



## Bear Creek Watershed Association

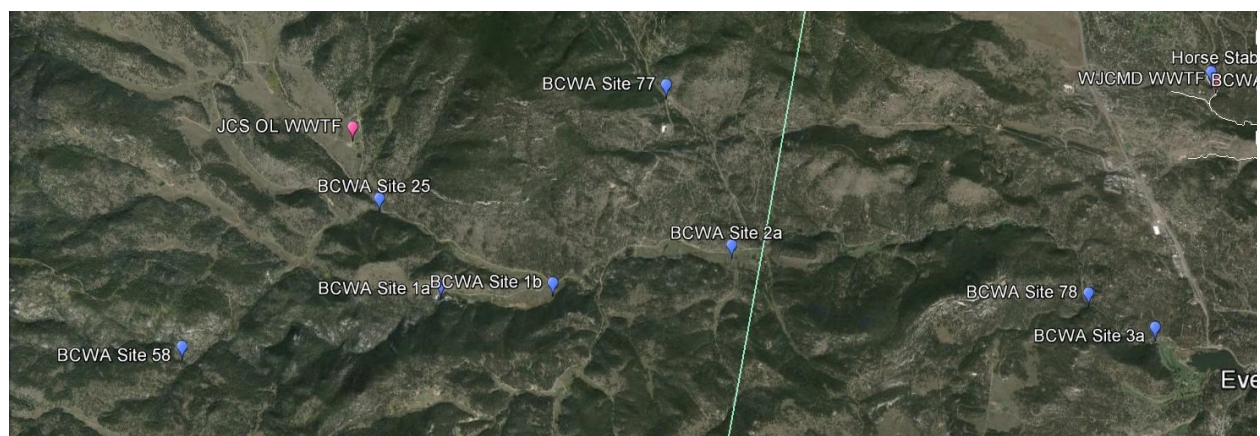
### BCWA Water Quality Data Summary 02 Nutrient Loading Upper Bear Creek Drainage May and October 2015

**Study Design & Purpose** - The BCWA is addressing measured WQ concerns on selected tributary drainages along Bear Creek. Total nitrogen and total phosphorus concentrations and loads at BCWA Site 3a Keys on the Green (Above Evergreen Lake) have been consistently higher when compared to data collected at Golden Willow Bridge BCWA Site 2a and BCWA Site 58 near the Mt. Evans Wilderness Boundary. Several tributaries flow into Bear Creek in this stream reach with Vance Creek, Witter Gulch and Buffalo Creek as the largest tributaries. The section of Upper Bear is sewered from Golden Willow to Keys on the Green, so the source of the nutrient loading is suspected to be either tributary nonpoint source loads from forested lands or from housing development along Bear Creek.

In 2015, the BCWA conducted a special assessment on the mainstem and major tributaries between Golden Willow and Dedisse Park. The BCWA conducted field surveys to identify potential “hot” spots and map these areas. The BCWA conduct limited multiple field probe measurements at intervals to see if any discernible field data can isolate hot spots based on specific conductance. The BCWA collected TP/ TN pair to isolate nutrient loading on branches of Bear Creek along with linked flow data to calculate nutrient loads after spring rainy period (May) and autumn (October) lower flows. Monitoring sites are shown in the map with major tributary flows.

The May sampling period represented an unusually high flow condition with excessive flows on both the mainstem and tributaries. The October sampling event represented more normal flow conditions. In higher flow periods, Vance Creek is the largest nutrient source. Additionally monitoring is required on the Vance Creek drainage to isolate the nutrient sources. Under normal flow conditions, the three tributaries are only about 7-8% of both the TP and TN load to Bear Creek. In the may high flow period, about 45% of the TN was from the forested lands and wilderness area above site 58; while this area contributed about 28% of the TP load. In October, the forested lands and wilderness area contributed about 13% of the TN load and 7% of the TP load. The home sites on OWTS between site 58 and the beginning of the sewered area near Goldenwillow contribute about 92% of the TN load and 17 % of the TP load.

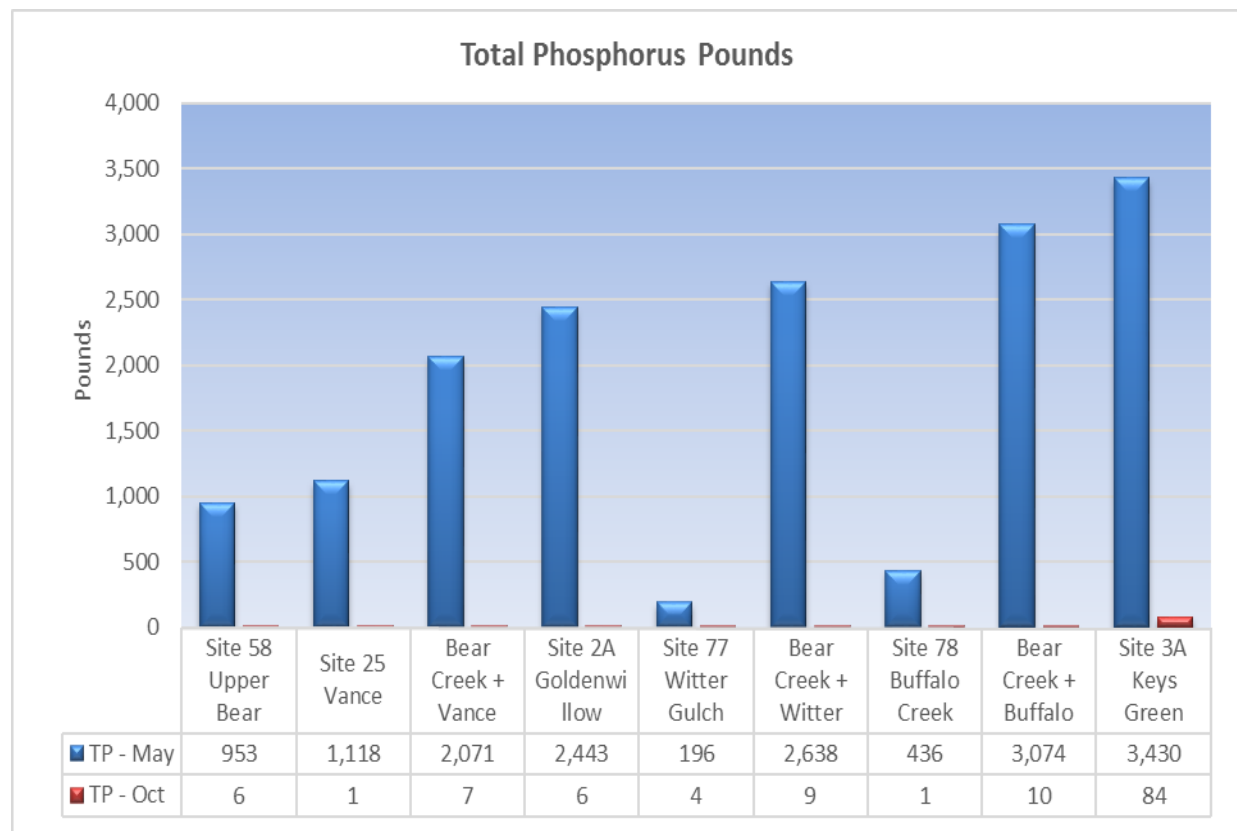
Tributary Contributions	May		October	
	TN %	TP %	TN %	TP %
Site 25 Vance	28%	33%	4%	2%
Site 77 Witter Gulch	9%	6%	3%	4%
Site 78 Buffalo Creek	26%	13%	1%	1%



## Special Water Quality Study Data

5/21/2015	Flow cfs	ac-ft/ mo May	Concentration ug/l		Load Pounds/Mo	
			TN	TP	TN	TP
Site 58 Upper Bear	140	8,329	360	42	8,164	953
Site 25 Vance	119	7,079	263	58	5,070	1,118
Bear Creek + Vance		15,408			13,234	2,071
Site 2A Golden Willow	260	15,467	349	58	14,699	2,443
Site 77 Witter Gulch	15	886	677	81	1,634	196
Bear Creek + Witter		16,354			16,333	2,638
Site 78 Buffalo Creek	39	2,320	736	69	4,650	436
Bear Creek + Buffalo		18,674			20,983	3,074
Site 3A Keys Green	316	18,799	354	67	18,121	3,430

10/26/2015	Flow cfs	ac-ft/ mo Oct)	Concentration ug/l		Load Pounds/Mo	
			TN	TP	TN - Oct	TP - Oct
Site 58 Upper Bear	18	1,059	32	2	92	6
Site 25 Vance	4	244	40	2	27	1
Bear Creek + Vance	22	1,303			119	7
Site 2A Goldenwillow	18	1,065	124	2	360	6
Site 77 Witter Gulch	0.7	42	180	32	20	4
Bear Creek + Witter	19	1,107			380	9
Site 78 Buffalo Creek	0.1	6	288	31	5	1
Bear Creek + Buffalo	19	1,112			385	10
Site 3A Keys Green	26	1,547	172	20	724	84



## Special Water Quality Study Data

