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A STUDY OF THE TUSKET ISLANDS*

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ABSTRACT

A study of the flora of the Tusket Islands, Yarmouth County, Nova Scotia seems to show that the islands were colonized by plants entirely of the coastal flora, under conditions similar to those now existing, and not consonant with any considerable change in the relationships of land and sea during the period.

The Tuskets are an ill-defined archipelago extending roughly southward from the shores of Yarmouth County at the southwestern corner of Nova Scotia. It is said of this group, as of many others, that there is an island for every day of the year, which may be true if one counts rocks and reefs. Geologically the islands are drumlins, oval hills of glacial drift solidified by clay ground from local slates or schists. Many islands have rocky cores or outcrops of granite which may have caused the formation of drumlins at these points or may simply have preserved them from attrition by the waves. Throughout the area oval shallows of boulders mark the sites of former drumlins now overrun by the sea; the number of these at less than five fathoms far surpasses that of the surviving islands. The inner islands, out as far as the Bald Tuskets, all lie within the ten-fathom line, while the twenty-five-fathom line includes the outermost of the group, Seal Island and its surrounding reefs, nearly twenty miles from shore.

The Tuskets lie at the eastern lip of the mouth of the Bay of Fundy and are under the influence of its remarkable tides,

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although among the islands these do not normally exceed twelve feet. These tides have a moderating effect upon the temperatures of the districts within their range, and especially upon the islands. The resulting ebb-tides, warmer than the open sea in summer, colder in winter, cause heavy fogs. These fogs have a depressing influence upon the vegetation, for they reduce the amount of sunlight during a very short summer, while the winter temperatures, although milder than on land, are still below that minimum necessary for plant growth. As a result the South Shore of Nova Scotia has had wider stretches of coniferous forest as a climax than has any other lowland part of the province, though in part this may have been helped by the poverty of the soil—till, overlying granite, quartzite and schist. However, the influence of the fog-belt extends only a few miles inland.

A small amount of phytohistorical work is being done to determine the pre-Columbian floras of the different area of Nova Scotia, but none of this has touched the Yarmouth district. Because of the richness of the sea and the poverty of the land, the coastal district is primarily the home of fishermen. Every fisherman is of necessity a part-time farmer, undercapitalized and ill-informed, using traditional pioneering techniques, burning enthusiastically, clean-cutting woodland and overgrazing the poor lands without making any provision for replacing the fertility consumed. Whole townships have been reduced to alder-scrub and barren, and the woods are largely poor second-growth. However, a few rocky points, too rough to pasture and too isolated to lumber, give indications of a former coniferous forest along the shore, holding its own with difficulty against the more aggressive hardwood flora from inland.

It seems probable, though not yet certain, that the coniferous flora, which is more boreal in character, antedates the Appalachian hardwoods which form the standard climax flora of most of Nova Scotia. There are also a number of so-called "coastal-plain species" of plants which show a discontinuous distribution from Chesapeake Bay to Newfoundland and are reasonably supposed to have migrated along a low plain or a series of offshore islands at some uncertain date. Yarmouth County is particularly rich in these species, chiefly in bogs, beside rivers and on the beaches of lakes.

Our geological picture of Nova Scotia during the pleistocene still leaves much to be desired. At some period all Nova Scotia was covered by an ice-sheet. Deposits of till in Cumberland County suggest two separate glaciations of that isthmus, while other areas show striae and deposits which indicate ice-movements in two different directions. It seems probable that we are dealing with one great glaciation and subsequent local recrudescence of glaciers of uncertain date. Isostatic movements and changes of sea-level are equally ill-defined. There is an ancient shore-line at an elevation of about eighty feet around northern Cape Breton, but the only old beach visible in Yarmouth County is about ten feet above the present high-tide level. This suggests a post-glacial isostatic movement which may have been complicated by some change in the depth of the sea.

The drumlins of the Tusquets should be considered in this connection. A drumlin is a highly compressed mass of clay, rock-flour and cracked rocks of all sizes. Such islands develop concave bluffs with a glacis of boulders that breaks the force of the waves. Even so, Seal Island, the outermost of the Tusquets, is being eaten away on its exposed west side at a rate of between one and two feet a year. If conditions were similar in the past, we cannot attribute a life of many millennia to these islands.

It is not unusual to find drumlin-islands that have been entirely overrun by the sea. In a very short time they have been reduced to heaps of boulders lying on beds of sand. A reduction of sea-level, lifting these again above the water, would not reinstate them as drumlins, for the clay and rock-flour would have been washed away forever. Yet the lowest of the surviving islands shows no sign of having been submerged. On Seal Island some granite outcrops by the central pond, perhaps fifteen feet above sea-level, are rounded as though by water, and Mrs. Hamilton, the owner, informs me that some recent well-diggers, and her father many years ago, found beach-pebbles at a depth which would approximate to that same fifteen feet above the sea. However, this underlies the drumlin material.

One problem of this floristic study, then, was to determine whether, when these drumlins were first freed from the ice, they were part of the mainland. If so, the floras of them all

should be similar, within the limitations of the habitats available. If the drumlins had been islands from the beginning, the accidents of seed-dispersal would have resulted in floras differing in detail, particularly with respect to the less common species. The survival of elements not now to be found on the mainland would suggest that a change of climate had occurred on the mainland since the colonization of the islands began, and this might be made demonstrable if distributions showed any zoning.

The investigation procedure adopted was the simple one of visiting as many islands as practicable along a line southward from Little River to Seal Island more than twenty miles away. Each island was to be examined and all plants, except algae and fungi, collected or listed, and vertebrate species were to be noted. In all, sixteen islands were examined, a fair sampling. The picture, however, was complicated by the weeds introduced, the native species exterminated and the environments altered by man and his animals.

The islands studied deserve a little general description:

Big Tusket Island. Although Big Tusket is not the northernmost island examined, it deserves first consideration. It is roughly a rectangle, two miles long by one and one-half miles wide and is cut almost across by two north-south bogs. To the north it is separated from the point of Comeau Hill peninsula by tidal mud-flats, so that at low tide only a narrow channel divides it from the mainland. The rocky wooded ridges are largely unspoiled. Perhaps because of its landward connection and its wildcats, it has not been used for sheep for many years, though a few cattle graze the edge of its salt-marshes. There are groups of shanties of overwintering lobster-fishermen, the largest village being at the Tittle opposite Harris Island (Haymarket on the ordnance map.) These people may have reduced the scanty amount of hardwood in the neighbourhood, but the conifers, being of little value for fire-wood or boards or pulp, have not been seriously attacked. As I was camped on Big Tusket, I devoted only odd hours of fog and bad weather to listing its flora, perhaps two days in all, so that my lists may well be less complete than for the other islands. The habitats were: ridges of tumbled stone and till covered with conifers and a sprinkling of hardwoods; wet sphagnum bogs; one wide salt-marsh; and stretches of pebble

beaches and rocky coast. There were no sand-flats or fresh-water ponds. Introduced weeds were almost confined to the area of the shanties. In spite of its limited environments, Big Tusket may be considered to be a fair sample of the coastal flora which was formerly available for the colonization of the other islands.

The Inner Islands.

Formerly these islands were all wooded to the shores, but burning, the cutting of firewood and the nibbling of sheep have now cleared the trees from many of them. These islands are scattered over an area about three miles long by one and one-quarter miles wide.

Deep Cove Island was the northernmost one examined. Geologically it is a double drumlin linked by pebble beaches and with a wet sphagnous bog in the middle. There are permanent houses and shanties there, and the inhabitants and the sheep have reduced the woodland to a few shrubby conifers, although traces of forest ground-cover remain among the rocks.

Eagle Island is steep and compact and wholly covered in fir forest. One small house, not yet complete, and a fisherman's camp are the only buildings and have hardly made a break in the woodland. No domestic animals or birds have ever been here, so that the number of weeds is very small.

Turpentine Island, continuing the same series of drumlins to the south-southeast, is larger than Eagle and much more varied and exploited. Here little woodland remains that does not look like second-growth. Many open slopes have been cropped to barrenness by sheep, and there is a small bog along the crown of the island.

Candlebox Island to the west of Eagle has an area of perhaps two acres with a lighthouse, a barn and a wharf. There are now no traces of trees, and the weeds outnumber the native plants.

Owlshead Island south of Candlebox is now the private property of a fishing club and is growing up again to woodland. Old wells suggest frequent, if not permanent, habitation in the past. The only habitats are rather scrubby woodland, bluffs and pebble-beaches.

Pease's Island, a mile southwest of Big Tusket is a doublet linked by beaches, a small salt-marsh and a salt pond. A few stumps show that the island was formerly wooded, but now it has been cropped clean by sheep. A lighthouse keeps permanent inhabitants there. Rats are frequent on this island.

Marks Island to the west of Pease had been wooded until recently when it was burned to make room for sheep. Remnants of the wood exist along the shoreline, but the rest of the island is covered with scrub and shoots from shrub-roots. The brown colour-phase of the garter-snake was seen here.

Outer Spectacle Island, again to the west, is a low crescentic ridge, its convex side to the open bay. Its former woodland is reduced to a few shrubby conifers. Its houses seem to be inhabited for much of the year, and the variety of weeds is high.

The Bald Tuskets.

These are five small islands extending southward from Pease's Island. No land in any direction except north is near enough to break the force of the winds and waves.

Half Bald, as its name seems to imply, may have been partly wooded, but now there is no trace of trees, and the abundant sheep on the island will see to it that none appear. Like most islands of this group, this one has at the southeast a pair of beaches, forming a V, which pen against the shore a small pond of fresh water which supplies the needs of the sheep. Sheep-distributed weeds are common, and great stretches of raspberries cover the eastern slope.

Mossy Bald is a tiny island, the innermost of the Balds. It has never had woods, has no fresh water and has never suffered from sheep. The smooth table of the top, rising slightly towards the south as in all this group, shows the usual conical holes, wells dug by overwintering fishermen. *Rubus idaeus* and *Solidago rugosa* form solid beds thigh-deep.

Inner Bald, next in line, has also been free from sheep and not from fishermen. Its dominant plant is *Ligusticum scoticum*, and its only thistle is the native *Cirsium muticum*, neither of which species was found elsewhere in the group. Leach's petrels and meadow-mice were observed here. A few small

tattered shrubs of *Myrica pensylvanica* seem to be the farthest spread woody plants of the Bald Tusketts.

Middle Bald has no fresh water and no sheep. Meadow-mice had abundant runs through the vegetation which was premoninantly *Solidago rugosa*.

Outer Bald must have had fresh water in the V of beaches at its southeast corner, but now the pond is filled with pebbles and completely dried out. Old pens and abundant weeds remain to show that once it carried sheep. The dominant herbs of the sheepless islands have been replaced here by grasses and abundant *Scutellaria epilobiifolia*.

The Mud Islands.

About six miles south of Outer Bald there lies a small cluster of islands, of which three, Flat, Round and Noddy, are small and treeless. The fourth, Big Mud Island, was the only one of the group examined.

Big Mud Island is a doublet, anchored by reefs of granite, and has only a thin capping of till, perhaps ten feet deep at the deepest. The northern and smaller section was entirely cleared of trees long ago when the island had a cannery and some permanent inhabitants. In the centre is a brackish pond with a high pebble beach to the west and a sand beach to the east. The pond is edged and partly filled with banks of *Scirpus paludosus atlanticus* four feet in height. South of this are several acres of hummocky marsh cleared of trees, and the southernmost half of the island is covered with a low forest of *Picea glauca*, *Picea mariana* and *Abies balsamea*. Except in the tangled centre of this wood, the sheep had undergrazed the trees to the point where no reproduction whatever was observable. In the centre the conifers were varied by small *Pyrus americana* and spindly *Pyrus floribunda* and various shrubby *Amelanchier* species, none of which were fruiting. No mammals or amphibians were observed on the island, but there were brown garter-snakes.

Seal Island.

Seal Island, another eight miles to the south, is the outermost of the series, except for a few granite reefs exposed at low tide. The island consists of a pair of drumlins up to fifty feet high, which are connected by a pebble beach on the west and a

sand beach on the east. Between the beaches there is a fairly large sandy flat and a large brackish pond. Except where cleared by man, the rest of the island is covered with low forest, chiefly of *Picea glauca*. It is said that there were hardwoods a century ago, and one fisherman said that he had seen "some sort of birch," but today only some quite large trees of *Pyrus americana* vary the coniferous cover. *Picea mariana* is frequent, while *Abies balsamea* is occasional at the southern end. There is another brackish pond at the southwest, and there is a series of freshwater ponds along the eastern side, each of which ponds has one or more species not found in the others. Near the southern lighthouse a garden and a fenced hayfield harbour some introduced weeds and a few native wood-edge species not found elsewhere. There are boggy patches in the woods, and a larger bog at the southwest seems from its stumps to have formerly been shaded. The island is roughly two miles long by three-quarters of a mile wide. There are no native terrestrial vertebrates.

Method.

The approach to the problem of distribution has been that of simple listing of the occurrence of species, with the addition of a subjective estimate of comparative abundance. The grouping of the islands in the tables is the result of experience. The first intention was to use "distance from mainland" as the criterion, but examination of the results showed this to be of trivial importance with regard to plants although significant in the distribution of animals. As woodland and sheep seem to be major factors limiting the variety of species, the islands have been grouped on that basis, although this departs entirely from the first purpose of the survey. Cultivation has been disregarded, for there has been none of areas larger than a tablecloth, except on Seal Island, and little more there. Although it was sometimes necessary to name species from rather fragmentary specimens, the proportion of mistakes is probably low. Vascular plants were checked by D. S. Erskine and the more dubious mosses and hepatics by Dr. A. L. Andrews, and my thanks are due to them. To save space species-references have been omitted, but, as the names used are consistently those of *Gray's Manual of Botany, 8th Edition*, for the vascular plants and of *Grout's Moss Flora of North America*, the authorities can easily be supplied. The lichen-names are taken from *Nearing's The Lichen Book* and, as the present author is quite

incompetent in this field, that list should be regarded as descriptive rather than authoritative. The division of vascular plants into "native" and "introduced" is, I think, justified since it invites comparison of the species spread prehistorically by natural means with those introduced accidentally by man, his animals and the accidents of nature during the last three centuries.

Summary of Plant Distributions

	Native		Mosses		Hepatics	
	Vascular	Introduced	Sphagna	Vascular	Lichens	
Middle Bald	12	6	—	—	—	1
Inner Bald	14	4	—	—	—	—
Mossy Bald	15	2	2	—	—	1
Outer Bald	17	17	—	—	—	1
Half Bald	16	10	3	—	—	1
Pease	42	25	3	—	—	3
Candlebox	23	25	—	—	—	—
Outer Spees	54	28	2	2	—	2
Deep Cove	61	22	8	3	1	10
Marks	41	8	7	1	—	3
Owlshead	49	19	1	—	—	—
Turpentine	44	15	11	4	—	4
Eagle	40	6	6	1	—	—
Big Tusket	115	37	15	6	3	14
Mud	108	37	20	8	3	10
Seal	134	51	23	6	2	8
TOTAL	227	71	33	13	6	23

Breaking down the figures of incidence for the native vascular plants (the cryptogams are probably less completely collected), we find that the following islands had plants not found on any other island:

Big Tusket.....	30
Seal.....	18
Mud.....	7
Deep Cove.....	3
Outer Spectacle...	3
Eagle.....	3
Candlebox.....	1
Owlshhead.....	1
Inner Bald.....	1
TOTAL.....	67 out of 227 species.

The innermost and largest has the most, as one would expect, and 18 of these are bog or marsh plants in conformity with the fact that Big Tusket has more marsh and bog than all the other islands together. The next highest number is from Seal Island, the next largest and the farthest out, and 7 of these are from freshwater habitats which hardly exist on the other islands. Another 47 species occurred on only two islands, 14 pairs being shared by Seal and Big Tusket, 7 pairs by Seal and Mud, and 4 by Mud and Big Tusket. These are the three large islands and the farthest apart. There is especial interest in certain rarish plants of the same habitats. The common ground-cover orchids in woods are: on Big Tusket, *Goodyera tessellata* and *Habenaria obtusata*; on Mud Island, *Goodyera tessellata* and *Listera cordata*; on Seal Island, *Listera cordata* and *Habenaria obtusata*. All of these are much more abundant on the islands than anywhere on the mainland. In short, everything seems to point to colonization by accident rather than across continuous land.

The three Bald Islands which have never had sheep, Middle, Inner and Mossy, are impressive in the scantiness of their native vascular species, only 12, 14 and 15 having been collected on them. This decrease of numbers outward from land (while the size of the islands is in the reverse order) suggests a spread of seed outwards along the chain. However, this is contradicted by the fact that only five species are common to all three islands, while Inner and Mossy Bald boast three species each which were not found on the other two islands. The dominant floras of the islands were also conspicuously different, Middle Bald with its *Solidago rugosa*; Inner Bald with *Ligusticum scoticum*, Mossy Bald with *Rubus idaeus*. In fact, there was no zoning of flora that could not be

attributed better to climatic conditions and limitations of habitat than to any time-factor in colonization.

The distribution of terrestrial vertebrates, however, was definitely zoned. A dead meadow-mouse was found on Inner Bald and mouse-runs were observed on Middle Bald. The brown colour-phase of the garter-snake has travelled farther, for it was seen on Big Tusket, Marks and Mud Islands. Probably these have been able to travel on driftwood which moves swiftly on Fundy tides.

On Seal Island the same phenomenon was observed as on the Bald Tusket. The island has a line of very small fresh-water ponds to the east and large brackish ponds in the centre and southwest. Each of these ponds had some conspicuous species not found elsewhere on the island, and observant fishermen had noticed the appearance of such plants as *Ruppia maritima* and *Scirpus validus* within the past generation, just as *Calluna vulgaris* (probably not native) is said to have appeared spontaneously some fifteen years ago. In short, everything throughout the whole group of islands suggests that the bulk of the flora has reached its present positions piecemeal and in random fashion and therefore almost certainly at a time when these were already islands.

Our first hope had been to find here some rare relic-flora antedating the present species of the mainland. This was wholly disappointed. A number of mosses, such as *Calliergon stramineum*, *Hypnum callichroum* and *Sphagnum fimbriatum*, have rarely been found on the mainland, but this may be due to the small number of bryologists who have collected in Nova Scotia. The origin of the Tusket flora cannot be in doubt. It came from the neighbouring mainland, carried by wind or by birds. The species associated with the coniferous forest are scarcely more conspicuous than those associated with deciduous forest. Species associated with the southwest of Nova Scotia, such as *Symplocarpus* and *Vaccinium corymbosum*, were represented, but the true coastal-plain species were completely absent. Of course, the habitats suited to them are not common on the Tusket, but their absence at least suggests that they were not invading aggressively at the time when the islands were being colonized.

On Sable Island, the origin of which was almost certainly in some great glacial deposit of the same period which gave

birth to the Tusquets, St. John found several plant entities which he and Fernald named as forms or varieties. On St. Paul Island, which is infinitely older in structure if not in flora, there were a few variants apparent. Occasional local variants exist also on the Tusquets. On Deep Cove one clone of *Spiranthes lacera* was roughly double in all dimensions to the typical form which also existed there, and had a double row of flowers on its spike. Oddly enough the weedy *Cirsium vulgare* of the pebble-beach of Mud Island had trebled stems and trebled fanlike flowers. The gigantic *Scirpus paludosus atlanticus* of Mud Island may result from lack of competition or lack of enemies or may be a form segregated by inbreeding.

In the troublesome genus *Amelanchier* the general absence of fruits made it difficult to assign specimens with assurance to any species. This was also true of some grasses such as *Poa pratensis*. The treatment of *Rubus* in Gray's Manual leaves one without much assurance that every clone should not rank as a new species, but the names given are correct at least as to series. D. S. Erskine identified some of the *Euphrasia* from Seal Island as *E. rigidula*, the introduced species, but as the present author was not aware of this when listing, the name of *E. americana* has been left and may include this species.

Many vascular species are native and yet should rank as introduced weeds. *Juncus bufonius*, *Spergularia rubra* and *Bidens frondosa* were rarely found apart from houses. The abundance of the introduced *Urtica urens* was surprising, for it is generally rare in Nova Scotia. The crucifers were found chiefly where hens had been kept; vetch, plantains and thistles seemed to be associated closely with sheep. Other weeds, such as the genus *Senecio*, *Solanum nigrum* and *Urtica dioica*, have become beach-pioneers far beyond human settlement. It is perhaps worth noticing that the commonest of mainland mosses, *Ceratodon purpureus*, is here rare and weedy, and on Seal Island its place is almost entirely filled by *Didymodon recurvirostris*.

The most interesting introduced plant was *Aira praecox*, a grass not uncommon on Seal Island but otherwise not known in eastern North America within a thousand miles. The explanation of its presence is probably that its seeds came ashore in the sand-ballast of ships driven up on the beach.

This explanation would also be satisfactory for certain European rarities of Sable Island, such as *Centaureum* and *Centunculus*, both of which are sand-ballast plants. St. Paul Island, though it has had innumerable wrecks, has no such adventives, for its ring of cliffs would prevent any sand-ballast from reaching the shore.

Summary.

A series of sixteen of the Tusket Islands, from the largest to the smallest, from inshore to the outermost, had their plants listed and the abundance of each species estimated. The result was a total of 227 native vascular species, 71 introduced species, 33 mosses, 13 sphagna, 6 hepatics and 23 lichens. The distribution of species showed much evidence for accidental colonization after these drumlins had become islands. There was no evidence of any earlier flora. The survival of these drumlins makes it improbable that the sea has been more than two fathoms above its present level since the melting of the glaciers. All the evidence points to a comparatively recent date for the creation of these drumlins and to an even more recent one for their colonization by plants.

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>C. exilis</i>														l		
<i>C. atlantica</i>														u	u	
<i>C. scoparia</i>														f	a	u
<i>C. hormathodes</i>				f				u	f							
<i>C. silicea</i>														l		
<i>C. paleacea</i>								u						u	a	a
<i>C. nigra</i> (chiefly <i>strickiformis</i>).....														u	u	
<i>C. viridula</i>														l	u	
<i>C. paupercula</i>														u	u	
<i>C. pauciflora</i>														u	u	
<i>C. folliculata</i>														l	u	
<i>Symplocarpus foetidus</i>				u				l		u		f	u	f	u	
<i>Juncus bufonius</i>								u	f	l				l	l	
<i>J. Gerardi</i>														f	f	
<i>J. tenuis</i>														f	f	
<i>J. filiformis</i>														f	f	
<i>J. effusus</i>														f	f	
<i>J. balticus</i>														f	f	
<i>J. canadensis</i>														f	f	
<i>J. brevicaudatus</i>														f	f	
<i>J. articulatus</i>														f	f	
<i>J. pelocarpus</i>								u						l	u	
<i>Luzula multiflora</i>										u	u	u		u	u	
<i>Clintonia borealis</i>														f	u	
<i>Smitacina trifolia</i>														l	l	
<i>Matanthemum canadense</i>														f	f	
<i>Streptopus roseus</i>														f	f	
<i>Siegrinchium montanum</i>														u	u	
<i>S. atlanticum</i>														u	u	
<i>Iris versicolor</i> (also white on Seal).....														f	a	
<i>Habenaria clavellata</i>														l	u	
<i>H. obtusata</i>														a	u	
<i>H. blephariglotis</i>														l	u	
<i>H. lacera</i>														u	u	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>R. acris</i>				u			u							u	u	f
<i>Coronopus didymus</i>								l	l							
<i>Capsella Bursa-pastoris</i>						l	f	l	l					l	u	u
<i>Raphanus raphanistrum</i>						u		u								
<i>Brassica Kaber pinnatifida</i>																u
<i>B. juncea</i>																u
<i>Armoracia lappathifolia</i>																u
<i>Trifolium pratense</i>						u	u	f	f	f	u	f		u	f	u
<i>T. repens</i>							f	f								u
<i>T. dubium</i>																u
<i>Medicago lupulina</i>																u
<i>Vicia Cracca</i>																u
<i>Millegrana Radiola</i>														u	l	l
<i>Carum Carvi</i>																u
<i>Daucus Carota</i>								u								u
<i>Calluna vulgaris</i>								u								l
<i>Frunella vulgaris</i>																u
<i>Galeopsis Tetrabit</i>																u
<i>Solanum nigrum</i>						u	l	l	l			u		u	l	l
<i>S. tuberosum</i>																l
<i>Veronica arvensis</i>																f
<i>Plantago major</i>							f	l	u	l	u	f	u	f	l	f
<i>P. lanceolata</i>							u	u			u			l	u	f
<i>Gnaphalium uliginosum</i>																l
<i>Ambrosia artemisiifolia</i>																l
<i>Helianthus annuus</i>								u								l
<i>Matricaria maritima</i>							u		l					u	u	u
<i>M. matricarioides</i>							f	l						l	u	u
<i>Chrysanthemum leucanthemum pinnatif</i>							u							u	l	u
<i>Artemisia Stelleriana</i>																u
<i>Senecio vulgaris</i>																u
<i>S. sylvaticus</i>						u								l	u	u
<i>Arctium minus</i>								u						l	u	u
<i>Cirsium vulgare</i>							u	f	f	f	f	f		l	u	f

