MEMORANDUM

TO:	Nathan Pence
FROM:	Ed Oborny (BIO-WEST)
DATE:	**May 2, 2014**
SUBJECT:	EA HCP Biological Monitoring – **Week 3**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

The Spring 2014 Comprehensive Biological Monitoring effort was completed this week. At the time of this memorandum, the total system discharge at Comal Springs was 129 cfs. As mentioned in previous memorandums, the routine monitoring effort was conducted in conjunction with the < 150 cfs full Critical Period sampling event. To date the following activities associated with Comal HCP biological monitoring have been conducted:

- Placement of cotton lures for Comal Springs riffle beetle sampling on April 3-4.
- Aquatic vegetation mapping of the four (Upper Spring Run, Landa Lake, Old Channel, and New Channel) study reaches was conducted April 7-15.
- Fixed-station photography was conducted on April 16th.
- Fountain darter presence/absence dipnetting was conducted on April 17th (standard) and 21st (fixed), with timed surveys conducted on April 23rd.
- Fish Community sampling was conducted from April 15-29.
- Fountain darter drop netting at all four study reaches was conducted April 21-24.
- Water quality grab samples at 12 established stations (plus required duplicates) were conducted longitudinally down the system on April 23rd.
- Thermister downloading was completed April 21-25.
- Cross–sectional discharge measurements at established transects were conducted on April 23rd.
- Comal Springs salamander surveys were conducted on April 25th.
- Comal invertebrate sampling using drift nets was conducted on April 24-25.
- Fountain darter SCUBA transect survey in Landa Lake was conducted on April 24th.
- Benthic macroinvertebrate sampling in aquatic vegetation throughout study sections was completed April 28-29.
- Flow partitioning evaluation in Landa Lake was conducted on April 29th.
- Retrieval of cotton lures for Comal Springs riffle beetle sampling following their 4-week set at designated sampling locations was conducted May 1-3.

This concludes all activities associated with the Spring Comprehensive monitoring / <150 Critical Period full sampling event on the Comal system. As Comal Springs remained below 150 cfs for a third consecutive week, the required weekly habitat evaluation was conducted on April 29th.

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. Should total system discharge decline below 120 cfs both Comal Springs riffle beetle and Comal Springs salamander sampling will be triggered. Finally, the next Critical Period full sampling event is not triggered until the total system discharge declines below 100 cfs.

SAN MARCOS SYSTEM:

The total system discharge for San Marcos Springs is around 111 cfs. A full critical period sampling event for the San Marcos system does not trigger until 100 cfs. The Spring 2014 Comprehensive sampling was initiated on April 17th. To date the following activities associated with Comal 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.

Comprehensive sampling activities scheduled for next week (May 5-9) include:

- Texas wild-rice physical habitat measurements.
- Fountain darter presence/absence dipnetting (standard and fixed method).
- Fountain darter timed dipnet surveys.
- Thermister downloading.
- Benthic macroinvertebrate sampling in aquatic vegetation throughout study sections.
- San Marcos salamander sampling is scheduled for May 6th in Spring Lake and the San Marcos River.

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 next week in conjunction with the Spring Comprehensive sampling. The first Critical Period full sampling event is not triggered until the total system discharge declines below 100 cfs.

COMAL SPRINGS/RIVER - WEEK 3 CONDITIONS:

Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Tuesday, April 29th. All pictures in this memorandum were taken on that date.

OBSERVATIONS AND ACTIVITIES:

The total system discharge at Comal Springs is 129 cfs and has declined steadily this past week (Figure 1).

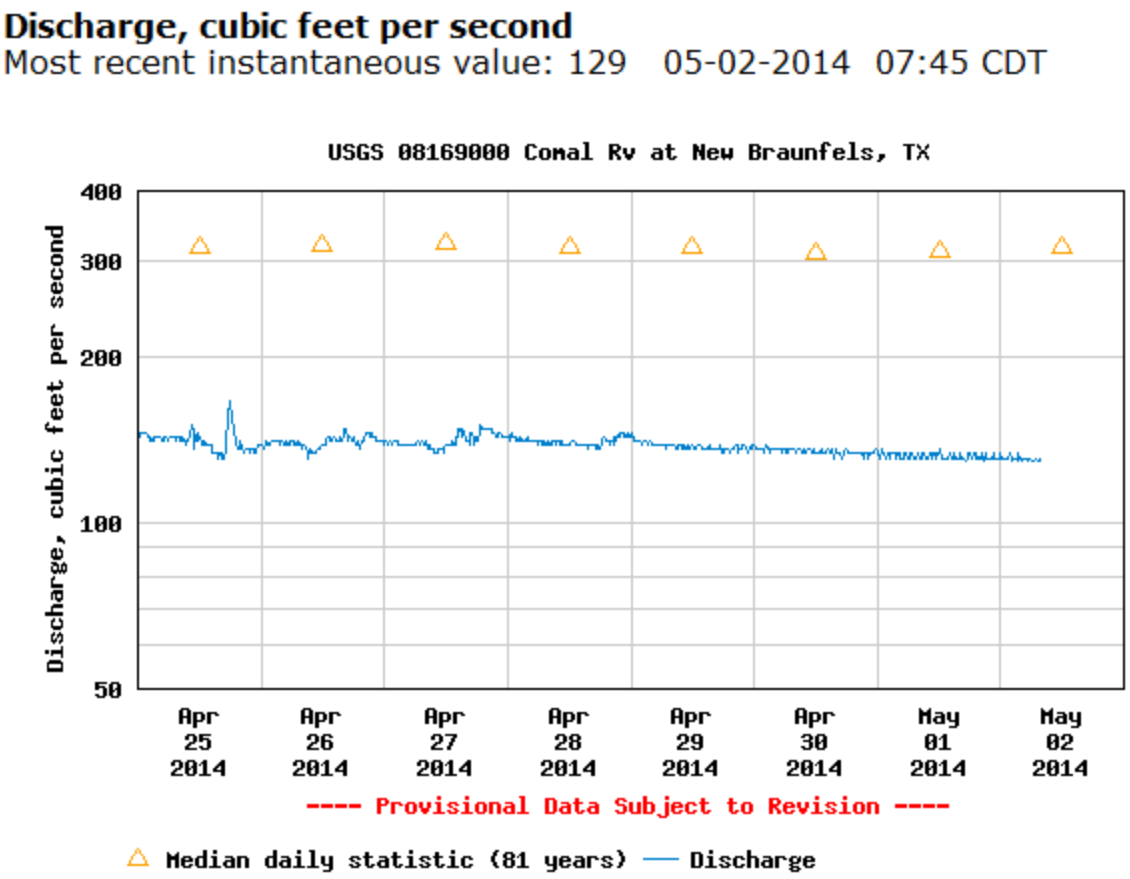

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge over the past week.

Surface water flow in Spring Run 1 is extremely low but continues to issue from the major headwater spring orifices (Figure 2). The channel downstream of the major orifices is starting to constrict from the limited discharge as well as the construction activities currently taking place within Spring Run 1 (Figure 3). Spring Run 2 continues to maintain flow with construction activities having limited (Figure 4) impact relative to conditions noted during the week 1 memorandum. Spring Run 3 continues to maintain connectivity throughout the run (Figure 5).

Algae is interspersed with bryophytes in most of the Upper Spring run reach (Figure 6) but habitat conditions remain suitable for fountain darters. The surface water level in the Spring Island area has declined slightly leaving a bit more surface habitat exposed relative to last week (Figure 7). Fountain darter habitat conditions in Landa Lake continue to look good although floating vegetation mats (Figure 8) are becoming a concern with the potential for shading underlying habitats. In addition to the lake, fountain darter habitat continues to thrive in the Old Channel (Figure 9) and New Channel (Figure 10). It is evident in the upper portion of Figure 10 that tubing during weekdays has officially kicked off for this summer. Fortunately, as was witnessed last year, there is plenty of habitat for fountain darters and humans presently within this stretch.

Figure 2: Spring Run 1 main orifices (April 29th)

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

Figure 4: Spring Run 2 – designated kiddie pool area

Figure 5: Spring Run 3 – looking downstream towards Landa Lake

Figure 6: Upper Spring Run reach – algae and bryophytes interspersed

Figure 7: Slightly increased exposed habitat adjacent to Spring Island area

Figure 8: Floating vegetation mats in Landa Lake

Figure 9: Restored submerged native aquatic vegetation in the Old Channel.

Figure 10: Fountain darter and human habitat abundant in the New Channel.

As outlined above, a number of biological sampling activities were conducted at Comal Springs this week. Figure 11 shows Dr. Tim Bonner and his Texas State University crew conducting expanded fish sampling at the confluence of the Upper Spring Run and Blieder's creek. Figure 12 was taken by Brad Littrell of Marcus Gary (EAA) and crew conducting flow partitioning measurements in Landa 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 some reduction in habitat quality occurring in the Upper Spring Run section. 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 decreased slightly over the past week. As always, please don't hesitate to contact me if you have any questions or concerns.

Ed

Figure 11: Expanded fish sampling by TSU crew.

Figure 12: Flow partitioning cross section in Landa Lake