MEMORANDUM

TO:	Nathan Pence
FROM:	Ed Oborny (BIO-WEST)
DATE:	**May 9, 2014**
SUBJECT:	EA HCP Biological Monitoring – **Week 4**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

At the time of this memorandum, the total system discharge at Comal Springs was 116 cfs. As Comal Springs remained below 150 cfs for a fourth consecutive week, the required weekly habitat evaluation was conducted on May 8th. Weekly habitat evaluations and memorandums will continue to occur until total system discharge at Comal Springs/River increases above 150 cfs. As per HCP triggered low-flow sampling requirements, should total system discharge continue to stay below 150 cfs, aquatic vegetation mapping in study reaches and fountain darter presence/absence dip net sampling will take place again in June. As total system discharge declined below 120 cfs, Comal Springs riffle beetle, Comal Springs salamander, and Comal discharge measurements/sampling were triggered and will be conducted next week. These three activities will be conducted every other week until total system discharge rebounds above 120 cfs. The next Critical Period full sampling event is not triggered until the total system discharge declines below 100 cfs. At the current rate of decline, this may only be a few weeks away.

SAN MARCOS SYSTEM:

The total system discharge for San Marcos Springs is approximately 108 cfs. The Spring 2014 Comprehensive sampling was initiated on April 17th and to date the following activities associated with San Marcos HCP biological monitoring have been conducted:

- Aquatic vegetation mapping (Spring Lake Dam, City Park, and I-35 study reaches) was conducted April 17-25.
- Fountain darter drop netting at all three study reaches was conducted April 30 – May 2).
- Thermister downloading and fixed station photographs.
- Texas wild-rice physical habitat measurements were conducted on May 5th.
- Fountain darter presence/absence dipnetting (standard and fixed method) were conducted on May 5th and 7th.
- Fountain darter timed dipnet surveys were conducted on May 6th.
- Benthic macroinvertebrate sampling in aquatic vegetation throughout study sections were conducted on May 5th.
- San Marcos salamander sampling was conducted on May 6th in Spring Lake and the San Marcos River.

- Fish Community sampling within Spring Lake was conducted on May 6th and throughout the river during the remainder of the week and next.

As part of critical period monitoring, Texas wild-rice physical measurements are to be conducted every 5 cfs decline (below 120 cfs), not to exceed one event per week. The next Texas wild-rice physical measurement sampling event will happen when total system discharge declines below 105 cfs. The first Critical Period full sampling event for San Marcos is not triggered until the total system discharge declines below 100 cfs.

COMAL SPRINGS/RIVER - WEEK 4 CONDITIONS:

Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Thursday, May 8th. All pictures in this memorandum were taken on that date.

OBSERVATIONS AND ACTIVITIES:

The total system discharge at Comal Springs is 116 cfs and has declined steadily this past week including a mid-week adjustment by the USGS (Figure 1).

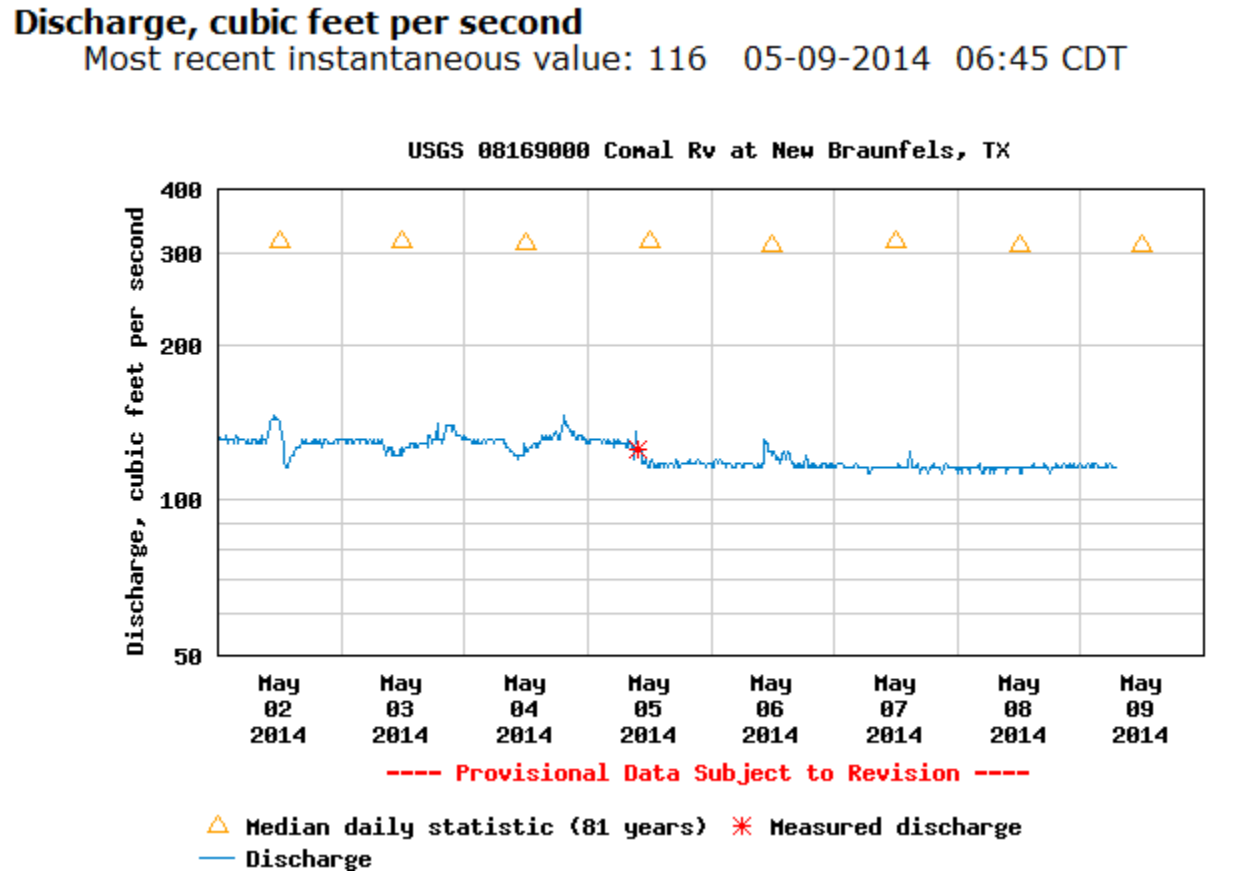

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge over the past week.

Surface water flow in Spring Run 1 is extremely low with complete cessation of surface discharge from the two major headwater spring orifices (Figure 2). There is currently only a small pool at the headwaters with the channel immediately downstream of the major orifices experiencing no surface flow for several hundred feet (Figure 3). Downstream of this area, upwelling and springs in the sides of the channel are issuing water and the channel starts and maintains surface flow for the remainder of the run. However, even this channel is quite constricted (Figure 4) as far down as below Landa Lake drive (Figure 4). This is poorest surface water flow condition experienced in Spring Run 1 since the inception of the biological monitoring program in 2000. This translates in the direct loss of surface habitat for the Comal Springs invertebrates for the better portion of Spring Run 1 at this time. Spring Run 2 continues to maintain surface flow (Figure 5) for the main portion of the channel (Figure 5) while Spring Run 3 continues to maintain connectivity throughout the run (Figure 6).

Algae continues to be interspersed with bryophytes in most of the Upper Spring run reach with stagnant conditions starting to be exhibited behind the concrete wall at Spring Run 5 (Figure 7). Habitat conditions in the Upper Spring Run reach are declining but fountain darters are still occupying this reach. The surface water level in the Spring Island area has declined considerably this past week leaving more exposed surface habitat (Figure 8). In fact, both the northern (Figure 9) and southern (Figure 10) spring runs associated with Spring Run 6 on Spring Island have ceased surface flow and minus the rain wetting the surface that day are represented by a dry channel bed.

Figure 2: Spring Run 1 main orifices have ceased surface discharge (May 8th)

Figure 3: Spring Run 1 dry channel (looking upstream toward headwaters).

Figure 4: Spring Run 1 channel (looking downstream of Landa Lake drive bridge).

Figure 5: Spring Run 2 – designated kiddie pool area

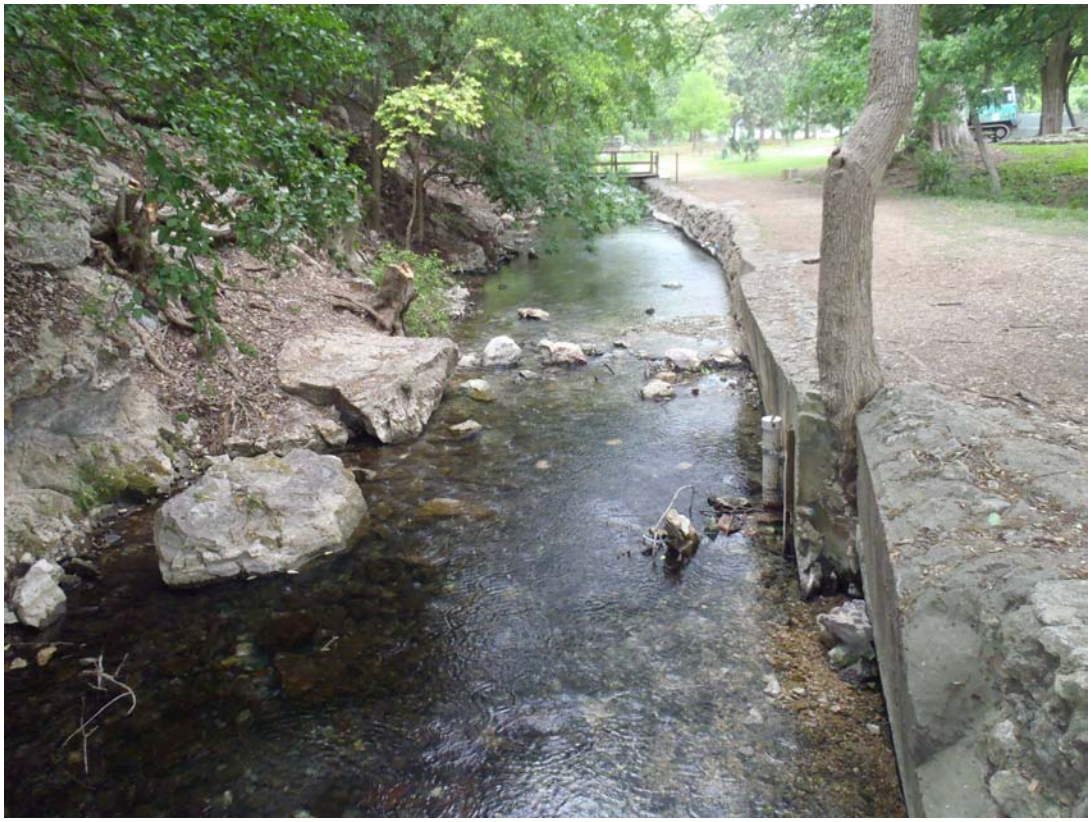

Figure 6: Spring Run 3 – looking downstream towards Landa Lake

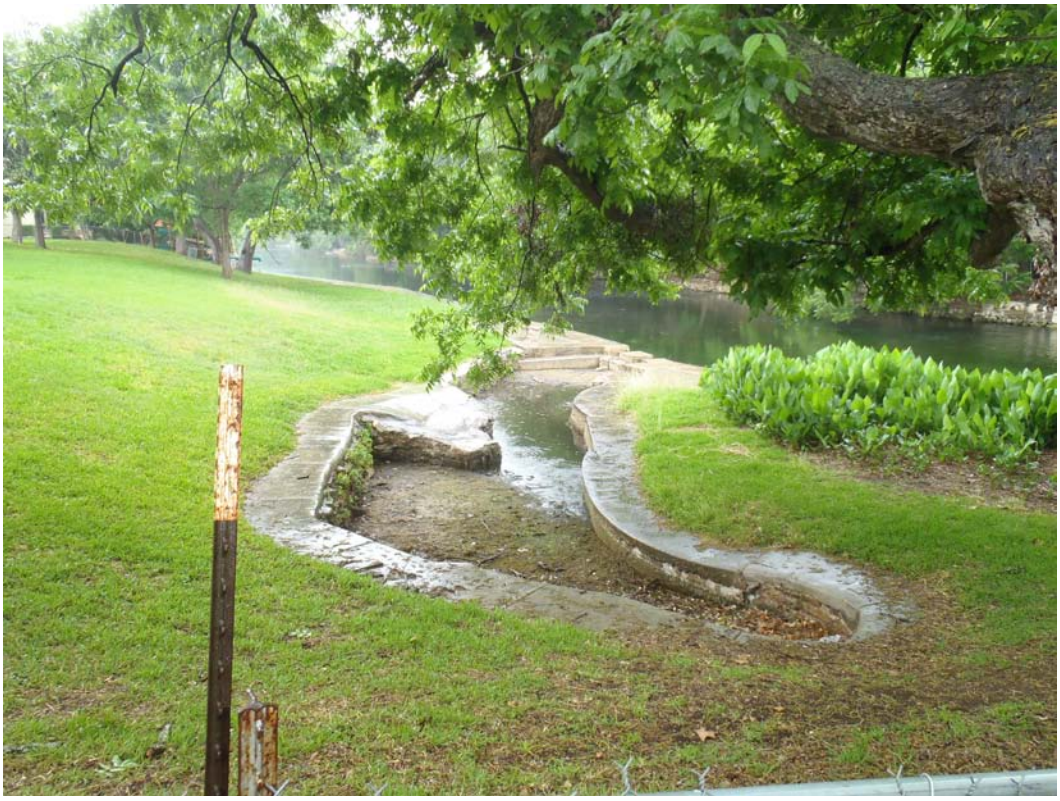

Figure 7: Upper Spring Run reach – stagnant conditions in Spring Run 5 with algae and bryophytes interspersed in Upper Spring Run reach in the background.

Figure 8: Exposed surface habitat adjacent to Spring Island area

Figure 9: No surface flow in northern channel of Spring Run 6 on Spring Island

Figure 10: No surface flow in southern channel of Spring Run 6 on Spring Island

Fountain darter habitat conditions in Landa Lake continue to look good although floating vegetation mats (Figure 11) continue to be a concern with the potential for shading underlying habitats. It was nice to experience a down pour while taking this photograph, albeit all too brief. Figure 12 shows that the Landa Park walls reconstruction project has extended out of just the spring runs to the main portion of Landa Lake this week. In addition to the lake, fountain darter habitat continues to thrive in the Old Channel and New Channel (Figure 13) at this time.

Figure 11: Floating vegetation mats in Landa Lake taken during a brief rain event.

Figure 12: Landa Park walls reconstruction project extended out into Landa Lake.

Figure 13: Fountain darter habitat remains abundant in the New Channel.

As outlined above, a number of biological sampling activities were conducted at San Marcos Springs this week. Figure 14 shows San Marcos salamander sampling in Spring Lake, while Figure 15 shows the Texas State University crew conducting expanded fish sampling in Spring Lake.

Figure 14: San Marcos salamander sampling in Spring Lake.

Figure 15: Habitat measurements for expanded fish community sampling in Spring Lake

Similar to last week's report, the Comal Springs/River continues to support quality fountain darter habitat conditions throughout most of the system, with continued reduction in habitat quality occurring in the Upper Spring Run section. Relative to fountain darters, conditions in the Comal system have not yet approached what was observed during low-flow conditions last Fall. Floating vegetation mats in Landa Lake remain a concern and will need attention all summer long should total system discharge remain low.

Surface habitat for the endangered Comal invertebrates has continued to decline over the past week. At this time, surface habitat conditions are slightly below the worst condition experienced last Fall, and the poorest since the inception of the biological monitoring program in 2000. Since 2000, Spring Run 1 has not experienced a portion of the main channel ceasing surface flow. Spring Run 5 often goes stagnant, but only last Fall did both runs at Spring Run 6 completely cease surface flow. The reduction in surface habitat directly relates to take of the HCP covered species. With that said, it needs to be remembered that the major spring runs (not just 1, 5, and 6, but all the major runs) periodically going completely dry for considerable periods of time is projected to occur during extended drought conditions in the agreed upon and approved HCP. So, although aesthetically displeasing and no doubt contributing to take of associated Covered species, this is not an unexpected event or result. We will continue to track conditions on the Comal System on a weekly basis.

At present, ecological conditions throughout the San Marcos system remain strong. Although at 108 cfs, this is well above total system discharge recorded multiple times and for extended periods of time over the past five years. Those previous conditions have not resulted in any significant ecological impacts. As previously mentioned, the first Critical Period full event trigger for San Marcos is not until 100 cfs.

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

Ed