ISU Monarch Data Summary for Pork Sites

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Table 1, 2, and 3 provide mean count of nectar plant species averaged across all data collection events. Table 7 provides mean count of milkweed ramets. Values in table represent the specific counting unit for each species, not necessarily a whole plant. Table 4, 5, and 6 provide nectar plant species density (per 100m2) averaged across all data collection events. Table 9 and 10 provides mean density of milkweed ramets. Values in table represent the specific counting unit for each species, not necessarily a whole plant. Figures 1, 2, 3, 4, and 5 are heatmaps which plot the log density of species (planted and non-planted) with transects on the columns and species on the rows; transects are sorted by average density and species are sorted by average presence.

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

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
common dandelion	-	-	-	1.0	5.0	26.7	18.7	19.0	1.0	13.7	17.7	-
plantain	-	-	-	98.3	6.7	-	-	-	-	17.7	37.3	-
red clover	16.7	-	-	-	-	-	-	-	-	-	-	-
white clover	3.3	42.0	-	116.3	13.3	763.3	318.3	624.3	41.7	279.3	365.7	20.7
yellow sweet clover	-	-	-	-	-	-	-	1.3	-	-	-	-

Table 2: 2017 nectar plant species: mean count across all surveys

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
alfalfa	-	16.7	-	-	-	-	-	-	-	-	-	-
black eyed susan	10.7	-	-	0.3	1.7	1.7	0.3	-	1.7	0.3	-	0.3
black medic	1.0	102.0	1.3	10.3	-	8.3	0.7	6.7	0.3	-	2.0	-
blue vervain	1.0	-	-	-	-	-	-	-	-	-	-	-
common cinquefoil	-	-	-	-	-	-	5.3	-	-	-	0.3	-
common dandelion	3.0	5.7	1.7	1.0	6.0	6.0	1.3	2.0	-	-	-	1.0
compass plant	0.3	-	-	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	-	33.3	-	-	-	-	-	-	-
marestail	20.3	-	-	-	-	-	-	-	-	-	-	-
musk thistle	-	-	-	-	1.0	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	0.3
partridge pea	2.7	5.0	4.0	-	-	0.3	-	-	0.3	-	-	1.3
pineapple weed	-	-	-	-	10.7	-	-	-	-	-	-	-
prostrate vervain	-	70.0	-	-	-	-	-	-	-	-	155.0	-
queen annes lace	-	-	-	-	-	1.3	-	-	-	-	-	-
red clover	105.7	-	-	-	-	-	-	-	-	-	-	-
shepherds purse	-	-	-	-	-	-	-	-	-	36.7	-	-
smartweed	84.0	17.7	39.7	-	151.0	15.0	9.0	10.7	119.0	-	7.3	3.7
velvetleaf	0.7	-	-	-	-	-	-	-	-	-	-	-
white clover	249.0	33.7	-	9.0	3.3	18.0	32.3	49.3	3.0	11.0	22.3	-
yellow coneflower	-	-	-	-	-	1.7	-	-	-	-	-	-

Table 3: 2018 nectar plant species: mean count across all surveys

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
alfalfa	0.3	-	-	-	-	-	-	-	-	-	-	-
black eyed susan	-	-	-	-	-	-	2.7	20.3	2.7	7.3	-	-
black medic	-	85.3	-	86.3	33.3	3.3	1.7	21.7	-	35.0	36.7	-
bladder campion	-	-	-	2.7	-	21.7	7.7	-	-	-	-	-
blue vervain	-	-	-	20.0	-	65.7	-	35.0	5.0	-	-	-
bog yellow-cress	-	-	-	7.3	-	0.7	-	38.0	-	-	-	-
butterfly milkweed	-	-	-	-	-	-	-	-	-	-	-	1.0
canada goldenrod	-	-	-	-	-	2.0	-	-	-	0.3	-	-
canada lettuce	-	-	-	-	-	-	-	-	-	-	-	21.7
canada milk vetch	-	-	-	-	-	-	0.7	-	-	-	-	1.0
canada thistle	8.3	-	-	12.3	5.3	1.7	-	-	-	-	-	23.3
catnip	-	-	-	-	-	10.7	-	-	-	-	-	-
common cinquefoil	3.0	23.0	-	94.3	119.3	273.0	205.0	35.3	236.7	153.3	264.0	16.7
common dandelion	-	5.0	2.3	6.7	12.0	2.0	2.0	6.0	0.7	1.0	8.7	7.0
common evening primrose	-	2.7	-	28.7	-	-	-	23.3	-	-	-	-
cup plant	-	-	65.0	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	0.7	277.0	0.7	0.3	0.3	1.7	23.7	-	-
field pennycress	-	13.7	101.0	-	-	-	-	-	-	-	-	-
field thistle	-	-	-	2.3	1.0	-	0.7	-	-	-	-	-
foxglove beardtongue	-	-	-	10.7	25.3	25.7	1.0	31.0	38.3	-	0.7	16.0
golden alexanders	-	-	-	-	-	-	-	-	-	-	8.3	1.7
hoary vervain	4.0	1.0	0.3	5.7	18.7	24.0	5.7	6.7	3.3	-	0.7	10.7
ironweed	0.3	-	1.3	-	-	-	-	-	-	-	-	-
marestail	13.7	1.7	0.7	-	-	-	-	0.3	-	-	0.3	29.0
morning glory	-	1.3	-	-	-	-	-	-	-	-	-	-
musk thistle	-	-	-	-	44.3	3.3	-	-	-	-	-	-
nodding stickseed	-	-	-	3.0	26.3	-	-	-	-	-	-	-
ox eye sunflower	62.7	71.0	4.3	110.0	189.7	477.0	91.3	166.7	1.3	28.7	145.3	128.0
pale purple coneflower	-	-	1.3	-	0.7	-	-	-	-	-	-	2.3
partridge pea	-	-	-	1.3	1.3	-	-	-	-	-	2.3	-
pineapple weed	-	-	-	-	-	-	-	-	-	-	-	125.0
prairie cinquefoil	-	-	0.7	-	-	-	-	-	-	-	-	-
prickly lettuce	-	6.7	-	42.7	40.3	-	-	-	-	-	-	-
prostrate vervain	-	0.7	-	-	-	-	-	-	-	99.3	24.3	-
purple prairie clover	-	-	-	-	-	-	-	-	0.7	-	-	1.0
queen annes lace	-	-	-	-	-	-	-	-	-	8.3	-	-
red clover	290.7	176.3	-	16.7	1.7	-	-	-	-	-	-	-
rough cinquefoil	-	-	-	-	-	-	-	-	-	-	-	16.7
shepherds purse	-	4.3	68.3	-	-	-	-	-	-	-	-	-
smartweed	18.3	-	-	104.7	54.3	78.3	-	10.0	-	-	221.7	226.7
stiff goldenrod	-	-	-	-	-	1.0	-	-	-	-	-	-
velvetleaf	-	-	1.7	-	-	-	-	-	-	-	-	-
virginia mountain mint	-	-	-	9.3	-	-	-	-	22.7	-	-	-
white clover	51.3	717.0	1.7	793.0	109.0	1245.3	1210.0	1970.3	498.7	403.0	1373.3	4.7
white heath aster	-	-	-	-	-	-	-	-	0.3	37.0	-	-
white sweet clover	-	125.7	0.3	78.0	3.0	2.3	10.3	4.0	-	8.0	-	-
wild bergamot	0.7	-	-	39.7	71.7	50.7	36.0	31.7	-	18.7	53.0	81.0
wild mustard	-	-	-	-	-	-	-	-	-	3.7	13.3	-
wild parsnip	0.3	-	-	-	-	-	-	-	-	-	-	-
yellow coneflower	153.7	119.0	143.7	409.3	788.3	860.0	345.0	836.7	337.0	268.0	528.3	612.0
yellow sweet clover	58.0	-	-	6.7	4.3	1.3	14.7	23.7	-	11.0	12.3	-
yellow wood sorrel	2.0	-	-	-	-	-	-	-	-	-	-	2.0

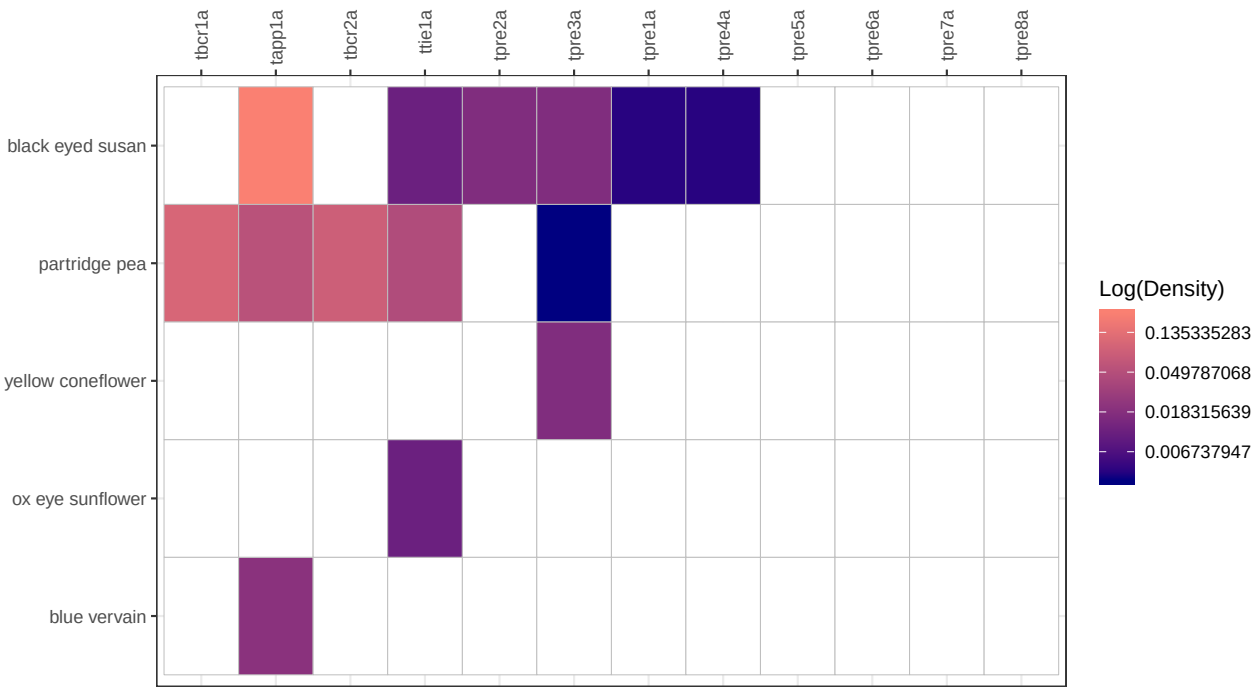

Figure 1: This plot is a heatmap for density of nectar species planted with transects on the columns and species on the rows sorting transects by average density and sorting species by avg presence for year 2017.

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

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
common dandelion	-	-	-	0.01	0.05	0.27	0.23	-	-	-	-	-
plantain	-	-	-	1.23	0.07	-	-	-	-	-	-	-
red clover	0.33	-	-	-	-	-	-	-	-	-	-	-
white clover	0.07	0.84	-	1.46	0.13	7.63	3.98	-	-	-	-	0.69
yellow sweet clover	-	-	-	-	-	-	-	-	-	-	-	-

Table 5: 2017 nectar plant species density: average density (count / m2) across all rounds

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
alfalfa	-	0.33	-	-	-	-	-	-	-	-	-	-
black eyed susan	0.21	-	-	0.00	0.02	0.02	0.00	-	-	-	-	0.01
black medic	0.02	2.04	0.03	0.13	-	0.08	0.01	-	-	-	-	-
blue vervain	0.02	-	-	-	-	-	-	-	-	-	-	-
common cinquefoil	-	-	-	-	-	-	0.07	-	-	-	-	-
common dandelion	0.06	0.11	0.03	0.01	0.06	0.06	0.02	-	-	-	-	0.03
compass plant	0.01	-	-	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	-	0.33	-	-	-	-	-	-	-
marestail	0.41	-	-	-	-	-	-	-	-	-	-	-
musk thistle	-	-	-	-	0.01	-	-	-	-	-	-	-
ox eye sunflower	-	-	-	-	-	-	-	-	-	-	-	0.01
partridge pea	0.05	0.10	0.08	-	-	0.00	-	-	-	-	-	0.04
pineapple weed	-	-	-	-	0.11	-	-	-	-	-	-	-
prostrate vervain	-	1.40	-	-	-	-	-	-	-	-	-	-
queen annes lace	-	-	-	-	-	0.01	-	-	-	-	-	-
red clover	2.11	-	-	-	-	-	-	-	-	-	-	-
shepherds purse	-	-	-	-	-	-	-	-	-	-	-	-
smartweed	1.68	0.35	0.79	-	1.51	0.15	0.11	-	-	-	-	0.12
velvetleaf	0.01	-	-	-	-	-	-	-	-	-	-	-
white clover	4.98	0.67	-	0.11	0.03	0.18	0.40	-	-	-	-	-
yellow coneflower	-	-	-	-	-	0.02	-	-	-	-	-	-

Table 6: 2018 nectar plant species density: average density (count / m2) across all rounds

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
alfalfa	0.01	-	-	-	-	-	-	-	-	-	-	-
black eyed susan	-	-	-	-	-	-	0.03	-	-	-	-	-
black medic	-	1.71	-	1.08	0.33	0.03	0.02	-	-	-	-	-
bladder campion	-	-	-	0.03	-	0.22	0.10	-	-	-	-	-
blue vervain	-	-	-	0.25	-	0.66	-	-	-	-	-	-
bog yellow-cress	-	-	-	0.09	-	0.01	-	-	-	-	-	-
butterfly milkweed	-	-	-	-	-	-	-	-	-	-	-	0.03
canada goldenrod	-	-	-	-	-	0.02	-	-	-	-	-	-
canada lettuce	-	-	-	-	-	-	-	-	-	-	-	0.72
canada milk vetch	-	-	-	-	-	-	0.01	-	-	-	-	0.03
canada thistle	0.17	-	-	0.15	0.05	0.02	-	-	-	-	-	0.78
catnip	-	-	-	-	-	0.11	-	-	-	-	-	-
common cinquefoil	0.06	0.46	-	1.18	1.19	2.73	2.56	-	-	-	-	0.56
common dandelion	-	0.10	0.05	0.08	0.12	0.02	0.03	-	-	-	-	0.23
common evening primrose	-	0.05	-	0.36	-	-	-	-	-	-	-	-
cup plant	-	-	1.30	-	-	-	-	-	-	-	-	-
eastern daisy fleabane	-	-	-	0.01	2.77	0.01	0.00	-	-	-	-	-
field pennycress	-	0.27	2.02	-	-	-	-	-	-	-	-	-
field thistle	-	-	-	0.03	0.01	-	0.01	-	-	-	-	-
foxglove beardtongue	-	-	-	0.13	0.25	0.26	0.01	-	-	-	-	0.53
golden alexanders	-	-	-	-	-	-	-	-	-	-	-	0.06
hoary vervain	0.08	0.02	0.01	0.07	0.19	0.24	0.07	-	-	-	-	0.36
ironweed	0.01	-	0.03	-	-	-	-	-	-	-	-	-
marestail	0.27	0.03	0.01	-	-	-	-	-	-	-	-	0.97
morning glory	-	0.03	-	-	-	-	-	-	-	-	-	-
musk thistle	-	-	-	-	0.44	0.03	-	-	-	-	-	-
nodding stickseed	-	-	-	0.04	0.26	-	-	-	-	-	-	-
ox eye sunflower	1.25	1.42	0.09	1.38	1.90	4.77	1.14	-	-	-	-	4.27
pale purple coneflower	-	-	0.03	-	0.01	-	-	-	-	-	-	0.08
partridge pea	-	-	-	0.02	0.01	-	-	-	-	-	-	-
pineapple weed	-	-	-	-	-	-	-	-	-	-	-	4.17
prairie cinquefoil	-	-	0.01	-	-	-	-	-	-	-	-	-
prickly lettuce	-	0.13	-	0.53	0.40	-	-	-	-	-	-	-
prostrate vervain	-	0.01	-	-	-	-	-	-	-	-	-	-
purple prairie clover	-	-	-	-	-	-	-	-	-	-	-	0.03
queen annes lace	-	-	-	-	-	-	-	-	-	-	-	-
red clover	5.81	3.53	-	0.21	0.02	-	-	-	-	-	-	-
rough cinquefoil	-	-	-	-	-	-	-	-	-	-	-	0.56
shepherds purse	-	0.09	1.37	-	-	-	-	-	-	-	-	-
smartweed	0.37	-	-	1.31	0.54	0.78	-	-	-	-	-	7.56
stiff goldenrod	-	-	-	-	-	0.01	-	-	-	-	-	-
velvetleaf	-	-	0.03	-	-	-	-	-	-	-	-	-
virginia mountain mint	-	-	-	0.12	-	-	-	-	-	-	-	-
white clover	1.03	14.34	0.03	9.91	1.09	12.45	15.12	-	-	-	-	0.16
white heath aster	-	-	-	-	-	-	-	-	-	-	-	-
white sweet clover	-	2.51	0.01	0.97	0.03	0.02	0.13	-	-	-	-	-
wild bergamot	0.01	-	-	0.50	0.72	0.51	0.45	-	-	-	-	2.70
wild mustard	-	-	-	-	-	-	-	-	-	-	-	-
wild parsnip	0.01	-	-	-	-	-	-	-	-	-	-	-
yellow coneflower	3.07	2.38	2.87	5.12	7.88	8.60	4.31	-	-	-	-	20.40
yellow sweet clover	1.16	-	-	0.08	0.04	0.01	0.18	-	-	-	-	-
yellow wood sorrel	0.04	-	-	-	-	-	-	-	-	-	-	0.07

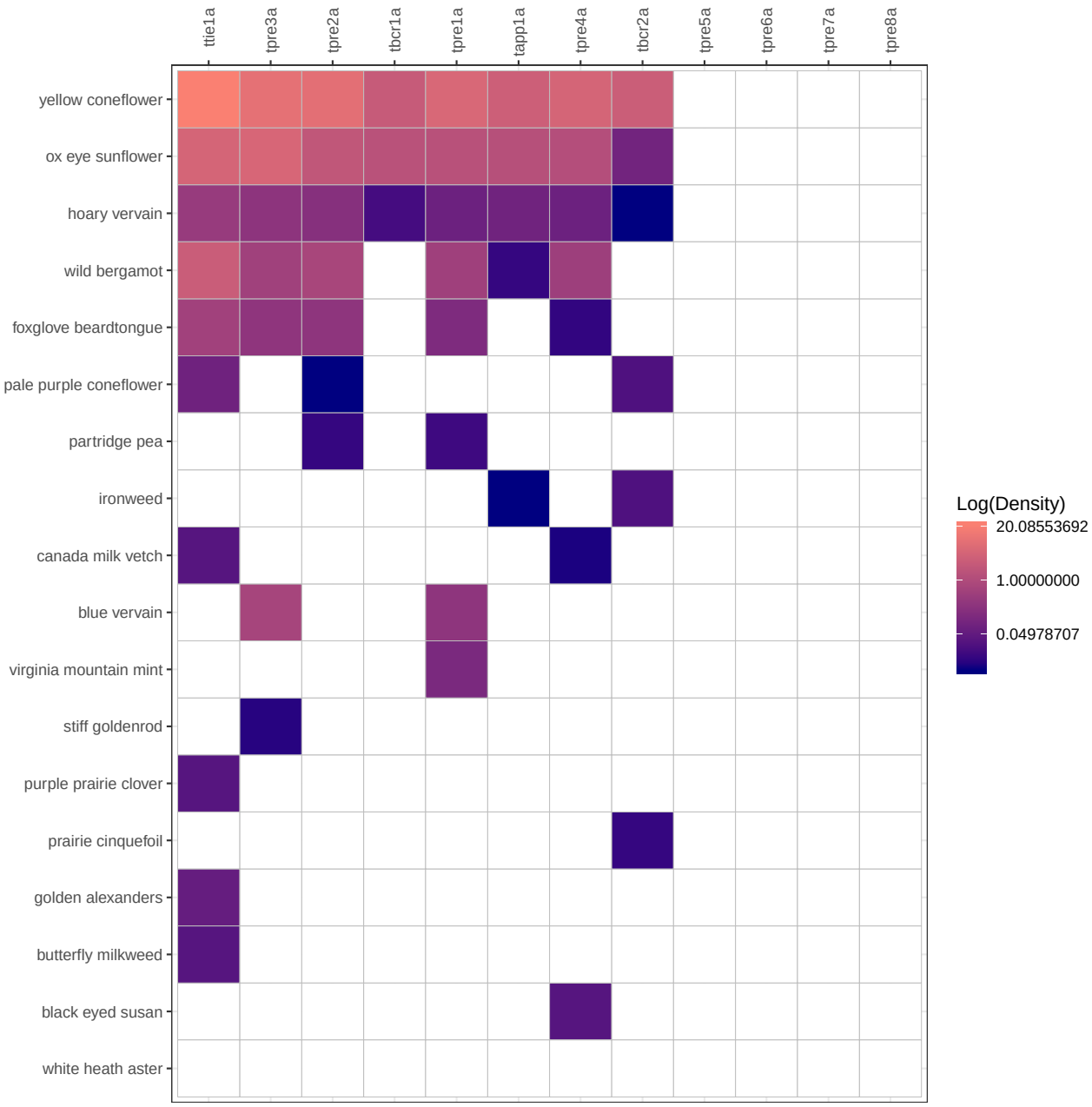

Figure 2: This plot is a heatmap for density of nectar species planted with transects on the columns and species on the rows sorting transects by average density and sorting species by average presence for year 2018.

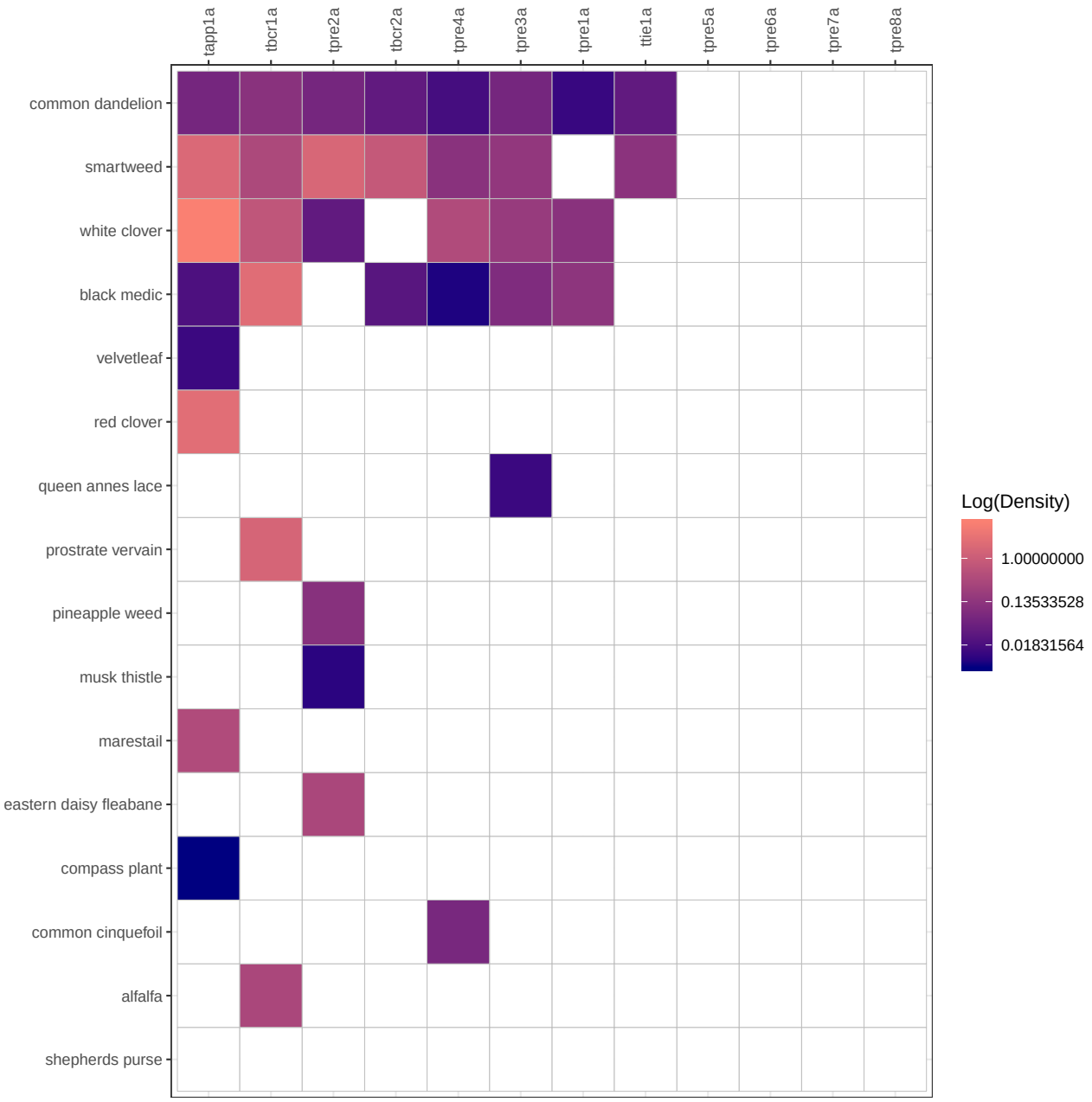

Figure 3: This plot is a heatmap for density of nectar species non planted with transects on the columns and species on the rows sorting transects by average density and sorting species by average presence for year 2017.

Figure 4: This plot is a heatmap for density of nectar 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.

Table 7: 2017 ramet plant species: mean count across all surveys

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
butterfly milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-
common milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-
swamp milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-

Table 8: 2018 ramet plant species: mean count across all surveys

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
butterfly milkweed ramet	-	0.3	-	-	-	-	-	-	-	-	-	0.3
common milkweed ramet	0.3	1.3	0.3	0.7	1.0	5.3	0.3	0.7	1.0	-	0.7	0.7
swamp milkweed ramet	0.3	-	-	-	-	0.3	-	-	-	0.3	-	-

Table 9: 2017 ramet plant species density: average density (count / m2) across all rounds

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
butterfly milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-
common milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-
swamp milkweed ramet	-	-	-	-	-	-	-	-	-	-	-	-

Table 10: 2018 ramet plant species density: average density (count / m2) across all rounds

Nectar Plant Species	tapp1a	tbcr1a	tbcr2a	tpre1a	tpre2a	tpre3a	tpre4a	tpre5a	tpre6a	tpre7a	tpre8a	ttie1a
butterfly milkweed ramet	-	0.01	-	-	-	-	-	-	-	-	-	0.01
common milkweed ramet	0.01	0.03	0.01	0.01	0.01	0.05	0.00	-	-	-	-	0.02
swamp milkweed ramet	0.01	-	-	-	-	0.00	-	-	-	-	-	-

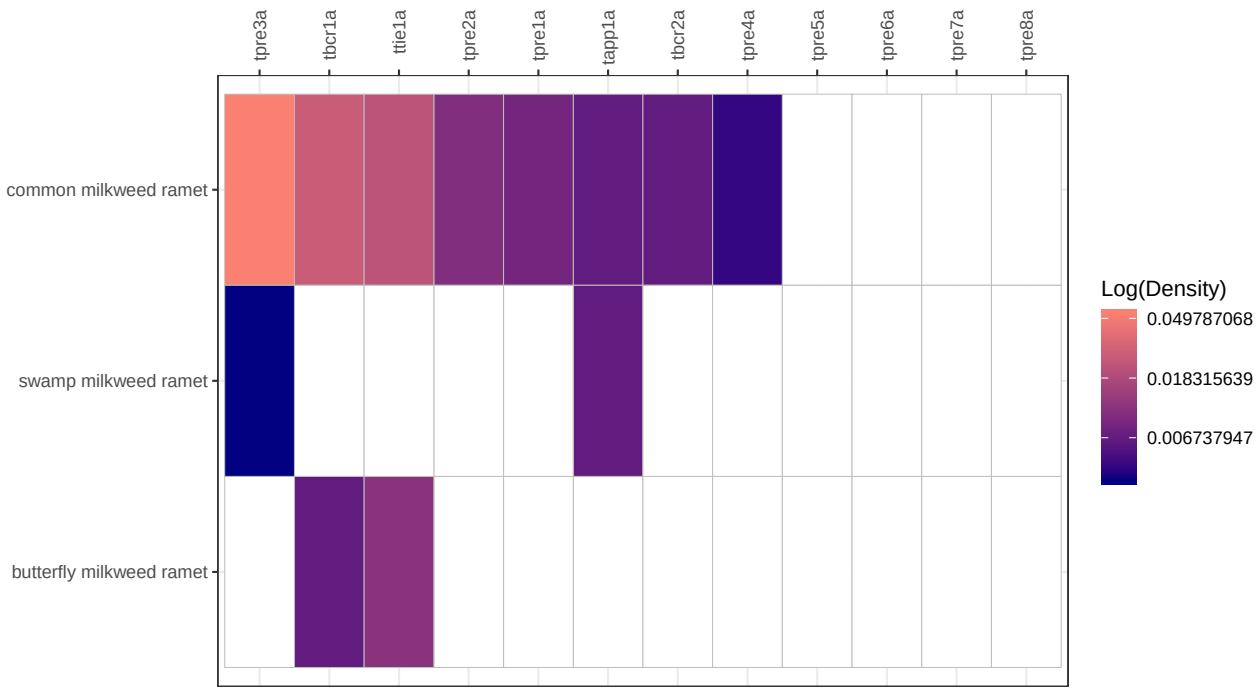

Figure 5: This plot is a heatmap for density of ramet species with transects on the columns and species on the rows sorting transects by average density and sorting species by average presence for year 2018.