

Figure 1: Monthly average vegetation height (cm) from 2016 through 2019.

Table 1: Monthly average vegetation height (cm) from 2016 through 2019.

	Boyd 1				Boyd 2				Crawfordsville				Uthe 3			
Month	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
June	18	4	42	73	14	4	39	78	7	5	93	48		20	38	60
July	12	16	30	111	15	14	39	125	11	31	115	58	62	18	42	83
August	11	21	20	113	12	16	55	94	10	47	116	88	64	22	54	84

Table 2: Yearly average vegetation height (cm) from 2016 through 2019.

site	2016	2017	2018	2019
Boyd 1	13.6	13.7	30.7	99.1
Boyd 2	13.2	11.2	44.3	99.1
Crawfordsville	9.4	27.6	108.1	64.5
Uthe 3	63.1	20.1	44.3	76.1

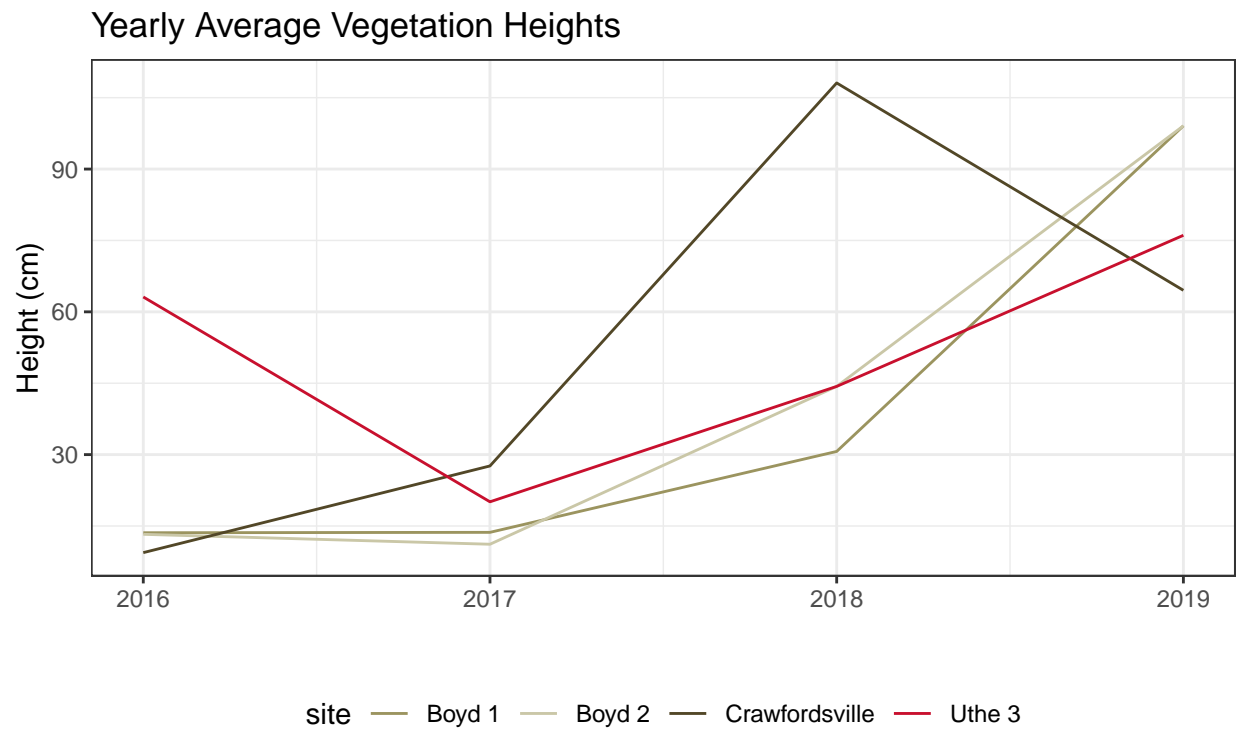


Figure 2: Yearly average vegetation height (cm) from 2016 through 2019.

Table 3: Yearly average percent cover of forbs, milkweed, warm season grasses, cool season grasses, woody species, and bare ground from 2016 – 2019.

class	Boyd 1				Boyd 2				Crawfordsville				Utter 3			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
Forbs	31	40	90	75	33	48	79	59	23	40	64	51	16	29	34	46
Milkweed	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0
Warm season grass	0	27	0	7	0	22	0	5	0	7	3	3	3	14	11	5
Cool season grass	70	3	8	19	66	3	18	32	46	19	11	14	63	11	31	57
Woody plants	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Bare ground	3	3	17	30	5	3	16	36	14	17	17	34	6	12	30	14

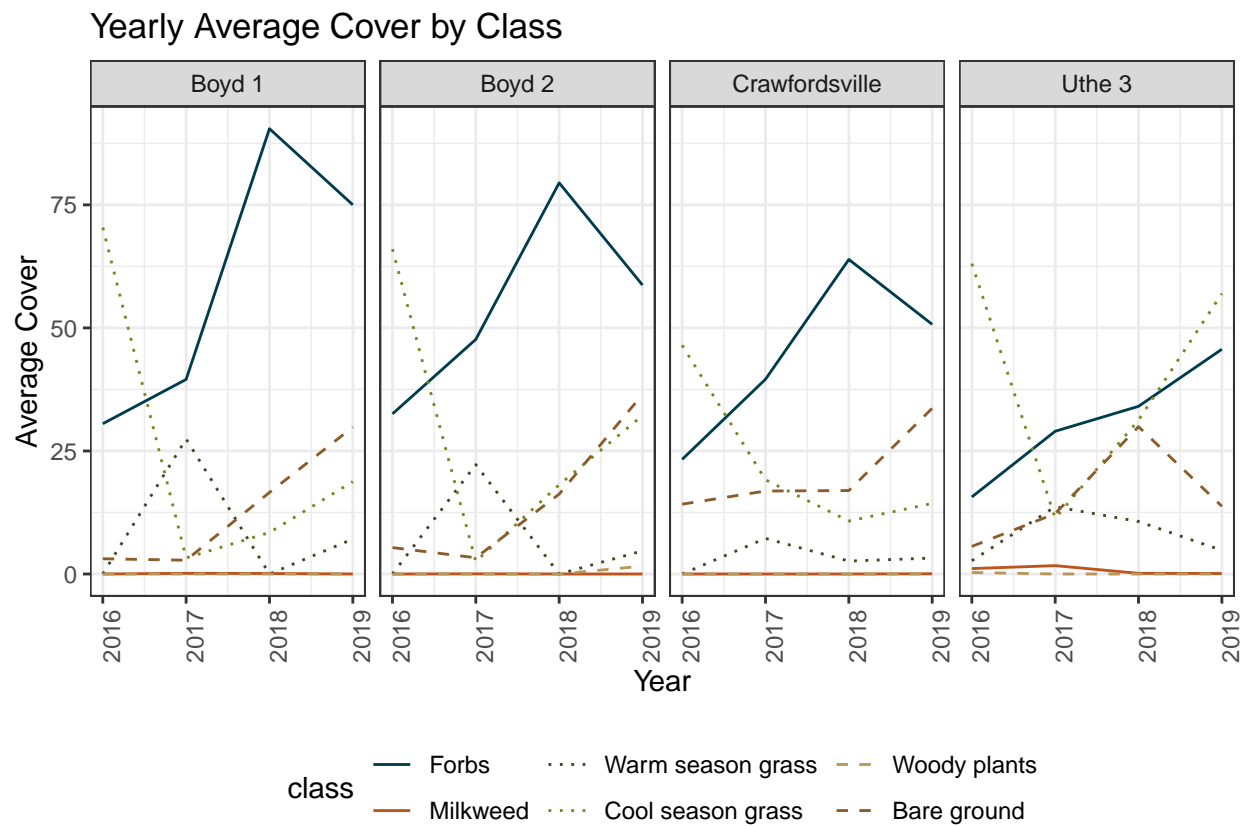


Figure 3: Yearly average percent cover of forbs, milkweed, warm season grasses, cool season grasses, woody species, and bare ground from 2016 – 2019.

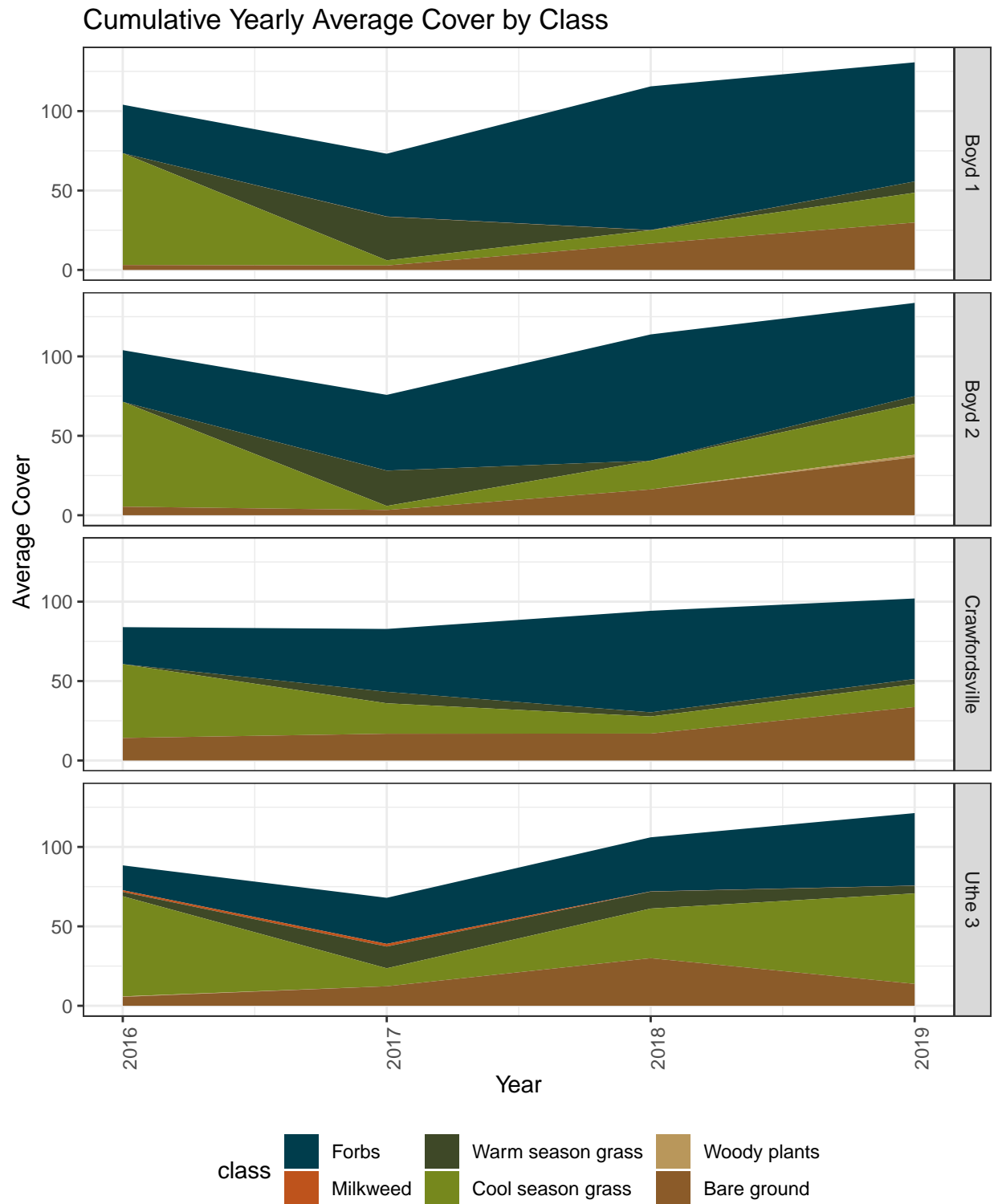


Figure 4: Trends in yearly cumulative percent cover by vegetative class and bare soil from 2016 through 2019 (based on results for Daubenmire surveys; see Table 2 and Figure 3).

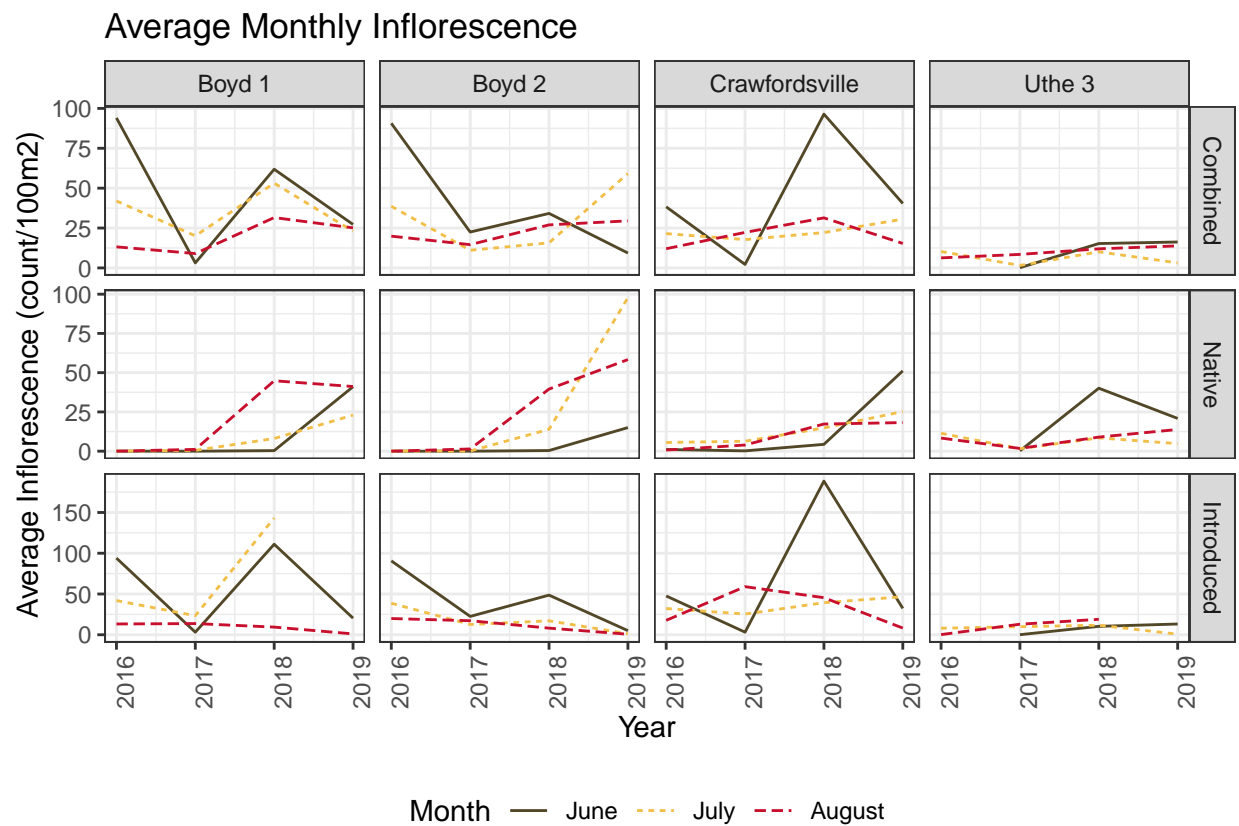


Figure 5: Plots of monthly average native forbs, extant native forbs, introduced/weed species, and combined (native and introduced/weed) nectar plant inflorescence density by year for each site.

Table 4: Logarithm of the ratio of inflorescence counts (+1) from 2019 to 2018 arranged by average across sites, thus negative values indicate a reduction while positive values indicate an increase. Missing values had no observations at that site for either 2018 or 2019.

Native status	Common name	Boyd 1	Boyd 2	Crawfordsville	Uthe 3
Native (planted)	foxglove beardtongue	1.5	1.1	2.9	2.5
Native (planted)	golden alexanders	2.0	1.9		1.9
Native (planted)	canada milk vetch				1.4
Native (planted)	wild bergamot	0.5	0.6	2.5	0.7
Native (planted)	showy tick trefoil			1.0	
Native (extant)	winged loosestrife			1.0	
Introduced/weed	silver cinquefoil			0.9	
Introduced/weed	prickly lettuce			0.7	
Native (planted)	virginia mountain mint			0.6	
Native (extant)	carolina horsenettle				0.5
Native (planted)	ironweed	0.3			
Native (planted)	blue vervain			0.3	
Native (planted)	ox eye sunflower	0.1	-0.0	0.2	0.5
Introduced/weed	common dandelion	0.6	-0.2	0.0	0.0
Introduced/weed	black medic	0.0	0.0		
Native (extant)	blue wild indigo				0.0
Native (extant)	canada goldenrod				0.0
Native (extant)	common evening primrose			0.0	
Native (planted)	common milkweed				0.0
Introduced/weed	hawkweed				0.0
Introduced/weed	morning glory	0.3			-0.3
Introduced/weed	prickly sowthistle	0.0	0.0		
Native (extant)	prostrate vervain			0.0	
Introduced/weed	shepherds purse	0.0	0.0		
Introduced/weed	smartweed			0.0	
Native (planted)	pale purple coneflower	-0.2	-0.5	0.5	
Native (planted)	partridge pea	0.0	0.0	0.0	-0.4
Native (planted)	yellow coneflower	-0.4	-0.3	0.1	0.0
Native (planted)	prairie cinquefoil		-0.3		
Native (planted)	purple prairie clover			-0.3	
Introduced/weed	canada thistle		0.2		-0.8
Introduced/weed	wild mustard		0.0	-0.9	-0.0
Introduced/weed	alfalfa	-0.7	-0.5	0.0	
Native (planted)	hoary vervain	-1.5	-0.6	-0.8	1.1
Native (planted)	swamp milkweed		-0.5		
Native (extant)	brown eyed susan			0.0	-1.0
Native (extant)	eastern daisy fleabane			-0.5	
Native (planted)	tall boneset			-0.6	
Native (extant)	common cinquefoil			-0.4	-0.9
Native (planted)	butterfly milkweed	-0.7			
Introduced/weed	red clover	-0.6	-0.3	-1.2	
Introduced/weed	common mullein		-0.3		-1.1
Introduced/weed	white sweet clover	0.0	-1.3	-1.3	
Introduced/weed	white clover	-1.3	-2.4	-0.4	-0.0
Native (extant)	panicledleaf tick trefoil				-1.0
Introduced/weed	musk thistle				-1.2
Introduced/weed	yellow sweet clover		-2.7	0.0	-1.0
Native (planted)	black eyed susan	-0.3	-1.2	-1.0	-2.8
Native (extant)	white vervain				-1.5
Introduced/weed	wild parsnip	-1.7	-1.6		-1.3
Introduced/weed	marestail			-2.9	-2.7

Table 5: Logarithm of the ratio of inflorescence counts (+1) from 2019 over 2018 arranged by mean ratio across sites within each native grouping: native above double line and planted above single line. Negative values indicate a reduction while positive values indicate an increase. Missing values had no observations at that site for either 2018 or 2019.

Common name	Boyd 1	Boyd 2	Crawfordsville	Uthe 3
foxglove beardtongue	1.5	1.1	2.9	2.5
golden alexanders	2.0	1.9		1.9
canada milk vetch				1.4
wild bergamot	0.5	0.6	2.5	0.7
showy tick trefoil			1.0	
virginia mountain mint			0.6	
ironweed	0.3			
blue vervain			0.3	
ox eye sunflower	0.1	-0.0	0.2	0.5
common milkweed				0.0
pale purple coneflower	-0.2	-0.5	0.5	
partridge pea	0.0	0.0	0.0	-0.4
yellow coneflower	-0.4	-0.3	0.1	0.0
prairie cinquefoil		-0.3		
purple prairie clover			-0.3	
hoary vervain	-1.5	-0.6	-0.8	1.1
swamp milkweed		-0.5		
tall boneset			-0.6	
butterfly milkweed	-0.7			
black eyed susan	-0.3	-1.2	-1.0	-2.8
winged loosestrife			1.0	
carolina horsenettle				0.5
blue wild indigo				0.0
canada goldenrod				0.0
common evening primrose			0.0	
prostrate vervain			0.0	
brown eyed susan			0.0	-1.0
eastern daisy fleabane			-0.5	
common cinquefoil			-0.4	-0.9
panicledleaf tick trefoil				-1.0
white vervain				-1.5
silver cinquefoil			0.9	
prickly lettuce			0.7	
common dandelion	0.6	-0.2	0.0	0.0
black medic	0.0	0.0		
hawkweed				0.0
morning glory	0.3			-0.3
prickly sowthistle	0.0	0.0		
shepherds purse	0.0	0.0		
smartweed			0.0	
canada thistle		0.2		-0.8
wild mustard		0.0	-0.9	-0.0
alfalfa	-0.7	-0.5	0.0	
red clover	-0.6	-0.3	-1.2	
common mullein		-0.3		-1.1
white sweet clover	0.0	-1.3	-1.3	
white clover	-1.3	-2.4	-0.4	-0.0
musk thistle				-1.2
yellow sweet clover		-2.7	0.0	-1.0
wild parsnip	-1.7	-1.6		-1.3
maretail	8		-2.9	-2.7

Table 6: Average inflorescence (count/100m2) across all rounds by plant classification: native (planted or extant) above double line, planted above single line, and introduced/weed below double line.

Plant name	Boyd 1				Boyd 2				Crawfordsville				Uthe 3			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
black eyed susan		14	1				1	15			3	14			26	343
blue vervain												7	14			
butterfly milkweed			9	1												
canada milk vetch																27
common milkweed													1	2		
foxglove beardtongue			6	619			9	380				1043				346
golden alexanders			1	202				70								71
hoary vervain		1	14				3				4				1	11
ironweed				1												
ox eye sunflower			236	492			216	135			103	166			20	68
pale purple coneflower			2	1			1					3				
partridge pea		12				14				44				7	25	10
prairie cinquefoil							1									
purple prairie clover												1				
showy tick trefoil													14			
swamp milkweed							2									
tall boneset											4					
virginia mountain mint												4				
wild bergamot			203	707			340	2663				456			38	204
yellow coneflower			886	346			1030	516			249	334			272	288
blue wild indigo													3			
brown eyed susan										4			116		10	
canada goldenrod													4			
carolina horsenettle																2
common cinquefoil									37	21	164	96			7	
common evening primrose										50						
eastern daisy fleabane									5	52	51	29				
panicledleaf tick trefoil															10	
prostrate vervain										7						
white vervain															90	2
winged loosestrife												14				
alfalfa	568	170	273	182	193	54	52	53		31						
black medic		52			102	377										
canada thistle							4	8					20	3	20	2
common dandelion		27	3	16	2	55	4	2	6					2		
common mullein							1								6	
hawkweed													383			
marestail											1094				500	
morning glory				1											1	
musk thistle													1	14		
prickly lettuce												14	86			
prickly sowthistle		12				15										
red clover	87	102	206	86	106	22	111	51	230	389	945	57				
shepherds purse		68				123										
silver cinquefoil												10				
smartweed										81						
white clover	645	450	2882	463	757	403	1327	14	192	281	1094	696			120	174
white sweet clover	5						10		7		12					
wild mustard						22					129	14			39	19
wild parsnip	1		45				20								356	18
yellow sweet clover					3		274		10						9	



Figure 6: Heat map of average nectar plant inflorescence density; species sorted by average presence.

Table 7: Yearly observed monarch eggs, larvae (by milkweed species), adults during the pollard walk, total adults during a site visit and total number of milkweed ramets (butterfly, common and swamp) and combined.

	Boyd 1				Boyd 2				Crawfordsville				Uthe 3			
Monarch	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
Adults, survey	0	0	21	2	0	0	15	0	0	4	4	7	4	8	9	6
Adults, total	0	0	24	6	0	0	17	8	0	7	5	11	8	11	21	11
Eggs, butterfly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs, common	0	0	0	3	0	0	0	8	0	17	9	4	0	2	0	1
Eggs, swamp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs, total	6	0	0	3	1	0	0	8	0	17	9	4	0	2	0	1
Larvae, butterfly	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Larvae, common	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	2
Larvae, swamp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Larvae, total	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	2
Ramets, butterfly	0	1	3	2	0	0	0	5	0	0	7	1	0	0	0	0
Ramets, common	0	14	30	30	0	7	24	30	0	29	20	30	0	30	30	28
Ramets, swamp	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Ramets, total	60	19	33	32	50	7	25	35	31	29	27	31	40	30	30	28

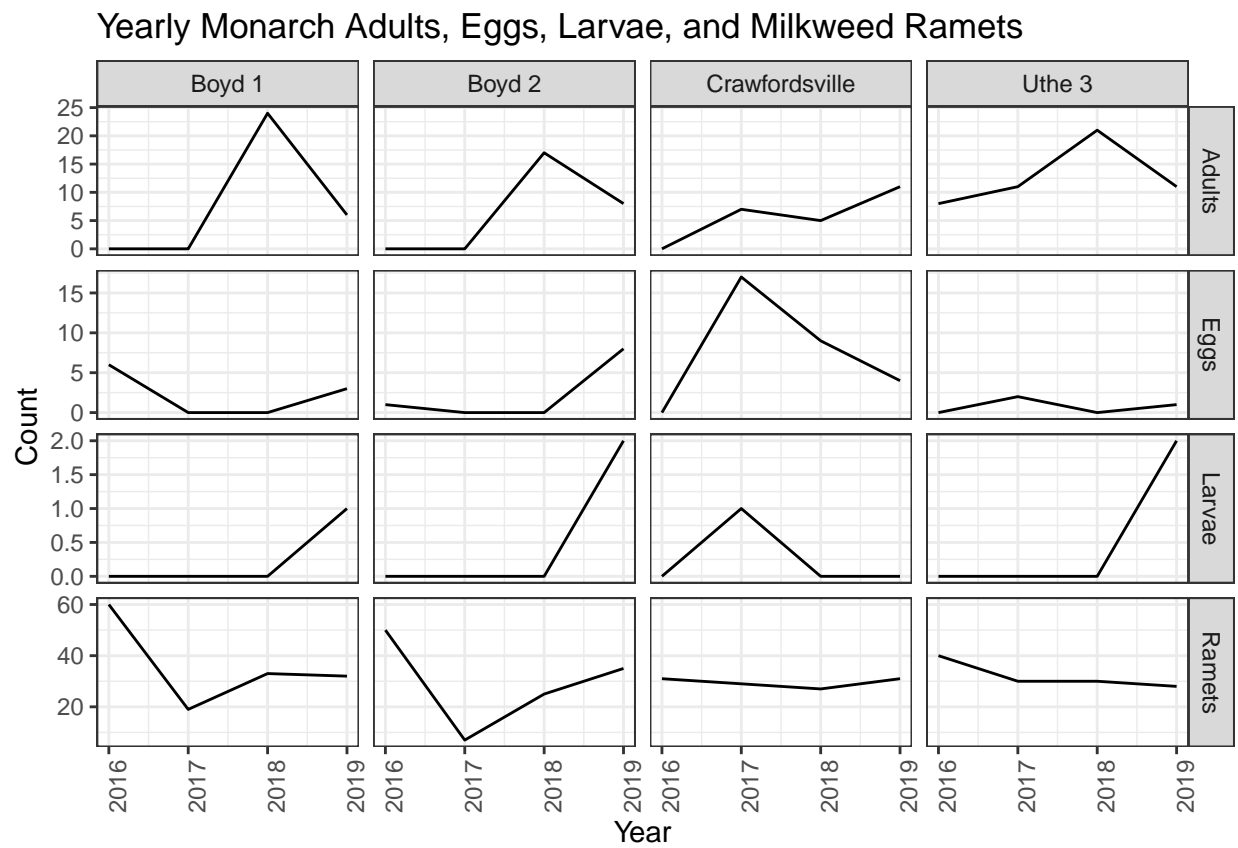


Figure 7: Yearly observed monarch eggs, larvae, and adults during a site visit and total number of milkweed ramets (butterfly, common and swamp combined).

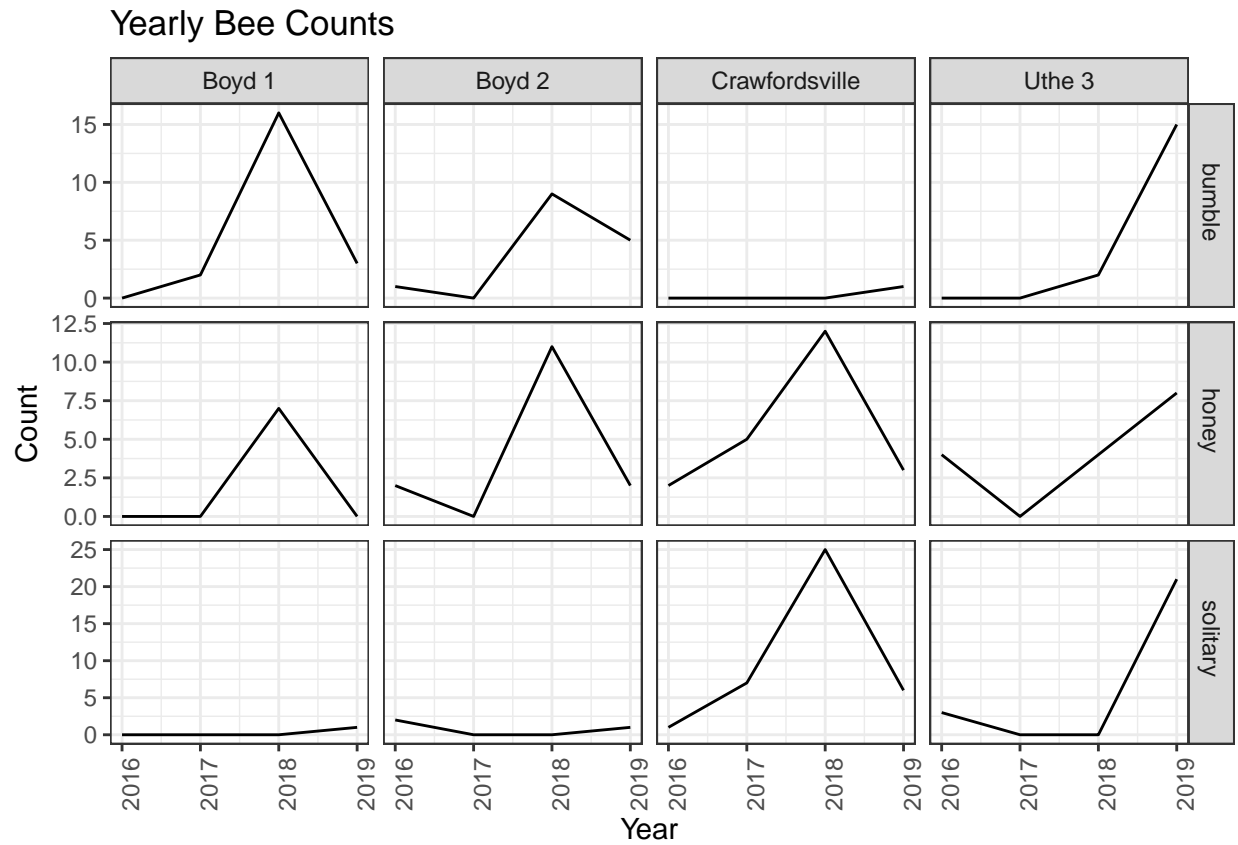


Figure 8: Total count of bumble bees, honey bees, and solitary bees by site and year.

Table 8: Yearly count of bumble bees, honey bees, and solitary bees by site.

Bee type	Boyd 1				Boyd 2				Crawfordsville				Uthe 3			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
bumble	0	2	16	3	1	0	9	5	0	0	0	1	0	0	2	15
honey	0	0	7	0	2	0	11	2	2	5	12	3	4	0	4	8
solitary	0	0	0	1	2	0	0	1	1	7	25	6	3	0	0	21

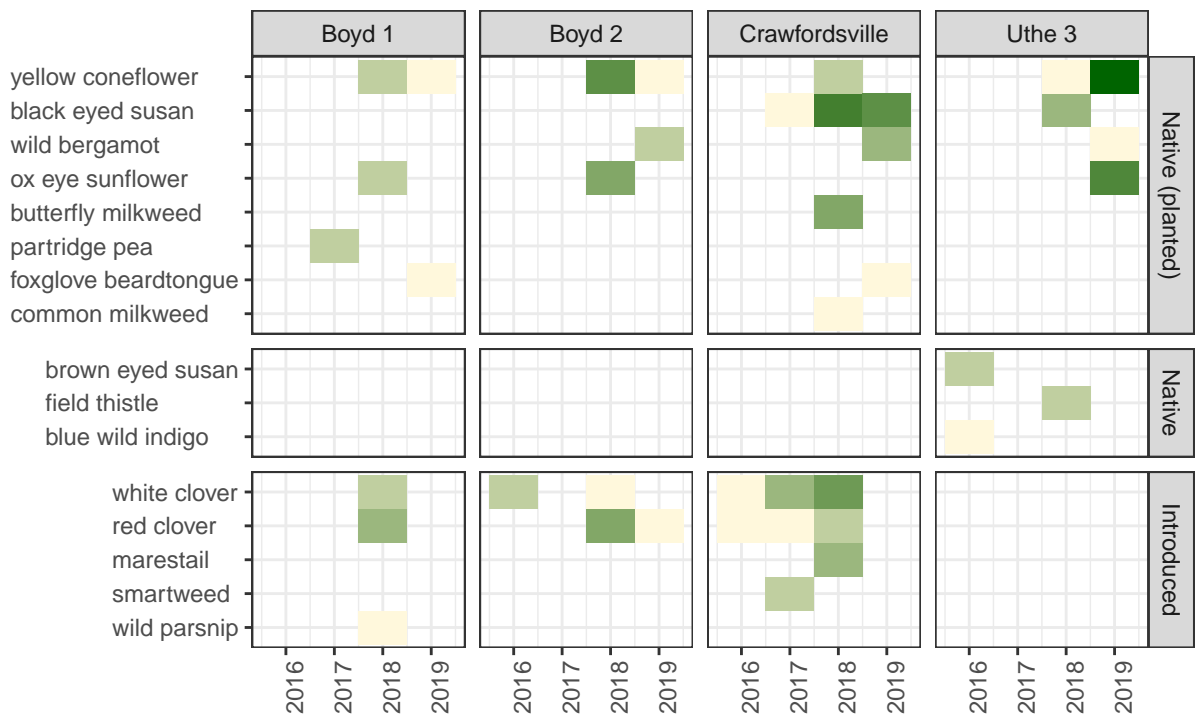


Figure 9: Plant usage by bees by classification: native (planted), native (extant), and introduced/weed.

Table 9: Bee plant usage by bee type and plant classification: native (planted or extant) above double line, planted above single line, and introduced/weed below double line.

Bee type	Plant name	Boyd 1				Boyd 2				Crawfordsville				Uthe 3			
		2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
bumble	foxglove beardtongue				1								1				
bumble	ox eye sunflower			1													
bumble	partridge pea		2														
bumble	wild bergamot								2								11
bumble	yellow coneflower			12	2			5	2								4
honey	black eyed susan											8				3	
honey	ox eye sunflower			2				4									
honey	wild bergamot												3				
honey	yellow coneflower			2				6	2							1	8
solitary	black eyed susan										1	8	6				
solitary	butterfly milkweed											4					
solitary	common milkweed											1					
solitary	ox eye sunflower																7
solitary	wild bergamot																1
solitary	yellow coneflower				1				1			2					13
bumble	field thistle															2	
honey	blue wild indigo													1			
honey	brown eyed susan													3			
solitary	brown eyed susan													2			
bumble	red clover			3				4	1								
bumble	white clover					1											
honey	red clover									1							
honey	white clover			2		2		1		1	5	4					
honey	wild parsnip			1													
solitary	marestail											3					
solitary	red clover										1	2					
solitary	smartweed										2						
solitary	white clover					2				1	3	5					