MEMORANDUM

TO:	Nathan Pence
FROM:	Ed Oborny (BIO-WEST)
DATE:	**September 26, 2014**
SUBJECT:	EA HCP Biological Monitoring – **Week 24**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

At the time of this memorandum, the total system discharge at Comal Springs was 84 cfs (Figure 1). This week marks the twenty-fourth consecutive week below 150 cfs, and therefore, the required weekly habitat evaluation was conducted on September 25th. Weekly habitat evaluations and memorandums will continue to occur until total system discharge at Comal Springs/River increases and consistently stays above 150 cfs. At present, HCP species specific low-flow monitoring activities are being dictated by the <120 cfs trigger. The next full system Critical Period monitoring effort will be triggered when total system discharge consistently declines below 50 cfs. However, the <50 cfs Full Critical Period event appears unlikely this fall considering the recent increases in total system discharge and the fact that the fall Comprehensive sampling will be conducted in late October/early November.

The following activities associated with HCP Biological Monitoring at Comal Springs were completed this week and are anticipated for next week:

CRITICAL PERIOD MONITORING

- September 22-28
  - Aquatic vegetation mapping of all four intensive study reaches as per the every other month requirement currently triggered.
  - Flow partitioning transects in the Upper Spring Run area and Landa Lake on September 24th.
  - Comal Springs salamander sampling was conducted on September 25th.
  - Comal Springs discharge measurements were taken on September 25th.
  - Weekly photo documentation and habitat evaluation on September 25th.
- September 29 – October 5
  - Flow partitioning transects in the Upper Spring Run area and Landa Lake
  - Weekly photo documentation and habitat evaluation.

SAN MARCOS SYSTEM:

The total system discharge for San Marcos Springs/River is recording 103 cfs this morning. As the total system discharge has remained below 105 cfs consistently this week per the USGS gage, Texas wild-rice physical measurements in vulnerable stands will be conducted next week. A Critical Period full sampling event is not triggered until total system discharge declines below 100 cfs. A separate <100 cfs Full Critical Period event is unlikely the remainder of the year considering the fall Comprehensive sampling will be initiated in two weeks (October 13th).

COMAL SPRINGS/RIVER - WEEK 24 CONDITIONS:

Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Thursday, September 25th.

Discharge, cubic feet per second

Most recent instantaneous value: 84 09-26-2014 04:45 CDT

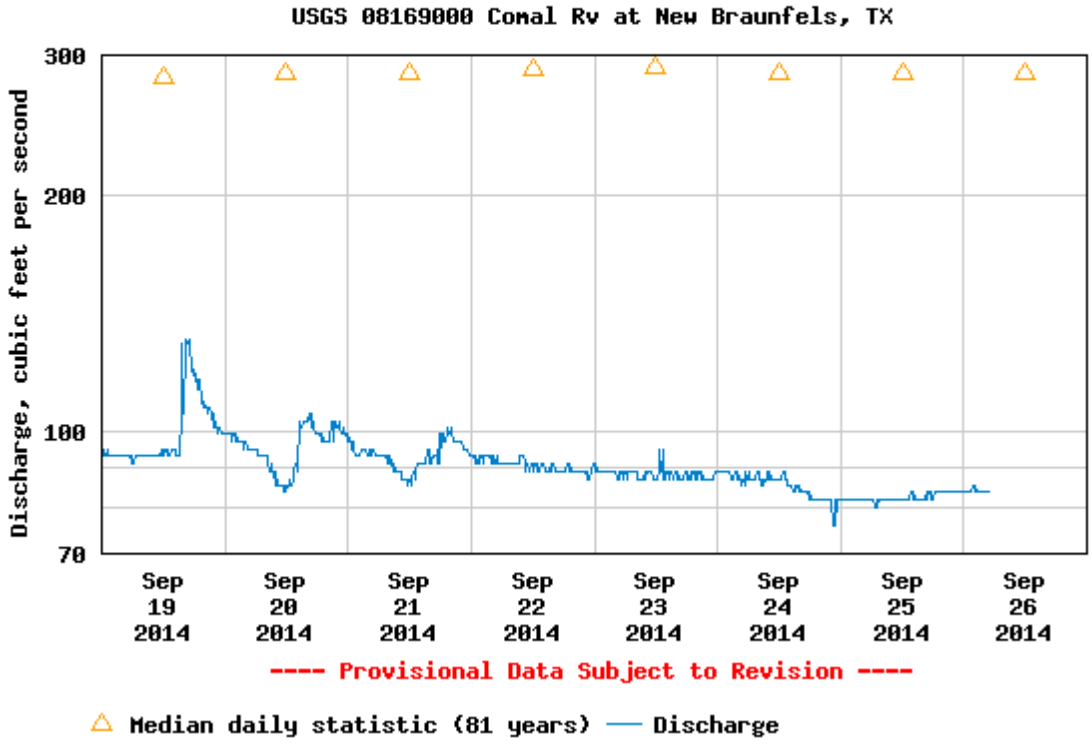

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge over the past week.

OBSERVATIONS AND ACTIVITIES:

The increase in total system discharge discussed in last week's memorandum was followed by a steady decline this week as evident in Figure 1. However, discharges throughout the system remain greater than recorded during late August / early September (Table 1). Increases in surface habitat compared to late August are evident for the major spring runs (Figures 2 and 3), Upper Spring run and Spring Island areas relative to water level and discharge. Although slightly improved relative to the past few months, surface habitat conditions in all of these areas remains poor. Algae has started to reestablish in the Upper Spring run reach (Figure 4) and exposed substrate is still present in the eastern outfall of Spring Island with both channels associated with Spring Run 6 remaining dry. Per the < 120 cfs HCP species specific trigger, Comal Springs salamander surveys (Figure 5) were conducted this week. Table 2 shows the long-term average as well as recent counts of Comal Springs salamanders in each of the sample locations. No salamanders were found in the extremely limited surface habitat in Spring Run 1 or in the dried up spring runs on Spring Island. Salamander numbers in Spring Run 3 and the eastern outfall at Spring Island were similar to two weeks ago but continue to be below long-term averages. This also marks the first time since the initiation of the salamander sampling in 2000 that counts from all four survey locations totaled up to a single digit result (9).

Table 1. Comparison of discharge (cfs) throughout Comal Springs during 2014.

Date	April 23	July 17	July 31	Aug 14	Aug 28	Sept 4	Sept 11	Sept 25
Spring Run 1	3.1	0.7	1.1	0.2	0.06	0*	0*	0*
Spring Run 2	2.5	1.4	1.8	0.1	0	0	0	0.3
Spring Run 3	16.9	10.0	12.2	5.8	2.1	2.1	3.2	5.5
Old Channel	52.2	52.7	53.9	54.4	47.9	48.7	50.9	46.0
Upper Spring Run	2.3	0.6	2.1	0*	0*	0*	0*	0.6
Total USGS Gage	143.0	113.0	109.0	85.0	66.0	66.0	70.0	84.0

* Not measureable although still visual evidence of spring upwelling in select areas

Figure 2: Spring Run 1 surface discharge and limited wetted channel this week.

Figure 3: Spring Run 2 improved habitat conditions.

Figure 4: Algae starting to reestablish in Upper Spring Run reach.

Figure 5: Comal Springs salamander surveys in Spring Run 1.

Table 2: Comal Springs salamander timed counts

Survey Date	Salamander Counts			
	Spring Run 1	Spring Run 3	Spring Island (runs)	Spring Island – Eastern outfall
Long-term average (2002-2014)	22	13	3	9
April 18, 2013	17	15	0	4
August 16, 2013	8	12	0	8
September 12, 2013	6	13	1	11
October 29, 2013	7	9	2	6
April 25, 2014	12	23	3	7
July 17, 2014	16	24	0	8
July 31, 2014	27	27	0	11
August 14, 2014	1	6	0	7
August 28, 2014	0	8	0	11
September 4, 2014	1	13	0	10
September 11, 2014	0	3	0	7
September 25, 2014	0	5	0	4

The ability of Comal Springs salamanders to occupy and persist in sub-surface habitats is unknown; therefore, continued monitoring under these rare conditions will help fill important data gaps for this species. Although the Comal Springs salamander is listed in the HCP and Incidental Take Permit (ITP), the conditions in the ITP are not presently active for this species as it is not listed as threatened or endangered with this directly acknowledged (Item H: 7-9) in the ITP.

Fountain darter habitat continues to be in poor condition in the Upper Spring Run reach but remains slightly improved relative to late August with small upwellings still evident within this reach. Fountain darter sampling associated with the fecundity study this week documented darters were still occupying this reach, but in reduced numbers. Quality fountain darter habitat persists in Landa Lake but as noted in previous weeks, impacts continue to occur. Shallow areas and floating mats of aquatic vegetation (Figure 6) continue to be the main cause of impacts in Landa Lake. The Old Channel continues to support high quality fountain darter habitat with thriving restored native aquatic vegetation (Figure 7). The New Channel continues to support aquatic vegetation in areas above the confluence of the Old Channel. However, fountain darter habitat in the New Channel continues to be of lesser quality than in either Landa Lake or the Old Channel.

Figure 6: Floating vegetation mats in the center of Landa Lake.

Figure 7: Restored native aquatic vegetation in Old Channel.

In summary, total system discharge, water level and habitat conditions were similar to those reported last week. Endangered invertebrate habitat continues to be impacted for surface dwelling invertebrates with Comal Springs salamander counts at the lowest levels reported since the initiation of the biological monitoring program. Fountain darters continue to persist in the Upper Spring Run reach although habitat is very minimal, water temperatures are approaching 30° C, and algae is starting to reestablish. Impacts to fountain darter habitat remain evident in Landa Lake with shading of rooted aquatic vegetation by thick mats of floating aquatic vegetation while decreased flows in the New Channel continue to impact fountain darter habitat conditions in that reach. Fortunately, the Old Channel continues to support high quality fountain darter habitat especially within the HCP restored reaches.

Have a great weekend!

Ed