MEMORANDUM

TO:	Nathan Pence
FROM:	Brad Littrell (BIO-WEST)
DATE:	**January 23, 2015**
SUBJECT:	EA HCP Biological Monitoring – **Week 41**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

The total system discharge at Comal Springs/River was 178 cfs this morning following the nice rain event yesterday (Jan. 22nd) (Figure 1). This week marks the 41st consecutive week for habitat evaluations and memorandums which will continue to occur until total system discharge at Comal Springs/River increases and consistently stays above 150 cfs. Although instantaneous discharge is above 150 cfs this morning, it is still falling after the pulse from the rain event. Should flow conditions stabilize above 150 cfs, this may represent the last consecutive critical period biological monitoring memorandum.

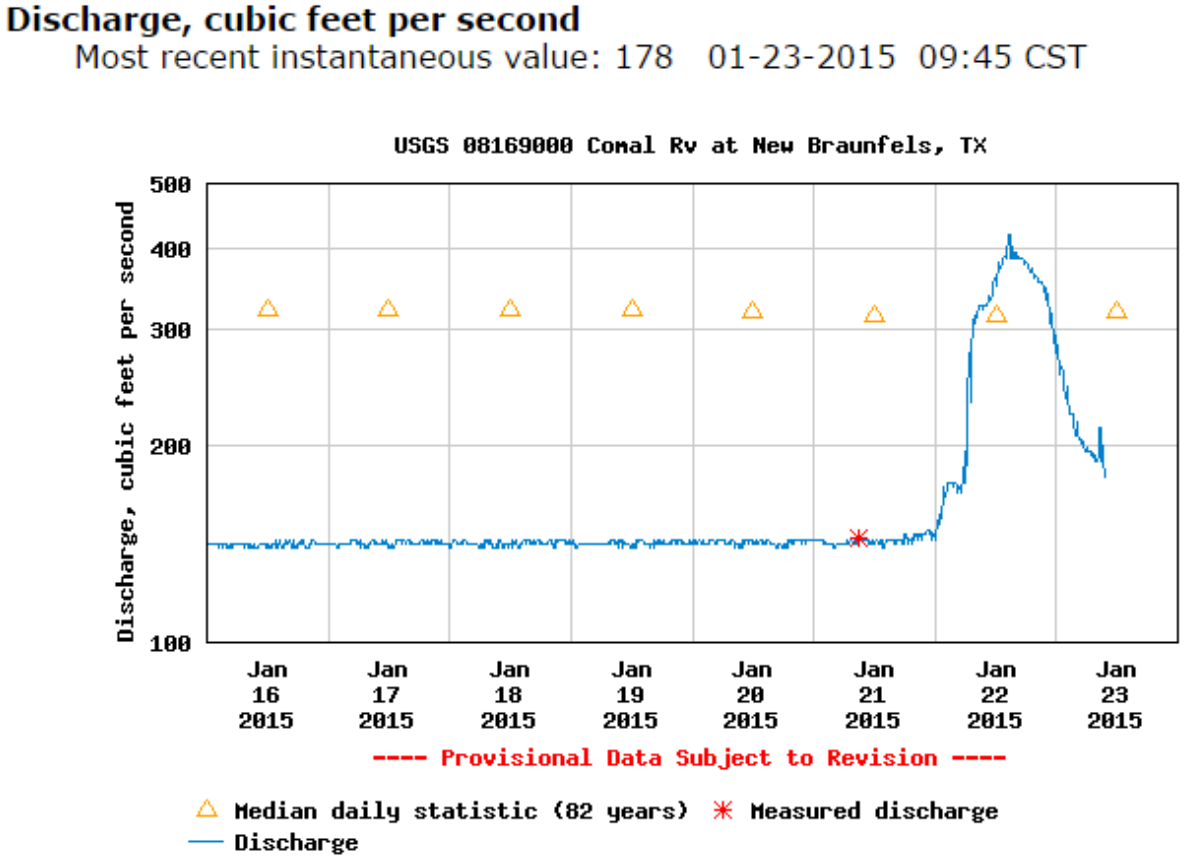

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge this past week.

SAN MARCOS SYSTEM:
The total system discharge for San Marcos Springs/River is approximately 137 cfs this morning. This represents an increase of approximately 17 cfs since last week due to rain in the area over the last couple of days. No Critical period sampling activities were conducted this week or are anticipated for next week.

COMAL SPRINGS/RIVER - WEEK 41 CONDITIONS:
Weekly habitat observations and photo documentation associated with HCP biological monitoring were conducted on Friday, January 23rd. Prior to the rain event on Jan. 22nd, HCP species specific low-flow monitoring activities were being controlled by the <150 cfs level, which triggered aquatic vegetation mapping of the four study reaches and fountain darter presence/absence dip netting to be conducted in January. Both of these events were scheduled for next week and will be conducted if flows stabilize below 150 cfs.

OBSERVATIONS AND ACTIVITIES: Beginning on the evening of Jan. 21st and continuing all day through Jan. 22nd a nice rain event in central Texas brought some much needed recharge to the system. A large portion of the recharge zone received over 0.5 inch, with localized reports of over 2.0 inches in many areas including New Braunfels. As evident in Figure 1, this rain resulted in a spike in discharge at the Comal gauge which peaked at over 400 cfs on the afternoon of Jan. 22nd. As of this morning (Jan. 23rd), we were still on the tail-end of this pulse and it is unclear where discharge conditions at Comal Springs will stabilize. It is suspected that this rain event may result in flows stabilizing above 150 cfs for a while. If so, this likely represents the last of 41 consecutive Critical Period biological monitoring memos.

As expected, the increased discharge in the system resulted in increased wetted area in the various spring runs and in the Spring Island area. Both of the main orifices at the headwaters of Spring Run 1 are flowing (Figure 2), and the spring run supports surface flow for the entirety of the channel with increased surface area compared to last week (Figure 3). Exposed surface habitat is still evident around Spring Island (Figure 4), but conditions are improved since last week, and greatly improved since the low flows of late summer. Although water levels have increased, the Upper Spring Run still contains little aquatic vegetation (Figure 5). Reduced abundance of fountain darters has been documented in this reach in recent months due to the marginal habitat. However, surveys conducted this month by Texas State University researchers show that fountain darters are still present in this reach. In Landa Lake, quality fountain darter habitat persists, and floating aquatic vegetation mats which were problematic during summer and fall 2014 are almost completely gone (Figure 6). Restored native aquatic vegetation in the Old Channel is still thriving and supports quality fountain darter habitat in this reach (Figure 7). As of this morning, water levels in the New Channel were still high and the water was turbid (Figure 8). This is a result of muddy runoff entering the system from Dry Comal Creek. Although a significant pulse of runoff entered the system from Dry Comal Creek, it is doubtful that this flow event was severe enough to cause scouring to aquatic vegetation within the New Channel Reach. This will be confirmed in coming weeks as water clarity improves.

Figure 2: Headwaters of Spring Run 1 with both major orifices flowing.

Figure 3: Spring Run 1 surface flow.

Figure 4: Improved water levels in the eastern outfall of Spring Island.

Figure 5: Little aquatic vegetation in the Upper Spring Run reach.

Figure 6: Aquatic vegetation mats mostly gone from Landa Lake.

Figure 7: Restored native aquatic vegetation in the Old Channel.

Figure 8: Turbid conditions in the New Channel Reach on a rainy morning.

In summary, water level conditions and wetted surface habitat were improved considerably this week due to the increase in total system discharge. However, relative to average flow conditions, endangered species habitat continues to be impacted for surface dwelling invertebrates in the spring runs, western shoreline, and Spring Island areas. Impacts to fountain darter habitat are mostly restricted to areas in the Upper Spring Run, but darters are still present throughout the system. Floating aquatic vegetation mats in Landa Lake were greatly improved thanks to the recent pulse in water levels. Increased turbidity from recent rain did not allow for a visual diagnosis of habitat conditions in the New Channel, but little change from the previous week is expected. Quality fountain darter habitat persists in Landa Lake and the Old Channel thanks in part to ongoing aquatic vegetation restoration activities.

Thanks,

Brad