

ISU Monarch Data Summary for NCIG

Jarad Niemi and Seth Appelgate

2019-03-11

Table 1 and 2 provide mean count of nectar plant species averaged across all data collection events. Table ?? provides mean count of milkweed ramets. Values in table represent the specific counting unit for each species, not necessarily a whole plant. Table 4 and 5 provide nectar plant species density (per 100m²) averaged across all data collection events. Table ?? provides mean density of milkweed ramets. Values in table represent the specific counting unit for each species, not necessarily a whole plant.

Table ?? provides average land cover percentage averaged across all data collection events.

Table ?? provides average amount of vegetation across all data collection events.

Table ?? provides total number of monarchs sighted anywhere around site during entire time at site, number of monarchs sighted during a survey period, number of milkweed ramets (an upper limit of 20 per round per site, although the same milkweed may have been surveyed in different rounds), number of monarch eggs counted on milkweed plants (if no milkweed present, no monarch eggs present, number of monarch larvae (caterpillars) counted on milkweed plants (if no milkweed present, no larvae present).

Table 1: 2016 nectar plant species: mean count across all surveys

Nectar Plant Species	tall1a	tall2a	tappla	tarm1b	tarm2a	tbcrla	tbcrla	tber2a	tber1a	tber3a	tbyd1a	tbyd2a	tcrala	tcrela	tdun2a	tdun3a	tfisla	tgrola	tgro2a	tharla
alfalfa	-	-	-	-	7.7	-	-	-	-	-	379.0	128.7	-	-	-	-	-	272.0	20.3	6.7
birdsfoot trefoil	-	-	-	18.3	-	-	-	-	-	-	-	-	-	9.0	-	-	-	-	-	-
black eyed susan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
black medic	-	8.3	-	-	-	-	-	-	-	-	-	34.0	-	-	-	-	-	-	-	-
bladder campion	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
blue vervain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
blue wild indigo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
brown eyed susan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
canada goldenrod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
canada thistle	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93.3	45.3	30.7
carolina horsenettle	-	-	-	-	-	-	-	-	7.3	2.3	-	-	-	-	2.7	33.3	9.7	-	11.7	-
chicory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common cinquefoil	-	-	-	-	-	-	-	-	-	3.0	-	-	8.7	-	-	-	-	-	-	-
common dandelion	1.3	1.0	-	-	-	-	-	-	-	0.7	-	1.7	1.3	-	-	-	-	-	-	-
common evening primrose	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common mallow	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common milkweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	0.3
common mullein	1.7	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-
common yarrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
compass plant	1.0	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	-	-	-	-	-	0.3	-	-	-	3.3	2.3	11.7	-	-	-	-	-
flowering spurge	-	-	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
golden alexanders	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	-
hoary vervain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7
lanceleaf fogfruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
morning glory	231.7	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	26.0	10.7	-
musk thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plantain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-
prickly lettuce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.3
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
queen ames lace	-	-	-	104.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
red clover	4.0	-	16.7	2.7	377.0	-	-	-	0.3	124.0	58.0	70.3	161.0	129.0	-	-	-	82.3	415.7	18.7
sawtooth sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	85.0	-	-	-	-	-	-
smartweed	1.3	1.7	-	-	-	-	-	-	11.3	-	-	-	-	-	-	-	-	-	-	-
stinging nettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	-
velvetleaf	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-
white clover	388.7	473.3	3.3	-	8.0	42.0	-	-	-	16.0	644.7	757.0	134.3	13.7	2.0	-	-	-	-	33.0
white sweet clover	-	-	-	-	-	-	-	-	-	-	3.3	-	1.7	-	-	-	-	-	-	-
whitestar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
whorled milkweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild bergamot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild mustard	-	-	-	-	-	-	-	-	-	11.0	-	-	-	-	-	-	-	-	-	-
wild parsnip	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-
yellow sweet clover	-	-	-	-	-	-	-	-	-	-	-	1.0	2.3	-	-	-	-	-	-	4.3

canada thistle	-	11.3	8.3	-	3.0	-	-	-	-	-	3.0	-	-	-	-	-	9.0	1.3
carolina horsenettle	-	-	-	-	-	-	5.7	1.0	-	-	-	-	6.3	5.3	-	-	-	2.3
catnip	-	-	-	-	-	-	-	-	-	-	-	-	16.0	-	-	20.0	-	-
chicory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common cinquefoil	126.7	21.0	3.0	0.3	-	23.0	0.3	-	-	-	-	114.7	0.7	-	0.7	-	-	1.0
common dandelion	0.7	0.3	-	-	-	5.0	2.3	0.3	1.0	1.3	-	-	-	0.3	0.7	-	-	-
common evening primrose	-	-	-	-	-	2.7	-	1.0	-	-	-	-	-	-	-	-	-	-
common mullein	-	-	-	-	-	-	-	-	-	0.3	-	-	-	18.0	19.3	-	-	-
common selfheal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common sneezeweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common yarrow	-	-	-	-	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-
compass plant	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cup plant	-	-	-	-	-	-	65.0	-	-	-	-	-	-	-	-	-	-	-
deftford pink	-	-	-	-	-	-	-	-	-	-	-	-	80.3	-	-	-	-	-
eastern daisy fleabane	-	-	-	195.3	-	-	-	93.3	197.7	-	24.0	928.3	51.7	301.7	-	-	-	-
field pennycress	-	-	-	-	-	13.7	101.0	-	-	-	-	-	4.3	-	-	-	-	-
field thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
flowering spurge	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
foxglove beardtongue	-	-	-	5.0	0.3	-	-	0.7	5.7	8.7	-	-	-	-	-	-	-	-
golden alexanders	-	-	-	0.3	1.7	-	-	-	0.3	-	-	-	-	-	-	0.7	-	-
great blue lobelia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
groundcherry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
hoary alyssum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	539.0
hoary vervain	0.3	-	4.0	-	-	1.0	0.3	-	9.3	1.0	1.7	-	10.0	127.7	-	10.0	-	19.3
ironweed	-	-	0.3	-	-	-	1.3	-	-	-	-	-	-	1.3	-	-	-	0.7
lanceleaf fogfruit	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-
leadplant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
lesser burdock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.3
marestail	-	-	13.7	-	30.7	1.7	0.7	-	-	-	255.3	6.7	-	-	-	-	-	1.7
morning glory	0.7	-	-	-	-	1.3	-	4.0	2.0	-	-	-	-	-	-	1.7	1.0	-
musk thistle	1.7	11.0	-	1.0	-	-	-	-	-	-	-	-	41.3	17.7	-	-	-	-
new england aster	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nodding stickseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ox eye daisy	-	0.7	-	-	-	-	-	-	-	-	-	6.7	-	-	-	-	-	0.7
ox eye sunflower	5.0	1.0	62.7	6.0	65.7	71.0	4.3	7.0	4.3	236.0	144.0	48.0	15.3	83.0	48.7	76.7	12.0	22.3
pale purple coneflower	-	-	-	-	-	-	1.3	-	0.7	0.7	-	-	-	-	-	-	-	-
panicledleaf tick trefoil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
partridge pea	-	-	-	-	-	-	-	-	-	-	-	-	1.3	-	-	-	-	-
pineapple weed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plantain	4.7	-	-	-	17.0	-	-	-	-	-	-	-	-	1.0	-	-	-	-
prairie blazing star	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
prairie cinquefoil	-	-	-	-	-	-	-	-	-	0.3	-	-	-	1.3	-	-	-	-
prickly lettuce	0.3	-	-	-	-	6.7	-	-	-	-	3.3	118.0	17.3	3.3	-	11.7	-	-
prickly sowthistle	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
prostrate knotweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
prostrate vervain	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-
purple prairie clover	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-
queen annes lace	-	-	-	350.3	-	-	-	-	-	-	-	943.3	6.3	36.7	-	-	0.7	1.0
red clover	68.3	28.3	290.7	1043.0	3244.0	176.3	-	197.7	889.3	206.3	111.3	661.3	1056.3	54.0	103.0	783.0	3081.7	393.3
rough avens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
rough cinquefoil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
shepherds purse	-	-	-	-	-	4.3	68.3	-	-	-	-	-	-	-	-	-	-	-
smartweed	58.3	9.3	18.3	-	-	-	-	170.0	20.0	-	-	-	-	2.3	10.0	190.0	29.7	1.7
stiff goldenrod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
stinging nettle	-	-	-	-	-	-	-	5.0	-	-	-	-	23.3	2.3	-	-	-	-
swamp milkweed	-	-	-	-	8.0	-	-	-	-	0.7	-	-	-	-	-	1.7	-	-

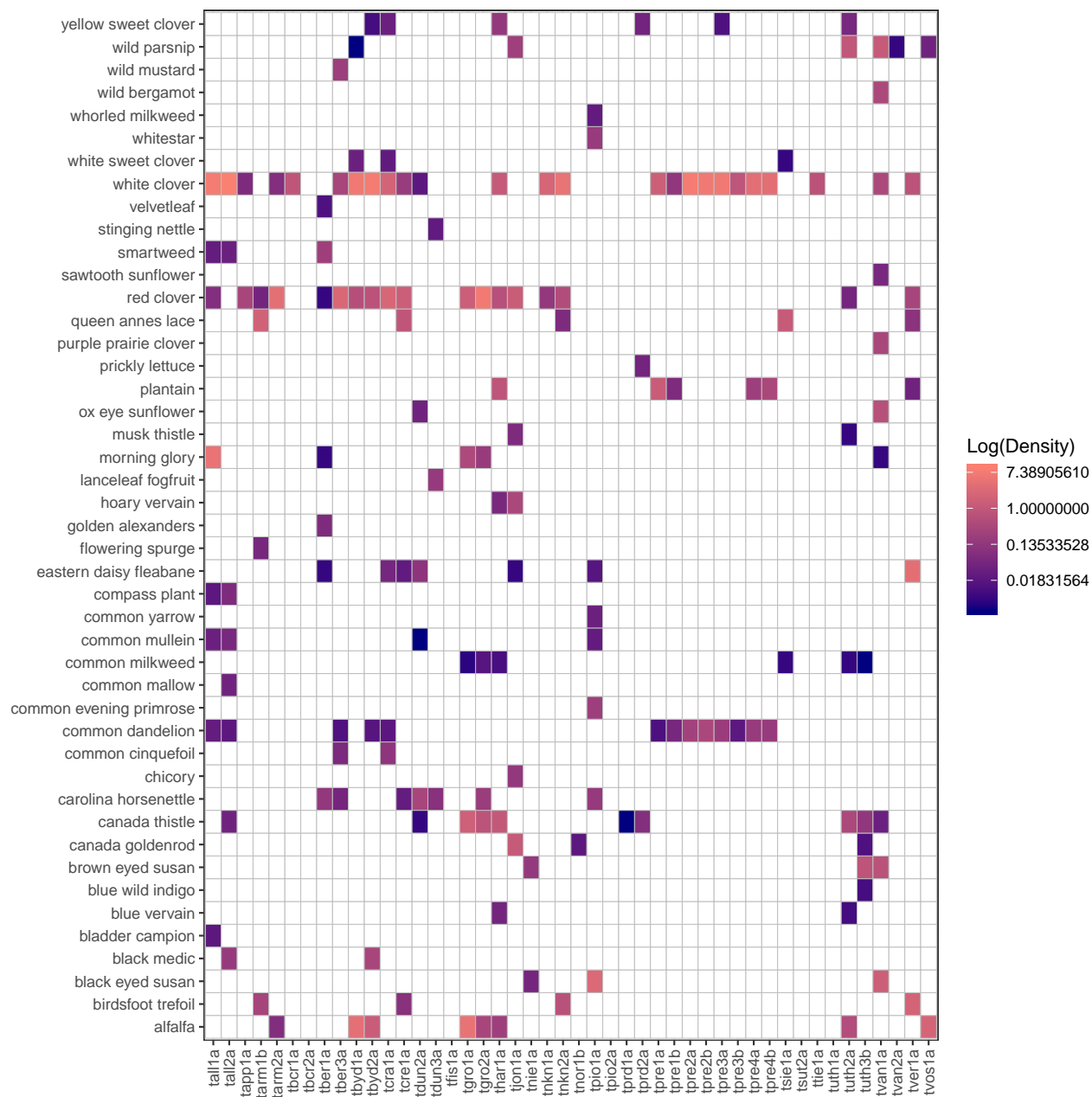
Here are some heatmaps which give us a visual display of our data.

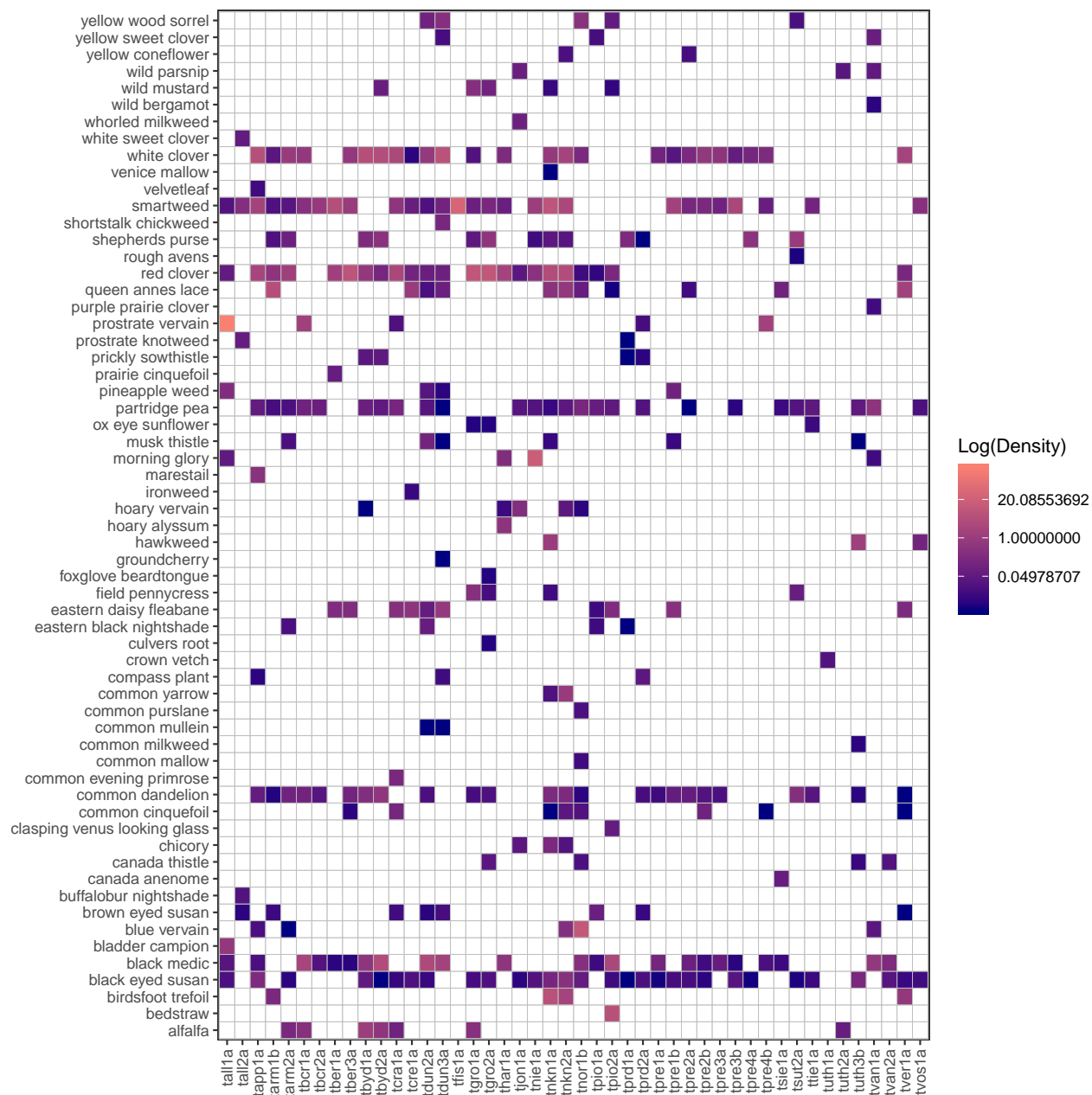
Table 4: 2016 Nectar plant species density: average density (count / m2) across all rounds

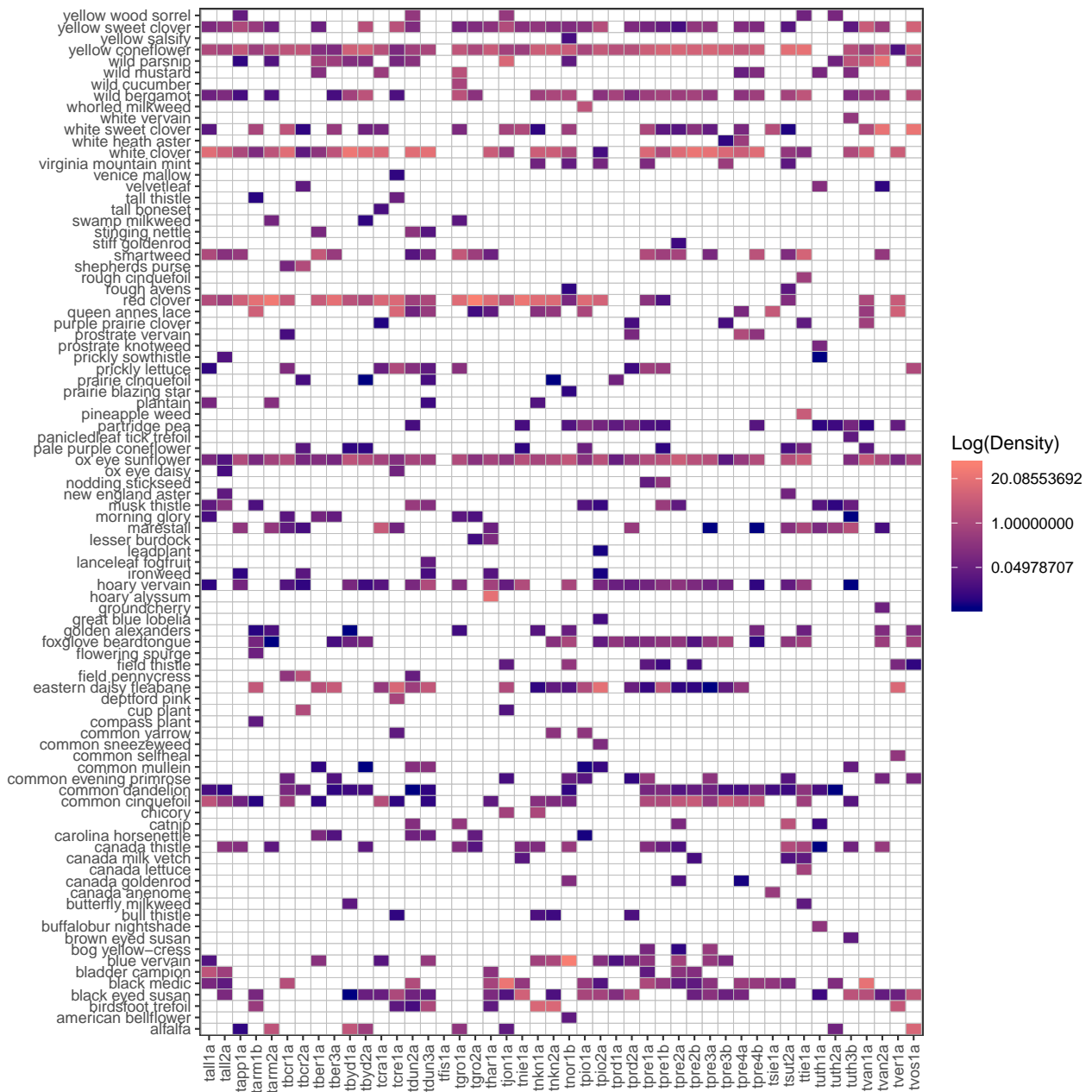
Nectar Plant Species	tall1a	tall2a	tappla	tarm1b	tarm2a	tbcrla	tbcrla	tber2a	tber1a	tber3a	tbydl1a	tbydl2a	tcr1a	tcr2a	tdun1a	tdun2a	tdun3a	tfis1a	tgrola	tgro2a	thar1a
alfalfa	-	-	-	-	0.08	-	-	-	-	-	3.79	1.29	-	-	-	-	-	-	4.53	0.34	0.22
birdsfoot trefoil	-	-	-	0.31	-	-	-	-	-	-	-	-	-	0.10	-	-	-	-	-	-	-
black eyed susan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
black medic	-	0.17	-	-	-	-	-	-	-	-	-	0.34	-	-	-	-	-	-	-	-	-
bladder campion	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
blue vervain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
blue wild indigo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
brown eyed susan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
canada goldenrod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
canada thistle	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04
carolina horsenettle	-	-	-	-	-	-	-	-	0.15	0.05	-	-	-	-	-	0.01	0.10	-	1.56	0.76	1.02
chicory	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.33	-	-	-	-	0.19	-
common cinquefoil	-	-	-	-	-	-	-	-	-	0.06	-	-	0.12	-	-	-	-	-	-	-	-
common dandelion	0.03	0.02	-	-	-	-	-	-	-	0.01	-	0.02	0.02	-	-	-	-	-	-	-	-
common evening primrose	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common mallow	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common milkweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.02	0.01
common mullein	0.03	0.05	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	-
common yarrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
compass plant	0.02	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	-	-	-	-	-	0.01	-	-	-	0.05	0.02	0.12	-	-	-	-	-	-
flowering spurge	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
golden alexanders	-	-	-	-	-	-	-	-	0.07	-	-	-	-	-	-	-	-	-	-	-	-
hoary vervain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.06
lanceleaf fogfruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-	-
morning glory	4.63	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	0.43	0.18	-
musk thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04	-	-	-	-	-	-
plantain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81
prickly lettuce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
queen annes lace	-	-	-	1.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
red clover	0.08	-	0.33	0.04	3.77	-	-	0.01	2.48	0.58	0.70	2.30	1.38	0.86	-	-	-	-	1.37	6.93	0.62
sawtooth sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
smartweed	0.03	0.03	-	-	-	-	-	0.23	-	-	-	-	-	-	-	-	-	-	-	-	-
stinging nettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-
velvetleaf	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
white clover	7.77	9.47	0.07	-	0.08	0.84	-	-	0.32	6.45	7.57	1.92	0.18	0.02	0.02	-	-	-	-	-	1.10
white sweet clover	-	-	-	-	-	-	-	-	-	0.03	-	0.02	-	-	-	-	-	-	-	-	-
whitestar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
whorled milkweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild bergamot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild mustard	-	-	-	-	-	-	-	-	-	0.22	-	-	-	-	-	-	-	-	-	-	-
wild parsnip	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-
yellow sweet clover	-	-	-	-	-	-	-	-	-	-	0.01	0.03	-	-	-	-	-	-	-	-	0.14

[illegible]

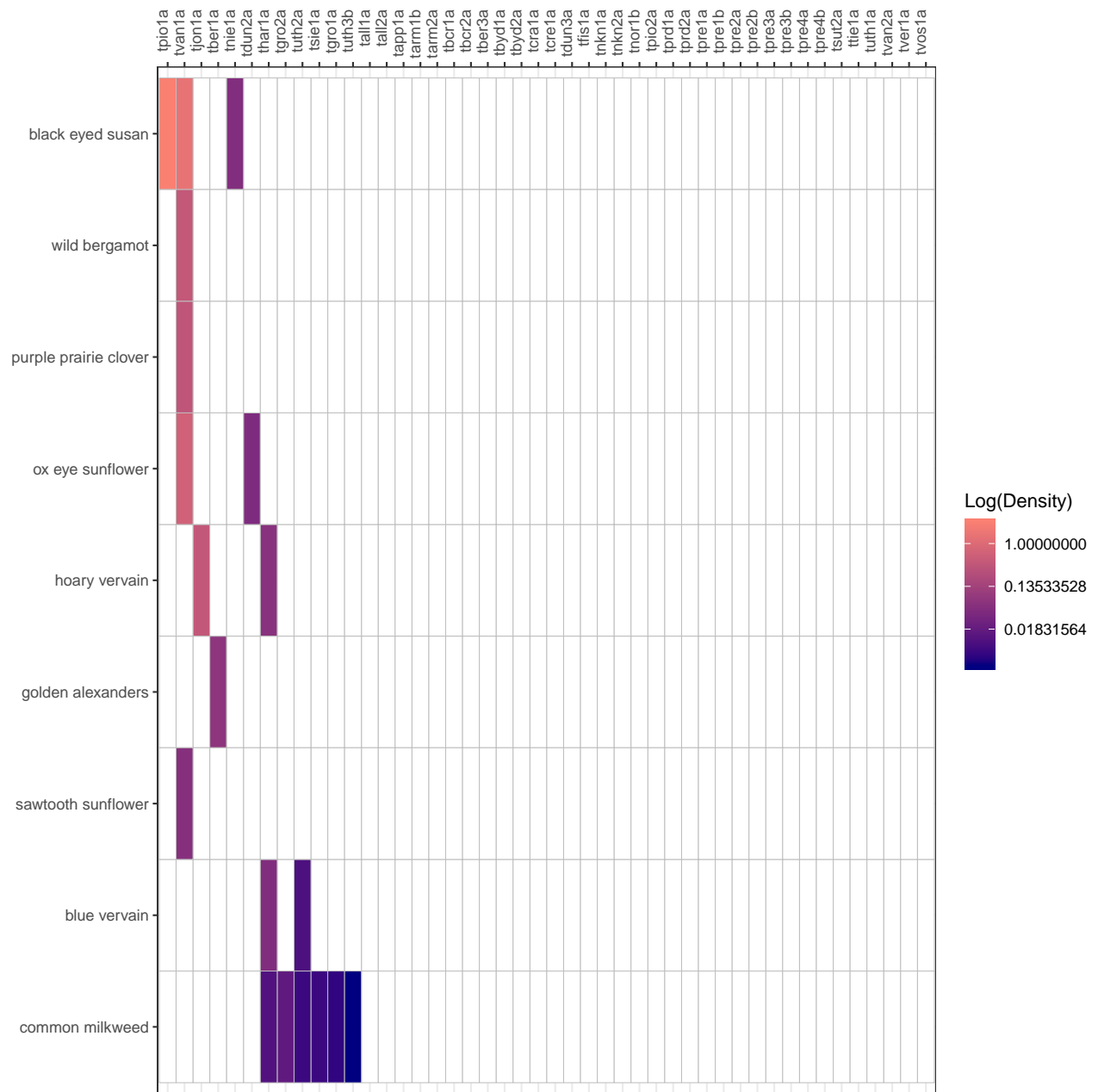
[illegible]

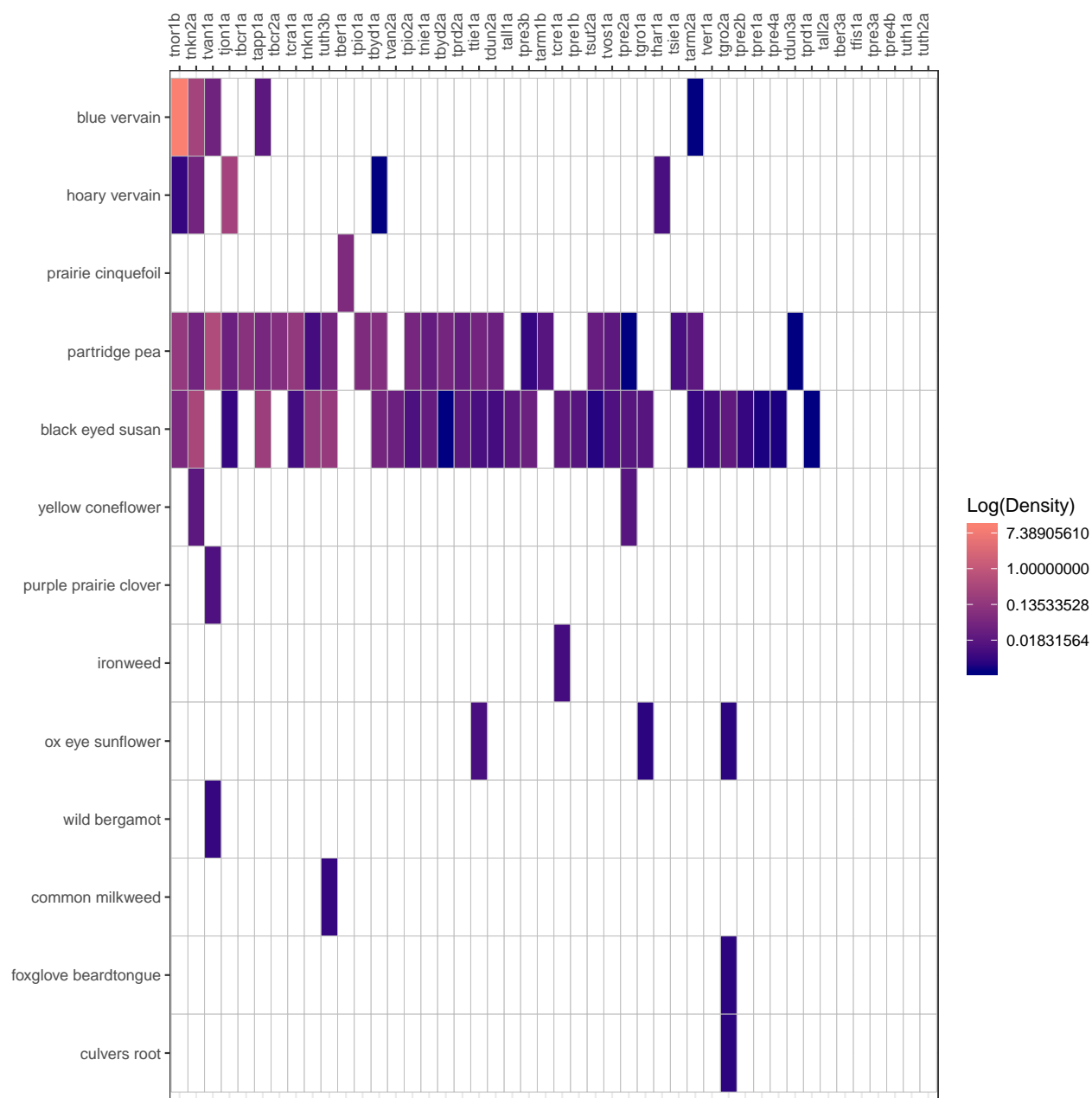


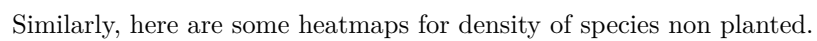


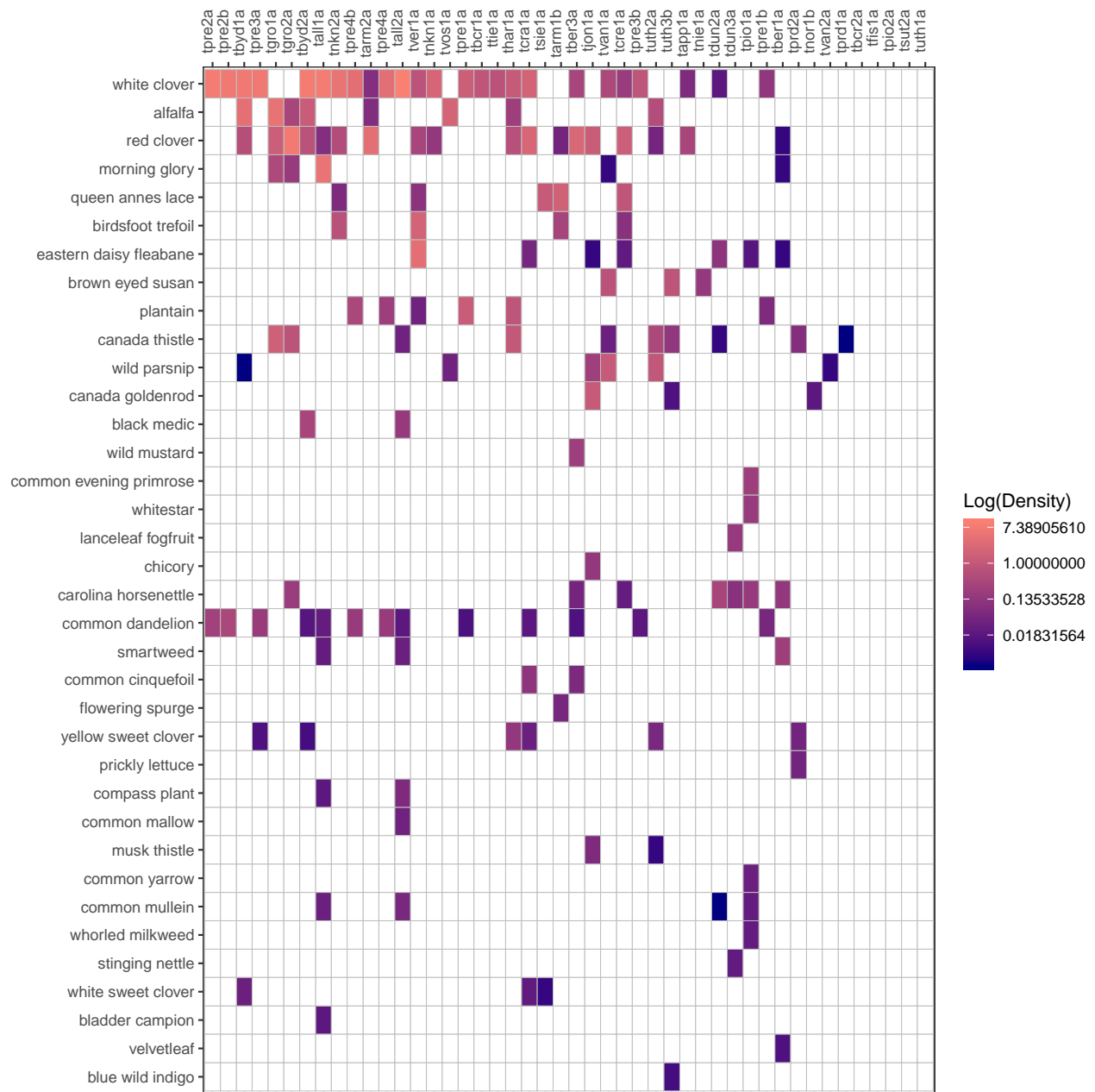


Here are some heatmaps for density of species planted with transects on the columns and species on the rows sorting transects by average density and sorting species by average density.













Binary heatmaps for density of species planted.

