



Edwards Aquifer Habitat Conservation Plan Nonroutine Adaptive Management Proposal

All relevant reports, citations, and analysis can be found at www.eahcp.org.

To: EAHCP Implementing, Adaptive Management Stakeholder, and Adaptive Management Science Committees
From: Nathan Pence, EAHCP Program Manager
Date: August 1, 2017
Re: Proposed Strategy to Improve the City of San Marcos and Texas State University Sediment Removal Conservation Measures (EAHCP §5.3.6, §5.4.4) and Introduce Low-Impact Development through City Water Quality Protection Plans as an aspect of the Impervious Cover & Water Quality Protection Measure (EAHCP §5.7.6).

PREAMBLE

The Edwards Aquifer Habitat Conservation Plan (EAHCP; EARIP, 2012) prescribes that the City of San Marcos (COSM) and Texas State University (TXSTATE) will “remove sediment from the river bottom at various locations from City Park to IH-35” (§5.3.6), and “key areas of Texas wild-rice habitat in Spring Lake and from Spring Lake Dam to City Park” (§5.4.4).

Additionally, it was contemplated by the EAHCP (2012), that the COSM and City of New Braunfels (CONB) will mitigate impacts of nonpoint source pollution through the Impervious Cover & Water Quality Protection measure (§5.7.6). This measure requires that the COSM and CONB “will establish a program to protect water quality and reduce the impacts of impervious cover (such as through low-impact development (LID)).”

This document presents a formal proposal for a Nonroutine Adaptive Management action (“Nonroutine AMP;” Funding & Management Agreement, “FMA” §7.6.2) involving the above Sediment Removal measures (§5.3.6 and 5.4.4) and Impervious Cover & Water Quality Protection measure (§5.7.6) prescribed by the EAHCP.

This proposal is submitted by the EAHCP Program Manager (PM) on behalf of the CONB, COSM & TXSTATE. The development of this proposal was a collaborative effort by all parties. Below, a brief background is provided describing the process leading to this proposal, followed by a description of the proposed Nonroutine AMP action, accompanied



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by justifications for this proposal. Additional technical specifications and other supporting documentation associated with the proposal is included here as an appendix.

BACKGROUND

Sediment Removal

The EAHCP has identified increased rates of sedimentation, due in part to increased urbanization, in the San Marcos River. This is believed to threaten Texas wild-rice (*Zizania texana*), one of the EAHCP Covered Species (EARIP, 2012; see Earl & Wood, 2002). Sedimentation is thought to impact Texas wild-rice by smothering or burying stands, leading to increased mortality and reduction of suitable habitat. In response, through the EAHCP, the COSM & TXSTATE committed to implement measures to mitigate and minimize these impacts. Sediment removal (via hydrosuction) was the sole method contemplated in the EAHCP to reduce the threat sediment loading presents to Texas wild-rice survival and enhancement.

This reactive approach to sediment management has proven costly and ineffective. As experience in implementing this measure was gained since 2013, issues were identified and, in parallel, possible alternative strategies for addressing sediment loading at the source were developed. Since 2013, data has been collected through the EAHCP Annual Report that supports the need to pursue an alternative strategy. Such strategies include a proactive approach that attempts to prevent, and/or mitigate for, sediment runoff in the watershed to protect water quality and the Covered Species habitat.

While the EAHCP specified sediment removal as the recommended strategy to manage sediment in the San Marcos River, removal seems to not effectively address the sources of excess sediment which continues to be deposited through contributing creeks, specifically observed at Sessom Creek following the October 2015 flood – providing evidence that the effort, as currently contemplated, is not a sustainable use of funds. The sediment volume removed from 2013-2016, and the costs associated, can be seen in the data provided in **Table 1**.



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Table 1: Sediment Removal results (2013-2016)

Year	Volume Removed (m³)	Annual Cost	Cost per m³
2013	48	\$151,800.00	\$3,450.00
2014	20	\$180,000.00	\$9,000.00
2015	85	\$219,450.00	\$2,612.50
2016	28	\$193,042.00	\$6,894.36
Total	181	\$744,292.00	\$4,228.93
Average per year	45.25	\$186,073.00	\$4,228.93

A sediment mitigation strategy is proposed to focus on sediment removal at the source because prevention can have fewer impacts, and be more sustainable and cost effective. Sediment removal in the river does not address the actual sources of sediment, such as stream erosion, thus sedimentation impacts will likely be persistent and recurring. Sediment prevention techniques could include stream restoration using Natural Channel Design (NCD) methods, stabilization of eroding stream beds and banks, riparian enhancement, and stormwater best management practices (BMPs) that reduce erosive flows.

In identifying that a source control approach may be most effective in managing sediment loading in the San Marcos River, the EAHCP PM and the EAHCP Science Committee jointly determined to create the San Marcos Water Quality Protection Work Group. This Work Group was intended to provide scientific review and input on questions related to the COSM & TXSTATE’s implementation of the EAHCP Sediment Removal measures, as well as the Impervious Cover/Water Quality Protection measure (§5.3.6, 5.4.4 & 5.7.6). This Work Group was comprised of members drawn from the Science Committee as well as external experts with experience related to water quality protection projects.

Work Group members¹ were presented with results from investigations by John Gleason LLC (JGLLC), as part of the San Marcos River Water Quality Protection Plan (WQPP), which provides strong evidence that Sessom Creek has a higher sediment loading rate

¹ Work Group members included: Glenn Longley, Charlie Kreitler, Jackie Poole, Shaun Condor, Ben Schwartz and Aarin Teague.



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than other watersheds that drain into the upper reaches of the San Marcos River north and just below of IH-35 (Appendix 1).

Impervious Cover/Water Quality Protection

The EAHCP contemplated mitigating for non-point source pollution through the Impervious Cover/Water Quality Protection Recovery measure (§5.7.6). According to this measure, the COSM and CONB are to implement low-impact development (LID) programs near the springs ecosystems. This effort was considered through the EARIP LID/Water Quality Work Group and recorded in their final report (Appendix Q of the EAHCP) (EAHCP Appendix Q). These programs were intended to mitigate for pollution from nonpoint sources such as parking lots and residential lawns; especially during periods of low-flow where pollutant presence could reduce the survivability of the Covered Species.

These LID programs, including an incentive program for private land owners, required in the EAHCP was suggested to not only improve the water quality protection near the springs, but also to gain public participation in the effort to protect the Covered Species. Unfortunately, in both San Marcos and New Braunfels city employees found little private interest in the program. Staff spent time developing criteria yet, due to the limited private residents along the San Marcos and Comal rivers, the incentive program was quickly replaced with a concentration on the implementation of strategic stormwater control measures that could maximize the effort and dollars allotted to improving water quality. Lists of control measures were developed for both the COSM and CONB in separate Water Quality Protection Plans (WQPPs).

In 2015, the COSM completed a WQPP (John Gleason LLC, 2017). This water quality protection planning document can be used as the basis of COSM's implementation of the measure calling for the establishment of a comprehensive program "to protect water quality and reduce the impacts of impervious cover". This program was carried out pursuant to COSM's commitment under the "Impervious Cover/Water Quality Protection" (§5.7.6) measure. Considerable research and technical analysis concerning the Spring Lake and Upper San Marcos River watershed, and how to best protect water quality, went into the WQPP. Additionally, a public vetting process was done by allowing the Stakeholder Committee for the Upper San Marcos River Watershed Protection Plan to



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comment on the suit of recommendations. Through this exercise, the WQPP identifies and recommends an array of structural elements, design features, and planning mechanisms to provide a comprehensive water quality protection program intended to enhance the survival and recovery of the Covered Species.

Similarly, the City of New Braunfels developed a WQPP (Alan Plummer Associates, INC., 2017). The primary intent of CONB's WQPP is to identify opportunities for the implementation of LID and stormwater control measures to treat runoff prior to entering Landa Lake and the Comal River system. As previously discussed, the criteria for a LID rebate program to offer financial incentives to private businesses and landowners was developed by CONB in the first years of EAHCP implementation. It became apparent that the program would require significant financial resources solely to administer the rebate program, thereby reducing the amount of EAHCP funds available for the actual implementation of control measures. It was also realized that publicly-owned infrastructure such as City parking lots, streets, and drainage ways had a greater potential to accumulate and transport sediment and pollutants to the Comal River system. In effect, the City abandoned the LID rebate program and is currently moving forward with implementing stormwater control measures identified in the WQPP.

Specifically, the CONB WQPP identifies seven water quality projects located within the Comal River watershed and in close proximity to the upper portions of the river system (i.e. Landa Lake and Upper Spring Run). The WQPP includes an analysis of project costs, pollutant removal efficiency, and maintenance requirements. All projects were presented to and approved by the Watershed Advisory Committee; an appointed committee that represents the public's interest. The CONB's WQPP also includes recommendations for pursuing funding opportunities outside the EAHCP to implement stormwater control measures that would protect water quality.

Ultimately, a source control approach; that is, reduce erosion and sedimentation in the watershed has been adopted by both COSM and CONB. This could be a less expensive and more sustainable approach than sediment removal for COSM & TXSTATE. Under the AMP, the goal of the sediment removal tasks in the river could be accomplished with source control measures; thus, this information serves as the basis for this Nonroutine AMP proposal.



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PROPOSED NONROUTINE ADAPTIVE MANAGEMENT ACTION

This proposed action is to limit the activities of Sediment Removal measures (§5.3.6 & §5.4.4) and to forgo the initial concepts of the Impervious Cover/Water Quality Protection measure (§5.7.6) as originally contemplated. This action proposes to instead use the majority of the resources allocated to these original programs to fund community-based WQPPs - which have been vetted through EAHCP Work Groups, EAHCP committees, City committees, and watershed planning stakeholder committees - to not only minimize and mitigate the impacts to the Covered Species, but to also contribute to the likelihood of their survival and recovery.

Sediment Removal

For the Sediment Removal measures (§5.3.6 & §5.4.4), removal efforts will be limited to the required maintenance of key Covered Species habitat areas, such as existing Texas wild-rice stands. These efforts will be performed using hydrosuction or mechanical equipment. Instead, the focus of these measures will be on implementing sediment mitigation and prevention strategies through the Impervious Cover/Water Quality Protection strategy.

Impervious Cover/Water Quality Protection

As stated above, in San Marcos, implementation of the Impervious Cover/Water Quality Protection measure should focus on sediment mitigation and/or prevention. This strategy, as discussed, will include the implementation of LID BMPs prioritized in both the WQPP as well as through an EAHCP water quality work group. Similarly, in New Braunfels, a strategy will include the implementation of LID BMPs - such as the construction of a stormwater treatment device - prioritized in a WQPP through a City advisory committee, to improve the quality of runoff into Landa Lake and the Comal River.

Whenever possible, the COSM and CONB will pursue interagency and/or external partnerships to leverage EAHCP funds with outside sources. Additionally, outside grants are a potential way to increase the effectiveness of the EAHCP efforts.

From the beginning of this evaluation, this exercise was designed to consider the funding limitations for EAHCP program activities established by the FMA and Table 7.1 of the



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EAHCP. Adoption of this proposal will not result in any deviations from the funding allowances prescribed in Table 7.1 of the EAHCP. Furthermore, as a collaborative effort between and among the EAHCP, COSM, TXSTATE, and CONB, the proposed Nonroutine AMP action could result in considerable cost efficiencies and savings in the service of stewarding EAHCP public funding by leveraging existing projects with outside funding sources. Also, the proposed action implements a management strategy that mitigates for sedimentation (COSM & TXSTATE) and other pollutants through more cost-effective means.

NONROUTINE AMP PROPOSAL

With the foregoing justifications stated, the EAHCP Program Manager, on behalf of the COSM and TXSTATE, proposes the “Sediment Removal” (EAHCP §5.3.6 & §5.4.4) Conservation Measures to be rewritten to focus on sediment prevention activities. Additionally, the COSM’s and CONB’s commitment under the “Impervious Cover/Water Quality Protection” (HCP §5.7.6) Recovery Measure will be rewritten to include work to be implemented regarding their respective Water Quality Protection Plans.



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REFERENCES

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- Alan Plumber Associates, Inc. 2017. *Edwards Aquifer Habitat Conservation Plan Impervious Cover and Water Quality Protection – 5.7.6 Water Quality Protection Plan: Phase I*.
- City of San Marcos. 2004. *Environmental Assessment/Habitat Conservation Plan for Issuance of an Endangered Species Act Section 10(a)(1)(B) Permit for the Incidental Take of the Fountain Darter (*Etheostoma fonticola*), San Marcos salamander (*Eurycea nana*), and the Comal Springs riffle beetle (*Heterelmis comalensis*) During the Implementation of Projects in the Upper San Marcos River, San Marcos, Hays County, Texas*.
- EARIPa (Edwards Aquifer Recovery Implementation Program). 2012. *Edwards Aquifer Recovery Implementation Program Habitat Conservation Plan*. [http://www.eahcp.org/files/uploads/Final%20HCP %20November%202012.pdf](http://www.eahcp.org/files/uploads/Final%20HCP%20November%202012.pdf)
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- John Gleason LLC. 2017. *Water Quality Protection Plan for the City of San Marcos and Texas State University*. Prepared for the City of San Marcos.