

Appendix A.

Environmental variables and weevil species number and abundance in all study sites (for definitions of variables included in the analyses, see Table 1). The information on bedrock and soil types are derived from open databases at the Geological Survey of Sweden (Bedrock: Scale 1:250 000, Soil: Scale 1:50 000), available at www.sgu.se.

Management treatment	Site name	Area (ha)	Time since restoration (years)	Plant species richness	Veg. Height (cm)	Veg. height squared	Variability in veg. height	Connectivity	Tree and shrub cover (%)	Weevil species nr	Weevil abund. (unit)	Soil	Bedrock
Abandoned	Eke Vidbo	2.763		47	41.25	1701.56	2.17	2.16	8	22	197	Postglacial sand, glacial clay	Gneiss tonalite
Abandoned	Forkarby	2.812		46	27.50	756.25	7.30	3.23	68	13	64	Glacial and postglacial clay	Granodiorite
Abandoned	GränRASbo	2.724		38	33.00	1089.00	10.72	16.17	60	15	61	Postglacial clay	Gneiss, meta-ryolite
Abandoned	Jordmarken Kungsör	3.614		39	12.75	162.56	2.49	11.22	100	4	5	Postglacial fine clay, sandy moraine	Meta-ryolite
Abandoned	KungsHusby	2.662		37	27.00	729.00	2.55	2.82	12	11	51	Sandy moraine	Pegmatite
Abandoned	StorsätraVänge	1.827		39	57.50	3306.25	19.20	1.50	73	18	91	Postglacial clay	Granite
Old restored	SjöängenEngsö	4.064	17	69	32.50	1056.25	5.59	13.80	22	26	121	Postglacial clay	Feldspat quartzite
Old restored	Focksta 2	7.601	13	54	48.75	2376.56	15.16	7.43	25	29	186	Sandy moraine	Tonalite
Old restored	TjärnsHage	5.182	13	70	31.00	961.00	11.87	15.74	55	10	68	Sandy moraine, Postglacial fine clay	Pegmatite

Old restored	Ändeberga Bålsta	4.543	12	39	25.50	650.25	3.50	4.48	14	17	38	Postglacial clay	Granodiorite
Old restored	Forsbacka Rimbo	2.492	12	62	22.25	495.06	1.79	5.65	9	20	54	Postglacial clay, Sandy moraine	Gneiss granitoid e
Old restored	Tyringe	1.652	10	36	31.75	1008.06	6.26	5.49	13	19	62	Sandy moraine	Meta-ryolite
Recently restored	S Lunger	5.071	7	47	59.75	3570.06	13.99	1.51	28	23	133	Postglacial fine clay, sandy moraine	Felsic meta-vulcanite
Recently restored	Reutersberg	2.811	6	43	23.75	564.06	9.71	13.09	22	6	7	Sandy moraine , Posgalcial fine clay	Granodiorite, Meta-basite
Recently restored	Tjälänge Skogstibble	0.787	6	47	23.00	529.00	4.12	2.17	33	22	89	Postglacial clay	Granite
Recently restored	Borgardalsbadet	1.032	5	37	43.75	1914.06	6.50	1.55	63	12	25	Sandy moraine	Gneiss granodiorite
Recently restored	Ahlezonshage	5.371	4	57	17.75	315.06	5.12	1.29	20	7	16	Glacial clay	Granite
Recently restored	St Tadinge	1.393	3	41	39.50	1560.25	4.56	10.62	14	29	197	Postglacial clay, Sandy moraine	Tonalite
Continuously grazed	Blänkhemshagen Kungsör	2.546		47	15.50	240.25	5.59	7.23	68	9	19	Glacial clay, Sandy moraine	Meta-dacite
Continuously grazed	EkebyNorrtälje	0.846		37	43.50	1892.25	18.08	1.22	19	27	139	Sandy moraine	Gneiss granitoid e
Continuously grazed	GranebergLit-slena	2.731		52	40.75	1660.56	6.83	7.65	9	27	69	Postglacial fine clay, Sandy moraine	Meta-greywacke

Continuousl y grazed	Läby	1.74 8		54	20.2 5	410.06	3.03	2.16	17	13	73	Sandy moraine , Glacial clay	Gneiss granitoid e
Continuousl y grazed	Långholmsbr yggan Engsö	5.89 3		68	29.5 0	870.25	0.87	8.79	0.0 8	18	69	Glacial clay	Gneiss tonalite
Continuousl y grazed	NorrbyVidbo	3.57 7		46	29.7 5	885.06	6.94	5.90	0.1 6	17	88	Sandy moraine , Glacial clay	Meta- dacite, Meta- ryolite

Appendix B.

Weevil species found in semi-natural grasslands under four treatments: Continuously grazed, Recently restored, Old restored and Abandoned. Numbers denote number of sites where the species occurred (n = 6 for each treatment) and (within parenthesis) the total number of individuals. Names and systematic order according to Löbl and Smetana (2003-2012).

Species	Host-range group	Continuously grazed	Recently restored	Old restored	Abandoned	Total
<i>Apion frumentarium</i> (Linnaeus, 1758)	oligoph	1(1)	-	-	-	1(1)
<i>Apion haematodes</i> Kirby, 1808	monoph	1(1)	-	1(1)	-	2(2)
<i>Apion cruentatum</i> Walton, 1844	oligoph	-	-	1(1)	-	1(1)
<i>Aizobius sedi</i> (Germar, 1818)	oligoph	1(2)	-	1(1)	-	2(3)
<i>Perapion violaceum</i> (Kirby, 1808)	oligoph	3(6)	1(1)	-	-	4(7)
<i>Perapion marchicum</i> (Herbst, 1797)	monoph	2(12)	-	1(1)	-	3(13)
<i>Perapion affine</i> (Kirby, 1808)	monoph	-	-	1(2)	-	1(2)
<i>Perapion curtirostre</i> (Germar, 1817)	oligoph	6(38)	2(7)	4(18)	4(11)	16(74)
<i>Ceratapion onopordi</i> (Kirby, 1808)	oligoph	-	1(1)	1(1)	-	2(2)
<i>Omphalapion hookerorum</i> (Kirby, 1808)	monoph	4(106)	3(21)	5(6)	6(37)	18(170)
<i>Betulapion simile</i> (Kirby, 1811)	monoph	-	4(8)	2(6)	-	6(14)
<i>Catapion seniculus</i> (Kirby, 1808)	oligoph	1(1)	1(1)	1(4)	2(2)	5(8)
<i>Catapion meieri</i> (Desbrochers des Loges, 1901)	monoph	2(4)	2(6)	4(11)	3(4)	11(25)
<i>Cyanapion afer</i> (Gyllenhal, 1833)	monoph	2(3)	-	1(1)	1(1)	4(5)
<i>Cyanapion spencii</i> (Kirby, 1808)	oligoph	1(2)	2(5)	1(1)	-	4(8)
<i>Cyanapion gyllenhalii</i> (Kirby, 1808)	oligoph	-	1(1)	-	1(1)	2(2)
<i>Eutrichapion viciae</i> (Paykull, 1800)	oligoph	5(11)	2(5)	3(5)	1(14)	11(35)
<i>Eutrichapion ervi</i> (Kirby, 1808)	oligoph	2(5)	3(10)	2(7)	4(16)	11(38)
<i>Eutrichapion punctiger</i> (Paykull, 1792)	oligoph	-	2(4)	3(9)	2(9)	7(22)
<i>Eutrichapion facetum</i> (Gyllenhal, 1839)	oligoph	-	1(1)	1(1)	1(6)	3(8)
<i>Ischnopterapion modestum</i> (Germar, 1817)	oligoph	-	1(1)	-	-	1(1)
<i>Ischnopterapion loti</i> (Kirby, 1808)	oligoph	1(3)	-	3(6)	-	4(9)
<i>Ischnopterapion virens</i> (Herbst, 1797)	oligoph	2(5)	2(4)	5(17)	-	9(26)
<i>Oxystoma subulatum</i> (Kirby, 1808)	oligoph	1(3)	4(9)	2(2)	5(18)	12(32)
<i>Oxystoma craccae</i> (Linnaeus, 1767)	oligoph	-	-	-	1(1)	1(1)
<i>Oxystoma cerdo</i> (Gerstaecker, 1854)	oligoph	3(4)	2(6)	2(3)	1(1)	8(14)
<i>Synapion ebeninum</i> (Kirby, 1808)	oligoph	1(1)	1(6)	-	2(3)	4(10)
<i>Protapion interjectum</i> (Desbrochers des Loges, 1895)	monoph	-	1(1)	1(1)	1(1)	3(3)
<i>Protapion varipes</i> (Germar, 1817)	oligoph	3(7)	3(6)	3(4)	1(1)	10(18)
<i>Protapion gracilipes</i> (Dietrich, 1857)	monoph	3(13)	2(45)	3(19)	5(132)	13(209)
<i>Protapion fulvipes</i> (Geoffroy, 1785)	oligoph	6(220)	6(218)	6(253)	6(69)	24(760)
<i>Protapion nigritarse</i> (Kirby, 1808)	oligoph	4(9)	-	2(13)	-	6(22)
<i>Protapion trifolii</i> (Linnaeus, 1768)	oligoph	2(5)	1(2)	2(3)	1(1)	6(11)
<i>Protapion apricans</i> (Herbst, 1797)	monoph	6(73)	5(79)	6(141)	5(14)	22(307)
<i>Protapion assimile</i> (Kirby, 1808)	oligoph	3(16)	3(23)	3(15)	1(5)	10(59)
<i>Protapion ononidis</i> (Gyllenhal, 1827)	oligoph	1(1)	1(3)	2(4)	-	4(8)
<i>Cionus tuberculosus</i> (Scopoli, 1763)	oligoph	-	1(1)	-	-	1(1)
<i>Tychius quinquepunctatus</i> (Linnaeus, 1758)	oligoph	-	-	1(23)	1(5)	2(28)
<i>Tychius stephensi</i> Gyllenhal, 1836	monoph	-	1(1)	1(1)	-	2(2)
<i>Tychius picirostris</i> (Fabricius, 1787)	oligoph	3(30)	4(10)	5(12)	-	12(52)
<i>Anthonomus humeralis</i> (Panzer, 1795)	oligoph	-	-	1(1)	-	1(1)
<i>Anthonomus conspersus</i> Desbrochers des Loges, 1868	monoph	-	-	-	2(2)	2(2)
<i>Anthonomus rubi</i> (Herbst, 1795)	oligoph	1(1)	2(3)	1(1)	2(3)	6(8)
<i>Anthonomus phyllocola</i> (Herbst, 1795)	oligoph	1(2)	1(2)	2(4)	2(25)	6(33)
<i>Anthonomus rectirostris</i> (Linnaeus, 1758)	oligoph	-	-	1(2)	-	1(2)
<i>Curculio venosus</i> (Gravenhorst, 1807)	monoph	1(1)	-	-	-	1(1)
<i>Archarius pyrrhoceras</i> (Marshall, 1802)	oligoph	-	1(1)	1(1)	-	2(2)
<i>Tachyerges pseudostigma</i> (Tempère, 1982)	oligoph	-	-	1(2)	-	1(2)
<i>Orchestes hortorum</i> (Fabricius, 1792)	oligoph	-	-	1(1)	-	1(1)
<i>Orchestes rusci</i> (Herbst, 1795)	oligoph	-	-	2(2)	-	2(2)
<i>Gymnetron melanarium</i> (Germar, 1821)	oligoph	1(2)	-	-	-	1(2)
<i>Gymnetron rostellum</i> (Herbst, 1795)	oligoph	3(10)	-	1(3)	1(1)	5(14)
<i>Gymnetron veronicae</i> (Germar, 1821)	oligoph	1(1)	-	-	-	1(1)
<i>Mecinus pascuorum</i> (Gyllenhal, 1813)	monoph	3(8)	1(1)	2(6)	1(16)	7(31)

<i>Mecinus pyrae</i> (Herbst, 1795)	monoph	2(4)	-	-	1(1)	3(5)
<i>Miarus</i> sp. ^a		3(13)	2(2)	5(8)	2(3)	12(26)
<i>Cleopomiarus</i> sp. ^a		3(4)	2(2)	2(3)	1(1)	8(10)
<i>Otiorhynchus porcatus</i> (Herbst, 1795)	polyph	-	-	-	1(1)	1(1)
<i>Otiorhynchus scaber</i> (Linnaeus, 1758)	polyph	-	-	1(2)	2(4)	3(6)
<i>Otiorhynchus singularis</i> (Linnaeus, 1767)	polyph	-	-	-	1(2)	1(2)
<i>Otiorhynchus ovatus</i> (Linnaeus, 1758)	polyph	-	1(1)	-	-	1(1)
<i>Otiorhynchus ligustici</i> (Linnaeus, 1758)	polyph	1(1)	-	2(3)	2(4)	5(8)
<i>Romualdius scaber</i> (Linnaeus, 1758)	polyph	-	1(1)	-	-	1(1)
<i>Phyllobius viridicollis</i> (Fabricius, 1792)	polyph	1(1)	2(2)	2(2)	4(23)	9(28)
<i>Phyllobius virideaeris</i> (Laicharting, 1781)	polyph	2(24)	1(22)	-	-	3(46)
<i>Phyllobius pyri</i> (Linnaeus, 1758)	polyph	4(8)	3(5)	2(10)	1(3)	10(26)
<i>Phyllobius maculicornis</i> Germar, 1824	polyph	2(4)	1(1)	1(9)	1(15)	5(29)
<i>Phyllobius argentatus</i> (Linnaeus, 1758)	polyph	1(1)	5(21)	1(3)	2(8)	9(33)
<i>Polydrusus cervinus</i> (Linnaeus, 1758)	polyph	-	1(2)	-	-	1(2)
<i>Polydrusus pilosus</i> Gredler, 1866	polyph	-	2(6)	-	-	2(6)
<i>Polydrusus tereticollis</i> (DeGeer, 1775)	polyph	-	3(8)	2(2)	2(4)	7(14)
<i>Polydrusus mollis</i> (Ström, 1768)	polyph	-	1(1)	-	-	1(1)
<i>Sciaphilus asperatus</i> (Bonsdorff, 1785)	polyph	3(4)	3(5)	2(3)	4(16)	12(28)
<i>Brachysomus echinatus</i> (Bonsdorff, 1785)	polyph	1(1)	3(4)	2(3)	3(5)	9(13)
<i>Exomias pellucidus</i> (Boheman, 1834)	polyph	1(2)	1(5)	1(5)	3(33)	6(45)
<i>Exomias trichopterus</i> (Gautier des Cottés, 1863)	polyph	-	-	-	1(11)	1(11)
<i>Strophosoma melanogrammum</i> (Forster, 1771)	polyph	-	-	1(1)	-	1(1)
<i>Strophosoma capitatum</i> (De Geer, 1775)	polyph	2(2)	5(32)	4(23)	4(15)	15(72)
<i>Barynotus obscurus</i> (Fabricius, 1775)	polyph	-	-	-	1(2)	1(2)
<i>Tropiphorus elevatus</i> (Herbst, 1795)	polyph	1(2)	3(4)	1(7)	1(1)	6(14)
<i>Sitona</i> sp. ^a		6(37)	6(85)	6(95)	6(83)	24(300)
<i>Hypera meles</i> (Fabricius, 1792)	oligoph	1(1)	2(2)	1(2)	2(2)	6(7)
<i>Hypera miles</i> (Paykull, 1792)	polyph	-	1(3)	-	-	1(3)
<i>Hypera postica</i> (Gyllenhal, 1813)	polyph	-	-	-	1(1)	1(1)
<i>Hypera nigrirostris</i> (Fabricius, 1775)	oligoph	2(2)	1(1)	1(1)	1(1)	5(5)
<i>Trachodes hispidus</i> (Linnaeus, 1758) ^b		-	1(1)	-	-	1(1)
<i>Neophytobius quadrinodosus</i> (Gyllenhal, 1813)	oligoph	-	-	-	1(2)	1(2)
<i>Rhinoncus inconspicuous</i> (Herbst, 1795)	monoph	-	-	1(1)	-	1(1)
<i>Rhinoncus pericarpus</i> (Linnaeus, 1758)	oligoph	4(7)	2(2)	1(1)	-	7(10)
<i>Rutidosoma graminosus</i> (Gistel, 1857)	oligoph	-	1(2)	1(1)	-	2(3)
<i>Coeliodorus transversealbofasciatus</i> (Goeze, 1777)	oligoph	-	1(1)	-	-	1(1)
<i>Micrelus ericae</i> (Gyllenhal, 1813)	monoph	-	-	-	1(1)	1(1)
<i>Zacladus geranii</i> (Paykull, 1800)	oligoph	-	2(14)	3(10)	2(34)	7(58)
<i>Ceutorhynchus atomus</i> Boheman, 1845	oligoph	1(1)	-	-	-	1(1)
<i>Ceutorhynchus obstrictus</i> (Marshall, 1802)	polyph	-	-	1(1)	-	1(1)
<i>Ceutorhynchus gallorhenanus</i> Hoffmann, 1954	oligoph	1(1)	-	-	-	1(1)
<i>Ceutorhynchus typhae</i> (Herbst, 1795)	oligoph	2(4)	1(2)	1(2)	1(3)	5(11)
<i>Sirocalodes depressicollis</i> (Gyllenhal, 1813)	oligoph	1(1)	-	-	1(1)	2(2)
<i>Trichosirocalus troglodytes</i> (Fabricius, 1787)	monoph	1(5)	-	-	-	1(5)
<i>Nedus quadrimaculatus</i> (Linnaeus, 1758)	monoph	2(14)	3(8)	2(3)	2(3)	9(28)
<i>Coeliodorus rubicundus</i> (Herbst, 1795)	oligoph	-	1(1)	1(1)	-	2(2)
<i>Glocianus punctiger</i> (Sahlberg, 1835)	oligoph	1(4)	3(9)	-	-	4(13)
<i>Mogulones asperifoliarum</i> (Gyllenhal, 1813)	oligoph	-	-	-	1(1)	1(1)
<i>Orobites cyanea</i> (Linnaeus, 1758)	oligoph	2(3)	1(2)	3(3)	4(7)	10(15)
TOTAL		6(758)	6(750)	6(821)	6(690)	24(3019)

^a) Not classified to host-range group as it was not determined to species level.

^b) Not classified to host-range group as it lives in dead wood.