5.7.1 Native Riparian Habitat Restoration

The City of San Marcos and Texas State University will undertake a program to increase the area and density of the riparian zone on public and private lands from the Spring Lake Dam to IH-35 using native vegetation. As plans take shape for the enhancement of the riparian zone, private landowners will be asked to participate in the plan.

Long-term Objective: Establish a robust native riparian community that benefits Covered Species and the habitat quality adjacent to and within the San Marcos River as well as prevents public access in undesirable locations to decrease bank erosion. A zone of prohibitive vegetation along the uppermost edge of the riparian community will be established to encourage river users to access the river via hardened access points.

Assumptions: Removal of non-native riparian vegetation (Measure 5.3.8) will occur prior to or simultaneous with Measure 5.7.1 and is funded from the Measure 5.7.1.

Target 2014/Performance Measure: Seven segments (upper Sewell Park to Ramon Lucio Park) along the San Marcos River were bid in 2013, so the cost of implementing this measure is now firm. Out of the seven segments, one and one/half segments (Bicentennial Park & half of Veramendi Park) were completed with 2013 funding. In 2014, the rest of Veramendi and the remaining upstream segments (3.5 segments) are proposed for invasive removal and native plantings. These segments have had elephants ears removed which exposed the bank to compaction and erosion, so replanting and fencing (city-funded) is critical.

Methods: Identify and remove invasive trees, shrubs and vines (Ligustrum sp., Chinaberry, Chinese Tallow, Paper Mulberry and Japanese Honeysuckle). Remove woody species to be spot treated with approved herbicide to prevent regrowth. All removed material must be recycled on site. A dense barrier (5 – 10 ft deep) of prohibitive native species will be planted behind and along fence line. Open areas behind barrier will be filled in with native trees and shrubs as funding allows and hands-on public workshops will be used to educate and stretch funding. Vegetation such as big bluestem, switchgrass, Indian grass, black willow, Texas red oak, bur oak, pecan, bald cypress, American beautyberry, and buttonbush will be used. Prefer use of plants achieving a USDA bank stabilization rating of 6 or greater. Adequate erosion control on slope and drainage areas will be provided by contractor. Bare slopes will be planted or stabilized to avoid bank erosion after removal of existing trees and shrubs. Fencing, provided by the City, will stay in place for at least two years to prevent foot traffic and allow the establishment of the newly-planted species. Plants will be irrigated by contractor for the first year to optimize their survival rate. Weeding and pruning will be done by contractor for length of project.

Monitoring: Monitoring will occur weekly in newly planted areas to ensure success and revise methods as needed. Success will be measured in two ways: first, (once the fence has been removed) undesirable public access will be surveyed throughout the recreation season; second, riparian coverage will be measured prior to enhancement efforts and post-completion to determine amount of increased coverage and continued annually to track changes.

Allocated funds for 2014 from Table 7.1: $ 20,000

Signage: $3000 – on-site signage & public meetings

Estimated Budget: $203,000 (Moving $180,000 from HCP Measure 5.7.6 - Impervious Cover/WQ Protection)

The cost of riparian restoration was originally based on vegetative transects performed in 2011. Surveys by the contractor have shown a higher percentage of invasive trees, shrubs and vines than was estimated by the vegetative transects. Increased tree removal and required plantings have increased the overall cost of this critical effort. This is a critical measure in that riparian restoration not only increases riverine integrity, but it provides the barrier to prevent undesired access and subsequent bank erosion and river sedimentation. The total cost for restoration from upper Sewell Park to Ramon Lucio was bid at $537,404. After the completion of the 2013 riparian restoration, the remaining cost is approximately $437,500. The City has provided and will continue to provide all fences to protect the sites as well as game cameras and other security measures as needed to prevent theft, vandalism and unauthorized access. Theft, vandalism and unauthorized access occurred within the two days of the first plantings. The fence was cut and both planted trees and potted plants were stolen. A portion of the fence was bent to achieve access to the river and minor cases of graffiti have occurred.

5.3.2/5.4.2 Management of Recreation in Key Areas

Public recreational use of the San Marcos Spring and River ecosystems include, but are not limited to swimming, wading, tubing, boating, canoeing, kayaking, golfing, scuba diving, snorkeling and fishing. To minimize the impacts of incidental take resulting from recreation, the City of San Marcos will implement the Recreation Mitigation Measures adopted by the San Marcos City Council on February 1, 2011 (Resolution 2011-21). The City of San Marcos and Texas State University will enforce these measures (as covered in HCP Section 5.3.2.1) to ensure their success. Section 5.3.2.1 includes multiple educational and public outreach suggestions for implementation:

> *Education of the river user and the community. Suggestions include*:
> a. Signage. Post signage at the City Park tube rental facility, Rio Vista Falls and at proposed hard access points along the river. Signage will be simple, natural, and when possible the existing sign locations will be used (trying to avoid too many signs). Signs will have the same template and coloration so they are recognized up and down the river. Signs will cover the rules of the river and educate the public on the importance of the resource. All signs will be bilingual.
>
> b. Video Loop at City Park offering information about the river and safety rules while people are waiting for shuttle or tubes. Possibly also at Rio Vista Falls.
>
> c. Posted maps showing trail, access points, fishing access and other amenities. Include a map at Stokes Park to help inform about the San Marcos River/Blanco confluence.
>
> d. Recreation information at hotels/restaurants, bed and breakfast facilities, Chamber of Commerce, Visitor's Center, City of San Marcos internet site, etc. could include information on restrictions so river users are prepared prior to entering the river.
>
> e. Park Rangers. Include a section on river biology in the training of the park rangers so they can help disseminate the information.
>
> f. School Outreach. Implement an outreach program for San Marcos Consolidated Independent School District (SMCISD) so this information can be relayed to youth in San Marcos and indirectly to the parents.
>
> g. Overall Interpretation Plan. This would pull all the informational ideas together for conformity, continuity, and implementation.

Long-term Objective: To establish a trained seasonal conservation resource that will monitor recreational activities and ongoing HCP measures in and along the San Marcos River while educating the public about the Covered Species and importance of their protection as part of our enforcement obligations under the SSA and HCP measures

Target 2014/Performance Measure: Educate the public engaged in water-based recreation on sustainable river use that protects listed species and their habitats. Collect data on recreational activities to determine impacts on listed species and success of HCP measures. The seasonal workers will also conduct miscellaneous cleanup while walking/kayaking.

Methods: The contracted conservation resource will monitor river user activities from May to September from Wednesday/Thursday through Sunday and holidays to actively engage in public education and outreach about target species and their habitats. In addition, they will collect data on specific recreational activities to provide insights for the HCP programs.

Monitoring: The public will be surveyed annually during the recreation season to assess the level of understanding of Covered Species, ongoing HCP Measures, effectiveness of the public outreach and education program, and the impacts of recreational activities on species and habitat.

Allocated funds for 2014 from Table 7.1: $ 56,000

Estimated Budget: $56,000

5.7.6 Impervious Cover/Water Quality Protection

The City of San Marcos and Texas State University will implement the program to protect water quality and reduce the impacts incentives for the program based upon the LID/BMP practices. Urban land development tends to increase the intensity of storm water flows and the amount of nonpoint source (NPS) pollution reaching local water resources. Buildings, roads, and other impervious surfaces shed rain more rapidly than areas covered by vegetation, and most typical urban land uses require rapid drainage of storm water. The very rapid, direct connection of developed land across paved surfaces and through drainage conveyances to waterways tends to carry more pollutants more quickly from the land surface to water resources. A number of water quality problems and impairments in Texas are attributed in full or in part to such urban storm water runoff carried through storm sewers and channelized streams. The science committee stated this measure was one of great importance to the success of the EAHCP for listed species protection (May 9, 2013).

Long-term Objective: Implement a program that minimizes the impacts associated with urbanization and changes in land use/cover in the Upper San Marcos watershed; manages stormwater as close to its source as possible, treats stormwater as a resource rather than a waste product; emphasizes conservation and the use of on-site features to protect water quality; and increases infiltration to groundwater and aquifer recharge for the protection of riverine integrity.

Assumptions: Construction of the proposed sediment retention ponds under Measure 5.7.4 will be funded under this Measure.

Target 2014/Performance Measure: Begin the implementation of the Water Quality Protection Plan by Texas State University and City of San Marcos that incorporates all jurisdictional watershed areas that directly or indirectly impact Covered Species' critical habitat for the purpose of meeting the goals stated in the long-term objective. Include public education, staff integration, five conceptual designs for retrofit water quality projects, grant proposals, and coordination with ongoing stormwater management plans for city and university. Upon completion, the WQPP should be provided to the Science Committee. The Science Committee has also requested an opportunity to review the Watershed Protection Plan (WPP) under development by the Meadows Center with funding from the Texas Commission on Environmental Quality.

Methods: City of San Marcos and Texas State University have a contract for the implementation of the developed plan.

Monitoring: N/A

Allocated funds for 2014 from Table 7.1: $ 500,000

Estimated Budget: $320,000 (Moved $180,000 to HCP Measure 5.7.1 – Riparian Restoration)

5.7.5 Management of Household Hazardous Waste

The City of San Marcos will maintain a HHW program that involves the periodic collection of Household Hazardous Waste Collection (HHWC) and its disposal.

Long-term Objective: Provide a place for citizens of San Marcos and Hays County to safely dispose of HHW.

Assumptions: City of San Marcos will continue its existing program.

Target 2014/Performance Measure: Continue outreach to 1400 participants; contract with two additional part-time personnel to conduct public outreach events and then convert or dispose of the HHW between events. Fund outreach to surrounding communities within the San Marcos River watershed that cannot afford to partner in a HHWC program.

Methods: Open drop-off opportunities two days a week (Tuesday and Friday) from 12:00 noon to 3:30 p.m. to the public. Conduct HHWC events to correspond with the National Pharmaceutical Take Back Day Events as announced by the EPA. Cover disposal costs for the four to six calls annually.

Monitoring: Track the amount of HHW received and number of participants from San Marcos, Hays County, and surrounding communities. All necessary documentation will be turned in to TCEQ. Identify the HHW that comes from communities with the San Marcos River watershed and the cost of collecting, processing and disposing of HHW from these communities.

Allocated funds for 2014 from Table 7.1: $30,000

Estimated Budget: $30,000

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

The City of San Marcos will coordinate with the Texas Department of Transportation to designate hazardous materials routes which minimize the potential for spills into the San Marcos River. This effort will include legislation, if necessary, and additional signage.

Long-term Objective: Reduce the potential of spill of hazardous materials in the San Marcos River and its tributaries.

Assumptions: The primary effort will involve stakeholder engagement, public meetings, and coordination with TXDOT.

Target 2014/Performance Measure: Coordination with TXDOT for the implementation of hazardous materials restrictions and establishment of signage.

Methods: Identify all transport routes that cross the San Marcos River and its primary tributaries. Identify any that have hazardous material traps. This information will be used to initiate public meetings, drafting of City ordinances, and coordination with TXDOT.

Monitoring: Bi-annual monitoring of hazmat traps on designated roadways to determine functionality and annual monitoring of all installed signage will be accomplished. Substandard conditions will be repaired or replaced as necessary.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

5.7.3 Septic System Registration and Permitting Program

The City of San Marcos will undertake an aerobic and anaerobic septic system registration, evaluation, and permitting program to prevent subsurface pollutant loadings from potentially being introduced to the San Marcos Springs ecosystem within city limits.

Long Term Objective: To continue the registration, permitting and inspection of all new or existing septic systems installed or modified in the City of San Marcos jurisdiction. This has and will continue to be done to ensure compliance of all Texas Commission on Environmental Quality (TCEQ) regulations governing septic systems.

Assumptions: The existing program is adequate to meet the intent of this Measure.

Target 2014/Performance Measure: To have an accurate record of new and existing septic systems installed and modified in city jurisdiction. Also, by ordinance, to have all owners of septic systems connect to municipal sewer lines as they become available.

Methods: It is required by law that all septic systems are permitted by the local Designated Representative (DR), which is the City of San Marcos Environmental Health Department. Plans are submitted with the application and reviewed by the DR for TCEQ compliance. Once these are met, the permit to construct is issued. The design, site evaluation, installation and inspections can only be performed by individual that are licensed by TCEQ. Before the installation or modification is approved, inspections are made by the DR to ensure that the system installed corresponds with the design. Once completed, a license to operate is issued to the property owner by the DR. All DRs are subject to TCEQ Compliance Reviews.

Monitoring: The City of San Marcos Environmental Health Department reviews all applications and inspects the installations of all new and modified septic systems within the City's jurisdiction. The Department also monitors maintenance and responds to all complaints reported or observed.

Allocated funds for 2014: None

Estimated Budget: N/A

5.7.4 Minimizing Impacts of Contaminated Runoff

The City of San Marcos will construct two sedimentation ponds along the river to help reduce the amount of contaminated material that enters the river as a result of rain events. The first pond will be located in Veramendi Park beside Hopkins Street Bridge. The second pond will be created by widening the drainage ditches that run alongside Hopkins Street and cut directly to the San Marcos River.

Long-term Objective: Reduce the input of sediment and roadway pollutants into the San Marcos River.

Assumptions: Construction of the proposed sediment retention ponds are funded under Measure 5.7.6.

Target 2014/Performance Measure: Design the Best Management Practices (BMPs) to be constructed at Veramendii Park and along Hopkins Street that will reduce total suspended solids (TSS) by 85%. The designs for these BMPs should be presented to the Science Committee. Baseline water quality measurements should be taken prior to BMP installation. Storm water discharge should be re-sampled after BMP installation to measure success.

Methods: A contractor will be retained to research applicable BMP designs and recommend the most economic and efficient methods to control contaminants.

Monitoring: N/A

Allocated funds for 2014: $0

Estimated Budget: See Measure 5.7.6

5.4.5 Diversion of Surface Water

Texas State University will curtail its permitted surface water diversions as a function of total San Marcos spring flow to protect the aquatic resources as specified under the HCP flow management strategy. Under TCEQ Certificates 18-3865 and 18-3866, Texas State University's total diversion rate from the headwaters of the San Marcos River for consumptive use is limited to 8.1 cfs (See HCP Section 2.5.5). The total diversion rate from Spring Lake is limited to 4.88 cfs; the total diversion rate from the San Marcos River at Sewell Park is limited to 3.22 cfs (See HCP Section 2.5.5.1 and 2.5.5.2 respectively).

Long-term Objective: Meet diversion restrictions specified under the HCP.

Assumptions: None

Target 2014/Performance Measure: Restriction of surface pumping as specified under the HCP.

Methods: To minimize the impacts of these diversions, when flow at the USGS gauge at the University Bridge reaches 80 cfs, Texas State University will reduce the total rate of surface water diversion by 2 cfs, *i.e.*, to a total of approximately 6.1 cfs. This reduction in pumping will occur at the pump just below Spring Lake Dam in order to maximize the benefits to salamanders, Texas wild-rice, and other aquatic resources in the San Marcos River below Spring Lake Dam. The University will reduce the total rate of surface water diversion by an additional 2 cfs when the USGS gauge reaches 60 cfs. The additional 2 cfs reduction will be made from the pumps located in the slough arm of Spring Lake, and, therefore, maximize the benefits to the aquatic resources within the main stem San Marcos River below Spring Lake Dam. When the USGS gauge reaches 49 cfs, Texas State University will reduce the total diversion rate to 1 cfs. This further reduction will be made by restricting the pumps located in the Sewell Park reach. The diversion of water will be suspended when the springflow reaches 45 cfs.

Monitoring: Pumping rates will be reported on a daily basis when any of the pumping restrictions are in force.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

5.4.7 Diving Classes in Spring Lake

Access to Spring Lake is strictly controlled and regulated in accordance to federal, state and local laws. City ordinance and state law designate the public waters of Spring Lake as restricted to activities authorized by the University. All diving activities in Spring Lake are governed by the Spring Lake Management Plan.

Long-term Objective: Maintain the integrity of the ecology and cultural resources within Spring Lake.

Assumptions: All diving activities in Spring Lake are governed by the Spring Lake Management Plan.

Target 2014/Performance Measure: Implement the diving protocols as outlined in the Spring Lake Management Plan and the Edwards Aquifer HCP Incidental Take Plan.

Methods: The Diving Safety Officer will monitor all diving activities in Spring Lake, assuring all guidelines contained in the Diving Safety Manual for Spring Lake and the EAHCP ITP are observed.

Monitoring: The Lake Manager, with assistance from the Diving Safety Officer, will compile an annual summary of diving activities conducted in Spring Lake and provide to the Diving Control Board for its review.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

5.4.8 Research Programs in Spring Lake

Access to Spring Lake is strictly controlled and regulated in accordance to federal, state and local laws. City ordinance and state law designate the public waters of Spring Lake as restricted to activities authorized by the University. Proposals for research projects in Spring Lake must be submitted to the Environmental Review Committee, through the Lake Manager, for review and approval.

Long-term Objective: Maintain the integrity of the ecology and cultural resources within Spring Lake.

Assumptions: All research activities in Spring Lake are governed by the Spring Lake Management Plan.

Target 2014/Performance Measure: Implement the protocols for research as specified in the Spring Lake Management Plan and the EAHCP ITP.

Methods: 1. Proposals for research projects in Spring Lake must be submitted to the Environmental Review Committee, through the Lake Manager, for review and approval.

Proposals for research projects must be submitted in writing and include:

- Name and contact information of the responsible party conducting the research,
- Purpose and expected outcomes of the activities, including a description of how the project contributes to science,
- Description of activities, including, if appropriate, measures to be taken to minimize any impact on endangered species or their habitat, or any cultural resources found in the lake,
- Methodology, including literature review,
- Type of equipment used, how much; where it will be placed, and for how long it will remain in lake (see Equipment in Lake Section E of the Spring Lake Management Plan)
- Expected impact, and
- Timeline of Project

A copy of the final report and any publications on a research project will be provided to the Lake Manager.

Monitoring: The Lake Manager will compile an annual summary of the research conducted in the lake, including statements on the impact of these activities on the health of the lake.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

5.4.10 Boating in Spring Lake and Sewell Park

Access to Spring Lake is strictly controlled and regulated in accordance to federal, state and local laws. City ordinance and state law designate the public waters of Spring Lake as restricted to activities authorized by the University. All activities involving access to the lake, including glass bottom boat operations, will abide by the rules and intentions of the Edwards Aquifer Recovery Implementation Program Habitat Conservation Plan.

Long-term Objective: Maintain the integrity of the ecology and cultural resources within Spring Lake and San Marcos River.

Assumptions: All boating activities in Spring Lake are governed by the Spring Lake Management Plan and the EAHCP ITP.

Target 2014/Performance Measure: Implement the protocols for boating as specified in the Spring Lake Management Plan in support of the EAHCP ITP.

Methods: Boats (canoe, kayak) used for educational activities, excluding glass bottom boats:

- All boats must be properly washed/disinfected before being placed in lake and once they are removed (see Equipment in Lake in the Spring Lake Management Plan).
- Participants must receive an orientation prior to boating including: instruction on safety, basic boat handling, and on-site rules and regulations. The orientation will cover information specific to Spring Lake's sensitivity and endangered species.
- All boating events must be designed to keep participants away from glass bottom boat operations.

To minimize the impacts of boating on the Covered Species' habitat in Sewell Park, canoeing/kayaking classes in Sewell Park will be confined to the region between Sewell Park and Rio Vista dam. Students will enter/exit canoes/kayaks at specified access points to avoid impacting the flora and fauna along the bank. Classes will be no longer than two hours and up to three classes will be held per day. Classes will have a maximum of 20 students in 10 canoes. All classes will be supervised.

Monitoring: The Lake Manager will compile an annual summary of boating activities conducted on the lake, including statements on the impact of these activities on the health of the lake.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

5.4.9 Management of Golf Course and Grounds

Texas State University will develop a golf course management plan that will document current practices and include an Integrated Pest Management Plan (IPMP). The golf course management plan and IPMP will incorporate environmentally sensitive techniques to minimize chemical application, improve water quality, and reduce negative effects to the ecosystem. Expanded water quality sampling targeted at Golf Course operations will be conducted as described in Section of 5.7.2. of the HCP.

Long-term Objective: Management of the golf course and grounds to minimize and reduce negative effects to aquatic ecosystem in Spring Lake and the San Marcos River.

Assumptions: None

Target 2014/Performance Measure: Implementation of the Golf Course Management Plan and Integrated Pest Management Plan. Research the Audubon Certification for Golf Courses to determine if it further protects the San Marcos River against golf course impacts.

Methods: The golf course and grounds will be maintained in an aesthetically pleasing, yet environmentally sensitive manner. It is the responsibility of the Golf Course Manager to maintain the course and grounds in accordance with the Integrative Pest Management Plan (IPM). This plan will describe the activities and materials to be used to control pests (i.e. insects, weeds, and other living organisms requiring control) on the golf course in a way that minimally impacts the environment. The IPM will be developed and updated by the Golf Course Manager, in consultation with the Lake Manager and the Environmental Review Committee. The Golf Course Manager will consult with the Lake Manager on any unique situation that may arise outside of routine maintenance that could impact Spring Lake.

Monitoring: Each year the Golf Course Manager will report to the Lake Manager detailed information on maintenance activities and materials used during the year. The water quality monitoring program performed by the Edwards Aquifer Authority will sample for runoff from the golf course.

Allocated funds for 2014: $ 0

Estimated Budget: $ 0

Protocol for Implementation of HCP Measures Requiring Diving and/or Boating

All activities in Spring Lake must be submitted to the Spring Lake Environmental Review Committee and/or the Spring Lake Diving Control Board for approval as outlined in the Spring Lake Management Plan. This includes required training and orientation for any diving based activities in Spring Lake by the RSI Diving Safety Officer, using guidelines set out in the RSI Diving Safety Manual for Spring Lake and the San Marcos River. This includes an orientation that covers: instruction on safety, basic boat handling, and on-site rules and regulations. The orientation will cover information specific to Spring Lake's sensitivity, endangered species as well as cultural resources.

All personnel implementing any portion of the HCP for the City of San Marcos and Texas State University will undergo an orientation at the SMARC to ensure awareness of the listed species and safe procedures while working in and along the San Marcos River.