MEMORANDUM

TO:	Nathan Pence
FROM:	Ed Oborny (BIO-WEST)
DATE:	**April 18, 2014**
SUBJECT:	EA HCP Biological Monitoring – **Week 1**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

The total system discharge at Comal Springs is ≈ 146 cfs (Figure 1). The Spring 2014 Comprehensive Biological Monitoring effort was initiated on April 3rd. This routine monitoring effort is being conducted in conjunction with the < 150 cfs full Critical Period sampling event that was subsequently triggered in early April. The two monitoring events complement each other in every aspect, with the exception that additional water quality grab samples will be conducted longitudinally down the river in association with the full Critical Period sampling event. To date the following activities associated with Comal Biological Monitoring have been conducted:

- Placement of cotton lures for Comal Springs riffle beetle sampling on April 3-4th. These lures will be retrieved the final week of April per the 4-week set protocol.
- Aquatic vegetation mapping of the four (Upper Spring Run, Landa Lake, Old Channel, and New Channel) study reaches was conducted April 7-15th. An additional section of the New Channel reach was added this year to better represent the entirety of the New Channel as outlined in the 2013 annual report.
- Fixed-station photography was conducted on April 16th.
- Fountain darter presence/absence dipnetting (standard method) was conducted on April 17th.
- Fish Community sampling via SCUBA was initiated the week of April 14-18.

As Comal Springs remained below 150 cfs for a continuous week, the < 150 cfs weekly habitat evaluation was conducted on April 16th. Initiation of weekly habitat evaluations also triggers the submittal of this weekly memorandum. Activities scheduled for next week (21-25 April) include:

- Fountain darter drop netting at all study reaches.
- Continuation of fish community sampling via SCUBA and seining at study segments.
- Water quality grab samples at 12 established stations longitudinally down the system.
- Thermister downloading.
- Cross – sectional discharge measurements at established transects.
- Comal Springs salamander surveys.
- Comal Invertebrate sampling using drift nets.

Weekly habitat evaluations and memorandums will continue to occur until total system discharge at Comal Springs/River increases above 150 cfs.

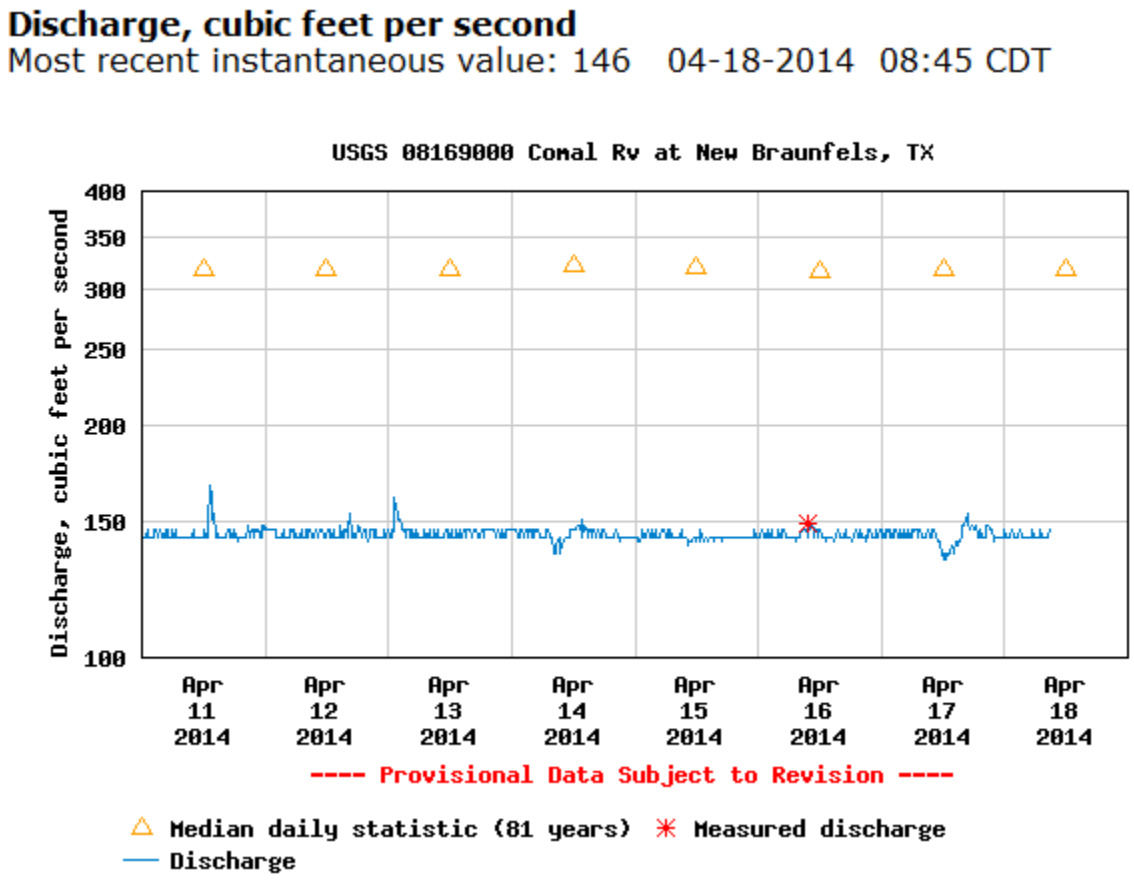

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge over the past week.

San Marcos System:

The total system discharge for San Marcos Springs is ≈ 123 cfs. No critical period sampling for the San Marcos system is scheduled until total springflow declines below 120 cfs (Texas wild-rice physical measurements) or below 100 cfs (full Critical Period sampling event). The Spring 2014 Comprehensive sampling is scheduled to start next week (21-25 April) with Aquatic Vegetation mapping of study reaches and Texas wild-rice physical measurements.

COMAL SPRINGS/RIVER - WEEK 1 CONDITIONS:

Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Wednesday, April 16th.

RESULTS:
Surface water flow in Spring run 1 is low but continues to issue from the major headwater spring orifices (Figure 2) as well as extend across the entire spring run flowing downstream (Figure 3). Note the Landa Lake walls project is currently conducting activities in Spring Run 1. Spring run 2 is maintaining flow above the park road to Landa Park circle (Figure 4) but is currently a stagnant mess in the kiddie pool area because of ongoing construction associated with the Landa Lake walls project (Figure 5). Spring run 3 continues to maintain connectivity throughout the run.

Algae is starting to become dominant in portions of the Upper Spring run reach (Figures 6 and 7) but not to the levels experienced each year in late summer. As in years past, when total system discharge declines below ≈150 cfs, Spring Run 5 ceases flow over the concrete wall (Figure 8). The surface water level in the Spring Island area is decreasing as evident by some exposed habitat (Figure 9) adjacent to the island, but spring flow continues in both the northern and southern (Figure 10) spring runs on the island itself.

Fountain darter habitat conditions in Landa Lake continue to look great with abundant and healthy bryophytes and flourishing aquatic vegetation (Figures 11 and 12). Floating vegetation mats in Landa Lake are starting to accumulate and will soon require attention (Figure 13). In addition to the lake, fountain darter habitat continues to thrive in the Old and New channels.

Figure 2: Spring Run 1 main orifices (April 16th)

Figure 3: Spring Run 1 channel flowing downstream (note construction on river left)

Figure 4: Spring Run 2 – flowing above park entrance road

Figure 5: Spring Run 2 – stagnant with algal build-up in designated kiddie pool area

Figure 6: Upper Spring Run reach – algal build up on bryophytes

Figure 7: Algal build up on rooted macrophytes (*Sagittaria*)

Figure 8: Spring Run 5 ceased flowing over concrete

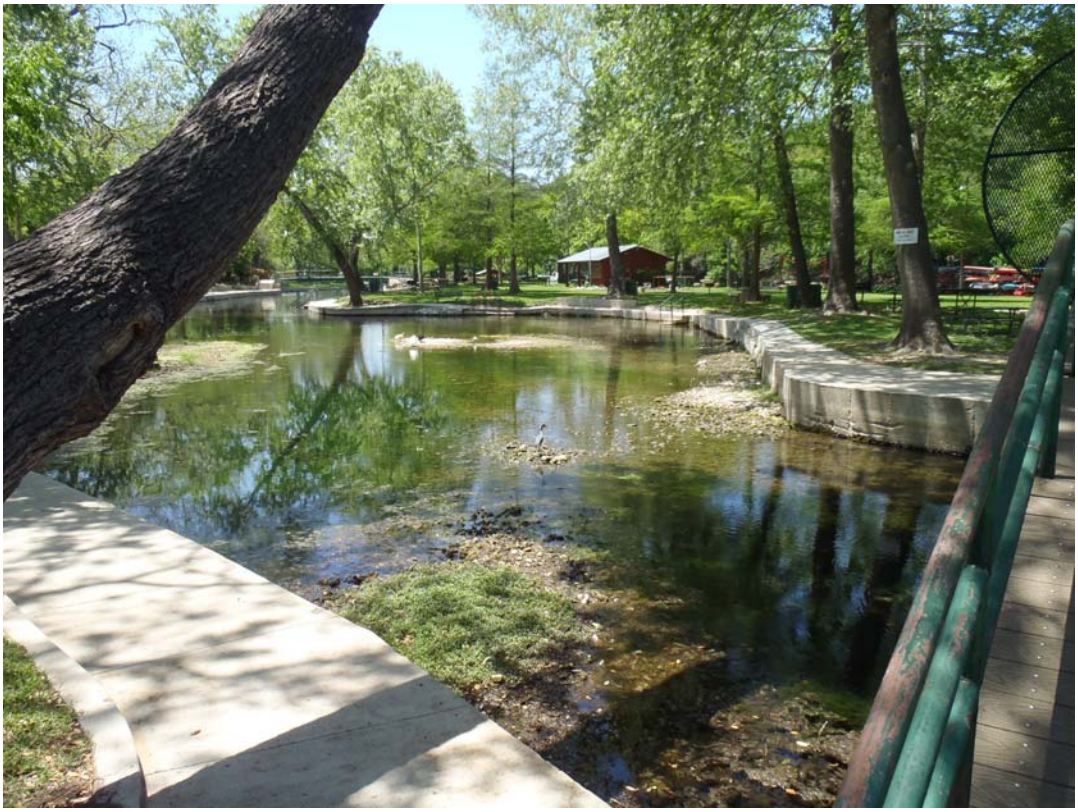

Figure 9: Exposed habitat adjacent to Spring Island area

Figure 10: Spring Run 6 – southern spring run – fully wetted and flowing

Figure 11: Restored native aquatic vegetation (*Ludwigia*) in Landa Lake

Figure 12: Restored native aquatic vegetation (*Cabomba*) in Landa Lake

Figure 13: Floating vegetation mats starting to accumulate in Landa Lake

Biological activities at Comal Springs this week included fountain darter presence/absence dipnetting on April 17th. To expand on the visual habitat assessment, Figure 14 shows the results from the presence/absence dipnetting that was conducted on the Comal River since 2005 including all Critical Period events. Figure 14 demonstrates the variance observed in this metric since 2005 and the solid blue lines represent the 5th and 95th percentiles on Non-Critical Period data.

The April 17, 2014 value (90%) is the highest value to date, well above the long-term average. As evident in Figure 14, an increasing trend appears evident in recent times. This is most likely reflective of the abundance of aquatic vegetation (lack of scour flows have allowed aquatic vegetation to thrive in typically scoured areas) and improving quality (ongoing native aquatic vegetation restoration efforts) of fountain darter habitat in the Comal system. Observations by the dipnet crew this week were as follows:

- Water level in the Upper Spring Run reach is low but some relatively large patches of bryophytes remain.
- Reproduction throughout the Comal system is in full swing as small darters are abundant in all reaches.
- The number of small darters in the New Channel reach was particularly notable with *Cabomba* in that reach looking as good as it ever has.
- Restored *Ludwigia* areas are full of fountain darters of all sizes.

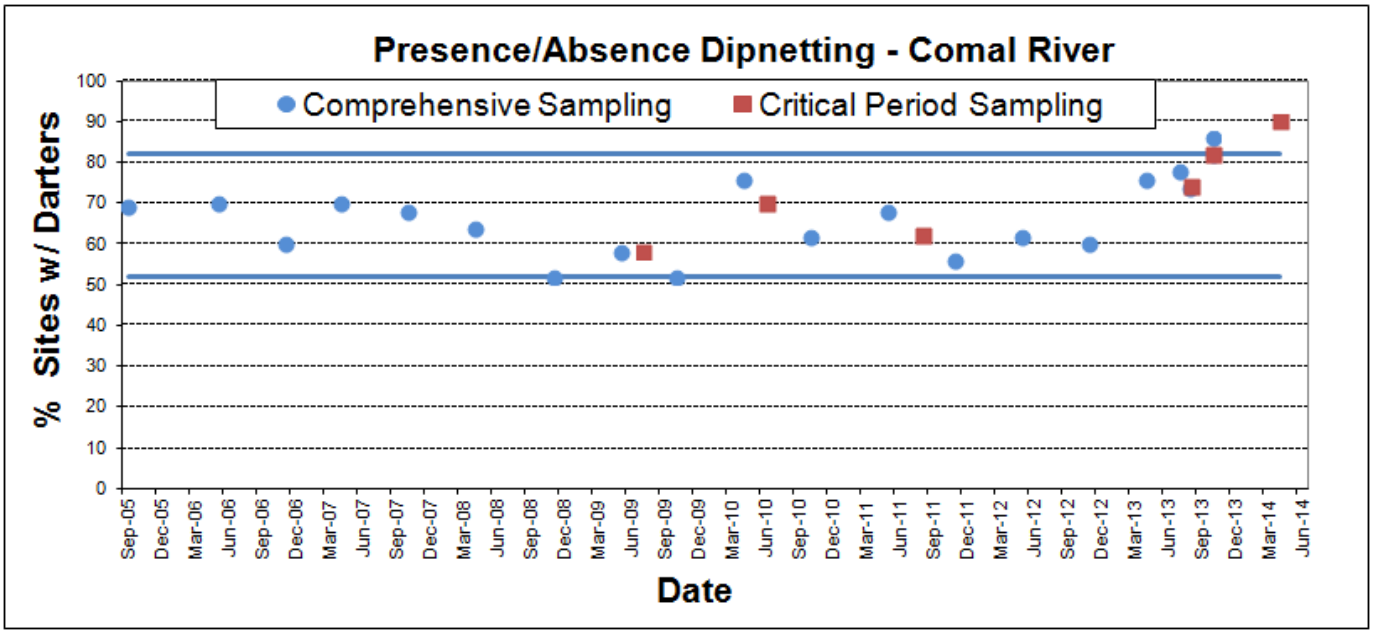

Figure 14: Percentage of sites (N = 50) in which fountain darters were present. Solid blue lines mark 5th and 95th percentiles for Comprehensive Period Sampling.

As a reminder, the presence/absence dip net technique represents ½ of the equation for potentially triggering refugia actions for the fountain darter at Comal Springs based on Section 6.4.3.1 of the HCP. As per that section, the proposed triggers levels for off-site refugia for the fountain darter are as follows:

- *Less than 50 percent mean aquatic vegetation (Landa Lake and Old Channel) AND less than 20 percent darter presence system-wide,*
  OR
- *Less than 25 percent mean aquatic vegetation (Landa Lake and Old Channel) AND less than 30 percent darter presence system wide.*

In Summary, at present the Comal system is supporting quality fountain darter habitat conditions throughout. Floating vegetation mats are starting to accumulate and will need to be addressed in the near future. Construction impacts in the spring runs from the wall construction project are inevitable and are being monitored under a separate permit. Surface habitat for the endangered Comal invertebrates is starting to decline in the main spring runs and Spring Island area.

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

Ed