

# **Preliminary Assumptions for Flow Regime Evaluations in the Comal and San Marcos River Systems**

## **The Edwards Aquifer Recovery Implementation Program**

**Prepared by:**

**Dr. Thomas B. Hardy, Ph.D.  
River Systems Institute  
Texas State University  
San Marcos, Texas**



June 28, 2010

### Introduction

This document describes the preliminary technical assumptions for evaluating flow regimes in the Comal and San Marcos River systems in support of the EARIP process.

### Goals:

The overall goal of these preliminary simulations at the target flow rates is to identify potential limiting conditions for the target aquatic resources in the Comal and San Marcos River systems. This includes identification of both spatial and temporal considerations. For example,

- In the case of Texas Wild Rice, this will include the identification of 'at risk' plant locations at each flow rate and identification of any plant locations that become unsuitable given their current distribution at ~ 240 cfs.
- If the diel oxygen swings in Llanda Lake using existing aquatic macrophyte densities appear to be problematic, then aquatic macrophyte density will be reduced to assess if this management alternative can mitigate this potential limiting condition.
- Based on the nature, spatial, and temporal characteristics of potential limiting factors, efforts will be made to identify potential management actions that might mitigate these conditions based on these preliminary simulations.

### General Assumptions:

- Recreation impacts are controlled to protect critical habitat areas in the San Marcos and Comal Rivers
- Gill parasites are controlled to maintain them at residual background levels
- Non-native aquatic species are controlled (includes fish and vegetation)
- Water quality from spring sources is not altered
- CO<sub>2</sub>, nutrients, and food sources of spring discharges remain unaltered
- The existing distribution of Texas Wild Rice will remain unaltered.

#### Flows:

- The initial flow modeling will utilize three total flow rates at Comal: 30, 45, and 60 cfs. The corresponding flow rates at San Marcos will be derived using the Comal – San Marcos flow correlation developed by HDR.
- Actual flow regimes for each system for the evaluated period of record will be provided for the Comal and San Marcos Rivers by the EARIP.
- Flow rates at specific springs will rely on the assumed flow rate contributions reported in Hardy (2009) unless revised by the EARIP. This includes which springs in Comal go dry at what total Comal Springs flow rate.
- For each Comal Springs total flow, more than 50 percent will be allocated to the old channel.
- At these flow levels, no specific springs in Spring Lake will be assumed to go dry.

#### Physical:

- The Comal and San Marcos Rivers will start with initial topography conditions based on our measured topography.
- Existing dams and control structures will remain in place for both river systems.

#### Chemical:

- Water quality characteristics of both spring discharge systems will remain unaltered
- Point and non-point loadings of nutrients will not change.
- Instead of using a single hottest day meteorological condition, a characteristic hot summer period will be used to simulate hourly results for the June through September period.
- Water temperature and dissolved oxygen input to the old channel will be derived from Llanda Lake simulated values at the height of the culvert openings.
- Temperature and dissolved oxygen are not an issue in either system during the winter fall, winter, and spring periods.

#### Biological:

- Loss of spring run surface flows at Comal will equate to complete loss of riffle beetle habitat.
- No new non-native species will be introduced (plant or animal).

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