MEMORANDUM

TO:	Nathan Pence
FROM:	Ed Oborny (BIO-WEST)
DATE:	**July 4, 2014**
SUBJECT:	EA HCP Biological Monitoring – **Week 12**

BIOLOGICAL MONITORING UPDATES

COMAL SYSTEM:

At the time of this memorandum, the total system discharge at Comal Springs was 129 cfs (Figure 1). This makes the twelfth consecutive week below 150 cfs, and therefore, the required weekly habitat evaluation was conducted on July 3rd. Weekly habitat evaluations and memorandums will continue to occur until total system discharge at Comal Springs/River increases and consistently stays above 150 cfs. Should total system discharge decline below 120 cfs (which is possible next week with no significant rainfall over the weekend), Comal Springs riffle beetle, Comal Springs salamander, and Comal discharge measurements/sampling will be triggered. As described in previous weeks, the next Critical Period full sampling event is not triggered until the total system discharge declines below 100 cfs. The next scheduled routine monitoring is fountain darter dip netting later this month.

SAN MARCOS SYSTEM:

The total system discharge for San Marcos Springs/River is approximately 152 cfs. This is very consistent with the past several weeks. At the present total discharge conditions, the San Marcos River should not trigger any critical period biological monitoring for some time. The next scheduled routine monitoring is full-system Texas wild-rice mapping and fountain darter dip netting later this month.

COMAL SPRINGS/RIVER - WEEK 12 CONDITIONS:

Weekly habitat observations and photo documentation associated with HCP triggered sampling were conducted on Thursday, July 3rd.

OBSERVATIONS AND ACTIVITIES:

The J17 water level at the time of this memorandum was approximately 635' with a slow but steady decline all week. As a result, habitat conditions relative to flow, water level and exposed substrate in select areas (Upper Spring Run, Spring Run 1, and Spring Island area) declined this past week and presently represent similar conditions to those experienced over a month ago when similar total system discharge was evident. The difference this week is that the hot, ambient air temperatures and longer days are contributing to greater algae build-up in these areas.

Discharge, cubic feet per second

Most recent instantaneous value: 129 07-04-2014 07:45 CDT

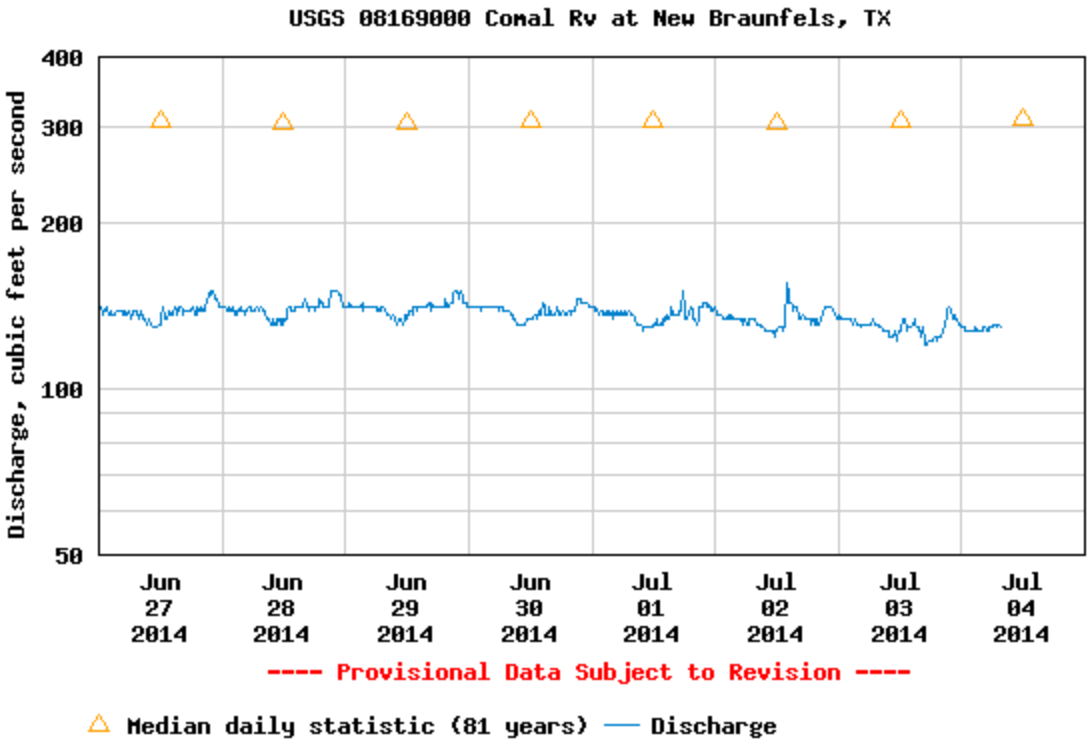

Figure 1: Screen shot of USGS webpage for the ***COMAL*** gage (08169000) showing total system discharge over the past week.

The two major orifices at Spring Run 1 continue to maintain surface discharge (Figure 2), although the western most orifice (upper left in photo) is very shallow. The Spring Run 1 channel continues to maintain surface flow connectivity (Figure 3) throughout the run but has declined in horizontal extent from previous weeks. It is encouraging that after 12 weeks of total system discharge below 150 cfs and extensive construction activities within Spring Run 1; native aquatic vegetation continues to be supported in the run (Figure 4). As in previous weeks, Spring Run 2 continues to maintain surface flow for the main portion of the channel and Spring Run 3 continues to maintain connectivity throughout the run. At present, algae is extremely thick in the Upper Spring Run reach eliminating most native bryophytes at this time (Figure 5). As mentioned last week, unless there is a significant change in flow conditions, this will likely only get worse in coming weeks, as previous experience has shown that algae coverage is worst during late July / early August. However, even with thick and expansive algae in this reach, a night dive for the fountain darter movement study conducted this week confirmed that darters are still present in this reach.

The surface water level in the Spring Island area was slightly less than last week resulting in slightly greater exposed surface habitat in the area along the eastern side of the island (Figure 6). The northern spring run on Spring Island continues to be mostly dry with only a few small surface puddles left and no observable surface flow. The southern spring run is barely maintaining surface flow and is becoming increasingly covered in algae, leaf litter, and grass clippings (Figure 7).

With longer, warmer days, algae continues to increase in portions of Landa Lake, yet aquatic vegetation including bryophytes in the lake continues to support quality fountain darter habitat. Figure 8 shows a thick *Cabomba* patch that is flowering in Landa Lake. With summer time conditions, increased paddle boat traffic also occurs. A paddle boat trail through a floating mat of aquatic vegetation is evident in Figure 9. Breaking up floating mats via paddle boats is likely a benefit to moving that disconnected vegetation downstream. However, paddle boat trails though shallow areas (caused by lower than average water level conditions) of restored native aquatic vegetation are quite disruptive. Overall, floating vegetation mats in Landa Lake were well controlled this past week (Figure 10), but certain areas like the fishing pier can quickly become buildup locations (Figure 11) especially with ongoing walls construction. Regardless, at the present total system discharge, weekly attention to floating mats will be necessary all summer to prevent impacts to underlying habitat.

Figure 2: Spring Run 1 main orifices (upper left orifice is very shallow).

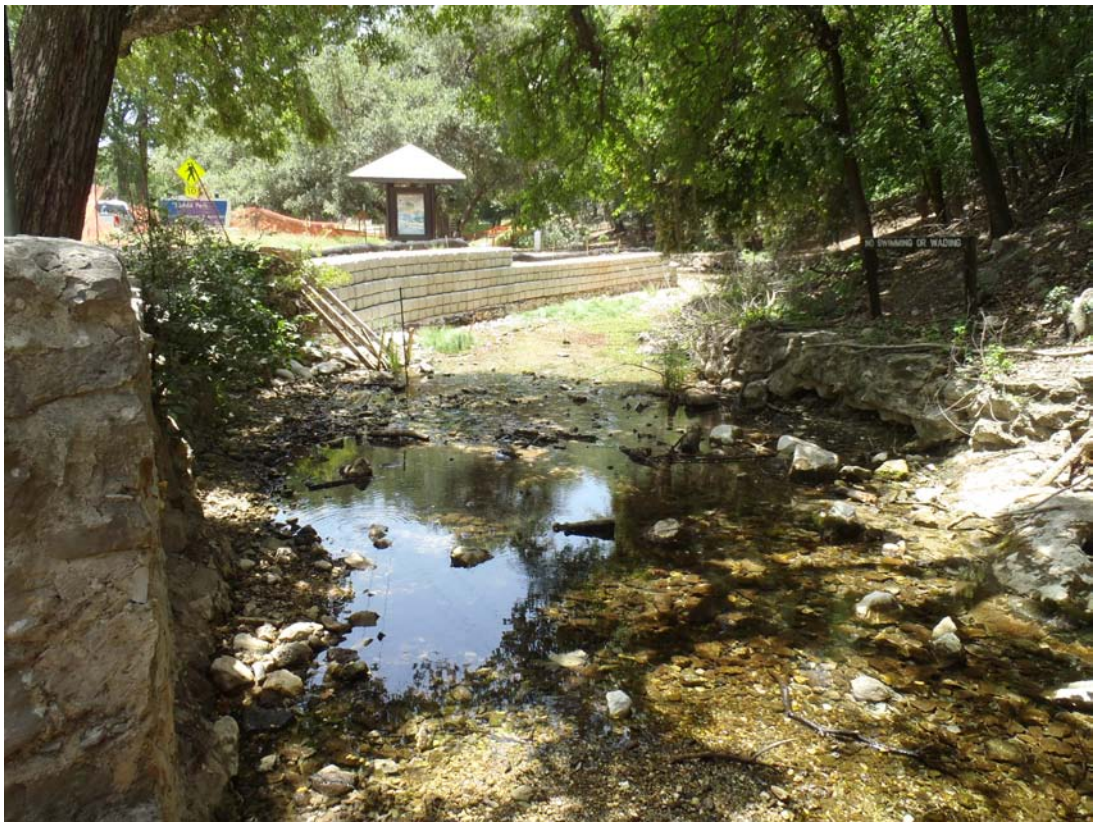

Figure 3: Spring Run 1 main channel looking downstream.

Figure 4: Native aquatic vegetation (*Ludwigia*) in very shallow Spring Run 1 area.

Figure 5: Thick algae - Upper Spring Run Reach. Note: Aspiring young fisheries biologists.

Figure 6: Continued exposed surface habitat adjacent to Spring Island.

Figure 7: Stagnant conditions within the southern spring run on Spring Island.

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Figure 8: Extensive patch of native aquatic vegetation (*Cabomba*) in Landa Lake.

Figure 9: Paddle boat traffic in Landa Lake. Note: Trail through floating vegetation mat.

Figure 10: Floating aquatic vegetation mat condition in Landa Lake.

Figure 11. Build up of floating aquatic vegetation at Landa Lake fishing pier.

In addition to the lake, fountain darter habitat continues to thrive throughout the Old Channel. Figure 12 shows an area once completely covered in non-native *Hygrophila* that upon restoration is supporting four different types of native aquatic vegetation. Despite continued heavy, summer recreational traffic, the New Channel above Clemens Dam continues to maintain extensive patches of *Cabomba* which provide quality fountain darter habitat (Figure 13).

Relative to last week's memo, endangered species habitat conditions in the Comal Springs/River decreased slightly due to increased exposed substrate and continuing build-up of algae in select areas. However, overall, the system continues to support quality fountain darter habitat conditions throughout most of its entirety and fountain darters continue to occupy the Upper Spring Run reach. Floating vegetation mats in Landa Lake will continue to need attention all summer and beyond should lower than average total system discharge conditions persist. Slight reductions in wetted area in individual spring runs this week translated into reduced surface habitat conditions for the endangered Comal invertebrates. As noted above, slight reductions in invertebrate surface habitat conditions were also caused by stagnant water and algae build-up continuing in select shallow areas such as the southern spring run on Spring Island.

Finally, I have included a photo of the sealed off old culverts on the downstream end from the Flow Split Management project (Figure 14) and Figure 15 is a poor attempt at some independence day humor. As always, if you have any questions, please give me a shout. Have a wonderful 4th of July weekend! Ed

Figure 12: Restored native aquatic vegetation growth occurring in the Old Channel.

Figure 13: Thick *Cabomba* in the New Channel interspersed with human tubers throughout.

Figure 14: Sealed off old culverts in Landa Lake – photo of the Old Channel side.

Figure 15: Possible reason for discharge discrepancies at USGS old channel gage ☺