M E M O R A N D U M

To: EAHCP Committees

From: Nathan Pence
EAHCP Program Manager

Date: August 24, 2016

Subject: **Summary of SAV Report – Updated per SAV Addendum**

Dear EAHCP Committee Members:

BIO-WEST, Inc. & Watershed Systems Group, Inc. have produced an addendum revising Section 3.1.2 and Appendix B of the *Submerged Aquatic Vegetation Analysis and Recommendations* report (2016). These revisions reflect the use of *Hydrocotyle* as a replacement for *Hydrilla* and *Hygrophila* in the San Marcos submerged aquatic vegetation restoration program, rather than *Heteranthera*, as originally had been proposed.

As a result of further analysis, this addendum identifies an additional management scenario for the San Marcos submerged aquatic vegetation restoration program. The following is a brief summary of the analysis of the three original scenarios, plus this additional scenario ("Scenario 4"). Also, this memorandum includes a summary of the adjustment to the operation of the flow-split infrastructure in the Old Channel of the Comal system, plus the lessons learned for removal and planting methods.

Summary of SAV Scenarios

1. ***Scenario 1 - Status quo***
   - Includes planting and maintenance of non-native submerged aquatic vegetation species
     - *Hydrilla* and *Hygrophila* are non-native species in the San Marcos system
     - *Hygrophila* is non-native in the Comal system
   - Not achievable due to competition between *Zizania* (Texas Wild-rice) and other submerged aquatic vegetation species for physical space
   - Cannot be achieved within the term of the permit due to space limitations
   - Potential for an estimated 34,325 Fountain Darters in the San Marcos system Long-term Biological Goal (LTBG) reaches
   - Potential for an estimated 176,150 Fountain Darters in the Comal system LTBG reaches.

2. ***Scenario 2***
   - Removes non-natives in the San Marcos system from the LTBGs (*Hydrilla* and *Hygrophila*) and replaces them with natives (*Heteranthera* and Texas Wild-rice)
   - Integrates Texas Wild-rice and submerged aquatic vegetation restoration for a realistic and achievable regime

- Removes a non-native in the Comal system from the LTBGs (*Hygrophila*) and replaces it with a native (*Potamogeton*)
- Potential for an estimated 29,300 Fountain Darters in the San Marcos system LTBG reaches
    - Represents a potential decrease of an estimated 5,025 darters in the San Marcos LTBG reaches
- Potential for an estimated 176,718 Fountain Darters in the Comal system LTBG reaches
    - Represents a potential increase of an estimated 568 darters in the Comal LTBG reaches

3. ***Scenario 3***
    - All of Scenario 2, plus the below
    - Maintains the lower-end range (9,480 m^2) of the Texas Wild-rice LTBGs
    - Defines "proportional expansion" as required by the Key Management Objectives
        - This definition provides for additional restoration in newly created "restoration reaches"
        - 5 San Marcos restoration reaches
            - Potential for an estimated 10,925 additional Fountain Darters in the San Marcos system within the restoration reaches beyond LTBG numbers
        - 3 Comal restoration reaches
            - Potential for an estimated 3,462 additional Fountain Darters in the Comal system within the restoration reaches beyond LTBG numbers

4. ***Scenario 4***
    - All of Scenario 3, with the following changes (applicable only to San Marcos)
    - *Heteranthera* is removed and is replaced with *Hydrocotyle*
    - Potential for an estimated 29,270 Fountain Darters in the San Marcos system LTBG reaches
        - Represents a potential decrease of an estimated 5,055 darters in the San Marcos LTBG reaches
    - 5 San Marcos restoration reaches
        - Potential for an estimated 9,940 additional Fountain Darters in the San Marcos system within the restoration reaches beyond LTBG numbers

Adjustment to Operation of Flow-Split Infrastructure

- Involves a modification to the flow requirements set by EAHCP Table 5-3
- The maximum controlled flow in the Old Channel would be reduced from 80 cfs to 65 cfs
- The minimum controlled flow in the Old Channel would remain the same (i.e., 20 cfs)

Removal and Planting Methods

Besides management scenarios, another important section of the BIO-WEST, Inc. & Watershed Systems Group, Inc. report is a discussion of the three years of lessons learned in methodologies from in-the-field implementation. These methodologies should be incorporated into Annual Work Plans by Permittees as appropriate.

The proposed changes would result in the following administrative proceedings:

Actions/Changes/Amendments/Clarifications

Assuming Scenario 1 is implemented

- No changes necessary

Assuming Scenario 2 is implemented

- *Clarification:* To replace non-natives with natives in the LTBG for the fountain darter for the Comal system, resulting in modifications to EAHCP Table 4-1.
- *Clarification and Amendment:* To replace non-natives with natives in the LTBG for the fountain darter and to note the loss of 5,025 darters in the San Marcos system, resulting in modifications to EAHCP 4-21.
- *Amendment*: Adjust target flows in the Flow-Split Management for the Old and New Channel resulting in modifications to EAHCP Table 5-3.

Assuming Scenario 3 is implemented

- *Clarification:* To replace non-natives with natives in the LTBG for the fountain darter for the Comal system, resulting in modifications to EAHCP Table 4-1.
- *Clarification and Amendment:* To replace non-natives with natives in the LTBG for the fountain darter and to note the loss of 5,025 darters in the San Marcos system, resulting in modifications to EAHCP 4-21.
- *Clarification:* Providing clarifying the Key Management Objectives for the fountain darter regarding the definition of "proportional expansion" by using restoration reaches in both systems.
- *Amendment*: Adjust target flows in the Flow-Split Management for the Old and New Channel resulting in modifications to EAHCP Table 5-3.

Assuming Scenario 4 is implemented

- *Clarification:* To replace non-natives with natives in the LTBG for the fountain darter for the Comal system, resulting in modifications to EAHCP Table 4-1.
- *Clarification and Amendment:* To replace non-natives with natives in the LTBG for the fountain darter and to note the loss of 5,055 darters in the San Marcos system, resulting in modifications to EAHCP 4-21.
- *Clarification:* Providing clarifying the Key Management Objectives for the fountain darter regarding the definition of "proportional expansion" by using restoration reaches in both systems.
- *Amendment*: Adjust target flows in the Flow-Split Management for the Old and New Channel resulting in modifications to EAHCP Table 5-3.

Timeline:

- **September 1, 2016**: Program Manager submits Nonroutine AMP proposal to the Implementing Committee, Stakeholder Committee and Science Committee.
- **September 9, 2016**: Science Committee to be convened to discuss and possibly recommend the Nonroutine AMP proposal to the Stakeholder Committee and to possibly endorse a draft scientific evaluation report on the proposal.
- **September 15, 2016**: Stakeholder Committee meets in the morning to review and recommend the Nonroutine AMP proposal and to approve the submittal of their report. Implementing Committee meets in the afternoon to review the Science and Stakeholder Committee's report. Final direction determined on this date.
- **October 1, 2016:** San Marcos/Texas State and New Braunfels to submit revised 2017 Work Plans and Funding Applications reflecting changes associated with implementation of the Nonroutine AMP proposal.

- **October 20, 2016**: The Implementing Committee to approve the Spring Communities' revised 2017 Work Plans and Funding Applications.