



MEMORANDUM

TO: Nathan Pence and Rick Illgner
FROM: Ed Oborny (BIO-WEST)
DATE: **September 27, 2013**
SUBJECT: EA HCP Bio-monitoring Update – **Week 7**

BIO-MONITORING UPDATES

Comal System:

The total system discharge at Comal Springs is ≈ 122 cfs. Weekly habitat evaluations continue to occur and will do so until total spring flow increases above 150 cfs. The next full system critical period sampling is not scheduled until total springflow declines below 100 cfs. As per the Section 6.3.4 of the HCP (< 150 cfs trigger), presence absence dip netting for the fountain darter is to take place every other month below 150 cfs. This was first conducted in August and will be performed again next week. Fall comprehensive sampling is scheduled to start on October 24th.

San Marcos System:

The total system discharge for San Marcos Springs is ≈ 105 cfs. As described in previous memorandums, no critical period sampling for the San Marcos system is scheduled until total springflow declines below 95 cfs (Texas wild-rice physical measurements) or below 85 cfs (full Critical Period sampling event). Fall comprehensive sampling is scheduled to start on October 10th.

WEEK 7 (September 22-29) CONDITIONS AND ACTIVITIES:

Comal: Weekly habitat observations and photo documentation were conducted on Thursday, September 26th. Additionally, Comal Spring riffle beetle surveys were completed on September 24th and 26th, with discharge also being measured on September 26th.

RESULTS:

Over the course of the past week, total system discharge at Comal springs held steady at approximately 120 cfs. Note: All photographs were taken on Thursday, September 26th unless otherwise noted. As observed the past several weeks, flow in spring runs 1 and 2 continues to go subsurface near the headwaters. As reported last week, surface habitat within Spring run 1 has shown slight improvements over the past two weeks (Figure 1). Spring run 3 continues to maintain connectivity throughout the run (Figure 2). During all full sampling and critical period events, discharge data is collected at HCP Bio-monitoring locations to relate directly to biological monitoring activities being conducted. We conducted discharge measurements Thursday afternoon (Figure 3 - September 26th) with the results of that trip and the August 9th, 23rd and September 12th data presented below:

Date:	August 9 th	August 23 rd	Sept. 12 th	Sept. 26 th
	Discharge (cfs)			
Spring Run 1 –	4.1	1.7	1.3	2.2
Spring Run 2 –	0.6	0.3	0.9	0.9
Spring Run 3 –	13.3	12.1	11.5	15.7
Old Channel –	57.1	60.6	53.3	55.0
Upper Spring Run –	4.8	3.1	0.76	1.7
Total USGS Gage – Daily Average	136	129	111	120



Figure 1: Flowing water in Spring Run 1 over bryophytes downstream of the main orifice.

Extensive algal buildup is still prominent in the Upper Spring run reach (Figure 4). However, even after 7 weeks of flow less than 5 cfs in the Upper Spring run reach, small amounts of bryophytes and *Ludwigia* remain (Figures 5 and 6, respectively). *Sagittaria* continues to represent the largest areal coverage of aquatic vegetation in the Upper Spring run reach (Figure 7). Considerable spring upwellings continue to be observed in the Spring Island area (Figures 8 and 9). Although surface flow stopped at Spring Run 6 back in August, improvement in standing surface water in the southern spring run has been evident the past two weeks.

Week 7 biological activities at Comal Springs included completing riffle beetle cotton lure retrieval at the three representative sample reaches (Figures 10-13).



Figure 2: Connectivity throughout Spring Run 3.



Figure 3: Discharge measurements in Spring Run 2.



Figure 4: Extensive algal build up in Upper Spring Run Reach.



Figure 5: Algae (left) and Bryophytes (right) in the Upper Spring Run Reach.



Figure 6: *Ludwigia* patch covered in algae in Upper Spring Run Reach.



Figure 7: *Sagittaria* in Upper Spring Run Reach.



Figure 8: Looking downstream toward Spring Island.



Figure 9: Eastern outfall from Spring Island



Figure 10: Comal Spring riffle beetle sampling at Spring Island study reach.



Figure 11: Cotton lure after 4-week placement. Note algae and detritus buildup on lure.

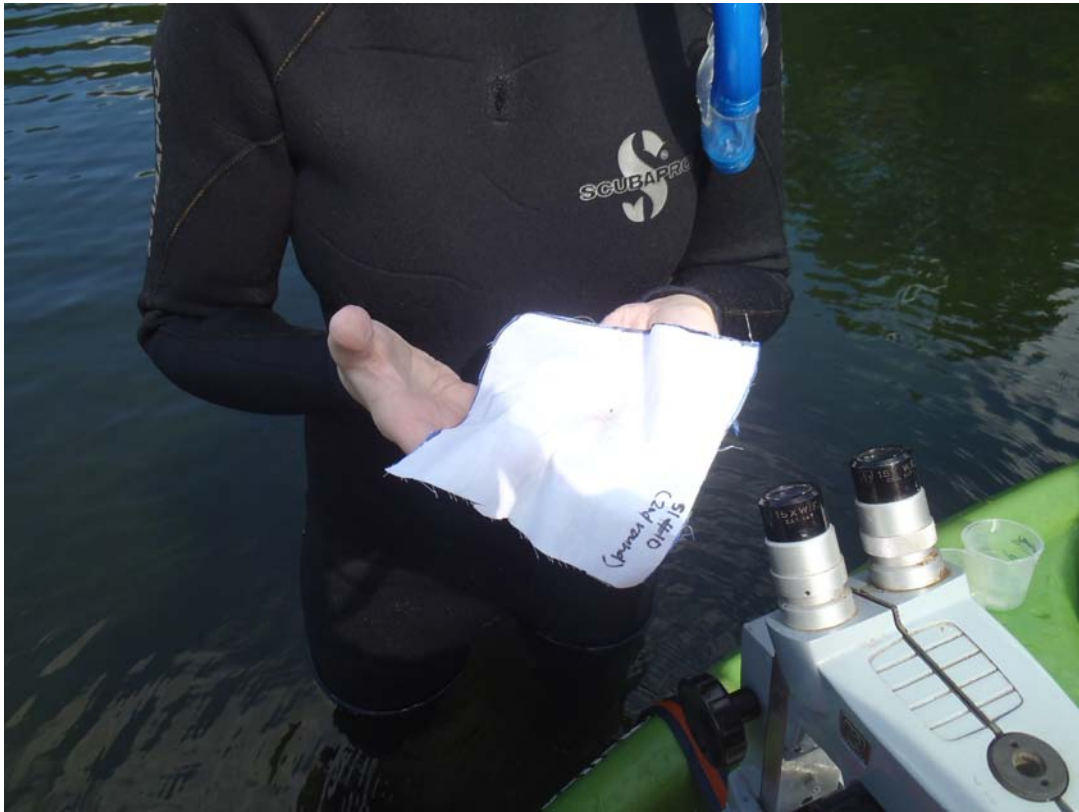


Figure 12: Clean cotton lure for re-setting at Spring Island.



Figure 13: Field identification of beetle adults and larvae.

This riffle beetle collection represents the second 4-week count during the Critical Period sampling this summer. Comal Springs riffle beetles were the most abundant beetle collected at the Western Shoreline and Spring Run 3 study reaches. The more common Elmid beetle, *Microcyloepus pusillus* was the most abundant beetle collected (202 individuals) on the lures at the Spring Island reach. Table 1 shows the total Comal Springs riffle beetle counts per representative sample reach over time and in recent collections.

Table 1: Comal Springs riffle beetles – Total Counts per area

Survey Date	Riffle Beetle Total Counts			
	Spring Run 3	Western Shoreline	Spring Island	Total
Long-term average (2004-2013)	152	146	132	430
May / June 2013 Spring sampling	124	68	97	289
August / Sept. 2013 Critical period (Sept. 9-15) 1 st 4-weeks	118	119	100	337
September 2013 Critical period (Sept. 23-29) 2nd 4-weeks	109	188	66	363
Lowest count per individual reach since going to cotton lures	53 (May 2010)	20 (May 2012)	20 (May 2010)	--
Lowest Total count since going to cotton lures (May 2010)	53	110	20	183

As evident in Table 1, the total Comal Springs riffle beetle counts in Spring Run 3 and Spring Island were less than the long-term average and May sampling as well as less than the first 4-week count. However, counts in both reaches continue to be considerably more than the lowest recorded samples (individually or in total) over the years. In contrast, the second 4-week riffle beetle count at the Western Shoreline (188 beetles) was greater than the long-term average and all other events shown in Table 1. We continue to maintain duplicate sets of cotton lures within the study reaches enabling us to document 4-week counts every 2 weeks.

Similar to the first 6 week's memorandums, fountain darter habitat conditions in Landa Lake continue to hold strong. *Cabomba* is still present in the Pecan Island slough adjacent to the Golf Course (Figure 14). The restoration areas within Landa Lake (Figures 15 and 16) continue to excel. The City of New Braunfels has made great progress in the removal of vegetation mats within Landa Lake (Figures 17 and 18). Additionally, they continue to keep the vegetation mats near the Old Channel culverts from the lake well under control (Figure 19). In addition to the lake, fountain darter habitat continues to prosper in the Old Channel (Figure 20) and New Channel (Figure 21). As per the Section 6.3.4 of the HCP (< 150 cfs trigger), presence absence dip netting for the fountain darter occurs every other month (which will be next week).



Figure 14: *Cabomba* patches in Pecan Island slough.



Figure 15: Restored *Cabomba* patches in Landa Lake.



Figure 16: Restored *Ludwigia* mixed with bryophytes in Landa Lake.



Figure 17: Improved vegetation mat condition in middle portion of Landa Lake.



Figure 18: Excellent vegetation mat conditions in lower Landa Lake.



Figure 19: Main Landa Lake culvert to the Old Channel.



Figure 20: Restored aquatic vegetation in Old Channel.



Figure 21: Expanses of *Cabomba* in the New Channel.

Overall, the Comal system continues to support quality fountain darter habitat conditions in Landa Lake and Old and New Channels. Reduced fountain darter habitat conditions continue to persist in the Upper Spring Run reach. Impacts to endangered Comal invertebrate surface habitat continue to occur in the main spring runs and Spring Island area. As noted in previous updates, the most notable impacts to both Comal Springs riffle beetle and Comal Springs salamander habitats continue to be in Spring Run 1.

San Marcos

As mentioned in all previous updates related to the Comal system, no critical period sampling activities have been triggered this summer on the San Marcos system. Fall comprehensive sampling is scheduled to start on October 10th.

As always, please don't hesitate to contact me if you have any questions or concerns.

Ed