



MEMORANDUM

TO: Nathan Pence and Rick Illgner
FROM: Ed Oborny (BIO-WEST)
DATE: August 23, 2013
SUBJECT: EA HCP Bio-monitoring Update – Week 2

Gentlemen,

This memorandum serves as the weekly correspondence on sampling activities and preliminary results regarding the condition of the Comal system.

WEEK 2 CONDITIONS AND ACTIVITIES:

Comal: The present total discharge at Comal Springs is \approx 129 cfs. Starting August 9th, BIO-WEST initiated the full Critical Period sampling effort which includes the following components and schedule:

- Water quality – 1st week.
- Thermisters – downloaded August 21st and 23rd.
- Aquatic vegetation mapping of 4 study reaches – 1st week.
- Fixed station photography – August 21st.
- Fountain darter specific sampling
 - 50 sites Dipnet – 1st week
 - Timed Dipnet surveys – August 19th.
 - Dropnet 3 study reaches – 1st week.
 - SCUBA transects – August 21st.
- Fish Community sampling
 - SCUBA mesohabitat and microhabitat – 1st week.
 - Seine – 1st week.
- Comal Spring salamander sampling – 1st week.
- Comal Springs discharge measurements – August 9th and August 23rd.
- Comal Springs invertebrate sampling – Lure retrieval – week of August 26th.

RESULTS:

As of this memorandum, all of the Critical Period field sampling activities (excepting cotton lure retrieval) have been completed with the following preliminary observations. During all full sampling events, we collect discharge data at HCP Bio-monitoring locations to relate directly to biological monitoring activities being conducted. We conducted discharge measurements this morning (August 23rd) with the results of both that trip and the August 9th data presented below:

Date:	August 9th	August 23rd
	Discharge (cfs)	
Spring Run 1 –	4.1	1.7
Spring Run 2 –	0.6	0.3
Spring Run 3 – Upper –	1.6	1.6
Spring Run 3 – Lower –	13.3	12.1
Old Channel –	57.1	60.6
Upper Spring Run –	4.8	3.1
Total USGS Gage – Daily Average	136.0	129

As evident in both sets of measurements, the main spring runs (1, 2, and 3) are getting quite low. This is very evident in Figures 1 through 3 below. In fact, the larger spring openings at the head of Spring Run 1 have ceased surface flow (Figure 1) which has not been observed since the initiation of the biological monitoring effort in Fall 2000.



Figure 1: Spring Run 1 orifice (August 21st)



Figure 2: Just downstream of Spring Run 1 orifice (August 21st)



Figure 3: Spring Run 3 – constriction in mid run and exposed area (August 21st)

Biological sampling activities within the main spring runs include the placement of cotton lures at 10 sites within Spring Run 3 for Comal Springs riffle beetles on 14-16 August and will be retrieved the week of 26 August for evaluation. Comal Springs salamander surveys in Spring runs 1 and 3 were conducted on August 16th. Although shallow water made sampling difficult, Comal Springs salamanders (Figure 4) were found in all three surveyed locations (Spring run 1, Spring run 3, and Spring Island area). Overall, a typical number of salamanders were observed in Spring Run 3, but less than normal were observed in the shallow water present in Spring Run 1.

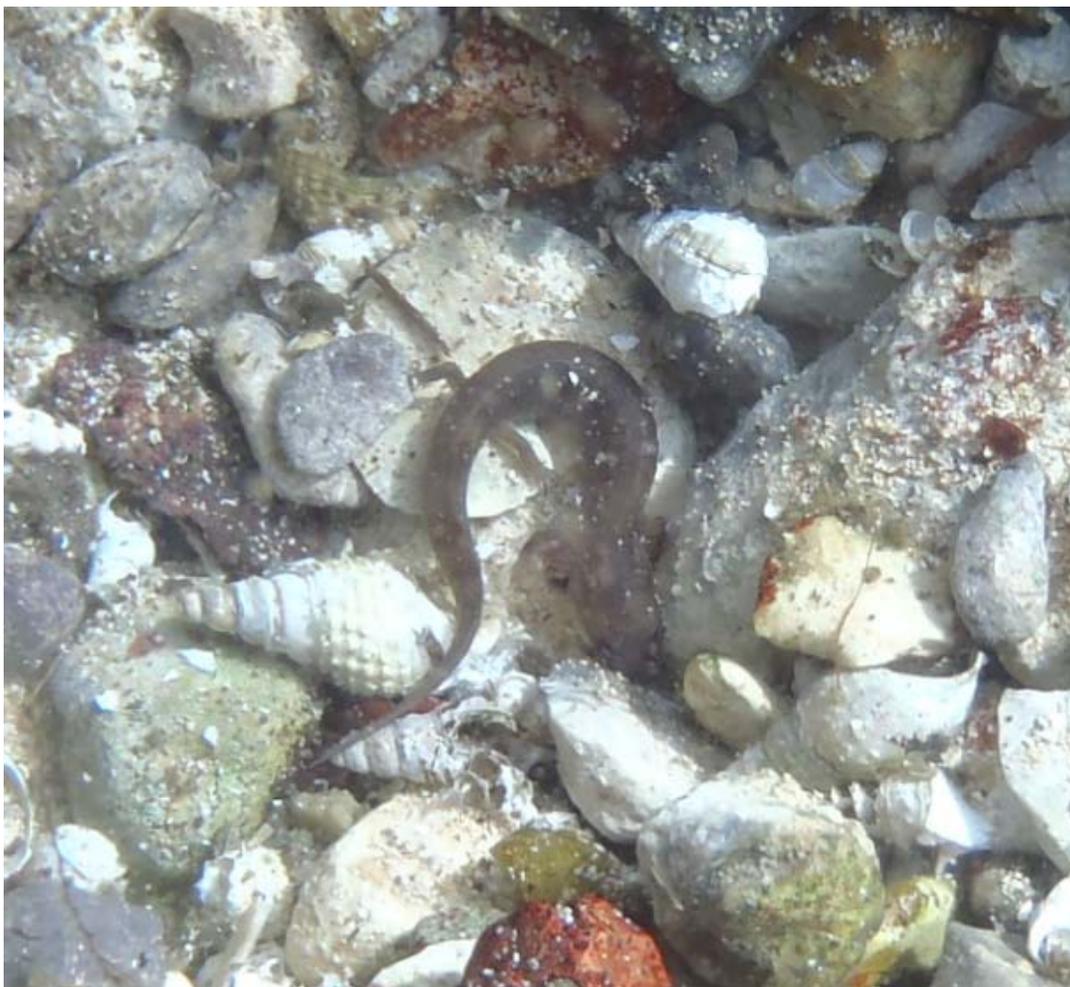


Figure 4: Comal Springs salamander in Landa Lake (August 21st)

From the above discharge measurements, it is encouraging that spring flow is still coming from the Upper Spring Run reach (≈ 3 cfs). As with last week's report, Spring Run 5 is still not flowing over the concrete wall. The limited spring flow throughout this upper reach coupled with the extreme air temperatures continues to support considerable algal production. However, even with this algal buildup, fountain darters were collected within this upper reach during timed fountain darter dip net surveys conducted this week.

As noted last week, the water level throughout the Spring Island area remains quite shallow with exposed sediment bars above Spring Island and along the shoreline of Spring Island. Although a small wetted area is still present at the head of the spring on Spring Island, neither spring run that typically connects to the main water body is flowing. In fact, most of the water in these runs has

gone subsurface (Figure 5). It was encouraging that Comal Springs salamanders were still documented in the Spring Island eastern outfall area at typical concentrations during the August 16th survey. As noted, additional biological monitoring activities conducted in the Spring Island area include the placement of cotton lures at 10 sites within the Spring Island upwellings for Comal Springs riffle beetles. The lures will be retrieved next week and results presented after that time.



Figure 5: Mostly dry southern spring run on Spring Island

Similar to last week, habitat conditions in Landa Lake, the Old and New Channels continue to maintain quality fountain darter habitat. Bryophytes still maintain a strong foothold within Landa Lake (Figure 6) while the aquatic vegetation restoration plants continue to prosper in the lake and Old Channel (Figure 7).

Although presence/absence dip netting (reported on last week) was not conducted this past week, timed fountain darter dip net surveys were conducted throughout the system. As per the contract, presence absence dip netting will occur next in October, or sooner should total discharge decline below 100 cfs. The timed dip net surveys this week continue to document that there is an abundance of aquatic vegetation in the New Channel, which complements the high quality habitat abundant in Landa Lake. The Old Channel continues to be dominated by non-native *Hygrophila* (minus the restored areas), but still maintains bryophytes within and surrounding the non-native vegetation. Fountain darter timed dip netting revealed darters were still present in all reaches.

On August 21st, the fountain darter SCUBA assessment (Figure 8) was conducted in Landa Lake. Bryophytes within the sample transect supported approximately 65% coverage with 39 fountain darters (Figure 9) observed in the survey. Both results are well within the range of typical conditions for fountain darters within the deeper portions of Landa Lake.



Figure 6: Abundant bryophytes and upwelling flow within Landa Lake.



Figure 7: Restored *Ludwigia* area in the Old Channel

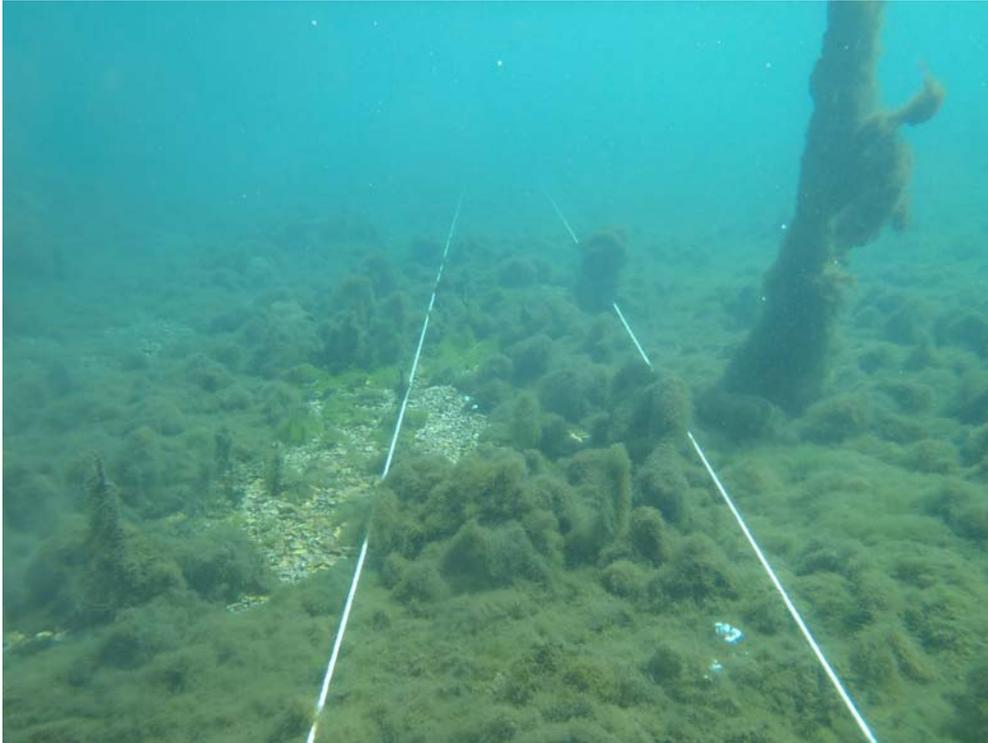


Figure 8: Fountain darter SCUBA transect within Landa Lake.



Figure 9: Fountain darter within Scuba transect in Landa Lake.

Although habitat conditions within the lake are holding steady, water levels are low and floating mats of aquatic vegetation are becoming more evident (Figure 10). If allowed to be stagnant for too long, these mats will shade out underlying vegetation. They are also popular hangout zones for large predators (Figure 11).



Figure 10: Fountain darter in within Scuba transect in Landa Lake.



Figure 11: Largemouth bass under floating mat of aquatic vegetation

In summary, the majority of the Comal system is maintaining quality fountain darter habitat conditions in spite of the extreme summer time conditions and total system discharge less than 130 cfs. To continue to have the coverage of aquatic vegetation (including bryophytes) in Landa Lake and Old and New Channels under these ambient air and discharge conditions is a real positive. Additionally, fountain darter numbers in these habitats remain high.

As mentioned last week, impacts to fountain darter habitat continue to occur in the Upper Spring Run reach and Spring Island area. The main impact in the upper reach is from the extensive algae build up that has blanketed the bryophytes and caused them to essentially disappear in that reach. Impacts to endangered Comal invertebrate habitat are also continuing to occur in the Spring Island area as well as the main spring runs. It is premature to speculate on how this might be affecting the actual populations of the Comal invertebrates at this time.

Other than retrieving the cotton lures, all field sampling associated with this critical period event has been concluded. We will continue to conduct weekly habitat evaluations and provide weekly progress updates until total discharge in the Comal system rebounds to above 150 cfs. Water quality results from grab samples and thermisters should be available for next week's update along with some preliminary riffle beetle results. If you have any questions or concerns, please don't hesitate to contact me at your earliest convenience.

Ed