

Supplementary Materials: Vegetation- and Environmental Changes on Non-Reclaimed Spoil Heaps in Southern Poland

Table S1. Vascular flora of the objects under study and their ecological requirement according Zarzycki et. al (2002).

Species	Life form	Ecological indicator values				
		L	T	D	H	M
<i>Acer pseudoplatanus</i> L.	M	3	3	2	2	.
<i>Acer platanoides</i> L.	M	4	4	4	2	.
<i>Acer negundo</i> L.	M	4	4-5	2-4	2	.
<i>Acer saccharinum</i> L.	M	n.d	n.d	n.d	n.d	n.d
<i>Achillea millefolium</i> L.	H	4	4-3	4	1-2	.
<i>Agrostis canina</i> L.	H	4	.	4	3	.
<i>Alnus glutinosa</i> (L.) Gaertn.	M	3	4	5	3	.
<i>Arctium lappa</i> L.	H	5	4	4	2	.
<i>Arctium tomentosum</i> Mill.	H	4	4	4	2	.
<i>Artemisia vulgaris</i> L.	H	5	4	4	2	.
<i>Athyrium filix-femina</i> (L.) Roth	H	2	4-2	4	2	.
<i>Berteroa incana</i> (L.) DC.	H, T	5	4	3	1	.
<i>Betula pendula</i> Roth	M	4	4-3	3-4	1-2	.
<i>Calamagrostis epigejos</i> (L.) Roth	G, H	4	4-3	3	1	1
<i>Cardamine pratensis</i> L.	H	4	4-3	4-5	2	.
<i>Cardaminopsis arenosa</i> (L.) Hayek	H	4	4-3	3-2	1-3	1
<i>Carduus crispus</i> L.	H	4	4	4-5	2	.
<i>Carpinus betulus</i> L.	M	2/3	4-5	4-5	2	.
<i>Crataegus monogyna</i> Jacq.	N	3-5	4-5	4-5	2-3	.
<i>Carex hirta</i> L.	G	4	4-3	3-4	2	1
<i>Cerastium semidecandrum</i> L.	H, T	5	4	3	2	1
<i>Chelidonium majus</i> L.	H	3-4	4-3	2-5	2-3	.
<i>Cornus alba</i> L.	N	4	4-3	4	3	.
<i>Corylus avellana</i> L.	N	4	5-3	4	2	.
<i>Corynephorus canescens</i> (L.) P.Beauv.	H	4	4	3	1	.
<i>Crataegus laevigata</i> (Poir.) DC.	N	4-5	4-5	4-5	2-3	.
<i>Crataegus monogyna</i> Jacq.	N	3-5	4-5	4-5	2-3	.
<i>Dactylis glomerata</i> L.	H	4	4-2	4	2	.
<i>Daucus carota</i> L.	H	5	5-3	4	2	.
<i>Deschampsia caespitosa</i> (L.) P.Beauv.	H	3-5	4-1	4	2-3	.
<i>Deschampsia flexuosa</i> (L.) Trin.	H	3-4	4-1	3-4	1-2	.
<i>Epilobium angustifolium</i> L.	H	5-4	4-2	3-5	2	.

<i>Erigeron acris</i> L.	H, T	5	5-3	2-5	2	1
<i>Erigeron annuus</i> (L.) Pers.	H, T	5-4	4-3	2-4	2	.
<i>Erigeron canadensis</i> L.	T, H	5	4-3	3-4	2	.
<i>Euonymus verrucosus</i> Scop.	N	3	5-4	1-4	2	.
<i>Euphrasia rostkoviana</i> Hayne	T, pp	4	4-3	4	2	.
<i>Fagus sylvatica</i> L.	M	3	3	3	2	.
<i>Festuca ovina</i> L.	H	4	4-3	3	2	1
<i>Fragaria vesca</i> L.	H	3-4	4-2	4	2	1
<i>Fraxinus excelsior</i> L.	M	3	4-3	4-5	2	.
<i>Galium verum</i> L.	H	5	5-3	4-3	2	.
<i>Herniaria glabra</i> L.	H	4	4-3	3-2	1	.
<i>Hieracium pilosella</i> L.	H	5	5-2	2-4	2	.
<i>Humulus lupulus</i> L.	H, li	3	4	4	2-3	.
<i>Hypericum perforatum</i> L.	H	4	5-3	4	2	.
<i>Juncus articulatus</i> L. em. K. Richt.	H	5	4-3	4-5	3	.
<i>Juncus conglomeratus</i> L. em. Leers	H	4	4-3	4-5	3	.
<i>Medicago falcata</i> L.	H	5	5-4	2-5	2	.
<i>Medicago lupulina</i> L.	H, T	5	4-3	2-4	1-2	.
<i>Medicago sativa</i> L.	H	5	4-3	2-4	2	.
<i>Molinia caerulea</i> (L.) Moench	H	4	4	3-5	2-3	.
<i>Oenothera biennis</i> L.	H	5	4	2-3	2	.
<i>Padus avium</i> Mill.	M	3	4-3	4-5	2	.
<i>Padus serotina</i> (Ehrh.) Borkh.	N, M	3-4	4	3-4	2	.
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	G, Hy	4-5	4-3	3-5	2-3	.
<i>Pinus nigra</i> J. F. Arnold	M	n.d	n.d	n.d	n.d	n.d
<i>Pinus sylvestris</i> L.	M	4-5	4-3	3-4	1-3	.
<i>Plantago lanceolata</i> L.	H	4	5-3	4	3	.
<i>Plantago major</i> L.	H	5	4-2	3-5	2-3	.
<i>Poa annua</i> L.	H, T	5-3	4-1	3-5	2	.
<i>Poa trivialis</i> L.	H	4	4-3	4-5	2	.
<i>Polygonum aviculare</i> L.	T	5	4-3	2-5	1-2	.
<i>Populus nigra</i> L.	M	4	4	3-5	2	.
<i>Populus tremula</i> L.	M	3	4-3	4-3	2	.
<i>Populus x canadensis</i> Moench	M	n.d	n.d	n.d	n.d	n.d
<i>Potentilla anserina</i> L.	H	5	4-3	4	2	.
<i>Prunus spinosa</i> L.	N	4	5-3	4	2	.
<i>Prunus cerasus</i> L.	N	n.d	n.d	n.d	n.d	n.d
<i>Quercus robur</i> L.	M	4	4-3	4	2	.
<i>Quercus rubra</i> L.	M	4	4	3-4	2	.
<i>Rhamnus cathartica</i> L.	N	3-4	4	2,4	2	.
<i>Robinia pseudoacacia</i> L.	M	4	4-5	2-4	2	.
<i>Rubus caesius</i> L.	N	4-5	4-5	3-4	2	1
<i>Rubus idaeus</i> L.	N	4-5	4-5	3-4	2	1
<i>Rudbeckia laciniata</i> L.	H	5-4	4-3	3-4	2	.

Rumex acetosa L.	H	4	4-3	4	2	.
Salix alba L.	M	4	4	4	1-2	.
Salix caprea L.	M, N	5-3	4-3	3-4	2	.
Salix cinerea L.	N	4	4-3	3-5	3	.
Salix x fragilis L.	M	4	4-3	4	2	.
Salix pentandra L.	M, N	4	4-3	4	3	.
Salix purpurea L.	N	4	4-3	2-4	1	.
Salix rosmarinifolia L.	N, Ch	4	4-3	4	3	.
Sambucus nigra L.	N	(5)4-3	4-3	3-4	2	.
Saponaria officinalis L.	H	4	4	2-4	1-2	.
Scabiosa ochroleuca L.	H	5	4-5	3-4	2	1
Senecio viscosus L.	T	4	4-3	3	.	.
Solidago canadensis L.	G, H	4-5	4	2-4	2	.
Solidago virgaurea L.	H	3-4	4-3	4-3	2	.
Sonchus arvensis L.	G,H	5	4-3	4-3	2	.
Symphotrichum nov-belgii (L.) G.L. Nesom	H	n.d	n.d	n.d	n.d	n.d
Tanacetum vulgare L.	H	5	4-3	4-2	2	.
Tilia americana L.	M	-	-	-	-	-
Tilia cordata Mill.	M	3	4-3	4	2	.
Trifolium arvense L.	T	5	5-3	3-1	2	.
Trifolium pratense L.	H	4	4-2	4	2	.
Trifolium repens L.	C, H	4	4-2	4	2	.
Ulmus laevis Pall.	M	3	4	4	2	.
Urtica dioica L.	H	2-5	4-2	3-4	2	.
Verbascum nigrum L.	H	4	4-3	2	2	.
Viburnum opulus L.	N	3	4-3	4	2	.
Vicia cracca L.	H	4	4-3	4	2	.

Note. Life form: M – megaphanerophytes, N – nanophanerophytes, Ch – arborous chamephytes, C – herbaceous chamephytes, H – hemicryptophytes, G – geophytes, T – therophytes, Hy – hydrophytes and helophytes, li – lianas, pp – semiparasites.

Ecological indices:

L – light (2 – moderate shade, 3 – semi-shade, 4 – moderate light, 5 – full light);

T – thermal (1 – coldest climatic conditions, 2 – moderately cold biotopes, 3 – moderately cold climatic conditions, 4 – moderately warm climatic conditions, 5 – warmest biotopes);

D – soil grain size index (1 – rocks and crevices, 2 – screes, gravel, 3 – sand, 4 – silts and silty deposits, 5 – loams and clays);

H – index of organic matter content in soils (1 – soils poor in organic matter, 2 – mineral-humus soils, 3 – soils rich in organic matter);

M – index of resistance to increased levels of heavy metals (1 – species resistant to increased levels of heavy metals, 2 – species demanding increased levels of heavy metals);
dot – index not determined; n.d. – no data