

# ISU Monarch Data Summary for NCIG

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Table ?? and 4 provide mean count of nectar plant species averaged across all data collection events. Values in table represent the specific counting unit for each species, not necessarily a whole plant. Table 6 and 7 provide nectar plant species density (per 100m<sup>2</sup>) averaged across all data collection events.

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

Nectar Plant Species	tall1a	tall2a	tappla	tarm1b	tarm2a	tbcrla	tbcrla	tbcrla	tber2a	tber1a	tber3a	tbyd1a	tbyd2a	tcrala	tcrla	tdav1a	tdun2a
alfalfa	-	-	-	-	7.7	-	-	-	-	-	-	379.0	128.7	-	-	-	-
birdsfoot trefoil	-	-	-	18.3	-	-	-	-	-	-	-	-	-	-	9.0	-	-
black medic	-	8.3	-	-	-	-	-	-	-	-	-	-	34.0	-	-	-	-
bladder campion	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
canada thistle	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
carolina horsenettle	-	-	-	-	-	-	-	-	-	7.3	2.3	-	-	-	2.7	-	33.3
common cinquefoil	-	-	-	-	-	-	-	-	-	-	3.0	-	-	-	-	-	-
common dandelion	1.3	1.0	-	-	-	-	-	-	-	-	0.7	-	1.7	1.3	-	-	-
common mallow	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
common mullein	1.7	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
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	-	-	-	-	-	-	-
morning glory	231.7	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0
queen annes lace	-	-	-	104.0	-	-	-	-	-	-	-	-	-	-	85.0	-	-
red clover	4.0	-	16.7	2.7	377.0	-	-	-	-	0.3	124.0	58.0	70.3	161.0	129.0	-	-
smartweed	1.3	1.7	-	-	-	-	-	-	-	11.3	-	-	-	-	-	-	-
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
white sweet clover	-	-	-	-	-	-	-	-	-	-	-	3.3	-	1.7	-	-	-
wild mustard	-	-	-	-	-	-	-	-	-	-	11.0	-	-	-	-	-	-
wild parsnip	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	0.3	-
yellow sweet clover	-	-	-	-	-	-	-	-	-	-	-	-	1.0	2.3	-	-	-

Table 2: 2016 nectar plant species: mean count across all surveys

Nectar Plant Species	tdun3a	tfisla	tgrola	tgro2a	tharla	tjonla	tniela	tnknla	tnkn2a	tnor1b	tpiola	tpio2a	tprd1a	tprd2a
alfalfa	-	-	272.0	20.3	6.7	-	-	-	-	-	-	-	-	-
birdsfoot trefoil	-	-	-	-	-	-	-	-	33.3	-	-	-	-	-
black eyed susan	-	-	-	-	-	-	2.3	-	-	-	210.3	-	-	-
blue vervain	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-
brown eyed susan	-	-	-	-	-	-	7.7	-	-	-	-	-	-	-
canada goldenrod	-	-	-	-	-	53.7	-	-	-	1.0	-	-	-	-
canada thistle	-	-	93.3	45.3	30.7	-	-	-	-	-	-	-	0.3	8.3
carolina horsenettle	9.7	-	-	11.7	-	-	-	-	-	-	13.3	-	-	-
chicory	-	-	-	-	-	7.3	-	-	-	-	-	-	-	-
common evening primrose	-	-	-	-	-	-	-	-	-	-	17.3	-	-	-
common milkweed	-	-	0.3	1.0	0.3	-	-	-	-	-	-	-	-	-
common mullein	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-
common yarrow	-	-	-	-	-	-	-	-	-	-	2.7	-	-	-
eastern daisy fleabane	-	-	-	-	-	0.3	-	-	-	-	1.3	-	-	-
hoary vervain	-	-	-	-	1.7	19.0	-	-	-	-	-	-	-	-
lanceleaf fogfruit	16.7	-	-	-	-	-	-	-	-	-	-	-	-	-
morning glory	-	-	26.0	10.7	-	-	-	-	-	-	-	-	-	-
musk thistle	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-
plantain	-	-	-	-	24.3	-	-	-	-	-	-	-	-	-
prickly lettuce	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3
queen annes lace	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-
red clover	-	-	82.3	415.7	18.7	64.7	-	7.3	25.0	-	-	-	-	-
stinging nettle	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-
white clover	-	-	-	-	33.0	-	-	107.7	257.0	-	-	-	-	-
whitestar	-	-	-	-	-	-	-	-	-	-	13.7	-	-	-
whorled milkweed	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-
wild parsnip	-	-	-	-	-	11.7	-	-	-	-	-	-	-	-
yellow sweet clover	-	-	-	-	4.3	-	-	-	-	-	-	-	-	4.3

Table 3: 2016 nectar plant species: mean count across all surveys

Nectar Plant Species	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	tsut2a	ttiela	tuth3b	tvanla	tverla	tvosla
alfalfa	-	-	-	-	-	-	-	-	-	-	-	-	-	100.3
birdsfoot trefoil	-	-	-	-	-	-	-	-	-	-	-	-	191.0	-
black eyed susan	-	-	-	-	-	-	-	-	-	-	-	71.0	-	-
blue wild indigo	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-
brown eyed susan	-	-	-	-	-	-	-	-	-	-	77.0	34.3	-	-
canada goldenrod	-	-	-	-	-	-	-	-	-	-	1.3	-	-	-
canada thistle	-	-	-	-	-	-	-	-	-	-	13.7	1.7	-	-
common dandelion	1.0	5.0	26.7	18.7	19.0	1.0	13.7	17.7	-	-	-	-	-	-
common milkweed	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-
eastern daisy fleabane	-	-	-	-	-	-	-	-	-	-	-	-	372.7	-
morning glory	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	30.7	-	-
plantain	98.3	6.7	-	-	-	-	17.7	37.3	-	-	-	-	4.0	-
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	17.3	-	-
queen annes lace	-	-	-	-	-	-	-	-	-	-	-	-	10.7	-
red clover	-	-	-	-	-	-	-	-	-	-	-	-	32.0	-
sawtooth sunflower	-	-	-	-	-	-	-	-	-	-	-	2.7	-	-
white clover	116.3	13.3	763.3	318.3	624.3	41.7	279.3	365.7	-	20.7	-	19.7	72.3	-
wild bergamot	-	-	-	-	-	-	-	-	-	-	-	19.7	-	-
wild parsnip	-	-	-	-	-	-	-	-	-	-	-	55.7	-	2.0
yellow sweet clover	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-



canada thistle	11.3	8.3	-	-	-	3.0	-	-	-	-	-	3.0	-	-	19.3	-	6.3	5.3	-	9.0	1.3	2.0
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
carolina horsenettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
catnip	-	-	-	-	-	-	-	-	5.7	1.0	-	-	-	-	-	-	16.0	-	-	-	-	
chicory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
common cinquefoil	126.7	21.0	3.0	0.3	-	23.0	-	0.3	-	-	-	114.7	0.7	-	-	-	-	0.7	-	-	-	
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	-	-	-	-	4.0	-	-	-	-	-	-	
common mullein	-	-	-	-	-	-	-	0.3	-	-	0.3	-	-	-	-	-	18.0	19.3	-	-	-	
common selfheal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
common sneezeweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
common yarrow	-	-	-	-	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	
compass plant	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
cup plant	-	-	-	-	-	-	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
deptford 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	-	-	23.3	-	-	-	-	-	-	
golden alexanders	-	-	-	0.3	1.7	-	-	-	-	-	0.3	-	-	-	6.7	-	-	-	0.7	-	-	
great blue lobelia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
groundcherry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.0	-	-	-	-	-	-	
hoary alyssum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
hoary vervain	0.3	-	4.0	-	-	1.0	0.3	-	-	9.3	1.0	1.7	-	-	-	10.0	127.7	-	10.0	-	-	
ironweed	-	-	0.3	-	-	-	1.3	-	-	-	-	-	-	-	-	-	1.3	-	-	-	-	
lanceleaf fogfruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	
leadplant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
lesser burdock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	
marestail	-	-	13.7	-	-	30.7	1.7	0.7	-	-	-	255.3	6.7	0.7	-	-	-	-	-	-	-	
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	-	-	-	-	-	-	-	-	
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	47.3	83.0	48.7	-	-	76.7	12.0	-	
pale purple coneflower	-	-	-	-	-	-	1.3	-	-	0.7	0.7	-	-	-	-	-	-	-	-	-	-	
panicleleaf tick trefoil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
partridge pea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	
pineapple weed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
plantain	4.7	-	-	-	17.0	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	
prairie blazing star	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
prairie cinquefoil	-	-	-	-	-	-	0.7	-	-	-	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 vervain	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	
queen annes lace	-	-	-	350.3	-	-	-	-	-	-	-	-	943.3	-	-	6.3	36.7	-	0.7	-	-	
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	-	-	
rough avens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
rough cinquefoil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
shepherds purse	-	-	-	-	-	4.3	68.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
smartweed	58.3	9.3	18.3	-	-	-	-	170.0	20.0	-	-	-	-	-	16.7	2.3	10.0	-	190.0	29.7	-	
stiff goldenrod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
stinging nettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.3	2.3	-	-	-	-	
swamp milkweed	-	-	-	-	8.0	-	-	-	-	-	-	0.7	-	-	-	-	-	-	1.7	-	-	
tall boneset	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	

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 presence.

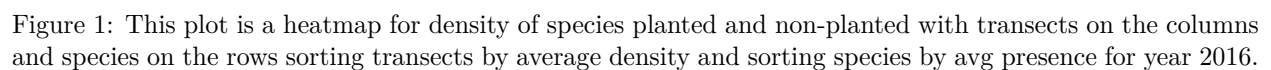
Table 6: 2016 Nectar plant species density: average density (count / m2) across all rounds

Nectar Plant Species	tall1a	tall2a	tappla	tarm1b	tarm2a	tbcrla	tbcrla	tber1a	tber3a	tbydl1a	tbydl2a	tcrala	tcrela	tdav1a	tdum2a	tdun3a	tfisla	tgrola	tgro2a
alfalfa	-	-	-	-	0.08	-	-	-	-	3.79	1.29	-	-	-	-	-	-	4.53	0.34
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	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	1.56	0.76
carolina horsenettle	-	-	-	-	-	-	-	0.15	0.05	-	-	-	0.03	-	0.33	0.10	-	-	0.19
chicory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
lanceleaf fogfruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-
morning glory	4.63	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	0.43	0.18
musk thistle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04	-	-	-	-
plantain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
prickly lettuce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
queen ames lace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
red clover	0.08	-	0.33	0.04	3.77	-	-	0.01	2.48	0.58	0.70	2.30	1.38	-	-	-	-	1.37	6.93
sawtooth sunflower	-	-	-	1.73	-	-	-	-	-	-	-	-	0.86	-	-	-	-	-	-
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	-	-	-	-
white sweet clover	-	-	-	-	-	-	-	-	-	0.03	-	0.02	-	-	-	-	-	-	-
whitestar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
whorled milkweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild bergamot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
wild mustard	-	-	-	-	-	-	-	-	0.22	-	-	-	-	-	-	-	-	-	-
wild parsnip	-	-	-	-	-	-	-	-	-	0.00	-	-	-	0.01	-	-	-	-	-
yellow sweet clover	-	-	-	-	-	-	-	-	-	-	0.01	0.03	-	-	-	-	-	-	-





[illegible]



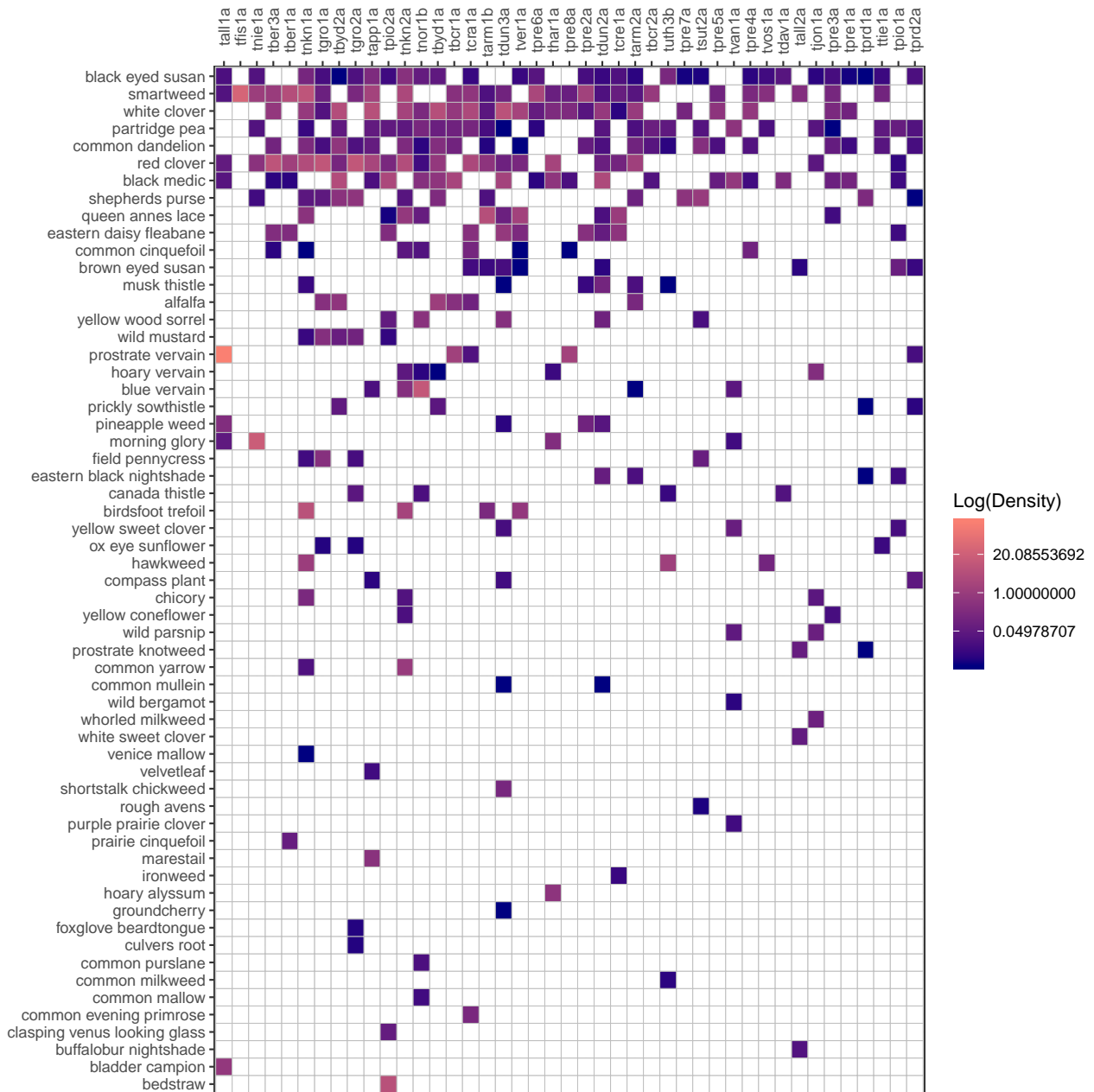


Figure 2: This plot is a heatmap for density of species planted and non-planted with transects on the columns and species on the rows sorting transects by average density and sorting species by avg presence for year 2017.

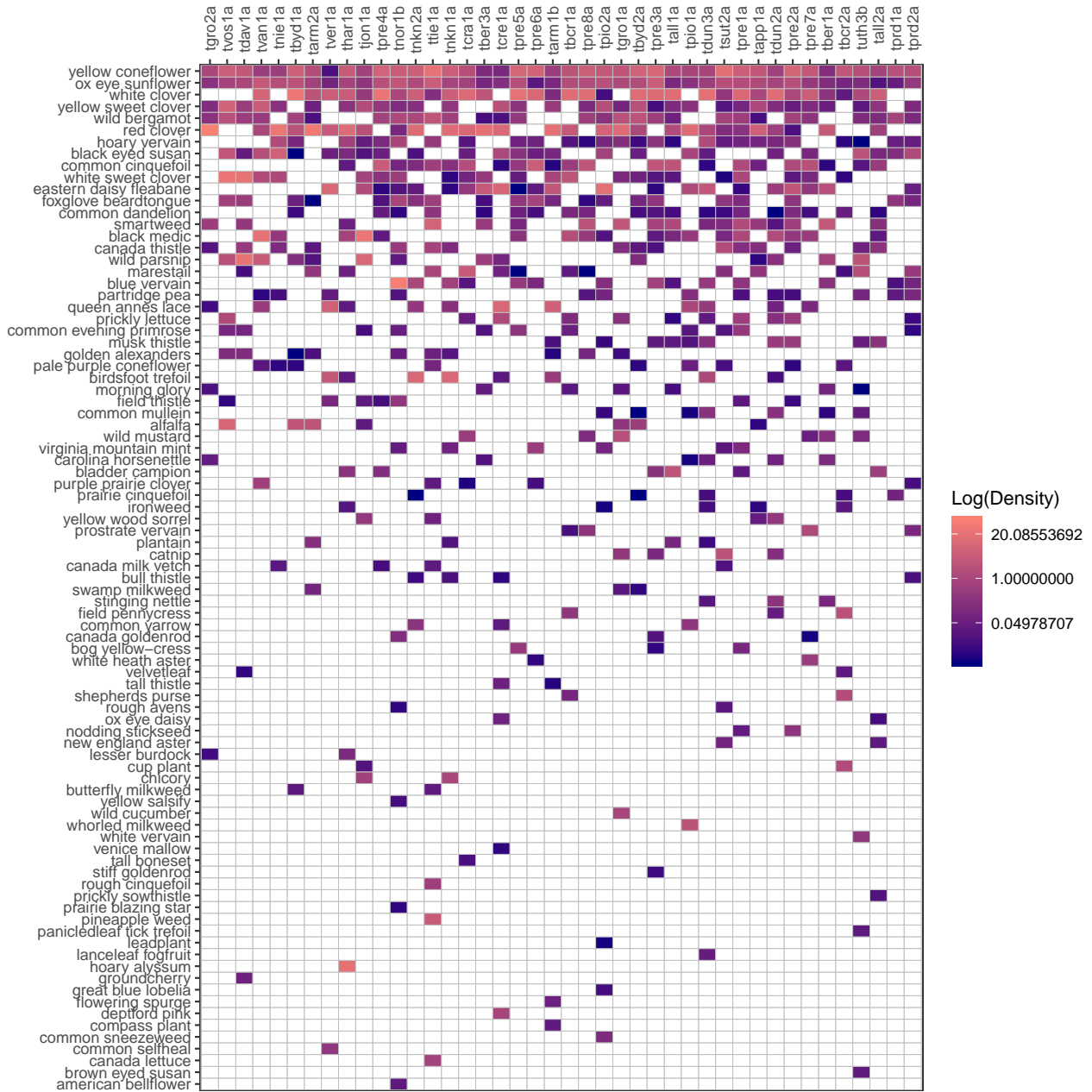


Figure 3: This plot is a heatmap for density of species planted and non-planted with transects on the columns and species on the rows sorting transects by average density and sorting species by avg presence for year 2018.

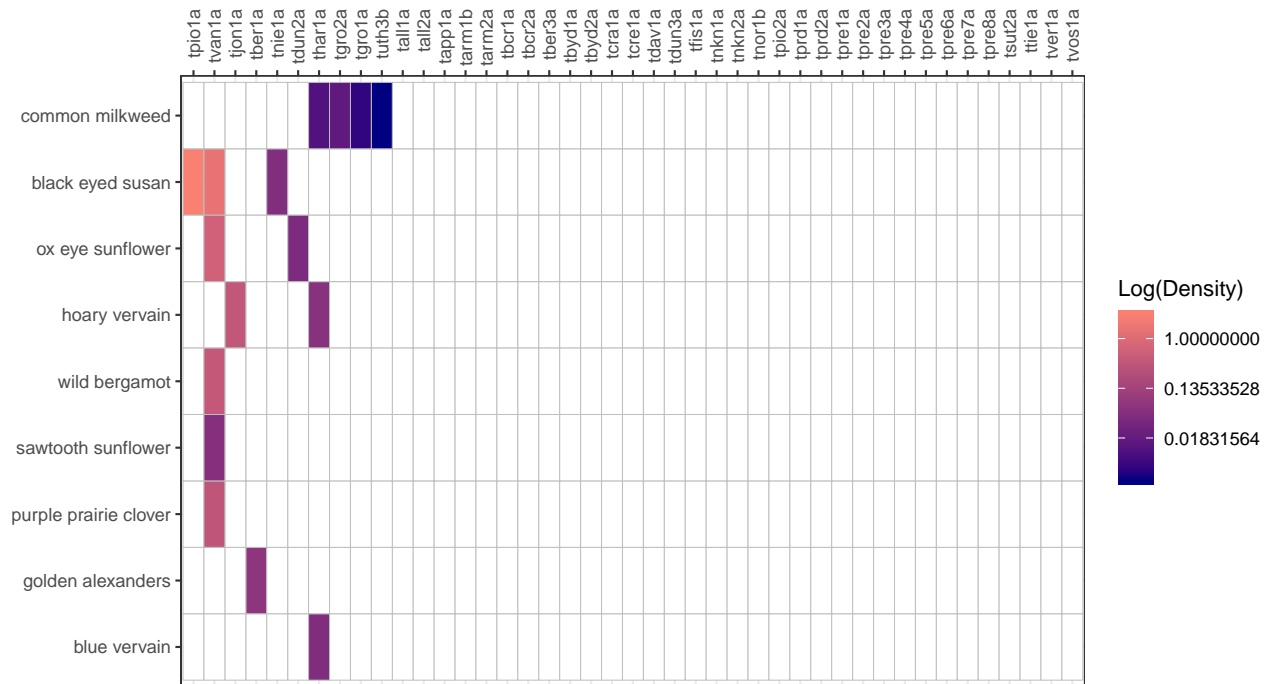


Figure 4: This plot is a heatmap for density of species planted with transects on the columns and species on the rows sorting transects by average density and sorting species by avg presence for year 2016.

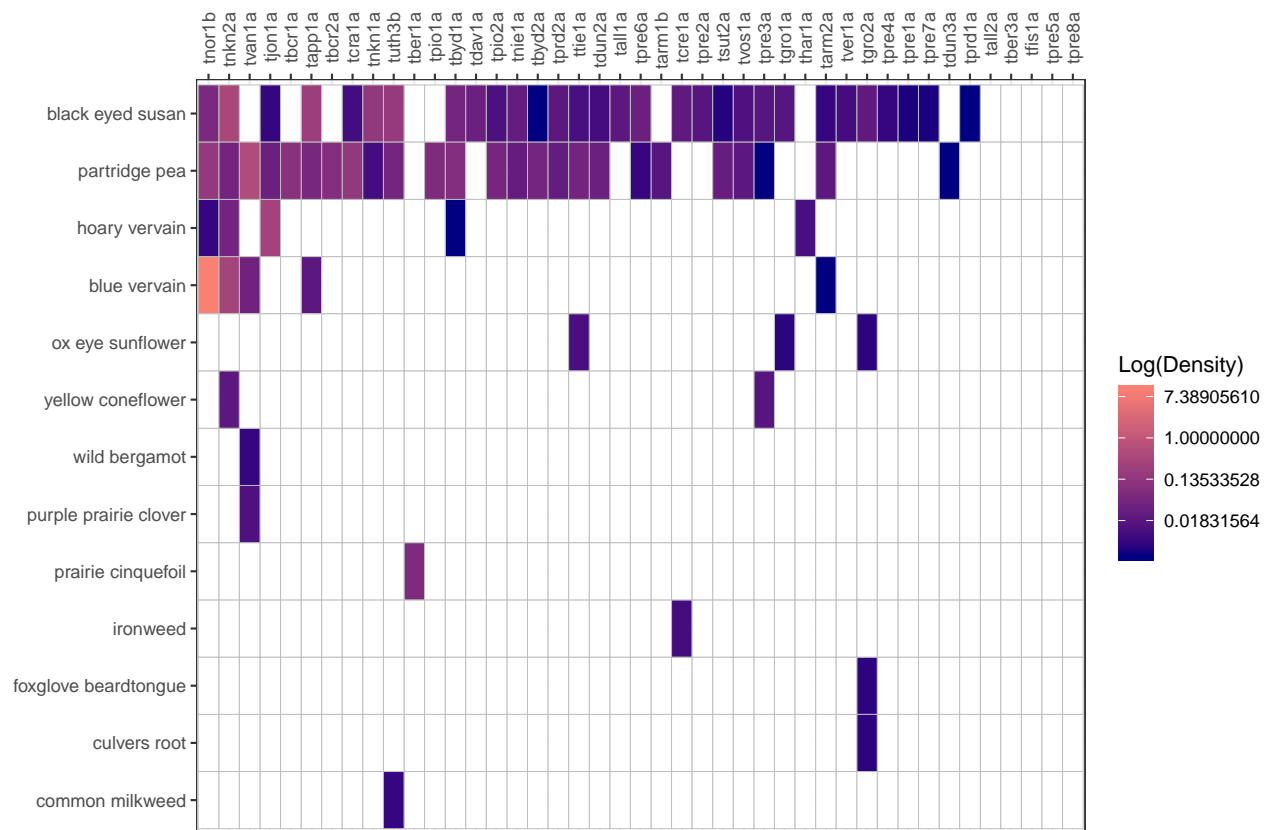
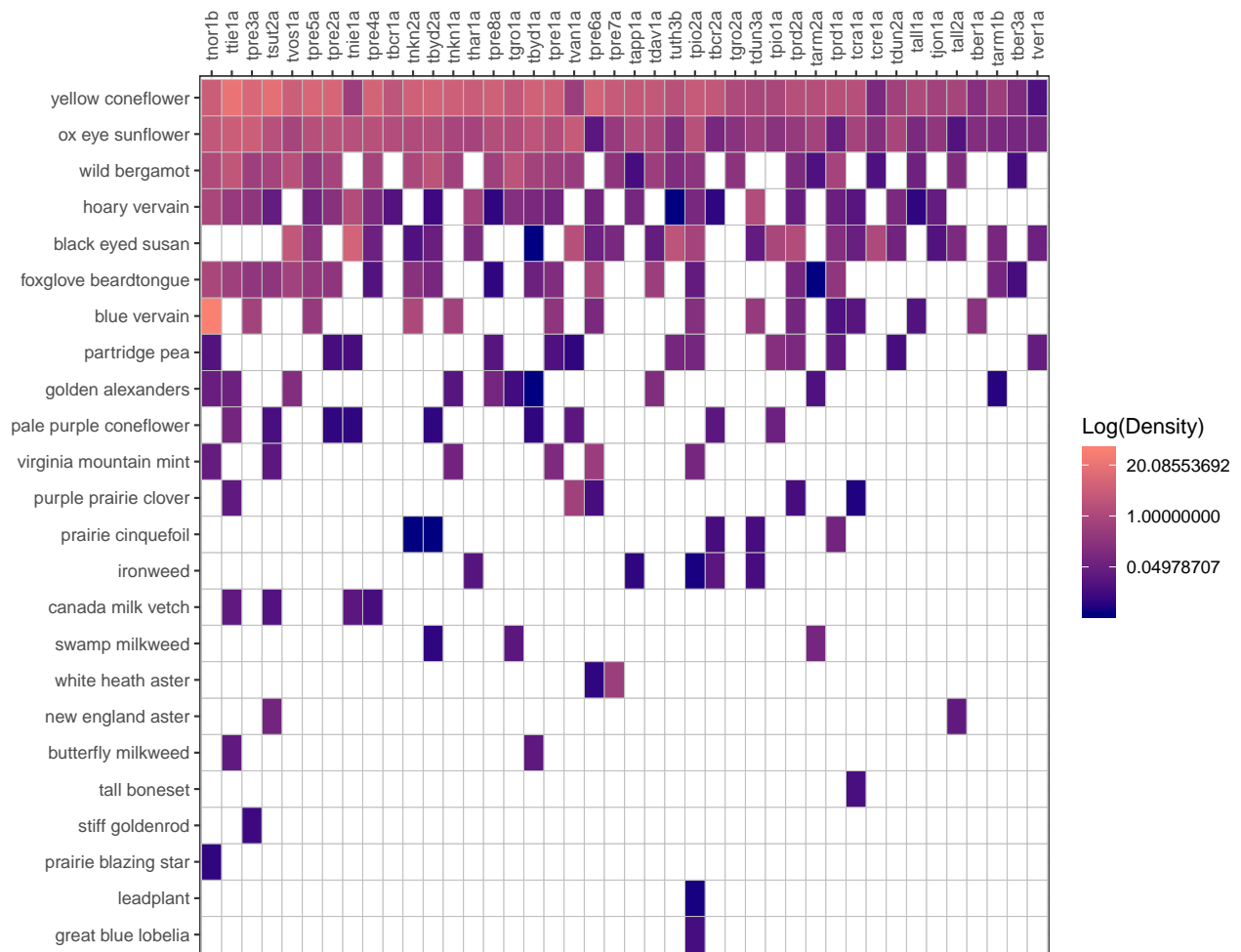
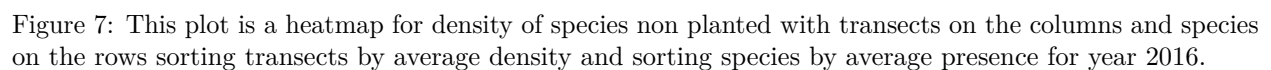
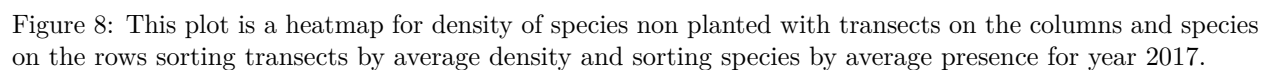


Figure 5: This plot is a heatmap for density of species planted with transects on the columns and species on the rows sorting transects by average density and sorting species by avg presence for year 2017.









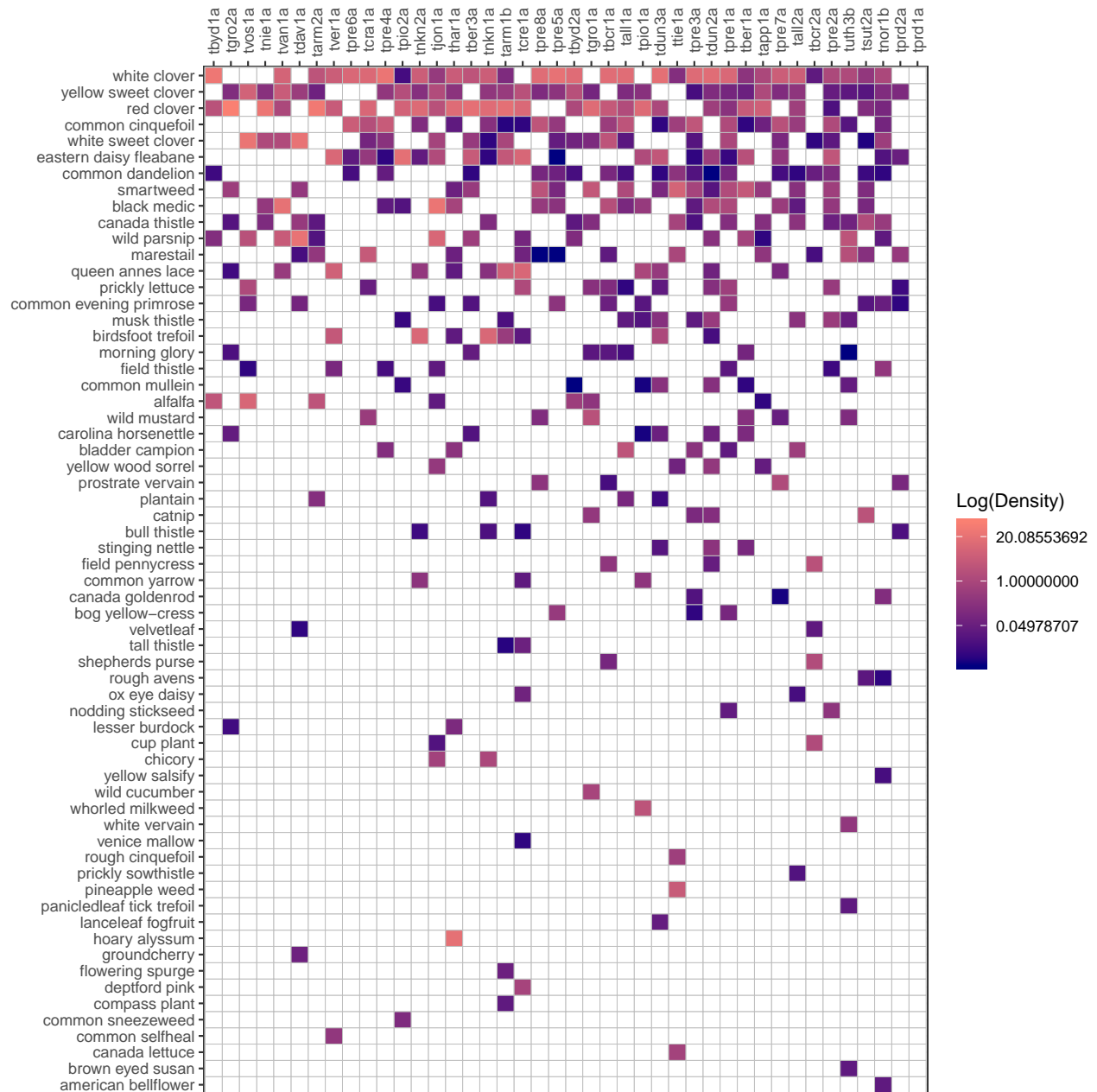


Figure 9: This plot is a heatmap for density of species non planted with transects on the columns and species on the rows sorting transects by average density and sorting species by average presence for year 2018.