 Juncus bufonius

SCORE 1 or less-----Veg. Type D3

SCORE 2 or more-----Veg. Type M2

INDICATORS:-

STEP NO.- 70

NEGATIVE

POSITIVE

Achillea millefolium
Ammophila arenaria

Agrostis stolonifera
Cardamine pratensis
Carex nigra
Hydrocotyle vulgaris
Pinguicula vulgaris
Plantago maritima
Potentilla anserina
Selaginella selaginoides

SCORE 1 or less-----Veg. Type D1
SCORE 2 or more-----Veg. Type D4

INDICATORS:-

STEP NO.- 71

NEGATIVE

POSITIVE

Arenaria serpyllifolia agg.
Carex flacca
Cerastium atrovirens
Echium vulgare
Festuca ovina

SCORE 2 or less-----Veg. Type D2
SCORE 3 or more-----Veg. Type C

INDICATORS:-

STEP NO.- 72

NEGATIVE

POSITIVE

Ranunculus repens

Armeria maritima
Cochlearia officinalis
Plantago coronopus
Plantago maritima

SCORE 1 or less-----Veg. Type D1
SCORE 2 or more-----Veg. Type S5

INDICATORS:-

NEGATIVE	POSITIVE
Carex arenaria	Achillea millefolium
Festuca ovina	Centaurea nigra
Hypochoeris radicata	Heracleum sphondylium
Luzula campestris	Thalictrum minus
Thymus drucei	
Viola riviniana	

SCORE -2 or less-----Veg. Type D2
 SCORE -1 or more-----Veg. Type D3

INDICATORS:-

NEGATIVE	POSITIVE
	Alopecurus geniculatus
	Holcus mollis
	Iris pseudacorus
	Oenanthe crocata
	Rorippa nasturtium-aquaticum agg.

SCORE 2 or less-----Veg. Type C
 SCORE 3 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE	POSITIVE
Agropyron junceiforme	Atriplex patula
	Bellis perennis
	Holcus lanatus
	Juncus articulatus

SCORE 1 or less-----Veg. Type C
 SCORE 2 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE
Calluna vulgaris

POSITIVE
Arcticum minus
Potentilla anserina
Rumex crispus
Senecio jacobaea

SCORE 1 or less-----Veg. Type C
 SCORE 2 or more-----Veg. Type M1

INDICATORS:-

NEGATIVE
Puccinellia maritima

POSITIVE
Agrostis stolonifera
Bellis perennis
Carex flacca
Euphrasia officinalis agg.
Juncus articulatus
Leontodon autumnalis
Lotus corniculatus
Sagina procumbens
Trifolium repens

SCORE 1 or less-----Step No. 78
 SCORE 2 or more-----Step No. 79

INDICATORS:-

NEGATIVE
Aster tripolium
Puccinellia maritima

POSITIVE
Agropyron junceiforme
Agropyron repens
Ammophila arenaria
Atriplex hastata
Rumex crispus

SCORE 0 or less-----Step No. 80
 SCORE 1 or more-----Step No. 81

INDICATORS:-

NEGATIVE

Armeria maritima
Juncus gerardii
Plantago coronopus
Plantago maritima

POSITIVE

Hydrocotyle vulgaris
Prunella vulgaris

SCORE -1 or less-----Step No. 82
 SCORE 0 or more-----Step No. 83

INDICATORS:-

NEGATIVE

Agrostis stolonifera
Festuca rubra
Juncus gerardii

POSITIVE

Salicornia spp.
Suaeda maritima

SCORE -1 or less-----Step No. 84
 SCORE 0 or more-----Step No. 85

INDICATORS:-

NEGATIVE

Atriplex hastata
Rumex crispus
Suaeda maritima

POSITIVE

Ammophila arenaria
Armeria maritima

SCORE 0 or less-----Veg. Type S3
 SCORE 1 or more-----Step No. 86

INDICATORS:-

NEGATIVE

Glaux maritima
Juncus gerardii
Triglochin maritima

POSITIVE

Festuca ovina
Thymus drucei

SCORE 0 or less-----Step No. 87
 SCORE 1 or more-----Veg. Type G5

INDICATORS:-

NEGATIVE

Bellis perennis
Leontodon autumnalis
Prunella vulgaris
Ranunculus flammula

POSITIVE

Rumex crispus

SCORE -1 or less-----Veg. Type G6
 SCORE 0 or more-----Veg. Type M2

INDICATORS:-

NEGATIVE

Armeria maritima

POSITIVE

Arenaria serpyllifolia agg.
Atriplex patula
Scirpus maritimus
Suaeda maritima

SCORE 1 or less-----Step No. 88
 SCORE 2 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE	POSITIVE
<i>Armeria maritima</i>	<i>Atriplex</i> spp.
<i>Plantago maritima</i>	<i>Spergularia marina</i>
<i>Spergularia media</i>	

SCORE -1 or less-----Step No. 89
 SCORE 0 or more-----Step No. 90

INDICATORS:-

NEGATIVE	POSITIVE
<i>Festuca rubra</i>	<i>Carex arenaria</i>
	<i>Hypochoeris radicata</i>
	<i>Koeleria cristata</i>
	<i>Viola riviniana</i>

SCORE 1 or less-----Step No. 91
 SCORE 2 or more-----Veg. Type S5

INDICATORS:-

NEGATIVE	POSITIVE
<i>Carex flacca</i>	<i>Atriplex patula</i>
<i>Euphrasia officinalis</i> agg.	<i>Rumex crispus</i>
<i>Trifolium repens</i>	

SCORE 0 or less-----Step No. 92
 SCORE 1 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Armeria maritima
Plantago maritima

POSITIVE

Agrostis stolonifera
Juncus bufonius
Spergularia marina

SCORE 0 or less-----Step No. 93

SCORE 1 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Aster tripolium
Salicornia spp.

POSITIVE

Festuca rubra
Spergularia media
Suaeda maritima

SCORE 2 or less-----Veg. Type S1

SCORE 3 or more-----Veg. Type S2

INDICATORS:-

NEGATIVE

Glaux maritima
Salicornia spp.
Spergularia marina
Suaeda maritima

POSITIVE

Agropyron junceiforme

SCORE -1 or less-----Step No. 94

SCORE 0 or more-----Veg. Type S1

INDICATORS:-

NEGATIVE

Atriplex laciniata

POSITIVE

Cerastium atrovirens
Elymus arenarius
Glaux maritima
Poa pratensis

SCORE 1 or less-----Veg. Type S3

SCORE 2 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Cochlearia officinalis
Triglochin maritima

POSITIVE

Carex distans
Potentilla anserina
Sagina procumbens

SCORE 0 or less-----Step No. 95

SCORE 1 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Aster tripolium
Glaux maritima

POSITIVE

Cochlearia officinalis
Plantago coronopus
Sagina nodosa

SCORE 0 or less-----Step No. 96

SCORE 1 or more-----Step No. 97

INDICATORS:-

NEGATIVE	POSITIVE
Salicornia spp.	Aster tripolium Atriplex spp. Honkenya peploides Triglochin maritima

SCORE 0 or less-----Step No. 98
SCORE 1 or more-----Veg. Type S1

INDICATORS:-

NEGATIVE	POSITIVE
Armeria maritima	Eleocharis quinqueflora Juncus articulatus Sieglingia decumbens Triglochin palustris

SCORE 0 or less-----Step No. 99
SCORE 1 or more-----Step No. 100

INDICATORS:-

NEGATIVE	POSITIVE
Leontodon autumnalis Puccinellia maritima	Agrostis stolonifera Carex extensa Centaurium littorale

SCORE 1 or less-----Step No. 101
SCORE 2 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

POSITIVE

Agrostis stolonifera
 Glaux maritima
 Juncus gerardii
 Puccinellia maritima
 Sagina nodosa

SCORE -2 or less-----Step No. 102

SCORE -1 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

POSITIVE

Atriplex littoralis
 Glaux maritima
 Plantago maritima
 Senecio jacobaea
 Spergularia marina

SCORE -2 or less-----Step No. 103

SCORE -1 or more-----Veg. Type S1

INDICATORS:-

NEGATIVE

POSITIVE

Carex flacca
 Sagina nodosa

Cochlearia danica
 Lotus corniculatus
 Taraxacum spp.

SCORE 1 or less-----Veg. Type S4

SCORE 2 or more-----Veg. Type S5

INDICATORS:-

NEGATIVE

Armeria maritima
Carex flacca
Triglochin palustris

POSITIVE

Carex nigra
Sieglingia decumbens

SCORE -1 or less-----Step No. 104
 SCORE 0 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Aster tripolium
Carex extensa
Salicornia spp.
Spergularia marina
Triglochin maritima

POSITIVE

SCORE 2 or less-----Step No. 105
 SCORE 3 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

Juncus gerardii

POSITIVE

Agropyron junceiforme
Elymus arenarius
Linum catharticum
Spergularia media

SCORE 0 or less-----Veg. Type S4
 SCORE 1 or more-----Veg. Type S2

INDICATORS:-

NEGATIVE

Aster tripolium

POSITIVE

Artemisia maritima
 Atriplex littoralis
 Plantago maritima
 Senecio jacobaea

SCORE 2 or less-----Veg. Type S1

SCORE 3 or more-----Veg. Type S3

INDICATORS:-

NEGATIVE

POSITIVE

Apium nodiflorum
 Carex demissa
 Eleocharis uniglumis
 Juncus bufonius
 Ranunculus flammula

SCORE 2 or less-----Veg. Type S5

SCORE 3 or more-----Veg. Type S4

INDICATORS:-

NEGATIVE

POSITIVE

Agrostis tenuis
 Aster tripolium
 Juncus gerardii
 Leontodon autumnalis

Agrostis stolonifera

SCORE -1 or less-----Veg. Type S4

SCORE 0 or more-----Veg. Type S2

Figure 6

Vegetation Classification - Higher Levels of Division

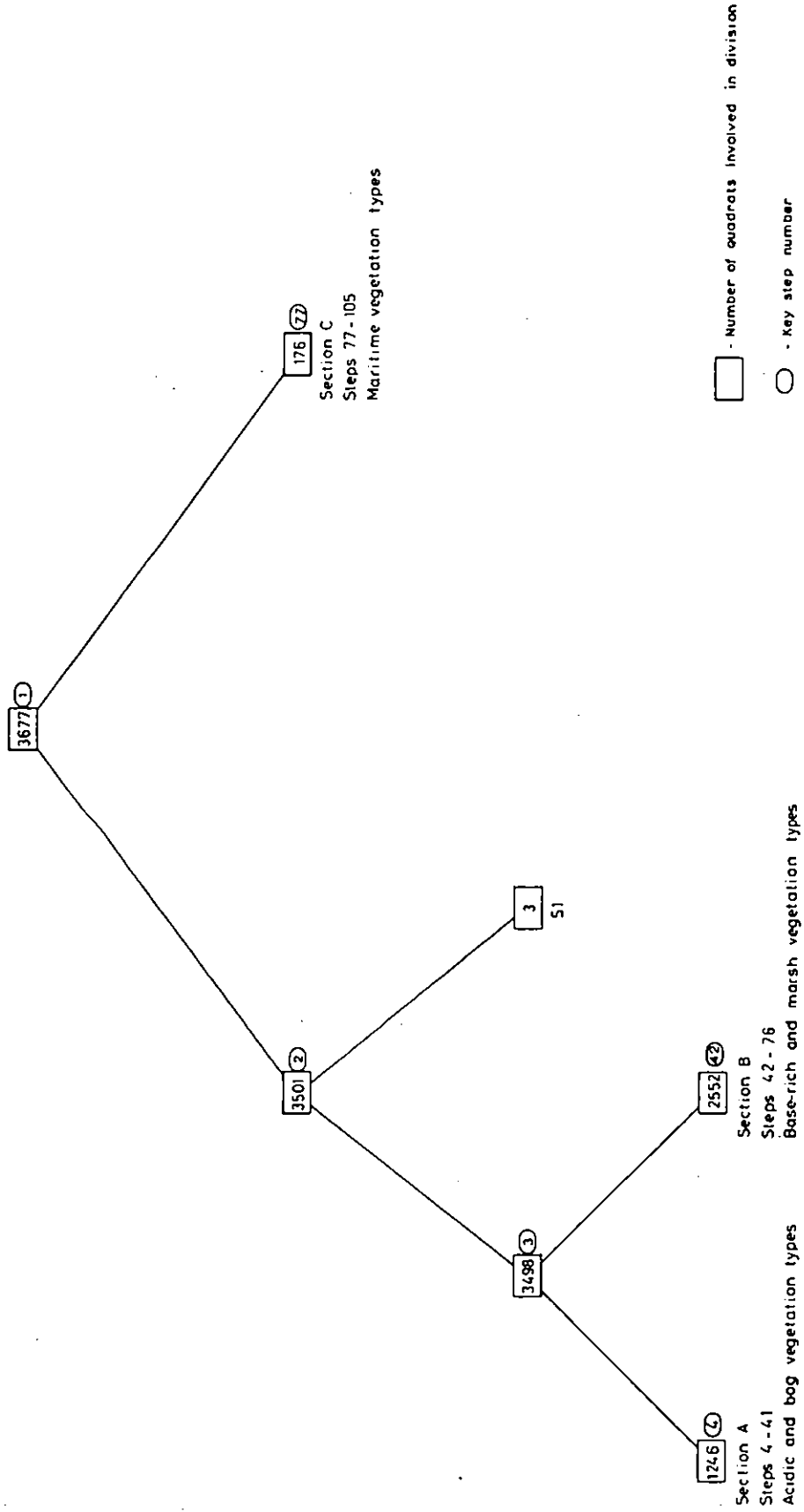


Figure 6A
 Steps 4-41 Acidic and Bog Vegetation Types

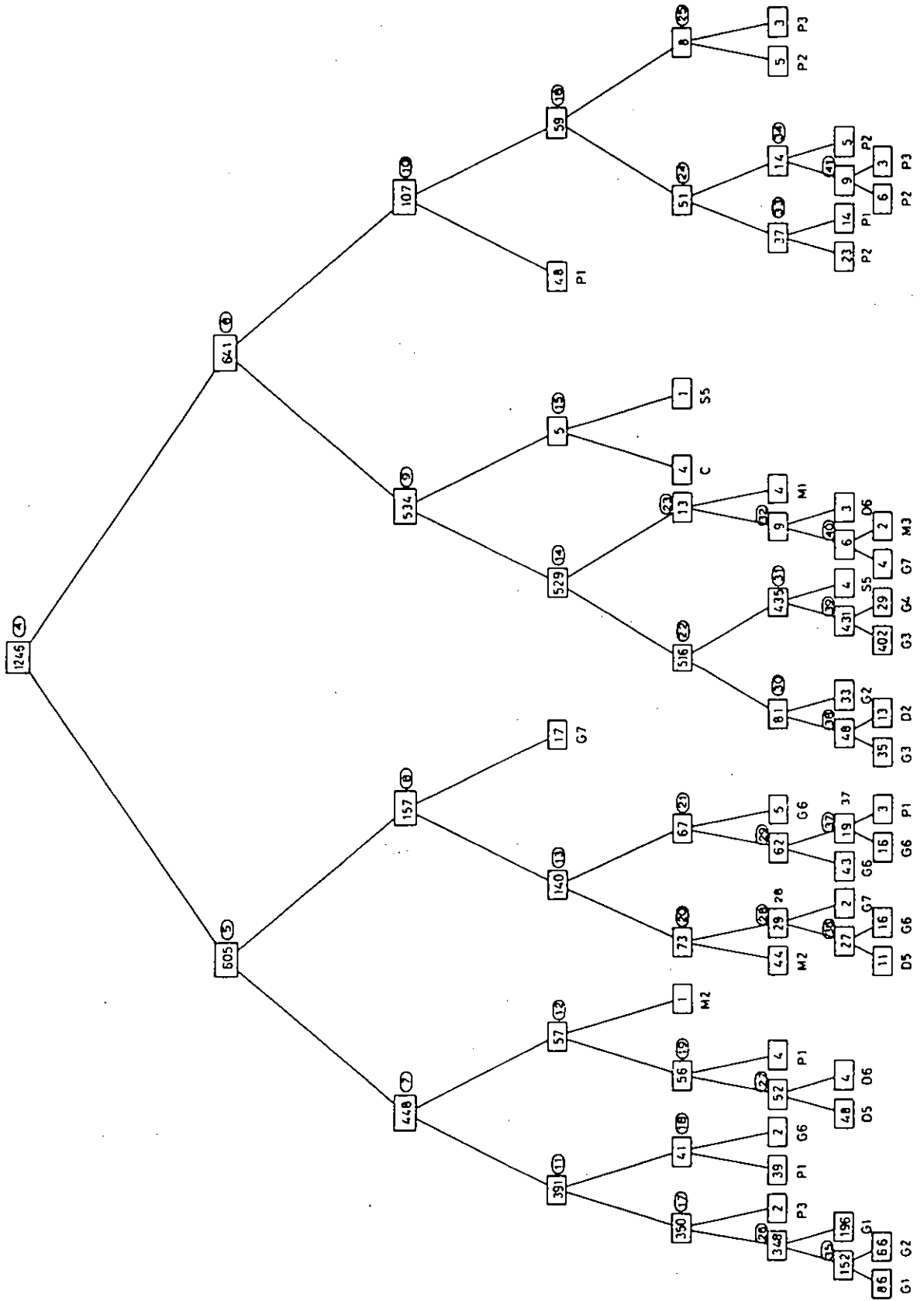


Figure 6B

Steps 42-76 Base-rich and Marsh Vegetation Types

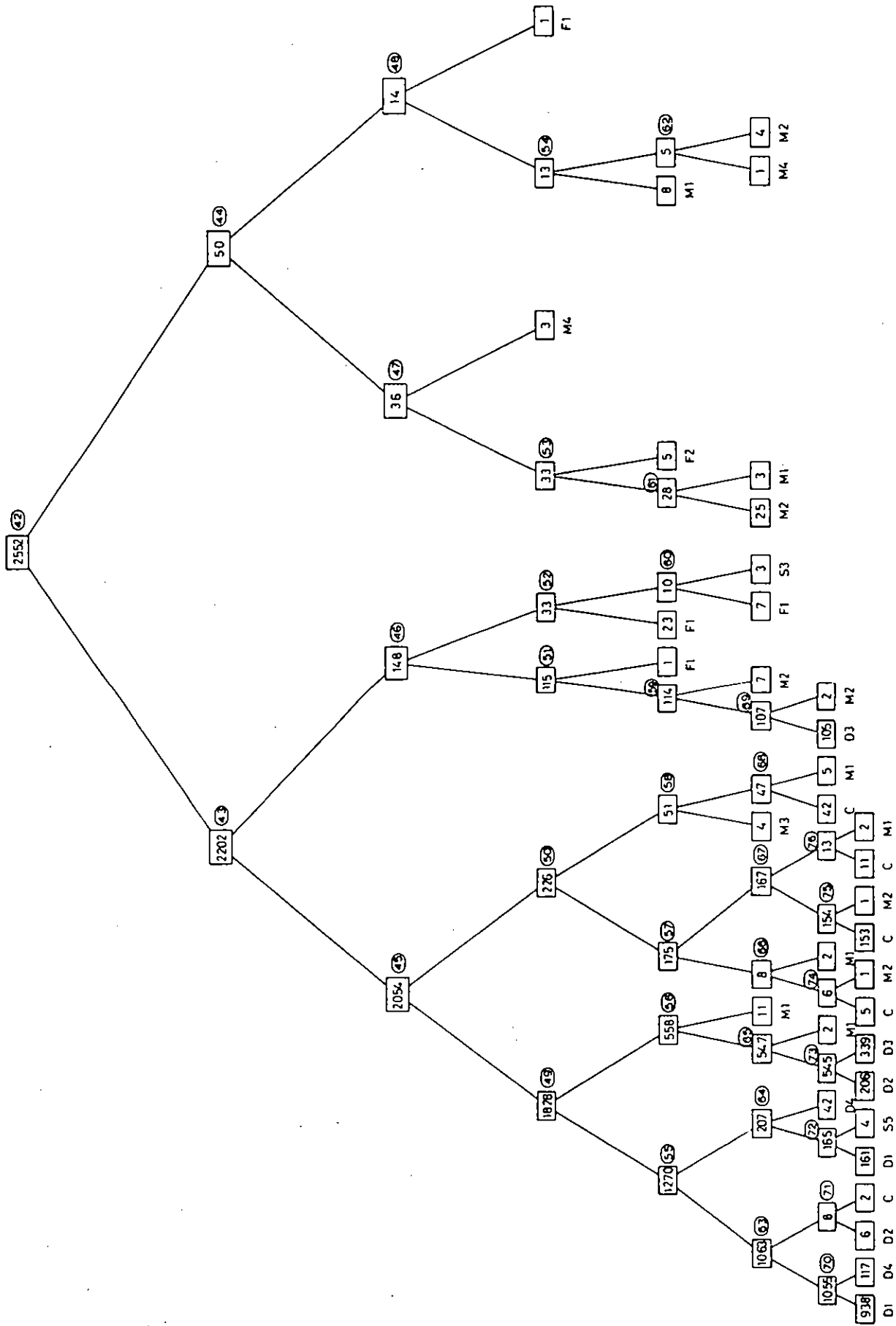


Figure 6C
Steps 77-105 Maritime Vegetation Types

