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RESEARCH NOTES

Vascular plant species in planned mire conservation areas in southern and central Finland

Putkilokasvien esiintyminen soidensuojeluohjelmassa esitetyillä alueilla Etelä- ja Keski-Suomessa

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The occurrence of the threatened and endangered vascular mire plant species was inventoried in the mire conservation areas in Finland. The survey was based on 246 sample plots (0.5 km × 0.5 km) randomly chosen in the Finnish mire conservation areas planned in 1981 in southern and central Finland. In the inventory, 243 vascular plant species and 2 hybrids were found in bog mires and 249 species and 10 hybrids were found in the southern aapa mires. The majority of the found mire plant species commonly occur on mires in Finland. In this survey, out of 18 threatened primary mire vascular plant species occurring in Finland, only three species (*Carex heleonastes* L. f., *Dactylorhiza incarnata ssp. cruenta* (O. F. Mull.) P. D. Sell, *D. cruenta* (O. F. Mull.) Verm, *Orchis cruenta* (O. F. Mull.) and *Dactylorhiza traunsteineri*) (Saut. ex Rchb.) Soo´, *Orchis traunsteineri* Saut. ex Rchb., *Dactylorchis traunsteineri* (Saut. ex Rchb.) Verm.; incl. *Dactylorhiza curvifolia* (F. Nyl.) Czerep.; incl. *D russowii* (Klinge) Holub and only one so called secondary mire plant species (*Carex paniculata* L.) were found in the sample plots. The found species occurred only on six mire conservation areas. Compared to the size of the material, the percentage of findings of threatened vascular plant species was remarkably low. It can be concluded that the complementary programs of the mire conservation in Finland have been important to protect the threatened vascular mire plants.

Key words: aapa mire, bog mire, endangered species.

Introduction

In Finland the ecological and regional diversity of mires is greater than in any other region of equal size in the world (Aapala et al. 1996). The original biological mire area of Finland has been 10.4 million hectares; about one third of the total land surface of the country. Over half of the original peatland area has been drained for forestry. Other important mire users are agriculture and peat harvesting (Vasander ed. 1996). Less than half of the mires are in pristine stage (Lindholm & Heikkilä 2006) and 13% of the total peatland area are protected today (Kaakinen & Salminen 2006). Drainage was most intense in the 1960's. The basic plan for mire conservation in Finland

(The National Mire Protection Programme) was made in 1977–1981 (Haapanen et al. 1977, Haapanen et al. 1980 and Valtakunnallinen soidensuojelun perusohjelma 1981). The 1981 conservation plan includes c. 600 conservation areas (4900 km^2) of which 267 areas (700 km^2) are located in the bog zone and 201 conservation areas (1660 km^2) are located in the southern aapa mire zone (Fig. 1). The main criterion for selection was the representativeness of mire-complex types including the diversity of hydrology, morphology, mire types and birds. Furthermore, the occurrence of endangered animal and plant species, research use as well as educational and landscape values were noted. The main objective was to protect typical and large, internationally and nationally important examples of mire-complex types (Aapala et al. 1996). The conservation plan was later completed and nowadays it consists of 523 mires, especially small-scale areas, which altogether add up to 1200 km^2 in the whole country (Heikkilä 1994).

Approximately 15% of Finland's original flora is made up of mire plants and about 5% of all endangered species in the country are mire species (Vasander 1996). According to Aapala (2001), of all the endangered species in Finland, 4.7% are primary and 3.2% secondary mire species. Out of the total 67 primary species and 48 secondary species, 18 (27%) and 17 (35%) are vascular plants, respectively. Out of the threatened species in Finland, 4.9% (52 species) are primary and 4.0% (42) are secondary mire species. In both groups, 14% (7 and 6) are vascular plants (Aapala 2001). Primary mire plants are species, which grow on mires or peatlands only. Secondary mire plants also grow in forests or other habitats on mineral soil sites or water courses.

About half (46%) of all endangered mire species grow on nutrient rich eutrophic mires, 20% mainly occur in minerotrophic forested spruce mires, 18% in ombrotrophic pine bogs, and 10% in treeless oligo-mesotrophic fens (Vasander 1996).

The aim of this survey is to inventory the occurrence of vascular mire plant species in the conservation areas in Finland, and to evaluate the representativeness of the basic mire conservation plan (Valtakunnallinen soidensuojelun perusohjelma 1981) for the mire flora in southern and central Finland.

Plant inventory methods

The mire vegetation was inventoried on 246 randomly chosen sample plots (0.5 × 0.5 km). Out of the sample plots, 94 are located on bog zone and 148 in southern aapa mire zone in Finland (Fig. 1). The northernmost part of Finland (Lapland and Kuusamo municipality) is excluded from this inventory, because most of the mires are in pristine state and intensive mire conservation measures are so far not needed in the north. The material was collected during 1989–1992, but has not been published earlier. Four of the 250 original plots were rejected, because they were not in pristine stage or they were too far to reach. In the inventory of the plots, the line transect method was used. The distance between the lines was 50 m. The used method was basically the same as presented by Eurola et al. 1991, but in this study all vascular plant species found in the plots are listed. Only the occurrence of the plant species was recorded. The total length of the walked lines was 619 km (238 km + 381 km). At the same time the mire vegetation was classified into to 56 mire site types (Eurola & Kaakinen 1978) in the bog area (Suikki 1992, Suikki & Hanhela 1993, 1994) and to 66 mire site types in the aapa mire area (Eurola & Hanhela 1995). The frequency results are compared to the statistics of the threatened species in Finland (Taxonthreath. 2004). The nomenclature of plant species is based on Hämet-Ahti et al. (1998).

Results

Altogether 243 vascular plant species and two hybrids were found in the studied plots on the mires in the bog mire zone and 249 species and 10 hybrids were found on the mires in the southern aapa mire zone.

The most common species (constancy percentage > 75) in the bog area (Appendix 1.) were *Andromeda polifolia, Betula nana, Betula pubescens, Calluna vulgaris, Carex rostrata,*

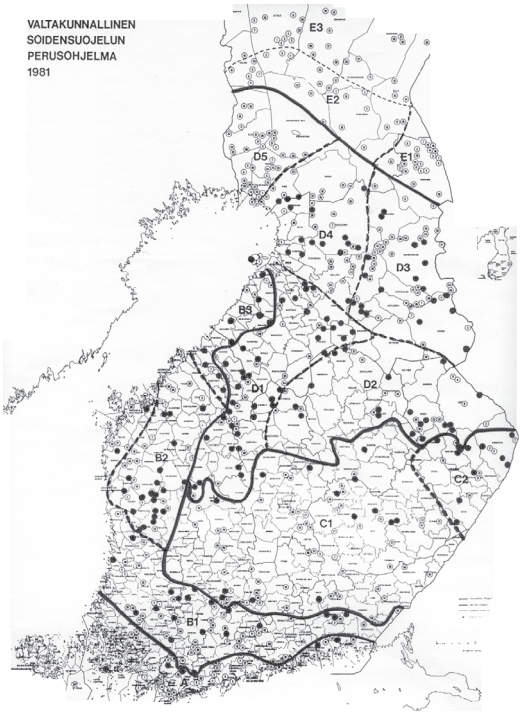

Fig. 1. The studied plots and mire vegetation zones of Finland (Valtakunnallinen soidensuojelun perusohjelma 1981). A Plateau bogs, B1 Concentric bogs in southern Finland, B2 Concentric bogs in western Finland, B3 Eccentric bogs and *Sphagnum fuscum* bogs in Central Ostrobothnia, C1 Eccentric bogs and *Sphagnum fuscum* bogs in the Finnish lake plateau, C2 Eccentric bogs and *Sphagnum fuscum* bogs in northern Carelia, D1 Sedge aapa mires in Suomenselkä, D2 Sedge aapa mirea in the northern part of Finnish lake plateau, D3 Sedge aapa mires in the northernmost part of northern Ostrobothnia, D4 Sedge aapa mires in the southern part of northern Ostrobothnia

Kuva 1. Tutkitut koealat ja Suomen suokasvillisuusalueet (Valtakunnallinen soidensuojelun perusohjelma 1981). A Laakiokeitaan, B1 Etelä-Suomen kilpikeitaat, B2 Länsi-Suomen kilpikeitaat, B3 Keski-Pohjanmaan viettokeitaat, C1 Järvi-Suomen viettokeitaat, C2 Pohjois-Karjalan viettokeitaat, D1 Suomenselän aapasuot, D2 Järvi-Suomen aapasuot, D3 Pohjois-Pohjanmaan aapasuot (pohjoiset), D4 Pohjois-Pohjanmaan aapasuot (eteläiset).

Drosera rotundifolia, Empetrum nigrum s.lat., Eriophorum vaginatum, Ledum palustre, Pinus sylvestris, Rubus chamaemorus, Vaccinium oxycoccos, Vaccinium uliginosum and *Vaccinium vitis-idaea*. These species were found on over 75% of the plots. More than half of the plots also had *Carex limosa, Carex pauciflora, Eriophorum angustifolium, Menyanthes trifoliata, Picea abies, Scheuchzeria palustris* and *Vaccinium myrtillus*.

In the aapa mire area the most common species (over 75% of the plots) were *Andromeda polifolia, Betula nana, Betula pubescens, Carex lasiocarpa, Carex pauciflora, Drosera rotundifolia, Empetrum nigrum s.lat., Eriophorum vaginatum, Ledum palustre, Pinus sylvestris, Rubus chamaemorus, Vaccinium oxycoccos* and *Vaccinium uliginosum*. On over half of the aapa mire plots were also found: *Calluna vulgaris, Carex chordorrhiza, Carex globularis, Carex limosa, Carex magellanica, Chamaedaphne calycylata, Equisetum fluviatile, Equisetum sylvaticum, Juniperus communis, Menyanthes trifoliata, Picea abies, Salix aurita, Scheuchzeria palustris, Trichophorum cespitosum, Trientalis europaea, Vaccinium microcarpum, Vaccinium myrtillus* and *Vaccinium vitis-idaea*.

In the bog area *Carex paniculata* (vulnerable, VU) on two plots (frequency 2.1%, Appendix 1.), *Dactylorhiza traunsteineri* (VU) on one plot (1.1%) and *Dactylorhihiza incarnata ssp. incarnata* (near threatened, NT) on seven plots (6.4%) belong to the endangered species (IUCN 1994, IUCN 2001) of Finland (Rassi et al. 2001). In the aapa mire area, *Carex heleonastes* (VU) occurred on two plots (1.4%.), *Carex laxa* (NT) occurred on one plot (0.7%) and *Dactylorhiza incarnata ssp. cruenta* (VU) occurred on one plot (0.7%). They belong to the primary mire plant species except *Carex paniculata* (Rassi et al. 2001).

The mire plant species for which Finland has international responsibility (Aapala ed. 2001) included *Carex heleonastes, Carex laxa, Carex livida* occurring on one bog mire plot and on eleven aapa mire plots, *Carex tenuiflora,* occurring on one aapa mire plot, and *Diplazium sibiricum* occurring on one aapa mire plot. Only three threatened mire plant species i.e. *Carex heleonastes, Dactylorhiza incarnata ssp. cruenta* and *Dactylorhiza traunsteineri* and one secondary plant species *Carex paniculata* were found in the sample plots.

Discussion

The most common species in the inventoried areas were ecologically oligotrophic or oligo-mesotrophic. Only meso-eutrophic *Juniperus communis* and mesotrophic *Trientalis europaea* belong to the most common vascular plants in this study. Generally, the status and future of the oligo-mesotrophic mire vascular plant species is good in the conservation areas in Finland. They are also common in mires outside the protected areas (e.g. Kasviatlas 2006, Hämet-Ahti et al. 1998, Hulten & Fries 1986).

As expected, the southern mire species (e.g. *Calla palustris, Lysimachia vulgaris, Lythrum salicaria, Rhynchospora fusca, Typha latifolia*) are most common in mires in bog zone and the northern mire species (e.g. *Pedicularis sceptrum-carolinum, Salix lapponum, Selaginella selaginoides, Trichophorum alpinum, Trichophorum cespitosum*) occur most frequently on aapa mires. Mesotrophic and eutrophic species (e.g. *Carex dioica, Carex flava, Eriophorum latifolium, Dactylorhiza incarnata*) are more common in the north because majority of the rich fens in Finland are located there (Eurola & Hanhela 1994).

Compared to the results by Hotanen et al. (2000) the most frequently occurred plant species in this survey are the most typical Finnish forest and mire species, but there are some differences in the observed frequencies between this survey and previous studies, however. For example, the border between northern and southern Finland and the southern Finland presented by Hotanen et al. (2000) is not exactly the border of the aapa and bog zones. Hotanen et al. (2000) also included mosses and lichens on the species lists but not trees and bushes. In the aapa mire areas, 15–16 plant species of the most common 20 vascular plant species are the same as in their study, but only 11 species are the same in the bog areas overall. Also the rank of the occurrence of the species is different: the largest difference is among the spruce mire species in Southern Finland. *Equisetum sylvaticum* (order number in this survey: 30), *Trientalis europaea* (32), *Deschampsia flexuosa* (46), *Maianthemum bifolium* (47), *Orthilia secunda* (62) and *Dryopteris carthusiana* (36) are not among the 20 most common mire plant species of bog mire area in this survey.

In this survey, many fen species occurred more frequently compared to the results of Hotanen et al. (2000). These dissimilarities are mostly due to differences in inventory methods. Hotanen et al. have systematically inventoried all vegetation types, also mineral soil sites, from the research lines but this material has been almost entirely collected from peatlands. However, the mire margin areas having thin peat layer are underrepresented in this survey (also Aapala ed. 2001).

Among common species, the most tender fen species are *Andromeda polifolia, Vaccinium oxycoccos, Equisetum fluviatile, Carex limosa, Menyanthes trifoliata, Carex rostrata, Eriophorum angustifolium* and *Carex chordorrhiza*, which are common in both areas (Reinikainen 2001). *Rubus chamemorus, Eriophorum vaginatum, Carex pauciflora, Chamaedphne calyculata, Potentilla palustris, Carex nigra, Trichophorum cespitosum* and *Molinia caerulea* are examples of mire species, whose frequency has been decreased due to drainage (Reinikainen 2001).

Many of the rare plants (frequency < 5%) found in this survey are not typical mire plants. They can be included under human introduced or forest flora, often found in non-pristine mires.

Altogether, of the species found in this survey, very few species were either threatened or those for which Finland has international responsibility (Suomen ympäristökeskus 2007). Of the threatened plants in this study *Carex tenuiflora* is a mesotrophic species, *Carex heleonastes, Carex laxa, Carex livida, Dactylorhiza incarnata* and *Dactylorhiza traunsteineri* are at least meso-eutrophic and *Carex paniculata* and *Diplazium sibiricum* are eutrophic species in Finland (Eurola et al. 1994). These plants grow on meso- and eutrophic mires, which are rare especially in Southern Finland (Eurola & Hanhela 1994, Suikki & Hanhela 1993, 1994).

The endangered mire plant species are extremely rare, because they were not found on the randomly chosen sample plots. Surprisingly, almost all of the findings of these species were new,

only the *Carex paniculata* sites and one *Dactylorhiza incarnata ssp. cruenta* site were known earlier (Ryttäri & Kettunen 1997, Taxonthreath 2004). Perhaps this also shows that the botanical survey of Finnish peatlands has been insufficient. *Carex livida* plots have not been compared to previous findings, because it is not a threatened species in Finland and there is insufficient statistical data for comparisons. Over all, the status of the regionally threatened mire species was difficult to research, because they have been classified according to the forest vegetation zones of Finland (Rassi et al. 1991), and this survey is based on the mire vegetation zones.

Compared to the size of the material, the percentage of findings of threatened vascular plant species was remarkably low. Thus, the complementary programs of mire conservation in Finland have been very important. The material of this survey is not representative enough to propose any changes to the lists of threatened mire plant species in Finland.

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Tiivistelmä

Putkilokasvien esiintyminen soidensuojeluohjelmassa esitetyillä alueilla Etelä- ja Keski-Suomessa

Suomen suoluonnon monimuotoisuus on maailman monimuotoisimpia mutta myös uhatuimpia. Tätä tutkimusta varten tutkittiin vuoden 1981 soidensuojeluohjelman soilta 246 satunnaisesti valittua neljännesneliökilometrin ruutua linjoilta, joiden yhteispituus oli 619 km. Keidassuoalueilta löydettiin 245 ja aapasuoalueilta 259 putkilokasvilajia tai risteymää. Suurin osa löydetyistä lajeista oli tavallisia, ei uhanalaisia lajeja. Korpilajit ovat aliedustettuna vuoden 1981 soidensuojeluohjelman suoalueilla, kun tuloksia verrataan muihin tutkimuksiin. Suomen kahdeksastatoista uhanalaisista, ensisijaisesti suolajista (kasvavat vain soilla) löydettiin kolme: lettosara (*Carex heleonastes* L. f), verikämmekkä (*Dactylorhiza incarnata ssp. cruenta* (O. F. Mull.) P. D. Sell, *D. cruenta* (O. F. Mull.) Verm, *Orchis cruenta* (O. F. Mull.) ja kaitakämmekkä *(Dactylorchis traunsteineri* (Saut. ex Rchb.) Verm.; incl. *Dactylorhiza curvifolia* (F. Nyl.) Czerep.; incl. *D russowii* (Klinge) Holub) ja lähdesara (*Carex paniculata* L.) toissijaisista seitsemästätoista suolajista (kasvavat myös muilla habitaateilla). Yhteensä näillä oli ainoastaan kuusi esiintymää. Suuresta aineistosta huolimatta uhanalaisia kasveja löytyi vain vähän. Tulosten perusteella voidaan päätellä, että soidensuojeluohjelman täydennysohjelmat ovat olleet uhanalaisten suokasvilajien säilymisen kannalta tarpeellisia.

Appendix 1. The frequencies of mire plant species in bog and aapa mire areas in the studied sites in Finland. The number of plots was 94 in the bog zone and 148 in the southern aapa mire zone.

Liite 1 Lajien frekvenssiprosentit keidas- ja aapasuoalueilla tutkituilla koealoilla. Koealoja oli keidassuoalueella yhteensä 94 ja eteläisellä aapasuoalueella 148.

Species	Bogs	Aapa mires	Species	Bogs	Aapa mires
Aegopodium podagraria	2.1	5.4	Carex globularis	39.4	68.9
Agrostis canina	14.9	12.2	Carex heleonastes	0.0	1.4
Agrostis capillaris	2.1	9.5	Carex lasiocarpa	44.7	77.7
Agrostis gigantea	0.0	1.4	Carex laxa	0.0	0.7
Agrostis stolonifera	0.0	0.7	Carex limosa	56.4	73.0
Alchemilla	1.1	0.7	Carex livida	1.1	9.5
Alisma plantago-aquatica	2.1	0.0	Carex loliacea	1.1	2.7
Alnus glutinosa	25.5	2.0	Carex magellanica	44.7	67.6
Alnus incana	24.5	35.8	Carex muricata	0.0	0.7
Alopecurus aequalis	3.2	0.0	Carex nigra ssp. juncella	1.1	10.1
Andromeda polifolia	91.5	89.9	Carex nigra ssp. nigra	44.7	27.0
Anemone nemorosa	4.3	0.0	Carex ovalis	1.1	0.7
Angelica sylvestris	5.3	16.9	Carex pallescens	1.1	0.0
Antennaria dioica	0.0	0.7	Carex panicea	4.3	4.7
Anthriscus sylvestris	3.2	1.4	Carex paniculata	2.1	0.0
Arctostaphylos uva-ursi	5.3	0.0	Carex pauciflora	55.3	79.7
Athyrium filix-femina	10.6	4.7	Carex pseudocyperus	1.1	0.0
Barbarea stricta	3.2	0.7	Carex rhynchophysa	1.1	0.0
Betula nana	76.6	90.5	Carex rostrata	74.5	81.1
Betula nana x pubescens	0.0	1.4	Carex rotundata	0.0	1.4
Betula pendula	3.2	1.4	Carex tenuiflora	0.0	0.7
Betula pubescens	86.2	89.9	Carex vaginata	1.1	12.8
Bidens cernua	1.1	0.0	Carex vesicaria	5.3	14.2
Bistorta vivipara	1.1	3.4	Carex viridula s.lat.	1.1	0.0
Calamagrostis arundinacea	1.1	0.7	Cerastium fontanum	1.1	4.1
Calamagrostis canescens	9.6	22.3	Chamaedaphne calyculata	39.4	62.8
Calamagrostis epigejos	12.8	7.4	Chrysosplenium alternifolium	1.1	0.0
Calamagrostis lapponica	0.0	0.7	Cicuta virosa	2.1	5.4
Calamagrostis purpurea	25.5	39.9	Circaea alpina	1.1	0.0
Calamagrostis stricta	5.3	2.0	Cirsium helenioides	5.3	12.8
Calla palustris	17.0	4.7	Cirsium palustre	9.6	7.4
Callitriche	2.1	1.4	Convallaria majalis	2.1	6.1
Calluna vulgaris	80.9	70.3	Corallorhiza trifida	0.0	6.8
Caltha palustris	11.7	12.2	Cornus suecica	1.1	10.8
Cardamine amara	2.1	0.0	Crepis paludosa	5.3	12.2
Cardamine pratensis	2.1	0.0	Crepis tectorum	0.0	1.4
Carex acuta	1.1	6.1	Dactylorhiza incarnata	6.4	20.3
Carex aquatilis	6.4	3.4	Dactylorhiza i. ssp. cruenta	0.0	0.7
Carex buxbaumii	3.2	4.1	Dactylorhiza maculata	35.1	32.4
Carex canescens	48.9	46.6	Dactylorhiza traunsteineri	1.1	0.0
Carex capillaris	0.0	0.7	Daphne mezereum	1.1	0.7
Carex capitata	0.0	0.7	Deschampsia cespitosa	8.5	10.1
Carex cespitosa	2.1	11.5	Deschampsia flexuosa	18.1	20.3
Carex chordorrhiza	20.2	54.1	Diplazium sibiricum	0.0	0.7
Carex diandra	4.3	5.4	Drosera anglica	45.7	49.3
Carex dioica	5.3	25.0	Drosera intermedia	0.0	1.4
Carex disperma	2.1	3.4	Drosera rotundifolia	72.3	76.4
Carex echinata	20.2	18.2	Dryopteris carthusiana	22.3	16.9
Carex elongata	3.2	1.4	Dryopteris cristata	5.3	1.4
Carex flava	5.3	11.5	Dryopteris expansa	1.1	2.0
Carex flava x viridula	0.0	1.4	Eleocharis mamillata	1.1	0.7

Species	Bogs	Aapa mires
Eleocharis palustris	1.1	0.0
Elymus caninus	0.0	1.4
Empetrum nigrum s.lat.	81.6	84.5
Epilobium alsinifolium	0.0	1.4
Epilobium angustifolium	19.1	18.9
Epilobium hornemannii	0.0	1.4
Epilobium palustre	14.9	17.6
Epilobium p.x als./horn.	0.0	1.4
Equisetum arvense	11.7	9.5
Equisetum arvense x fluviatile	0.0	0.7
Equisetum fluviatile	34.0	62.8
Equisetum hyemale	2.1	0.0
Equisetum palustre	12.8	29.1
Equisetum pratense	0.0	0.7
Equisetum scirpoides	0.0	0.7
Equisetum sylvaticum	34.0	52.7
Eriophorum angustifolium	50.0	77.7
Eriophorum gracile	0.0	6.1
Eriophorum latifolium	4.3	12.2
Eriophorum scheuzerii	0.0	0.7
Eriophorum vaginatum	96.8	93.2
Festuca ovina	1.1	2.0
Festuca rubra	4.3	4.1
Filipendula ulmaria	11.7	20.3
Fragaria vesca	1.1	0.0
Galium boreale	4.3	2.0
Galium palustre	20.2	19.6
Galium trifidum	2.1	1.4
Galium uliginosum	3.2	9.5
Geranium sylvaticum	1.1	14.9
Geum rivale	5.3	8.8
Gymnadenia conopsea	0.0	0.7
Gymnocarpium dryopteris	14.9	20.9
Hammarbya paludosa	1.1	4.7
Hippuris vulgaris	2.1	1.4
Huperzia selago	2.1	1.4
Hydrocharis morsus-ranae	1.1	0.0
Hypochoeris maculata	1.1	0.0
Iris pseudacorus	2.1	0.0
Juncus alpinoarticulatus	1.1	1.4
Juncus effusus	2.1	0.0
Juncus bufonius	0.0	0.7
Juncus filiformis	25.5	10.1
Juncus stygius	1.1	6.8
Juniperus communis	21.3	50.0
Lathyrus pratensis	2.1	0.7
Ledum palustre	86.2	82.4
Lemna minor	1.1	1.4
Leontodon autumnalis	0.0	1.4
Linnaea borealis	4.3	11.5
Listera cordata	2.1	4.7
Listera ovata	1.1	2.7
Lonicera xylosteum	0.0	0.7
Luzula multiflora	2.1	0.7
Luzula pilosa	10.6	11.5
Luzula sudetica	0.0	2.0
Lychnis flos-cuculi	1.1	0.0
Lycopodiella inundata	0.0	1.4
Lycopodium annotinum	14.9	29.7
Lysimachia thyrsiflora	19.1	14.2
Lysimachia vulgaris	11.7	0.7
Lythrum salicaria	5.3	1.4
Maianthemum bifolium	18.1	21.6
Melampyrum pratense	33.0	43.2
Melampyrum sylvaticum	9.6	11.5
Melica nutans	4.3	8.1
Mentha arvensis	1.1	2.7
Menyanthes trifoliata	50.0	74.3
Milium effusum	3.2	1.4
Molinia caerulea	9.6	44.6
Moneses uniflora	2.1	5.4
Montia fontana	0.0	2.0
Myosotis laxa	0.0	0.7
Myosotis scorpioides	3.2	0.0
Myrica gale	5.3	0.0
Nardus stricta	1.1	0.0
Nuphar lutea	3.2	4.1
Nymphaea alba ssp. candida	1.1	5.4
Orthilia secunda	11.7	14.9
Oxalis acetosella	6.4	6.1
Paris quadrifolia	4.3	6.1
Parnassia palustris	1.1	11.5
Pedicularis palustris	8.5	22.3
Pedicularis sceptrum-carolinum	3.2	8.1
Peucedanum palustre	21.3	20.3
Phalaris arundinacea	2.1	2.7
Phegopteris connectilis	5.3	7.4
Phleum pratense	0.0	0.7
Phragmites australis	25.5	23.0
Picea abies	56.4	68.2
Pinguicula vulgaris	0.0	2.0
Pinus sylvestris	92.6	90.5
Platanthera bifolia	1.1	0.0
Poa alpigena	1.1	2.7
Poa annua	0.0	0.7
Poa nemoralis	0.0	1.4
Poa palustris	0.0	0.7
Poa pratensis	2.1	4.1
Poa trivialis	0.0	1.4
Polypodium vulgare	2.1	0.0
Populus tremula	2.1	9.5
Potamogeton alpinus	0.0	0.7
Potentilla erecta	19.1	8.1
Potentilla norvegica	2.1	0.0
Potentilla palustris	43.6	44.6
Prunella vulgaris	2.1	1.4
Prunus padus	0.0	2.7
Pteridium aquilinum	2.1	0.0
Pyrola media	3.2	0.0
Pyrola minor	4.3	10.8

Species	Bogs	Aapa mires
Pyrola rotundifolia	7.4	14.2
Ranunculus acris	5.3	3.4
Ranunculus repens	2.1	4.1
Rhamnus frangula	22.3	23.0
Rhynchospora alba	22.3	23.6
Rhynchospora fusca	0.0	6.1
Ribes alpinum	1.1	0.0
Ribes nigrum	2.1	0.7
Ribes spicatum	1.1	2.7
Rorippa palustris	0.0	1.4
Rosa acicularis	0.0	1.4
Rosa majalis	0.0	3.4
Rubus arcticus	16.0	21.6
Rubus chamaemorus	90.4	85.8
Rubus idaeus	8.5	2.0
Rubus saxatilis	12.8	10.8
Rubus x castoreus	0.0	2.7
Rumex acetosa	3.2	4.1
Rumex acetosella	2.1	2.0
Rumex aquatilis	0.0	0.7
Rumex longifolius	0.0	0.7
Sagina procumbens	0.0	0.7
Salix aurita	48.9	60.8
Salix aurita x cinerea	3.2	5.4
Salix aurita x myrsinifolia	0.0	0.7
Salix aurita x myrtilloides	1.1	1.4
Salix caprea	10.6	16.2
Salix caprea x cinerea	0.0	0.7
Salix cinerea	12.8	6.8
Salix glauca	0.0	0.7
Salix lapponum	6.4	25.0
Salix lapponum x phylicifolia	0.0	0.7
Salix myrisinifolia	1.1	2.0
Salix myrsinites	0.0	2.0
Salix myrtilloides	9.6	28.4
Salix myrtilloides x repens	0.0	0.7
Salix pentandra	6.4	7.4
Salix phylicifolia	36.2	48.0
Salix repens	8.5	5.4
Salix starkeana	5.3	0.0
Sambucus racemosa	3.2	0.0
Scheuzeria palustris	51.1	62.8
Schoenoplectus lacustris	2.1	0.0
Scirpus sylvaticus	7.4	0.0
Scutellaria calericulata	6.4	2.0
Solanum dulcamara	1.1	0.0
Selaginella selaginoides	0.0	16.9
Silene dioica	0.0	1.4
Solidago virgaurea	7.4	30.4
Sorbus aucuparia	29.8	43.2
Sparganium angustifolium	0.0	0.7
Sparganium hyperboreum	0.0	1.4
Sparganium natans	1.1	2.7
Sparganium	3.2	0.7
Stellaria borealis	0.0	1.4
Stellaria borealis x longifolia	0.0	1.4
Stellaria crassifolia	0.0	0.7
Stellaria graminea	1.1	0.0
Stellaria longifolia	3.2	3.4
Stellaria media	1.1	0.7
Stellaria nemorum	2.1	2.7
Stellaria palustris	1.1	1.4
Taraxacum	1.1	0.7
Thalictrum flavum	1.1	0.7
Thelypteris palustris	3.2	0.0
Tofieldia pusilla	0.0	4.7
Trichophorum alpinum	16.0	28.4
Trichophorum caespitosum	39.4	64.2
Trientalis europaea	28.7	54.7
Tussilago farfara	1.1	0.7
Typha latifolia	4.3	0.0
Urtica dioica	6.4	0.7
Utricularia intermedia	7.4	30.4
Utricularia minor	0.0	0.7
Utricularia vulgaris	3.2	1.4
Vaccinium microcarpum	40.4	55.4
Vaccinium myrtillus	55.3	66.9
Vaccinium oxycoccos	95.7	92.6
Vaccinium uliginosum	90.4	92.6
Vaccinium vitis-idaea	71.3	69.6
Valeriana officinalis	1.1	1.4
Valeriana sambucifolia	2.1	0.7
Veronica chamaedrys	1.1	1.4
Veronica officinalis	1.1	0.0
Viburnum opulus	2.1	0.0
Vicia cracca	1.1	2.7
Vicia sylvatica	1.1	0.0
Viola epipsila	4.3	17.6
Viola palustris	19.1	21.6
Viola riviniana	1.1	0.0