EAHCP Submerged Aquatic Vegetation Analysis and Recommendations
Scope of Work
draft 11/12/2015

Contractors:	Prime – BIOWEST; Sub – TXSTATE
Co-Principal Researchers:	Ed Oborny and Thom Hardy
Cost:	$XX.XX (TBD once SOW is established)
Timeline:	Begin Dec 2015; terminate July 2016 Draft report due March 2016; Final Report due May 2016; presentation to IC in June 2016.

Purpose

- This Scope of Work is intended to generate information and data for consideration by the EAHCP Implementing Committee when evaluating potential changes to vegetation restoration through the EAHCP Adaptive Management process.
- To establish a timeline, with annual goals, to achieve the vegetation restoration Biological Goals in the EAHCP. This timeline and information will be used in the preparation of annual work plans by the Permittees.
- To use lessons learned from field experience in the first years of implementation, to if necessary, modify methodologies and vegetative goals, to achieve the Biological Goals of the EAHCP.
- The purpose of this Scope is *not* to consider the appropriateness of the "reaches" as associated with measuring compliance with the Biological Goals. That shall be considered by the Biological Monitoring work group in early 2016.

Criteria and Information

- BioWest and TXSTATE shall operate by *consensus*. All recommendations presented in Task 3 shall be agreed to by both. Recommendations not agreed to by both, shall not be included.
- This Scope of Work is for both the Comal and San Marcos Rivers.
- For Task 1, the vegetation mapping from the 2013 - 2015 EAHCP BioMonitoring shall be used. For Task 1(4), the comparison to the Biological Goals, the vegetation mapping from October 2015 shall be used.
- Rationales provided for any recommendations in Task 3, shall be based on the amount of Fountain Darter habitat created or protected.
- All recommendations for the San Marcos system provided in Task 3, shall acknowledge the delicate balance towards achieving restoration goals for both fountain darter habitat and Texas wild-rice.
- BioWest and TXSTATE shall also base their recommendations on information found in a literature review of native Submerged Aquatic Vegetation in the San Marcos and Comal Rivers.

Task 1: Baseline Documentation and Status Determination (snapshot)

1. Document detailed vegetation species type and planting and removal methodologies used in the Comal and San Marcos Rivers, identifying significant differences between the two river systems.
2. Document benefits or concerns of restoration methodologies in Task 1(1) established by monitoring data.

3. Document benefits or concerns of restoration methodologies in Task 1(1) established by observations of the EAHCP Permittees or contractors.
4. Document current coverage of vegetative species restoration as compared to the Biological Goals, for compliance purposes, of the EAHCP for the San Marcos and Comal Rivers.
5. Document the flow manipulations, of the Old Channel since 2012, that have occurred as a result of implementing Table 5-3 of the EAHCP.
6. Document any significant shifts in Old Channel flows since 1990.
7. Document benefits or concerns of flow changes in Task 1(5) and 1(6) to vegetation in the Old Channel established by monitoring data.
8. Document benefits or concerns of flow changes in Task 1(5) and 1(6) to vegetation in the Old Channel established by EAHCP Permittee and contractor observations.

Task 2: Status Quo

- use the information generated from Task 1 to:
  1. For both the Comal and San Marcos rivers, draft a restoration schedule, with annual milestones specific to each vegetation species and monitoring reach, to accomplish the vegetative Biological Goals, as currently established in the EAHCP, by Dec 2027. This schedule should also include gardening and maintenance efforts.
  2. Describe anticipated impacts to the Covered Species and their habitat, positive or negative, of continuing to follow Table 5-3 of the EAHCP.

Task 3: Recommendations for Consideration

- Implementation of provided recommendations will not require a major amendment to the HCP, but may require a minor amendment or clarification to the EAHCP. Vegetation represents Fountain Darter habitat, therefore it is assumed that swapping one native species for another represents a clarification, not a major amendment.
- If a new species of native vegetation is recommended for utilization, documentation of its historical existence in the related system shall be included.
- Implementation of provided recommendations will not require additional funding. However, recommendations may require a shifting of funds between line items that results in an overall budget neutral outcome. Therefore, less significant conservation measures of which money would be borrowed from, should be identified.
- Recommendations will not address the adequacy of the "reaches". That task will be addressed by the BioMonitoring Work Group in 2016.

  <u>Methodologies</u>
  1. Based on Task 1(1), 1(2) and 1(3), should restoration methodologies for either Comal or San Marcos be adjusted? This should also consider changes to methodologies of other EAHCP conservation measures that may impact vegetation restoration (i.e. sediment removal or riparian restoration).

  <u>Status Quo</u>
  1. With changes to methodologies implemented per Task 3(M)(1), is the schedule provided in Task 2(1) achievable?
  2. Based on Task 1(5), 1(6), 1(7), 1(8) and 2(2), does Table 5.3 of the EAHCP achieve the maximum benefit possible to the endangered species in the Old Channel of the Comal River?

  <u>Recommended Changes to Vegetation Restoration</u>
  1. If the answer to Task 3(SQ)(1) is "No", then provide recommendations (changes to restoration methodologies, species type, meters of coverage of a species type, or other

change to the Biological Goals) needed to achieve the Biological Goals (as modified if necessary), including a restoration schedule, with annual milestones specific to each vegetation species and monitoring reach, to accomplish the vegetative Biological Goals (as modified if necessary) by Dec 2027. This schedule should also include gardening and maintenance efforts.

2. If the answer to Task 3(SQ)(2) is "No", then provide a new Table 5.3 to achieve the maximum benefit possible to the endangered species in the Old Channel of the Comal River?
3. What vegetation mapping occurrence (or combination thereof) should be used to measure compliance against the Biological Goals? And why?
4. Does the established # of fountain darters per square meter of vegetation species, as set by Table 4-21 and 4-1 need to be confirmed with field experiments? Do additional species of vegetation need to be evaluated with field data, for inclusion into Table 4-21 or 4-1?

Deliverables

- A detailed report documenting all information from Task 1 and answering all questions, with appropriate rationales, from Task 2 and 3.
- A restoration schedule for each system per Task 1 and, if necessary, a second set of restoration schedules from Task 3(Recommendations)(1).
- If necessary, a revised Table 5.3.