

Appendix B

Comparison of impervious cover data from U.S. Fish and Wildlife (FWS), SWCA Environmental Consultants (SWCA), and City of Austin (COA).

Springshed	Area Analyzed						Area Impervious						Percent Impervious			FWS vs. SWCA Notes	FWS vs. COA Notes
	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Austin Blind Salamander																	
Parthenia (Main) Spring	76597	30,998					2579.4						3.37				
Eliza Spring	76615	31,005					2581.0						3.37				
Sunken Gardens (Old Mill) Spring	2	1					0.0						2.86				
Georgetown Salamander																	
Avant Spring	8,993	3,639	8,937	3,617			62.9	25	515.6	209			0.70	5.77			Watersheds appear similar. New quarry at downstream end of watershed (approximately 200+ acres) accounts for some of the difference. Additional difference in IC acres is likely due to differences in analysis methods.
Bat Well																	
Buford Hollow Springs	417	169	333	135			0.7	0	38.6	16			0.16	11.61			The difference in watersheds is mostly due to the fact that we went 164 ft (50 m) downstream and picked up another small drainage. The difference in the impervious cover is most likely because there's a new road and quarry [approximately 28 ac (11 ha)] that we did not have in our analysis. Additional difference in IC acres is likely due to differences in analysis methods.
Cedar Breaks Hiking Trail Spring	207	84	211	86			0.3	0	46.8	19			0.16	22.14			Watersheds appear similar. Two more roads and a new quarry [approximately 33 ac (13 ha)] in upper watershed. Additional difference in IC acres is likely due to differences in analysis methods.

Springshed	Area Analyzed						Area Impervious						Percent Impervious			FWS vs. SWCA Notes	FWS vs. COA Notes
	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Cedar Hollow Spring	121	49	69	28			0.1	0	4.8	2			0.08	6.94			
Cobb Springs	535	216	454	184			0.0	0	0.2	0			0.01	0.04			
Cobb Well																	
Cowan Creek Spring	6,660	2,695	6,515	2,636			61.3	25	526.4	213			0.92	8.08			
Hog Hollow Spring	83	33	77	31			0.0	0	0.3	0			0.00	0.35			
Knight (Crockett Garden) Spring	7	3	7	3			0.0	0	0.3	0			0.00	4.09			
San Gabriel Spring	258,017	104,416					2013.5	815					0.78				
Shadow Canyon	25	10	24	10			0.2	0	0.7	0			0.74	3.02			

The difference in watershed size most likely due to slightly different point location and the fact that we went 164 ft (50 m) downstream and included an extra small ephemeral stream. A large lot development our layer didn't pick up is likely the reason for difference in impervious cover. Difference in watershed size most likely due to slightly different point location and the fact that we went 164 ft (50 m) downstream of the site, picking up an extra small ephemeral stream.

Watersheds appear similar. The difference in impervious cover is somewhat explained by an additional high density subdivision in the watershed (about 700 ac (284 ha) of new development). Other differences likely due to differences in analysis methods.

The difference in watersheds is due to the fact that we started 164 ft (50 m) downstream of the site. Watersheds appear similar. Difference in impervious cover is likely due to differences in analysis methods.

Watersheds appear similar. Difference in impervious cover acres is likely due to differences in analysis methods.

Springshed	Area Analyzed						Area Impervious						Percent Impervious			FWS vs. SWCA Notes	FWS vs. COA Notes	
	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA			
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares						
Swinbank Spring	9	4	19	8			0.6	0	3.9	2			6.90	20.53		<p>Watersheds are slightly different due to different methods of delineation. Difference in IC acres is likely due to differences in analysis methods.</p> <p>The difference in watersheds is due to the fact that we went 164 ft (50 m) downstream. Difference in IC acres is likely due to differences in analysis methods. Our point is more than 1,640 ft (500 m) from theirs, so the watersheds are not comparable.</p>		
Twin Spring	78	32	72	29			2.7	1	10.2	4			3.45	14.27				
Walnut Spring	1	0	196	79			0.0	0	13.4	5			0.00	6.85				
Water Tank Cave																		
Jollyville Plateau Salamander																		
1	1,736	703			1,736	703	124.0	50			127.1	51	7.14			7.32		
2	1,659	671			1,658	671	124.0	50			126.9	51	7.48			7.65		
3, Lanier Spring	1,604	649	1,565	633	1,604	649	124.0	50	208.7	84	126.7	51	7.73	13.34		7.90	<p>Watersheds appear similar. There is some difference in impervious cover acres due to an additional development that was not reflected in our analysis [~68 ac (28 ha)]. The rest of the difference in impervious cover acres is likely due to differences in analysis methods.</p>	
4	1,688	683			1,688	683	124.0	50			126.9	51	7.35			7.52		
5	648	262			648	262	61.2	25			65.7	27	9.45			10.14		
6	243	98			243	98	38.8	16			40.8	17	15.99			16.80		
9	215	87			215	87	43.5	18			43.5	18	20.27			20.26		
10	235	95			235	95	43.5	18			43.5	18	18.50			18.50		
12	293	119			293	118	43.5	18			44.0	18	14.84			15.04		
13	411	166			411	166	43.5	18			44.7	18	10.58			10.88		

Springshed	Area Analyzed						Area Impervious						Percent Impervious			FWS vs. SWCA Notes	FWS vs. COA Notes	
	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA			
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares						
14, Lower Ribelin	520	210	521	211	519	210	43.5	18	106.3	43	45.1	18	8.37	20.39	8.69	Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream of the site. There is some difference in impervious cover acres due to an additional development that was not reflected in our analysis [-68 ac (28 ha)]. The rest of the difference in IC acres is likely due to differences in analysis methods.		
15	17	7			17	7	0.0	0			0.0	0	0.00		0.00			
16	15	6			15	6	0.0	0			0.0	0	0.00		0.00			
17	788	319			788	319	150.9	61			147.0	60	19.16		18.67			
20	11	5			11	5	0.0	0			2.8	1	0.28		24.90			
21	188	76			188	76	50.7	21			47.9	19	26.93		25.50			
22	31	13			31	12	12.5	5			10.2	4	40.60		33.06			
24	74	30			73	30	3.7	1			6.0	2	4.95		8.18			
25	467	189			469	190	0.0	0			0.7	0	0.00		0.16			
Audubon Spring	23	9	10	4	23	9	0.0	0	0.0	0	0.0	0	0.00	0.00	0.00		The difference in watersheds is due to the fact that their point was more than 32 ft (10 m) from ours and we went 164 ft (50 m) downstream of the site.	
Avery Deer Spring	246	100	250	101	246	99	43.4	18	54.3	22	47.7	19	17.66	21.72	19.40	The difference in watersheds is due to the fact that their point was more than 328 ft (100 m) downstream from ours. The difference in impervious cover acres is likely due to differences in analysis methods.		
Avery Springhouse Spring	24	10			25	10	11.2	5			9.1	4	45.60		36.87			
Baker Spring	79	32	9	4	79	32	0.3	0	0.0	0	0.8	0	0.41	0.46	1.06	Our point is about 66 ft (20 m) from theirs and on the creek with a much larger watershed, so the watersheds are not comparable.		
Balcones District Park Spring	2,256	913			2,256	913	755.7	306			916.5	371	33.50		40.63			
Barrow Hollow Spring	183	74			184	74	22.2	9			50.8	21	12.19		27.68			

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	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Hamilton Reserve West	554	224			553	224	80.5	33			81.5	33	14.55		14.73	<p>Difference in watersheds is due to the fact that their point was about 262 ft (80 m) upstream from ours. The difference in impervious cover acres is likely due to differences in analysis methods.</p> <p>This is a site that COA did not analyze.</p> <p>The difference in watersheds is due to the fact that their starting point was about 3281 ft (1000 m) upstream from ours. The difference in impervious cover acres is likely due to differences in analysis methods.</p> <p>Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream. The difference in impervious cover acres is likely due to differences in analysis methods.</p>	
Hearth Spring	719	291			720	291	162.4	66			228.0	92	22.58		31.67		
Hideaway Cave																	
Hill Marsh Spring	146	59	138	56	146	59	14.9	6	22.2	9	14.6	6	10.21	16.08	10.03		
Horsethief, 18	7	3			7	3	0.0	0			0.0	0	0.00		0.00		
House Spring	93	38			93	37	24.2	10			23.2	9	25.96		25.01		
Hunter's Lane Cave																	
Ilex Cave																	
Indian Spring	111	45					12.3	5					11.13				
Ivanhoe Spring 2	11	5			11	4	0.0	0			0.0	0	0.00		0.00		
Kelly Hollow Springs	254	103			253	103	58.9	24			61.0	25	23.23		24.07		
Kretschmarr Salamander Cave																	
Krienke Spring	3,235	1,309	3,085	1,248	3,233	1,308	282.7	114	562.1	227	396.0	160	8.74	18.22	12.25		
Lanier 90-foot Riffle	814	329		0	813	329	80.5	33			81.6	33	9.89		10.04		
Little Stillhouse Hollow Spring	26	11			26	11	5.3	2			6.3	3	20.46		24.24		
Long Hog Hollow	191	77	182	74	191	77	47.4	19	45.8	19	56.7	23	24.78	25.15	29.71		
Tributary Below Fire Oak																	
MacDonald Well	535	217			535	217	41.9	17			43.9	18	7.82		8.21		
Moss Gully	26	11			27	11	0.0	0			0.0	0	0.00		0.00		

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	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
PC Spring	1,630	660	1,507	610	1,631	660	190.3	77	344.0	139	218.3	88	11.68	22.82	13.39	<p>The difference in watersheds is somewhat due to the fact that their point was over 1312 ft (400 m) downstream from ours. Slightly more development [~ 45 ac (18 ha)] shows up in SWCA's analysis than ours. The rest of the impervious cover acres difference is likely due to differences in analysis methods.</p> <p>This is a recently added site that COA did not analyze.</p> <p>Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream of the site. We were about 66 ft (20 m) different in locations as well. The difference in impervious cover acres is likely due to differences in analysis methods.</p>	
Pit Spring	1,823	738			1,822	737	124.0	50			127.4	52	6.80		6.99		
Ribelin	12	5			12	5	0.0	0			0.0	0	0.00		0.00		
Ribelin 2	416	168					43.5	18				0	10.46				
Ribelin / Lanier	578	234			578	234	43.5	18			45.1	18	7.53		7.81		
Salamander Cave																	
Salamander Squeeze Cave																	
SAS Canyon	68	28			68	28	8.0	3			10.9	4	11.64		15.99		
Schlumberger Spring # 1, 19	58	24			58	23	15.8	6			13.5	5	27.03		23.45		
Schlumberger Spring #2	86	35			85	35	17.1	7			15.4	6	19.82		18.06		
Sierra Spring	347	140			347	141	69.3	28			119.7	48	19.96		34.47		
Small Sylvia Spring	1,241	502			1,240	502	274.3	111			360.6	146	22.09		29.07		
Spicewood Spring (USGS), Spicewood Tributary	377	152	368	149	376	152	115.8	47	149.1	60	176.6	71	30.75	40.50	47.01		
Spicewood Park Dam	259	105			259	105	46.4	19			63.3	26	17.96		24.47		
Spicewood Valley Park Spring, Sylvia Spring Area 4	855	346			855	346	179.8	73			241.5	98	21.03		28.25		
Stillhouse Hollow	44	18					11.2	5					25.20				
Stillhouse Hollow Spring	9	4			9	4	1.1	0			1.8	1	11.26		19.83		

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	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Stillhouse Hollow Tributary	67	27	57	23	67	27	13.4	5	11.8	5	18.5	7	19.83	20.78	27.48	Watersheds appear slightly different due to the fact that we went 164 ft (50 m) downstream of the site and we picked up more area on the eastern side. The difference in impervious cover acres is likely due to differences in analysis methods.	This is a recently added site that COA did not analyze
Stillhouse Tributary	63	25	63	26	13.2	5	17.9	7	20.96		28.31						
Sylvia Spring Area 2, Sylvia Spring Area 3	839	340			174.8	71							20.83				
Tanglewood 2	64	26											32.05				
Tanglewood Spring, Tanglewood 3	141	57	148	60	137	55	42.2	17	46.8	19	49.6	20	30.03	31.69	36.21	Watersheds appear slightly different due to the fact that we went 164 ft (50 m) downstream and we added Tanglewood 3 just downstream from Tanglewood Spring. The difference in impervious cover acres is likely due to differences in analysis methods.	The watershed is different because COA used our Tanglewood Spring watershed before we added the recent site, Tanglewood 3.
Testudo Tube																	
Three Hole Spring	645	261			61.2	25							9.49			This is a recently added site that COA did not analyze	
Treehouse Cave																	
Tributary Downstream of Grandview	101	41			100	41	8.0	3			11.3	5	7.89		11.26		
Tributary No. 3	640	259	633	256	640	259	136.5	55	145.2	59	154.1	62	21.34	22.92	24.10	Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream. The difference in impervious cover acres is likely due to differences in analysis methods.	
Trib 4 shaft - upstream	1,445	585	1,445	585	314.2	127			409.0	166	21.75				28.30		
Trib 4 shaft (downstrm)	1,595	646	1,596	646	336.8	136			445.4	180	21.11				27.91		

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	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Tributary No. 5	794	321	776	314	794	322	151.0	61	174.3	71	147.2	60	19.00	22.47	18.53	<p>Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream of the site. SWCA's analysis includes an additional ~20 ac (8 ha) of development not reflected in our analysis</p> <p>Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream of the site. The difference in impervious cover acres is likely due to differences in analysis methods.</p> <p>We could not match this site with any known Jollyville Plateau salamander sites.</p> <p>Watersheds appear similar; slight difference due to the fact that we went 164 ft (50 m) downstream of the site and SWCA's point is an additional 164 ft (~50 m) upstream from ours. The differences in impervious cover calculations partially attributable to new apartment complex [~15 ac (6 ha)] that our analysis did not analyze. Other differences likely due to differences in analysis methods.</p>	
Tributary No. 6, Bull Creek Tributary 6 (2)	1,190	482	1,221	494	1,190	481	238.4	96	308.5	125	296.5	120	20.04	25.26	24.92		
Tributary 6 @ Sewage Line	1,178	477			1,178	477	238.3	96			295.8	120	20.22		25.11		
Tributary 7			1,795	726					214.5	87				11.95			
Troll Spring	129	52			129	52	62.5	25			65.2	26	48.29		50.68		
Tubb Spring	9	4			9	4	2.7	1			3.1	1	28.55		34.29		
TWASA Cave Two Hole Cave																	
Upper Ribelin	284	115	261	106	284	115	43.5	18	76.0	31	44.0	18	15.34	29.14	15.53		
Wheless 2	283	115														This is a recently added site that COA did not analyze	

Springshed	Area Analyzed						Area Impervious						Percent Impervious			FWS vs. SWCA Notes	FWS vs. COA Notes
	FWS		SWCA		COA		FWS		SWCA		COA		FWS	SWCA	COA		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares					
Wheless Springs	411	166	142	57	412	167	0.0	0	4.6	2	0.7	0	0.00	3.21	0.18	The differences in watershed due to the fact that our point is about 1,000 ft (305 m) downstream of theirs. The difference in impervious cover acres is likely due to differences in analysis methods.	
Whitewater Cave																	
Salado Salamander																	
Big Boiling Spring, Lil' Bubbly Spring	86,681	35,079	88,143	35,670			354.2	143	3596.2	1,455			0.41	4.08		Their watershed added a portion of Stillman Creek drainage that runs into Lampassas River (different drainage). Their impervious cover layer picks several large areas of what looks like open ground with no vegetation.	
Cistern Spring	4,480	1,813					1.8	1					0.04				
Happy Days Fish Farm	172	69					11.0	4					6.42				
Hog Hollow Spring	89	36					0.0	0					0.00				
Robertson Spring	86,500	35,005					327.4	132					0.38				
Solana Spring #1	67	27					0.0	0					0.01				