



MEMORANDUM

TO: Nathan Pence and Rick Illgner
FROM: Ed Oborny (BIO-WEST)
DATE: **November 1, 2013**
SUBJECT: EA HCP Bio-monitoring Update – **Week 12**

BIO-MONITORING UPDATES

COMAL SYSTEM:

The total system discharge at Comal Springs is currently receding (Figure 1) following this week's large rainfall event and subsequent high flow pulses. Should total system discharge stabilize above 150 cfs, it will trigger the termination of this weekly Critical Period habitat evaluation that has been performed for the past 12 weeks.

On Thursday, October 31st, BIO-WEST conducted a visual evaluation of the Comal system following the nearly 4,000 cfs pulse recorded the previous night. There were no noted impacts in the Upper Spring run area through Landa Lake or in the Old Channel. Water was clear in all of these areas with no signs of any scouring activity. The New Channel was still too turbid to make a full assessment of whether aquatic vegetation was scoured out in the stretch downstream of the confluence with Dry Comal Creek and the confluence with the Guadalupe River. However, in areas that were starting to clear up Thursday afternoon, aquatic vegetation was evident.

Subsequently, a second pulse (Figure 1) occurred, this time apparently from the flow coming down Dry Comal Creek (Figure 2) that had not yet made it to the Comal River by Thursday afternoon. BIO-WEST staff reported this morning that there were no changes from yesterday afternoon in the Upper Spring run area through Landa Lake or in the Old Channel. They did note that the New Channel was considerably more turbid this morning than yesterday afternoon. We will evaluate aquatic vegetation in the New Channel next week when the turbidity subsides, but it is unlikely the second pulse of ≈ 350 cfs caused extensive scour in the New Channel.

The apparent lack of impact in the Comal system following the $\approx 4,000$ cfs event and higher levels of turbidity in the upper part of the New Channel following the second ≈ 350 cfs pulse leads us to speculate that a large portion of the recorded flow pulse (gage height) ($\approx 4,000$ cfs) may have been caused by the combination of some water coming down the Comal River and the backwater effect caused from the Guadalupe River which is presently flowing over 30,000 cfs.

As limited to no impacts were caused by the high flow pulses this week in the Comal River, those photographs are incorporated into the weekly evaluation portion of this assessment further below. Fall comprehensive sampling on the Comal system continued this week with Comal Springs salamander sampling, Comal Springs riffle beetle sampling, fountain darter transect survey in Landa Lake, and expanded fish sampling.

Discharge, cubic feet per second

Most recent instantaneous value: 219 11-01-2013 09:45 CDT

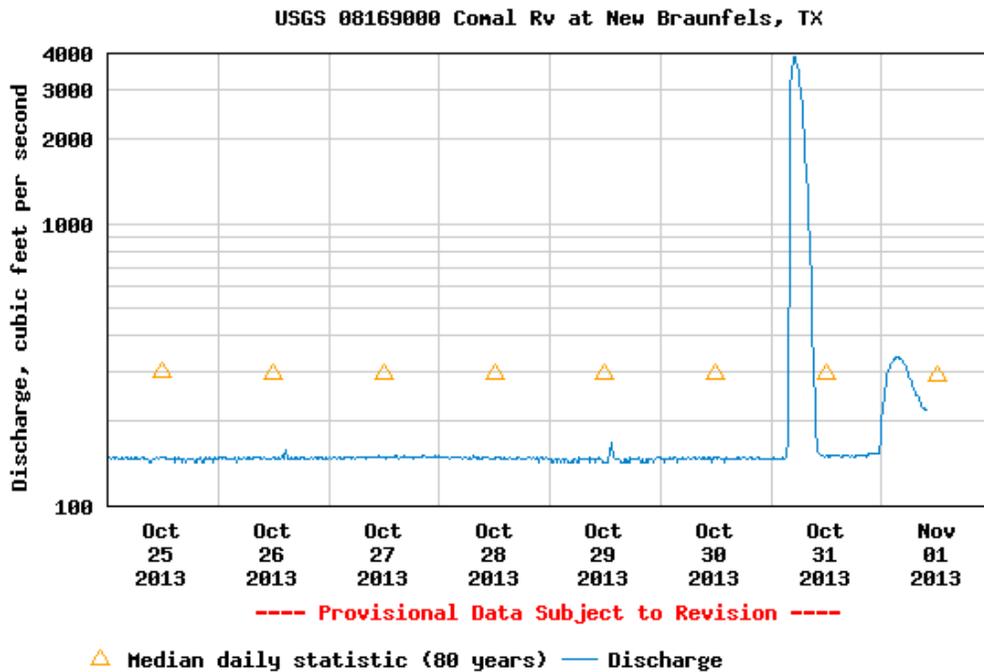


Figure 1: Screen shot of USGS webpage for the *COMAL* gage (08169000) showing total system discharge over the past week.

Discharge, cubic feet per second

Most recent instantaneous value: 118 11-01-2013 10:00 CDT

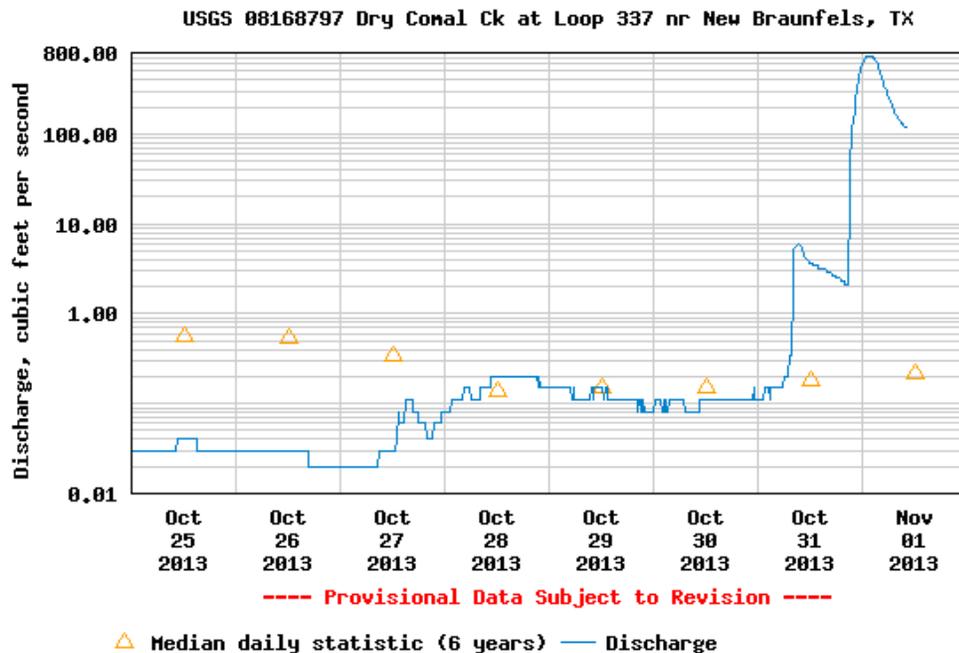


Figure 2: Screen shot of USGS webpage for the *DRY COMAL* gage (08168797) showing total system discharge over the past week.

SAN MARCOS SYSTEM:

Fall comprehensive sampling was completed this week with expanded fish community sampling in Spring Lake and San Marcos salamander sampling being conducted on Tuesday, October 29th.

The total system discharge for San Marcos Springs is unknown at the present time as the high flow pulse experienced Wednesday night apparently rendered the USGS gage inoperable. On Thursday, October 31st, BIO-WEST conducted a visual evaluation of the San Marcos system following the extensive high flow pulse and subsequent flooding presently on-going. The following several photographs (figures 3 through 9) show a snapshot of conditions the San Marcos River was experiencing on October 31st. With the high water levels and turbidity associated with this latest event, it is impossible to tell, at this time, the level of impact this event had and is having on the aquatic habitat and endangered species. We recommend that a visual assessment of conditions be conducted when flow, water level, and water clarity allow for this activity. That assessment will help guide decisions whether subsequent high flow bio-monitoring may be appropriate.



Figure 3: Spring Lake – Slough arm over the road at Aquarena entrance. (October 31st)



Figure 4: San Marcos River – Chute at Western Spillway. (October 31st)



Figure 5: San Marcos River - Looking upstream from City Park. (October 31st)



Figure 6: San Marcos River – Concrete steps at City Park. (October 31st)



Figure 7: San Marcos River - Looking upstream at Rio Vista near River Pub. (October 31st)



Figure 8: San Marcos River – Looking upstream from Cheatham Street Bridge. Note: Rapids are submerged. (October 31st)



Figure 9: San Marcos River – Pedestrian Bridge in I35 reach. (October 31st)

COMAL RIVER - WEEK 12 CONDITIONS AND ACTIVITIES:

Comal: Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Tuesday, October 29th. Subsequent photographs were taken on Thursday, October 31st and Friday, November 1st to evaluate the high flow conditions resulting from the intense overnight rains experienced on October 30th. Note: All photographs will state in the caption the date on which they were taken.

RESULTS:

Since last week's memorandum, a few minor rainfall events occurred early in the week followed by one major event on Wednesday, October 30th (Figure 1). Although total system discharge spiked to near 4,000 cfs, by Thursday afternoon it had already receded back to 151 cfs. Subsequently, a subsequent pulse of ≈ 350 cfs followed Friday morning as water from Dry Comal Creek reached the Comal River.

Surface water flow in Spring run 1 continues to improve with increasing springflow (Figure 10). As in all previous weeks, Spring run 3 continues to maintain connectivity throughout the run. Some additional restoration work along Spring run 3 has been completed to reduce sedimentation into salamander and riffle beetle habitat (Figure 11). With the rise in aquifer levels this week, Spring run 5 had a trickle of water flowing over the concrete structure this morning (Figure 12). This is the first time this has been witnessed in nearly 12 weeks. Algae is still present in portions of the Upper Spring run reach (Figure 13) but not to the levels experienced in August or even recent weeks. Increased surface water level and springflow continue to maintain near full inundation around the Spring Island area as well as surface flow in both the northern and southern (Figure 14) runs of Spring run 6.

As a considerable amount of dirt work took place for the Landa Lake walls construction project since last week, I have included a few photographs showing the area of wall removal (Figure 15) on river left just above the confluence of the combined Spring run 1 and 2 with Landa Lake and the pile of sediment in the park being loaded and removed (Figure 16).

There were no Critical period biological sampling activities conducted at Comal Springs this week. Fall comprehensive sampling activities included Comal Springs salamander sampling, Comal Springs riffle beetle sampling, fountain darter transect survey in Landa Lake, and expanded fish sampling. Similar to the first 11 week's memorandums, fountain darter habitat conditions in Landa Lake continue to look really good. Figure 17 shows the condition of bryophytes within the fountain darter transect, while the subsequent photographs show the high quality bryophytes in Landa Lake both in individual patches (Figure 18) and within *Sagittaria* (Figure 19). The floating vegetation mat condition in Landa Lake continues to be under control (Figure 20). Fountain darter habitat continues to thrive in the Old Channel with no noted impacts from this week's pulse events (Figure 21). With the recent pulse events, it will be interesting to see if there were any impacts to the expanses of aquatic vegetation that was persisting in the New Channel.

Overall, the Comal system continues to support quality fountain darter habitat conditions in Landa Lake and Old and New Channels. Reduced habitat conditions are present in the Upper Spring Run reach but are gradually improving. Relative to average flow conditions, slight impacts to invertebrate habitat are still occurring in the Comal system.

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



Figure 10: Looking upstream toward Spring run 1 main orifice (continuous surface flow extending bank to bank). (October 29th)



Figure 11: Spring run 3 restoration – Natural erosion control and sedge plantings where elephant ears used to be. (October 29th)



Figure 12: Spring Run 5 – Upper Spring Run (trickle of flow) (November 1st)

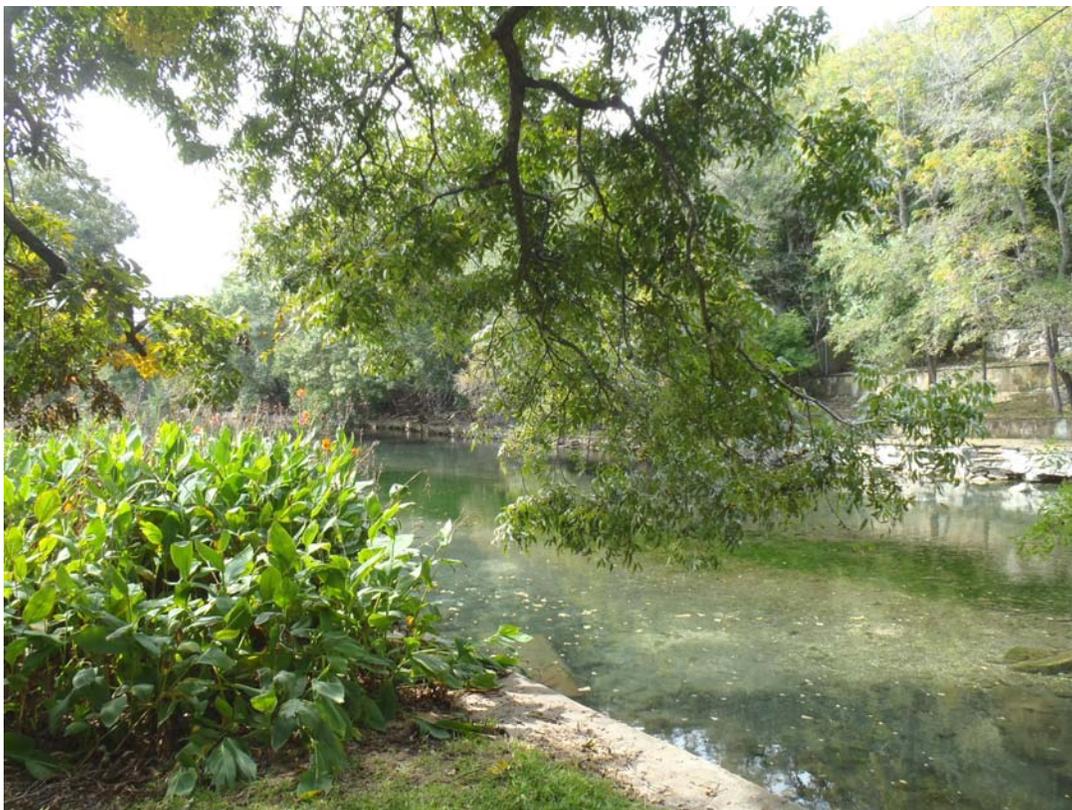


Figure 13: Upper Spring run reach adjacent to Spring run 5. (October 29th)



Figure 14: Spring run 6 – southern spring run. (October 29th)



Figure 15: Landa Lake walls construction project - downstream view towards the lake.

Extensive areas of sediment removed along shoreline. (October 29th)



Figure 16: Landa Lake walls construction project – Sediment being loaded into trucks. (October 29th)

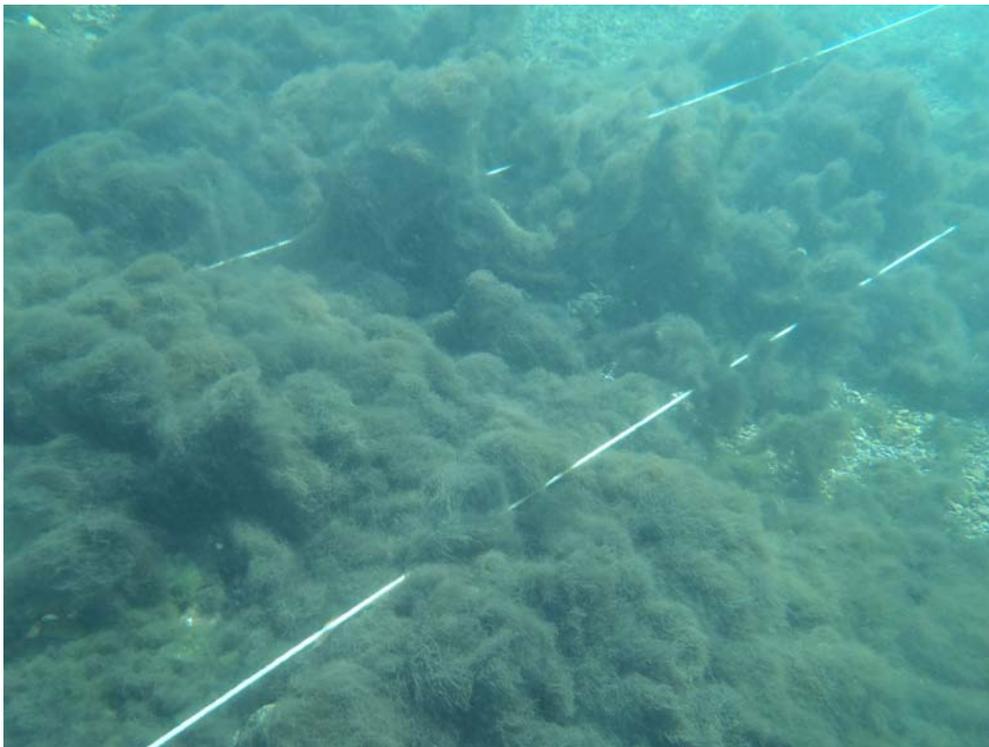


Figure 17: Bryophytes within fountain darter transect survey in Landa Lake. (October 29th)



Figure 18: Extensive bryophyte patches in Landa Lake. (October 29th)



Figure 19: Bryophytes within *Sagittaria* in Landa Lake. (October 29th)



Figure 20: Floating vegetation mat condition in Landa Lake. (October 29th)



Figure 21: Restored aquatic vegetation in Old Channel – Photo taken after high flow pulse event. (October 31st)