

BRIEF DESCRIPTION OF EAHCP CHAPTER 5 MINIMIZATION AND MITIGATION MEASURES SPECIFICALLY INTENDED TO CONTRIBUTE TO RECOVERY

Measures proposed for clarification

5.0. Approach to the Implementation of the Minimization and Mitigation Measures

5.1 Edwards Aquifer Authority

- 5.1.1 San Marcos National Fish Hatchery and Technology Center, Uvalde National Fish Hatchery, and Inks Dam National Fish Hatchery-Refugia
The EAA will support and coordinate with the USFWS on the work relating to the San Marcos NFHTCs operation and maintenance of a series of off-site refugia at USFWS's San Marcos, Uvalde and Inks Dam facilities.
- 5.1.2 Voluntary Irrigation Suspension Program Option
The EAA will administer the Voluntary Irrigation Suspension Program Option (VISPO) is intended to minimize and mitigate the impacts of incidental take from low spring flows by suspending the use of Aquifer water for irrigation purposes during drought.
- 5.1.3 Regional Water Conservation Program
The Regional Water Conservation Program will minimize and mitigate the impacts of pumping from the Aquifer by building on the expertise of successful programs to realize savings throughout the Edwards Aquifer region. The goal is to conserve 20,000 ac-ft/yr of permitted or exempt Edwards Aquifer withdrawals.
- 5.1.4 Critical Period Management – Stage V
The EAA will amend its Critical Period Management Program to add new emergency Stage V pumping reduction of 44% applicable in both the San Antonio and Uvalde pools.

5.2 City of New Braunfels (CONB)

- 5.2.1 Flow-Split Management in the Old and New Channel
Flow-split management is intended to complement the ecological restoration of aquatic vegetation in the Old Channel by reducing long-duration high flows, allowing for more seasonal variability to be maintained and mimicking a more natural flow pattern. The flow will be split between the Old Channel and New Channel according to Table 5-3 found in the EAHCP.
- 5.2.2 Native Aquatic Vegetation Restoration and Maintenance
CONB will undertake a program of native aquatic vegetation restoration with key, sustainable reaches of the Comal River by planting native vegetation in unoccupied areas, and in areas previously occupied by non-native aquatic vegetation (after the non-native vegetation has been removed).

- **5.2.3 Management of Public Recreational Use of Comal Springs and River Systems**

CONB will minimize and mitigate the impacts of recreation use of the Comal Springs and Comal River Ecosystem through two methods:

- 1) *CONB will not reduce current protections provided by City Ordinance or Policy and will continue to enforce those regulations, including:*
 - a. *limiting recreation on Landa Lake to paddle boats*
 - b. *prohibiting recreational access to the spring runs in Landa Park to the Wading Pool in Spring Run 2.*
 - c. *prohibiting water recreation on the Old Channel, with the exception of Schlitterbahn operations within its present location.*
- 2) *CONB will issue Certificates of Inclusion (COI) to those commercial outfitting businesses that facilitate recreational activities on the Comal River (Outfitters) that comply with the requirements of the COI program.*

- **5.2.4 Decaying Vegetation Removal and Dissolved Oxygen Management**

CONB will institute a dissolved oxygen management program in Landa Lake when the springflow drops below 80 cfs that may include solutions such as removal of decaying vegetation and aeration.

- **5.2.5 Control of Harmful Non-Native Animal Species**

To minimize and mitigate the impacts of low flows, CONB will conduct non-native animal species control on an annual basis. The non-native species that will be addressed include the suckermouth catfish, tilapia, nutria, and ramshorn snail.

- **5.2.6 Monitoring and Reduction of Gill Parasites**

CONB will retain and oversee the work of a contractor to establish a gill parasite monitoring and reduction program.

- **5.2.7 Prohibition of Hazardous Material Transport Across the Comal River and Its Tributaries**

CONB will coordinate with the Texas Department of Transportation (TXDOT) to prohibit transportation of hazardous materials on routes that cross the Comal River and its tributaries. This may require legislation, CONB ordinances, additional signage, and TXDOT approval.

- **5.2.8 Native Riparian Habitat Restoration**

To minimize and mitigate the impacts of low flows, CONB will restore native riparian zones, where appropriate, to benefit the Comal Springs Riffle Beetle by increasing the amount of usable habitat and food sources. In addition, riparian restoration also benefits the system through bank stabilization and nutrient process.

- **5.2.9 Reduction of Non-Native Species Introduction and Live Bait Prohibition**

CONB will prohibit by Ordinance introductions of domestic and non-native aquatic organisms, specifically targeting bait and aquarium trade species.

- **5.2.10 Litter Collection and Floating Vegetation Management**

To minimize and mitigate the impacts of recreation and pumping during low flow periods, CONB will clean litter and debris from and manage floating vegetation in the Comal Springs, Landa Lake, and Old and New Channels of the Comal River.

- **5.2.11 Management of Golf Course Diversions and Operations**

CONB will develop a golf course management plan that will document current practices and include an Integrated Pest Management Plan (IPMP), incorporating environmentally sensitive techniques to minimize chemical application, improve water quality, and reduce negative effects to the Covered Species.

5.3 City of San Marcos (COSM)

- **5.3.1 Texas Wild-Rice Enhancement and Restoration**

COSM, in partnership with Texas State University (TXST) will implement a Texas wild-rice enhancement and restoration program.

- **5.3.2 Management of Recreation in Key Areas**

COSM will control recreation in key areas by limiting parking near the river, permanent access points, creation of State Scientific Areas (with limited recreation during low flows), and the installation of informational and educational kiosks.

- **5.3.3 Management of Aquatic Vegetation and Litter Below Sewell Park**

COSM will perform activities to manage floating vegetation and litter to enhance habitats for Covered Species, using techniques that include removal of litter and vegetative mats that form on top of the water surface, as well as on top of Texas wild-rice plants, particularly during low flows.

- **5.3.4 Prohibition of Hazardous Materials Transport Across the San Marcos River and Its Tributaries**

COSM will coordinate with TXDOT to designate hazardous materials routes which minimize the potential for spills entering the San Marcos River. The effort may include signage and legislation.

- **5.3.5 Reduction of Non-Native Species Introduction**

COSM will partner with the Meadows Center, TXST and local citizen groups and possibly local schools and pet stores to institute an educational program that includes signage and brochures to stop or substantially reduce the introduction of non-native aquarium species.

- **5.3.6 Sediment Removal below Sewell Park**

To minimize and mitigate the impacts of incidental take from recreation and pumping during low flow periods, COSM will remove sediment from key areas of Texas wild-rice habitat below Sewell Park.

- 5.3.7 Designation of Permanent Access Points/Bank Stabilization
COSM will establish permanent river access points terraced and stabilized with natural rock or restored riparian vegetation while planting vegetation (prickly pear, acacia, etc.) that discourages non-authorized streamside access.
- 5.3.8 Control of Non-Native Plant Species
COSM will partner with TXST to implement an on-going non-native plant replacement program for the recreational corridor from Spring Lake to the city limits. Non-native species of aquatic, littoral and riparian plants will be replaced with native species to enhance covered species habitat.
- 5.3.9 Control of Harmful Non-Native and Predator Species
*COSM, in partnership with TXST, will implement non-native and predator species control for the San Marcos River with extended effort, if needed, at low flows. The non-native species include suckermouth catfish, tilapia, *Melanoides* sp. and *Marisa* sp. snails.*

5.4 Texas State University (TXST)

- 5.4.1 Texas Wild-Rice Enhancement and Restoration
TXST will partner with COSM (5.3.1) to undertake a Texas wild-rice enhancement and restoration program in Spring Lake, the San Marcos River within the TXST campus boundaries.
- 5.4.2 Management of Recreation in Key Areas
TXST will partner with COSM (5.3.2) to control recreation in Spring Lake and the San Marcos River within the TXST campus boundaries.
- 5.4.3 Management of Vegetation
TXST will use hand cutting by divers and its harvester boat on Spring Lake. Floating vegetation will be pushed downstream of Texas wild-rice stands. Inorganic litter will be picked up weekly from Sewell Park to City Park during the peak recreational season and monthly during the offseason.
- 5.4.4 Sediment Removal in Spring Lake and from Spring Lake Dam to City Park
TXST will mitigate the impacts of incidental take from diving activities, research activities, recreation and pumping during low flow period by removing sediment from key areas of Texas wild-rice habitat in Spring Lake and from Spring Lake to Dam to City Park.
- 5.4.5 Diversion of Surface Water
TXST will reduce their diversion rate from Spring Lake and the San Marcos River at Sewell Park based on the flow from San Marcos Springs.
- 5.4.6 Sessom Creek Sand Bar Removal
TXST and COSM will conduct a study of sand bar removal options. TXST will submit the study for review and will implement the actions.

- 5.4.7 Diving Classes in Spring Lake
TXST will conduct the “Diving for Science Program,” limiting the number of participants in a class to 20, no more than that 16 volunteer divers a day or 8 at any given time.
- 5.4.8 Research Programs in Spring Lake
All proposals to conduct research in Spring Lake will be reviewed by the Meadows Center to ensure there is no, or minimal, impact on Covered Species or their habitat.
- 5.4.9 Management of Golf Course and Grounds
TXST will develop a golf course management plan that will document current practices and include and Integrated Pest Management Plan (IPMP) to incorporate environmentally sensitive techniques to minimize chemical application, improve water quality, and reduce negative effects on the ecosystem.
- 5.4.10 Boating in Spring Lake and Sewell Park
Boats in Spring Lake will undergo a USFWS-approved cleaning process and will be confined to areas that are mowed by the lake harvester, specifically avoiding Texas wild-rice.
- 5.4.11 Reduction of Non-Native Species Introduction
TXST will partner with COSM (5.3.5) will limit introductions of non-native species by aquarium dumps into the San Marcos River and its tributaries through education, signage and alternative disposal methods.
- 5.4.12 Control of Non-Native Plant Species
TXST will partner with COSM (5.3.8) to undertake a of non-native plant replacement program for Spring Lake and the San Marcos Rive within TXST’s boundaries.
- 5.4.13 Control of Non-Native Plant Species
TXST will partner with COSM (5.3.9) to undertake a program of non-native and predator species control for Spring Lake and the San Marcos Rive within TXST’s boundaries.

5.5 San Antonio Water System (SAWS)

- 5.5.1 Use of the SAWS ASR for Springflow Protection
To minimize the impacts of incidental take from extended drought, the SAWS ASR facility will be used for storage and delivery of Aquifer water leased by the EAA.
- 5.5.2 Phase II Expanded Use of the SAWS ASR and Water Resources Integration Program Pipeline
The presumptive action for Phase II of the HCP involves the use of the SAWS ASR with a planned construction of the WRIP Pipeline scheduled for completion by 2020.

5.6 Texas Parks and Wildlife Department

- **5.6.1 State Scientific Areas**

This is a low flow measure that is in effect when the flow in the San Marcos is less than 120 cfs. TPWD has created a two-mile segment of the public waters of the San Marcos River as a State Scientific Area to protect Texas wild-rice by restricting recreation in this area. TPWD will pursue creation of State Scientific Areas in the Comal Springs ecosystem.

5.7 Measures that Specifically Contribute to Recovery

- **5.7.2 Expanded Water Quality Monitoring**

The EAA will expand its monitoring program to examine stormwater runoff, including additional surface and groundwater monitoring near the Comal and San Marcos springs, with particular focus on point and non-point sources. Areas targeted include, but are not limited to, large areas of impervious cover, golf courses, swimming pools and industrial runoff areas.

- **5.7.3 Septic System Registration and Permitting Program**

COSM will undertake an anaerobic and aerobic septic system registration, evaluation and permitting program to prevent potential subsurface pollutants from entering the San Marcos Springs ecosystem.

- **5.7.4 Minimizing Impacts of Contaminated Runoff**

COSM will construct two sedimentation ponds to help reduce surface runoff velocity as well as reduce the amount of contaminated materials that enter the river during rainfall event.

- **5.7.5 Management of Household Hazardous Wastes (HHW)**

- 1) *CONB will initiate a HHW program that will include accepting prescription drugs and Freon. Collections will be held four times a year and could be recognized in the CONB's MS4 compliance and stormwater permit as a contributing activity.*
- 2) *COSM will maintain a HHW program that involves the periodical collection of HHW and its disposal.*