

Appendices from:

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Appendix A. Conceptual structural equation meta-model showing hypothesized influences on the plant community.

Appendix B: Correlation matrix of environmental variables and plant community response variables.

Appendix C. Table of AIC comparisons of alternative models for total species richness.

Appendix D: ANOVA table for linear models including interaction terms for total species richness, richness of specialists species, and richness of generalist species.

Appendix E. Master species list for Ozark dolomite glade study sites with coefficient of conservatism values.

Appendix F. Formula for proximity index.

Appendix A. Conceptual structural equation meta-model showing hypothesized influences on the plant community.

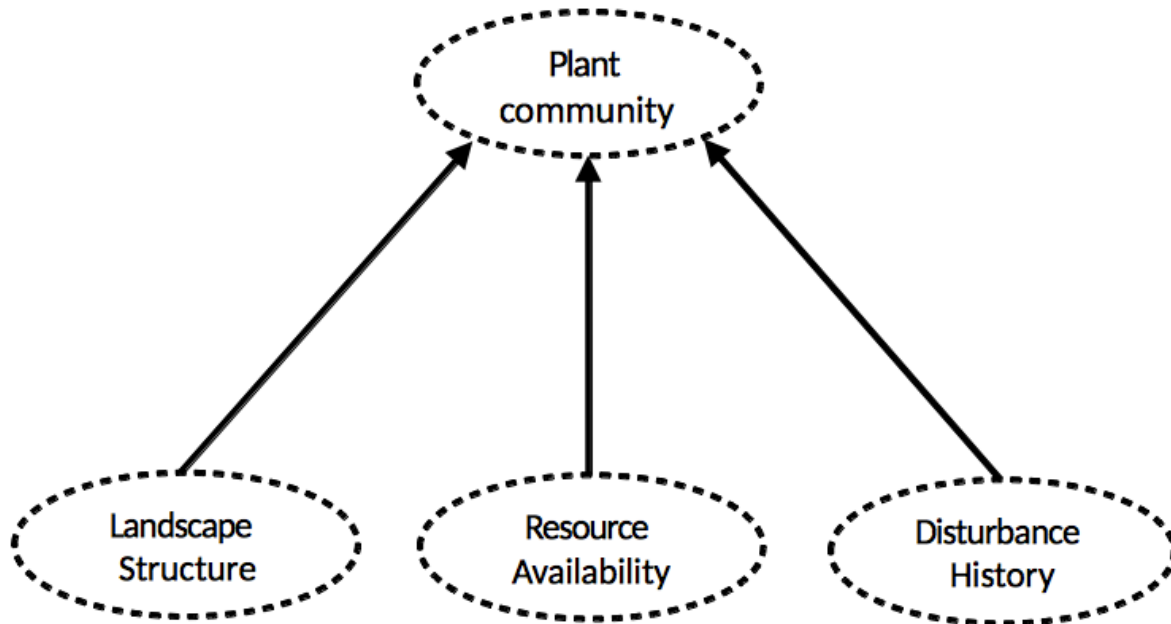


Fig. A1. Structural equation conceptual meta-model for influences of landscape spatial structure, resource availability and disturbance history on the plant community.

Appendix B: Correlation matrix of environmental variables and plant community response variables.

Table B1. Correlation matrix of predictor variables and species richness response variables. Spearman correlation coefficients are on the bottom, and p-values are on the top (n=56). Significant coefficients ($P < 0.05$) are bolded.

	org	thc	tf	prox	clay	tsf	slope	cvb	cvr	bare	rock	herb	spec	gen
Organic matter	-	0.23	0.56	0.88	0.00	0.19	0.01	0.41	0.70	0.02	0.77	0.00	0.04	0.00
Total herb cover	0.16	-	0.77	0.24	0.39	0.61	0.17	0.08	0.58	0.03	0.52	0.18	0.43	0.20
Total fires	-0.08	0.04	-	0.40	0.06	0.00	0.07	0.95	0.10	0.30	0.55	0.14	0.05	0.20
Proximity index (1 km)	0.02	-0.16	-0.11	-	0.87	0.11	0.09	0.89	0.75	0.12	0.14	0.35	0.06	0.44
Clay %	0.50	0.12	-0.25	-0.02	-	0.08	0.00	0.50	0.07	0.40	0.07	0.00	0.00	0.00
Time since fire	0.18	0.07	-0.50	0.21	0.24	-	0.00	0.17	0.41	0.01	0.73	0.43	0.35	0.38

Slope	0.33	0.19	-0.25	0.23	0.39	0.38	-	0.62	0.51	0.11	0.35	0.00	0.00	0.00
CV of bare soil	0.11	0.24	0.01	-0.02	-0.09	0.19	0.07	-	0.36	0.00	0.22	0.73	0.12	0.98
CV of rock cover	0.05	-0.08	-0.22	-0.04	0.24	0.11	-0.09	0.12	-	0.89	0.00	0.13	0.23	0.17
Bare soil	-0.31	-0.30	0.14	0.21	-0.12	-0.37	-0.21	-0.74	-0.02	-	0.75	0.29	0.28	0.27
Rock cover	0.04	-0.09	0.08	0.20	-0.25	-0.05	0.13	-0.17	-0.83	0.04	-	0.18	0.17	0.33
Total herb species richness	0.61	0.18	-0.20	0.13	0.64	0.11	0.46	0.05	0.21	-0.14	-0.18	-	0.00	0.00
Specialist richness	0.27	0.11	-0.26	0.25	0.37	0.13	0.51	0.21	0.16	-0.15	-0.19	0.76	-	0.00
Generalist richness	0.70	0.17	-0.17	0.11	0.65	0.12	0.40	0.00	0.19	-0.15	-0.13	0.96	0.61	-

Appendix C. Table of AIC comparisons of alternative models for total species richness.

Table C1. Akaike information criterion (AIC) comparison of structural equation models for total species richness. Table shows our final model (containing proximity index, soil resource availability and time since fire) and alternative models that contain all the variables from the final model as well as one additional exogenous variable, which is listed as the “model name.” CV stands for coefficient of variation.

Model name	K	AICc	Delta_AICc
Final model	13	749.3	0
CV of bare soil cover	14	888.8	139.5
Topographic slope	14	904.5	155.2
Total herb cover	14	904.9	155.6
Mean bare soil cover	14	907	157.7
Mean rock cover	14	908.8	159.5
CV of rock cover	14	909.4	160.1
Sampling year	14	910	160.7
Quadratic time since fire	14	910	160.8
Quadratic proximity index	14	910.1	160.8

Appendix D: ANOVA table for linear models including interaction terms for total species richness, richness of specialists species, and richness of generalist species.

Table D1. ANOVA table for the effects of soil resource availability, landscape structure (proximity index) and time since fire on total species richness, richness of generalist species, and richness of specialist species. Soil resource availability was represented here using the first axis from a principal components analysis (PCA) of soil organic matter and soil clay content. Higher values of the resulting PCA axis correspond to higher organic matter and clay content.

Effect	Total species richness			Generalist richness			Specialist richness		
	Df	F-value	P-value	Df	F-value	P-value	Df	F-value	P-value
soil	1	50.71	<0.01	1	65.07	<0.01	1	7.6	0.01
landscape	1	2.14	0.15	1	1.07	0.31	1	7.03	0.01
fire	1	1.35	0.25	1	1.75	0.19	1	0.01	0.93
soil*landscape	1	0.01	0.95	1	0.08	0.78	1	0.04	0.85
soil*fire	1	0.4	0.53	1	0.25	0.62	1	0.83	0.37
landscape*fire	1	0.02	0.89	1	0.07	0.8	1	0.51	0.48
soil*landscape*fire	1	0.15	0.7	1	0.17	0.68	1	0.03	0.87
Residuals	48			48			48		

Appendix E. Master species list for Ozark dolomite glade study sites with coefficient of conservatism values.

Table E1: Master species list for dolomite glade species encountered across all study sites. Taxonomy follows the Flora of Missouri (Yatskievych 1999, 2006, 2013), except for the undescribed hybrid *Panicum acuminatum X ashei* which was identified by a regional expert. The frequency column lists the number of sites (n=56 total sites) in which each species occurred, and the “CC” column lists Coefficients of Conservatism for each species as classified by Ladd (Ladd 1992). Six unknown species, which occurred at one site each, are not listed.

<u>Family (/Tribe)</u>	<u>Species</u>	<u>Common name</u>	<u>Frequency</u>	<u>CC</u>
Acanthaceae	Ruellia humilis	hairy ruellia	55	3
Agavaceae	Manfreda virginica	agave	22	7
Apiaceae	Polytaenia nuttallii	prairie parsley	4	8
Apiaceae	Zizia aptera	meadow zizia	6	7
Apocynaceae	Apocynum cannabinum	dogbane	7	3
Asclepiadaceae	Asclepias purpurascens	purple milkweed	3	6
Asclepiadaceae	Asclepias sp.	milkweed	1	
Asclepiadaceae	Asclepias tuberosa	butterfly milkweed	5	5
Asclepiadaceae	Asclepias verticillata	threadleaf milkweed	15	2
Asclepiadaceae	Asclepias viridiflora	green milkweed	43	9
Asclepiadaceae	Asclepias viridis	spider milkweed	5	6

Asteraceae/Astereae	<i>Erigeron strigosus</i>	prairie fleabane	7	3
Asteraceae/Astereae	<i>Grindelia lanceolata</i>	narrowleaf gumweed	10	3
Asteraceae/Astereae	<i>Solidago gattingeri</i>	Gattinger's goldenrod	22	10
Asteraceae/Astereae	<i>Solidago nemoralis</i>	field goldenrod	14	2
Asteraceae/Astereae	<i>Solidago ptarmicoides</i>	white upland aster	11	9
Asteraceae/Astereae	<i>Solidago radula</i>	western rough goldenrod	17	6
Asteraceae/Astereae	<i>Solidago rigida</i>	stiff goldenrod	8	6
Asteraceae/Astereae	<i>Solidago speciosa</i> var. <i>speciosa</i>	showy goldenrod	1	7
Asteraceae/Astereae	<i>Symphyotrichum laeve</i>	smooth blue aster	10	7
Asteraceae/Astereae	<i>Symphyotrichum oblongifolium</i>	aromatic aster	27	6
Asteraceae/Astereae	<i>Symphyotrichum oolentangiense</i>	azure aster	7	7
Asteraceae/Astereae	<i>Symphyotrichum patens</i>	later purple aster	4	5
Asteraceae/Astereae	<i>Symphyotrichum sericeum</i>	silky aster	14	8
Asteraceae/Cichorieae	<i>Lactuca canadensis</i>	Canada lettuce	2	2
Asteraceae/Cichorieae	<i>Lactuca</i> sp.	wild lettuce	1	
Asteraceae/Eupatorieae	<i>Brickellia eupatorioides</i>	false boneset	12	5
Asteraceae/Eupatorieae	<i>Eupatorium altissimum</i>	tall thoroughwort	3	3
Asteraceae/Eupatorieae	<i>Liatris aspera</i>	tall blazingstar	23	6
Asteraceae/Eupatorieae	<i>Liatris cylindracea</i>	cylindrical blazingstar	33	7
Asteraceae/Eupatorieae	<i>Liatris mucronata</i>	cusped blazingstar	4	10
Asteraceae/Eupatorieae	<i>Liatris pycnostachya</i>	prairie blazingstar	2	6

Asteraceae/Eupatorieae	<i>Liatrix squarrosa</i>	scaly blazingstar	5	5
Asteraceae/Heliantheae	<i>Ambrosia artemisiifolia</i>	common ragweed	7	0
Asteraceae/Heliantheae	<i>Coreopsis lanceolata</i>	lanceleaf tickseed	24	7
Asteraceae/Heliantheae	<i>Coreopsis palmata</i>	stiff tickseed	11	6
Asteraceae/Heliantheae	<i>Echinacea pallida</i> / <i>simulata</i>	pale purple coneflower	33	7
Asteraceae/Heliantheae	<i>Echinacea paradoxa</i>	yellow coneflower	18	9
Asteraceae/Heliantheae	<i>Helianthus hirsutus</i>	bristly sunflower	10	4
Asteraceae/Heliantheae	<i>Helianthus maximiliani</i>	Maximilian sunflower	5	5
Asteraceae/Heliantheae	<i>Helianthus mollis</i>	ashy sunflower	3	6
Asteraceae/Heliantheae	<i>Helianthus occidentalis</i>	fewleaf sunflower	9	5
Asteraceae/Heliantheae	<i>Heliopsis helianthoides</i>	false sunflower	1	5
Asteraceae/Heliantheae	<i>Palafoxia callosa</i>	small palafox	9	8
Asteraceae/Heliantheae	<i>Parthenium integrifolium</i> var. <i>integrifolium</i>	wild quinine	10	6
Asteraceae/Heliantheae	<i>Ratibida pinnata</i>	gray-headed coneflower	3	5
Asteraceae/Heliantheae	<i>Rudbeckia missouriensis</i>	missouri-black-eyed susan	55	6
Asteraceae/Heliantheae	<i>Silphium integrifolium</i>	cup plant	2	4
Asteraceae/Heliantheae	<i>Silphium laciniatum</i>	compass plant	11	6
Asteraceae/Heliantheae	<i>Silphium terebinthinaceum</i>	prairie dock	40	5
Asteraceae/Heliantheae	<i>Verbesina helianthoides</i>	gravelweed	1	4
Asteraceae/Senecioneae	<i>Arnoglossum plantagineum</i>	Indian plantain	2	8
Asteraceae/Vernonieae	<i>Vernonia arkansana</i>	Arkansas ironweed	8	6

Boraginaceae	<i>Lithospermum canescens</i>	hoary puccoon	22	6
Boraginaceae	<i>Lithospermum canescens</i>	narrowleaf stoneseed	4	7
Boraginaceae	<i>Onosmodium molle</i>	soft-hair marbleseed	1	4
Brassicaceae	<i>Boechera canadensis</i>	sicklepod	2	4
Brassicaceae	<i>Draba brachycarpa</i>	shortpod draba	1	0
Brassicaceae	<i>Draba cuneifolia</i>	wedgeleaf draba	9	5
Brassicaceae	<i>Leavenworthia uniflora</i>	Michaux's gladecress	1	7
Cactaceae	<i>Opuntia</i> sp.	pricklypear	4	
Campanulaceae	<i>Lobelia spicata</i>	palespike lobelia	6	5
Caryophyllaceae	<i>Minuartia michauxii</i>	bog stitchwort	3	9
Caryophyllaceae	<i>Minuartia patula</i>	sandwort	25	7
Caryophyllaceae	<i>Silene antirrhina</i>	sleepy silene	3	2
Clusiaceae	<i>Hypericum punctatum</i>	spotted St Johnswort	1	3
Clusiaceae	<i>Hypericum sphaerocarpum</i>	roundseed St Johnswort	6	5
Convolvulaceae	<i>Calystegia macounii</i>	Macoun's false bindweed	1	10
Convolvulaceae	<i>Cuscuta</i> sp.	dodder	3	
Convolvulaceae	<i>Evolvulus nuttallianus</i>	shaggy morningglory	11	7
Convolvulaceae	<i>Ipomoea pandurata</i>	man of the earth	3	2
Crassulaceae	<i>Sedum pulchellum</i>	stonecrop	1	6
Cyperaceae	<i>Carex albicans</i>	oak sedge	1	8
Cyperaceae	<i>Carex crawei</i>	Crawe's sedge	38	10

Cyperaceae	<i>Carex granularis</i>	limestone meadow sedge	1	4
Cyperaceae	<i>Carex hirsutella</i>	fuzzy wuzzy sedge	1	4
Cyperaceae	<i>Carex meadii</i>	Mead's carex	27	5
Cyperaceae	<i>Carex</i> sp.	unk carex	2	
Cyperaceae	<i>Cyperus squarrosus</i>	bearded flatsedge	1	4
Cyperaceae	<i>Eleocharis compressa</i>	flatstem spike rush	13	6
Cyperaceae	<i>Fimbristylis puberula</i>	glade fimbry	37	5
Cyperaceae	<i>Scirpus pendulus</i>	rufous bulrush	1	5
Cyperaceae	<i>Scleria oligantha</i>	littlehead nutrush	2	10
Cyperaceae	<i>Scleria pauciflora</i>	Carolina nut grass	3	8
Cyperaceae	<i>Scleria</i> sp.	nutrush	1	9
Euphorbiaceae	<i>Acalypha monococca</i>	slender threeseed mercury	2	3
Euphorbiaceae	<i>Croton monanthogynus</i> and / or <i>capitatus</i>	croton	53	2
Euphorbiaceae	<i>Euphorbia corollata</i>	flowering spurge	49	3
Euphorbiaceae	<i>Euphorbia missurica</i>	prairie sandmat	1	8
Euphorbiaceae	<i>Euphorbia nutans</i>	eyebane	2	0
Euphorbiaceae	<i>Tragia ramosa</i>	branched noseburn	17	7
Fabaceae/Faboideae	<i>Amorpha canescens</i>	leadplant	8	8
Fabaceae/Faboideae	<i>Baptisia alba</i>	wild white indigo	5	6
Fabaceae/Faboideae	<i>Baptisia australis</i>	blue wild indigo	4	8

Fabaceae/Faboideae	<i>Baptisia bracteata</i>	longbract wild indigo	5	6
Fabaceae/Faboideae	<i>Dalea candida</i>	white prairie clover	3	8
Fabaceae/Faboideae	<i>Dalea purpurea</i>	purple prairie clover	48	8
Fabaceae/Faboideae	<i>Desmodium ciliare</i>	hairy small-leaf ticktrefoil	8	5
Fabaceae/Faboideae	<i>Desmodium obtusum</i>	stiff tick-trefoil	1	5
Fabaceae/Faboideae	<i>Desmodium sessilifolium</i>	sessileleaf ticktrefoil	1	5
Fabaceae/Faboideae	<i>Galactia regularis</i>	eastern milkpea	18	
Fabaceae/Faboideae	<i>Lespedeza capitata</i>	roundhead lespedeza	5	6
Fabaceae/Faboideae	<i>Lespedeza virginica</i>	slender lespedeza	9	5
Fabaceae/Faboideae	<i>Pedimelum esculentum</i>	prairie turnip	4	10
Fabaceae/Faboideae	<i>Pedimelum tenuiflorum</i>	scurfypea	8	8
Fabaceae/Faboideae	<i>Stylosanthes biflora</i>	sidebeak pencilflower	1	5
Fabaceae/Mimosoideae	<i>Acaciella angustissima</i>	prairie acacia	1	10
Fabaceae/Mimosoideae	<i>Mimosa quadrivalvis</i>	sensitive briar	6	6
Gentianaceae	<i>Centaurium texense</i>	Lady Bird's centaury	3	10
Gentianaceae	<i>Sabatia angularis</i>	rosepink	1	4
Gentianaceae	<i>Sabatia campestris</i>	prairie star	2	4
Heliotropiaceae	<i>Heliotropium tenellum</i>	pasture heliotrope	42	6
Iridaceae	<i>Sisyrinchium campestre</i>	prarie blue-eyed grass	21	4
Lamiaceae	<i>Blephilia ciliata</i>	downy pagoda-plant	1	5
Lamiaceae	<i>Clinopodium arkansanum</i>	calamint	30	7

Lamiaceae	<i>Monarda bradburiana</i>	wild bergamont	1	4
Lamiaceae	<i>Monarda fistulosa</i>	wild bergamont	2	4
Lamiaceae	<i>Physostegia angustifolia</i>	false dragonhead / obedient plant	13	6
Lamiaceae	<i>Pycnanthemum pilosum</i>	hairy mountain mint	1	5
Lamiaceae	<i>Pycnanthemum tenuifolium</i>	slender mountain mint	1	4
Lamiaceae	<i>Scutellaria bushii</i>	Bush's skullcap	9	10
Lamiaceae	<i>Scutellaria parvula</i>	small skullcap	10	4
Lamiaceae	<i>Trichostema brachiatum</i>	fluxweed	7	4
Liliaceae	<i>Allium canadense</i>	meadow garlic	28	1
Liliaceae	<i>Allium stellatum</i>	autumn onion	15	6
Liliaceae	<i>Camassia scilloides</i>	Atlantic camas	17	6
Liliaceae	<i>Hypoxis hirsuta</i>	yellow stargrass	10	4
Liliaceae	<i>Nothoscordum bivalve</i>	crowpoison	16	4
Linaceae	<i>Linum sulcatum</i>	flax (glade)	30	5
Malvaceae	<i>Callirhoe digitata</i>	poppymallow	1	6
Nyctaginaceae	<i>Mirabilis albida</i>	white four o'clock	6	5
Onagraceae	<i>Gaura longiflora</i>	longflower beeblossom	1	1
Onagraceae	<i>Oenothera macrocarpa</i>	Missouri evening primrose	40	7
Ophioglossaceae	<i>Ophioglossum engelmannii</i>	limestone adderstongue	7	6
Orobanchaceae	<i>Agalinis gattingeri</i>	roundstem false foxglove	1	7
Orobanchaceae	<i>Buchnera americana</i>	blue hearts	4	10

Orobanchaceae	<i>Castilleja coccinea</i>	paintbrush	19	5
Orobanchaceae	<i>Pedicularis canadensis</i>	lousewort	1	5
Orobanchaceae	<i>Penstemon</i> sp.	Beard-tongue	2	5
Oxalidaceae	<i>Oxalis dillenii</i>	slender yellow woodsorrel	1	0
Oxalidaceae	<i>Oxalis violacea</i>	violet woodsorrel	10	5
Plantaginaceae	<i>Leucospora multifida</i>	narrowleaf paleseed	5	4
Plantaginaceae	<i>Penstemon digitalis</i>	smooth beard-tongue	2	4
Plantaginaceae	<i>Penstemon pallidus</i>	pale beard-tongue	6	4
Plantaginaceae	<i>Penstemon tubaeiflorus</i>	white wand beardtongue	1	5
Plantaginaceae	<i>Plantago virginica</i>	virginia plantain	4	1
Poaceae/Andropogoneae	<i>Andropogon gerardii</i>	big bluestem	39	5
Poaceae/Andropogoneae	<i>Schizachyrium scoparium</i>	little bluestem	56	5
Poaceae/Andropogoneae	<i>Sorghastrum nutans</i>	Indian grass	39	5
Poaceae/Aristideae	<i>Aristida purpurascens</i>	Three-awn	14	5
Poaceae/Cynodonteae	<i>Bouteloua curtipendula</i>	sideoats gramma	38	7
Poaceae/Eragrostideae	<i>Eragrostis spectabilis</i>	purple lovegrass	1	3
Poaceae/Eragrostideae	<i>Muhlenbergia capillaris</i>	hairawn muhly	1	7
Poaceae/Eragrostideae	<i>Sporobolus clandestinus</i>	rough dropseed	37	5
Poaceae/Eragrostideae	<i>Sporobolus compositus</i>	rough dropseed	8	4
Poaceae/Eragrostideae	<i>Sporobolus heterolepis</i>	prairie dropseed	13	6
Poaceae/Eragrostideae	<i>Sporobolus ozarkanus</i>	Ozark dropseed	35	3

Poaceae/Eragrostideae	<i>Tridens flavus</i>	purpletop	1	1
Poaceae/Meliceae	<i>Melica nitens</i>	threeflower melicgrass	1	6
Poaceae/Paniceae	<i>Panicum acuminatum</i>	panicgrass	18	2
Poaceae/Paniceae	<i>Panicum acuminatum</i>	panicgrass	3	2
Poaceae/Paniceae	<i>Panicum acuminatum</i> X <i>ashei</i>	panicgrass	1	
Poaceae/Paniceae	<i>Panicum boreale</i>	northern panicgrass	1	8
Poaceae/Paniceae	<i>Panicum commutatum</i> var. <i>ashei</i>	panicgrass	1	7
Poaceae/Paniceae	<i>Panicum flexile</i>	wiry panicgrass	1	3
Poaceae/Paniceae	<i>Panicum linearifolium</i>	panicgrass	6	5
Poaceae/Paniceae	<i>Panicum oligosanthos</i> var. <i>scribnerianum</i>	Scribner's rosette grass	5	3
Poaceae/Paniceae	<i>Panicum ravenelii</i>	panicgrass	1	5
Poaceae/Paniceae	<i>Panicum</i> sp.	panicgrass	2	
Poaceae/Paniceae	<i>Panicum virgatum</i>	switchgrass	48	4
Poaceae/Triticeae	<i>Elymus virginicus</i> var. <i>glabriflorus</i>	Virgina wildrye	1	4
Polemoniaceae	<i>Phlox pilosa</i>	prairie phlox	8	6
Polygalaceae	<i>Polygala verticillata</i>	whorled milkwort	5	4
Polygonaceae	<i>Eriogonum longifolium</i>	longleaf wild buckwheat	1	10
Portulacaceae	<i>Claytonia virginica</i>	eastern spring beauty	1	3
Portulacaceae	<i>Phemeranthus calycinus</i>	fame flower	3	8
Primulaceae	<i>Lysimachia lanceolata</i>	lance-leaved loosestrife	1	4
Primulaceae	<i>Lysimachia quadriflora</i>	whorled yellow loosestrife	1	8

Primulaceae	<i>Primula meadia</i>	shooting star	13	5
Pteridaceae	<i>Pellaea atropurpurea</i>	purple cliffbrake	5	7
Ranunculaceae	<i>Anemone virginiana</i>	tall thimbleweed	2	4
Ranunculaceae	<i>Clematis fremontii</i>	Fremont's leatherflower	2	10
Ranunculaceae	<i>Delphinium carolinianum</i>	Carolina larkspur	8	7
Ranunculaceae	<i>Delphinium treleasei</i>	glade larkspur	2	10
Rosaceae	<i>Fragaria virginiana</i>	strawberry	1	2
Rosaceae	<i>Potentilla simplex</i>	cinquefoil	3	3
Rubiaceae	<i>Diodia teres</i>	poorjoe	2	2
Rubiaceae	<i>Galium virgatum</i>	dwarf bedstraw	9	2
Rubiaceae	<i>Houstonia nigricans</i>	diamondflowers	56	5
Rubiaceae	<i>Houstonia purpurea</i>	Venus' pride	1	6
Santalaceae	<i>Comandra umbellata</i>	bastard toadflax	18	6
Scrophulariaceae	<i>Verbascum thapsus</i>	mullein	1	0
Solanaceae	<i>Physalis virginiana</i>	Virginia groundcherry	11	3
Verbenaceae	<i>Glandularia canadensis</i>	rose vervain	14	5
Verbenaceae	<i>Verbena simplex</i>	narrowleaf vervain	3	4
Violaceae	<i>Viola pedata</i>	birdfoot violet	24	5

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Appendix F. Formula for proximity index.

Formula for proximity index from Mcgarigal (2015):

a_{ijs} = area (m) of patch ij s within specified neighborhood (m) of patch ij

h_{ijs} = distance (m) between patch ij s and patch ij s, based on patch edge-to-edge distance, computed from cell center to cell center.

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