5.3.6 Sediment Removal Management below Sewell Park

In order to manage sediment deposition into the San Marcos river, the City of San Marcos, in partnership with Texas State University, may implement a proactive approach to mitigating sediment impacts by designing and constructing low impact development (LID) best management practices (BMPs) in priority watersheds to benefit the Covered Species. These BMPs can include natural streambed restoration, sediment ponds or retention basins, as well as other effective approaches to managing sediment loads into the San Marcos river. In development of construction plans, the Science Committee (or subcommittee of specialized perspectives) are to provide justification of site selections as well as BMPs proposed.

The City of San Marcos may implement a reactive approach by removing sediment from the river bottom at various locations from City Park to IH-35 below Sewell Park. These areas include but are not limited to reaches of the river in City Park, Veramendi Park, Bicentennial Park, Rio Vista Park, and Ramon Lucio Park. Sediment has accumulated at these locations due to the installation of flood control dams, urbanization, and natural processes. These accumulations have altered the river’s morphology and natural flow patterns. In addition, when deposition of sediments on or around Texas wild-rice stands causes direct mortality by smothering or burying strands. In addition, the City of San Marcos may remove sediment from key areas of Texas wild-rice habitat below Sewell Park to minimize and mitigate the impacts of incidental take from recreation and pumping during low flow periods, complement the planting and gardening of submerged aquatic vegetation, or to mitigate impacts of sediment on Texas wild-rice caused specifically by floods or other extreme weather events that deposit large amounts of sediment in one area. Upon site identification, the EAHCP Science Committee (or appropriate subcommittee) will be consulted prior to the annual Work Plan submission.

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

Depending on location and desired outcome, hydrosuction or mechanical removal may be used to help remove accumulations of sediment. The silt will be vacuumed using a hose that has a screen to prevent suction biota greater than 0.25 inch in diameter. The divers doing the hydrosuctioning will take the following measures to minimize loss/harm of biota in the area. Divers will fin disturb the area to be suctioned to encourage the darters and other biota to move out of the area. Divers will be trained to recognize all stages of listed species from larval to adult. If hydrosuctioning, the nozzle of the vacuum will be kept down in the soil and not allowed to swing through the water column during the operation. In addition, placement of stakes around the area to be suctioned will keep divers away from protect stands of Texas wild-rice. An observer will be on the bank to monitor the effluent for presence of listed species and all other biota, as well as for the safety of the diver.

Sediment samples will be sent to TCEQ for contaminant testing per TCEQ requirements.
5.4.4 Sediment Removal Management in Spring Lake and from Spring Lake Dam to City Park

In order to manage sediment deposition into the San Marcos river, Texas State University, in partnership with the City of San Marcos, may implement a proactive approach to mitigating sediment impacts by designing and constructing low impact development (LID) best management practices (BMPs) in priority watersheds to benefit the Covered Species. These BMPs can include natural streambed restoration, sediment ponds or retention basins, as well as other effective approaches to managing sediment loads into the San Marcos river. In development of construction plans, the Science Committee (or subcommittee of specialized perspectives) are to provide justification of site selections as well as BMPs proposed.

Monitoring of the San Marcos River since 1990 reveals that sediment production has increased from 160 m$^3$/yr to 920 m$^3$/yr due to a combination of upstream flood control dams and sediment inflow increases (Earl and Wood 2002). Deposition of sediments on or around Texas wild-rice stands causes direct mortality by smothering or burying stands. Texas State University may mitigate the impacts of incidental take from diving activities, research activities, recreation and pumping during low flow periods by removing sediment from key areas of Texas wild-rice habitat in Spring Lake and from Spring Lake Dam to City Park.

Texas State University may implement a reactive approach by removing sediment from the river bottom at various locations when deposition of sediments on or around Texas wild-rice stands causes direct mortality by smothering or burying strands. Texas State University may remove sediment from key areas of Texas wild-rice habitat in Spring Lake and from Spring Lake Dam to City Park to minimize and mitigate the impacts of incidental take from recreation and pumping during low flow periods, complement the planting and gardening of submerged aquatic vegetation, or to mitigate impacts of sediment on Texas wild-rice caused specifically by floods or other extreme weather events that deposit large amounts of sediment in one area. Upon site identification, the EAHCP Science Committee (or appropriate subcommittee) will be consulted prior to the annual Work Plan submission.

Depending on location and desired outcome, hydrosuction or mechanical removal will may be used to help remove accumulations of sediment. The silt will be vacuumed using a hose that has an end piece covered by a 0.25-inch mesh screen to prevent suctioning biota greater than 0.25 inch in diameter. The divers doing the hydrosuctioning will take the following measures to minimize loss/harm of biota in the area. Vegetation will be finned disturbed before turning on the pump sediment removal Finning will encourage the darters and other biota to move out of the area. Divers will be trained to recognize all stages of listed species from larval to adult. If hydrosuctioning, the nozzle of the vacuum will be kept down in the soil and not allowed to swing through the water column during the operation. In addition, placement of stakes around the area to be suctioned treated will keep divers away from protect stands of Texas wild-rice. An observer will be on the bank to monitor the effluent for presence of listed species and all other biota, as well as for the safety of the diver.

Sediment samples will be sent to TCEQ for contaminant testing per TCEQ requirements.
5.7.6 Impervious Cover/Water Quality Protection

Most potential water quality problems are linked to nonpoint source pollution such as fertilizer runoff and chemicals washed in from adjacent streets; however, spills and leaks from industrial and municipal infrastructure also present hazards. The potential for accidents and nonpoint source pollution to affect the Covered Species may be exacerbated during below average flows since chemicals and nutrients would be less diluted when a lower volume of water is present. Runoff and spills originating even at long distances from the spring opening also can affect water quality at the springs.

The EAHCP originally contemplated establishing incentive criteria for private landowners in proximity of the San Marcos and Comal springs ecosystems to implement low-impact development (LID) best management practices (BMPs) on their property. It was identified that due to lack of interest, and limited overall impact of private property, the incentive program was de-prioritized. In its place, a Water Quality Protection Plan (WQPP) was developed for both the City of San Marcos and City of New Braunfels. These WQPPs provide the cities a list of proposed BMPs that could be implemented to protect water quality from the impacts of nonpoint source pollution. Therefore, both the City of San Marcos and City of New Braunfels will focus their efforts in implementing the water quality management strategies included in their WQPPs.

For the City of New Braunfels stormwater runoff prevention/reduction impacting Landa Lake and the Old Channel is of primary concern. BMPs will be selected that demonstrate the highest load reduction potential. The City of New Braunfels will use the prepared WQPP to assist in prioritizing locations and appropriate BMPs. Upon selection, the EAHCP Science Committee (or appropriate subcommittee) will be consulted prior to the annual Work Plan submission and selected BMPs implemented.

For the City of San Marcos, as referenced in 5.3.6, sediment prevention/reduction is a primary concern. BMPs will be selected in priority watersheds that demonstrate abnormal erosion issues and cause disproportionate sedimentation into the San Marcos river threatening Texas wild-rice and other Covered Species habitat. Thus, the City of San Marcos will implement water quality protection measures that directly improve sediment load reductions, and protect water quality from other potential contaminates. The City of San Marcos will use the prepared WQPP to assist in prioritizing locations and appropriate BMPs. Upon selection, the EAHCP Science Committee (or appropriate subcommittee) will be consulted prior to the annual Work Plan submission.

Additionally, the City of New Braunfels will may establish criteria related to desired impervious cover and provide incentives to reduce existing impervious cover on public and private property in New Braunfels. The City of New Braunfels will may establish criteria and incentives for the program based upon the low impact development (LID)/Water Quality Work Group Final Report (Appendix Q) recommendations for Implementation Strategies and best management practices (BMPs).

The City of San Marcos will establish a program to protect water quality and reduce the impacts of impervious cover (such as through LID). The City of San Marcos will develop criteria and incentives for the program based upon the LID/Water Quality Work Group Final Report (Appendix Q) recommendations for Implementation Strategies and BMPs.

The EAA will put together material regarding the value of a ban on the use of coal tar sealants and work with local governments to explore and encourage their consideration of such a ban.
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
Edwards Aquifer Habitat Conservation Plan
Nonroutine Adaptive Management Proposal

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

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.
Table 1: Sediment Removal results (2013-2016)

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

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.
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
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.
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
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.
REFERENCES

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


- 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.


Overview
This Report is issued in response to the Nonroutine Adaptive Management Process (AMP) proposal submitted by the Program Manager of the Edwards Aquifer Habitat Conservation Plan (EAHCP), dated August 1, 2017. Per the Funding & Management Agreement, the EAHCP Stakeholder Committee is responsible for reviewing and making recommendations to the Implementing Committee for proposals submitted through the Nonroutine AMP. This Report presents the final recommendation of the EAHCP Stakeholder Committee concerning this Nonroutine AMP proposal.

Summary of the Nonroutine Adaptive Management Proposal
On August 1, 2017, the EAHCP Program Manager submitted the attached Nonroutine AMP proposal to the Science, Stakeholder, and Implementing Committees. The proposal involves modifying the Sediment Removal measures with efforts to focus on sediment prevention activities (§5.3.6 and §5.4.4) and modifying the Impervious Cover & Water Quality Protection measure (§5.7.6) to include the implementation of Water Quality Protection Plan activities.

Summary of September 21, 2017 Stakeholder Committee Discussion
At the September 21, 2017 Stakeholder Committee meeting, Alicia Reinmund-Martinez, HCP Director, provided a presentation – Proposed Nonroutine Adaptive Management Proposal: City of San Marcos/Texas State University Sediment Removal and City of San Marcos/City of New Braunfels Impervious Cover-Water Quality Protection – to the Committee. This presentation covered the following: 1) the AMP process, 2) the challenges and opportunities of sediment removal; 3) a comparative analysis between implementing storm water BMPs and sediment removal, 4) a summary of the COSM and CONB Water Quality Protection Plans, and 5) the Scientific Evaluation Report issued by the Science Committee in response to the Proposal.

Following this presentation, the Stakeholder Committee had a short discussion on the merits of the proposal. This section provides a summary of this discussion. It also includes the final motions taken by the Committee.

1) Cost Effectiveness due to Cost Sharing
Ms. Carol Patterson asked about whether this annualized capital cost, which is less annually than sediment removal, is also a shared cost between the City of San Marcos as well as utilization of other grant funds. Mr. Reinmund-Martinez said yes, that it was a shared cost and could be used as match for federally-funded projects.
2) **Specific Water Quality Protection Plan Projects**

Mr. Nathan Pence clarified that this AMP proposal is not specifically about Sessom Creek or Landa Lake BMPs but rather a broader amendment that would affect Low Impact Development work in San Marcos and New Braunfels. The specific details regarding these efforts will go through the proper annual Work Plan and Funding Application process.

Mr. Myron Hess asked for clarification on the process for work plans and funding applications. Mr. Pence did correct his statement and confirmed that annual work plans and funding applications will go the prescribed review process - first through a Science Committee review and then through the Implementing Committee review. Mr. Pence stated that the Stakeholder Committee does not have a role in the work plan review, but if a Stakeholder Committee member has a request regarding a work plan, staff will always respond.

**Final Motions by the Committee**

Mr. Cary Betz provided a correction to the language in Nonroutine AMP Proposal to change the word “respected” to “respective.” With that correction, Ms. Dianne Wassonich made a motion to approve, Ms. Carol Patterson seconded. There were no objections.

An expedited process whereby this Nonroutine AMP Stakeholder Report, reflecting the discussion of the Stakeholders concerns the proposed Nonroutine AMP proposal, would be approved by the Chair and Vice-Chair of the Stakeholder Committee was presented to the Committee for their consideration. Mr. Roger Biggers made a motion to approve the expedited process, Ms. Cindy Loeffler seconded. There were no objections.

**Nature of Stakeholder Committee Decision**

Twenty-two members of the Committee attended the September 21, 2017 meeting in attainment of a quorum for the meeting. Votes for both Committee actions concerning the Nonroutine AMP proposal were by consensus; there were not competing positions.

**Stakeholder Recommendation**

By consensus, the Stakeholder Committee recommends the Nonroutine AMP proposal to the Implementing Committee for approval and adoption.

**Attachments**

- Nonroutine Adaptive Management proposal dated August 1, 2017

Minutes from the September 21, 2017 Stakeholder Committee Meeting
Overview

This Scientific Evaluation Report¹ is issued in response to the Nonroutine Adaptive Management (AMP) proposal submitted by the HCP Program Manager dated August 1, 2017. The proposal calls to modify 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 Water Quality Protection Plans (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.

Once approved by the Chair and Vice-Chair or other designee of the Science Committee, this Scientific Evaluation Report will be presented for consideration by the Stakeholder Committee at its meeting on September 21, 2017.

Scientific Evaluation

The evaluation of this Nonroutine AMP proposal is based on the Science Committee’s analysis of (1) whether enough information, of sufficient quality, exists to properly ascertain that the proposed modifications meet the basic EAHCP objective for this Measure, and (2) whether, also based on the review of the information provided, the modifications reasonably represent an improvement over the current provisions for the Sediment Removal and Impervious Cover/Water Quality Protection (HCP §5.3.6, §5.4.4 and §5.7.6) Measures in the EAHCP. Here, “improvement” refers to both an increase in reducing contamination associated with stormwater runoff and sedimentation that negatively affects Covered Species habitat (specifically Texas wild-rice).

Evaluation of Information Provided

This reactive methodology has been the historical approach to sediment management and has proven costly and ineffective. As experience in implementing this measure was gained since 2013, issues were identified and, in parallel, possible alternative strategies

¹ According to the Funding and Management Agreement (2012), the Adaptive Management Science Committee is tasked with evaluating all Nonroutine Adaptive Management proposals. These evaluations result in a “Scientific Evaluation Report” for presentation to the Stakeholder Committee. The Stakeholder Committee considers this report in their decision whether to recommend the Nonroutine AMP proposal to the Implementing Committee for final approval.
for addressing sediment loading at the headwaters were developed. Since 2013, sediment removal data has been collected and presented in the EAHCP Annual Reports that support the need to pursue an alternative strategy. Such strategies include a proactive approach that prevents, and/or mitigates for, sediment runoff in the watershed before it reaches the river to protect water quality and the Covered Species habitat.

Figure 1: Accumulation of sediment at the confluence of Sessom Creek at the San Marcos River before (left) and after (right) the October 2015 flood.

While the EAHCP specified sediment removal as the recommended strategy to manage sediment in the San Marcos River, excess sediment continues to be deposited through contributing creeks. This has been observed at Sessom Creek following the October 2015 flood (Figure 1) – evidence that this effort, is not effective and best use of funds. The sediment volume removed from 2013-2016, and the costs associated, can be seen in the data provided in Table 1.

Table 1: Yearly Sediment Removals and Costs for Spring Lake and the San Marcos River (Gleason 2017).

<table>
<thead>
<tr>
<th>Year</th>
<th>Area (m²)</th>
<th>Volume (m³)</th>
<th>Est. Load (lb)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>106</td>
<td>48</td>
<td>169,509</td>
<td>$151,800</td>
</tr>
<tr>
<td>2014</td>
<td>77</td>
<td>20</td>
<td>70,629</td>
<td>$180,000</td>
</tr>
<tr>
<td>2015</td>
<td>284</td>
<td>85</td>
<td>300,173</td>
<td>$219,450</td>
</tr>
<tr>
<td>2016</td>
<td>92</td>
<td>28</td>
<td>98,880</td>
<td>$193,042</td>
</tr>
<tr>
<td>TOTAL</td>
<td>559</td>
<td>181</td>
<td>639,192</td>
<td>$744,292</td>
</tr>
</tbody>
</table>

A sediment mitigation strategy is proposed to focus on sediment management and prevention at the source resulting in fewer impacts, and to be more sustainable and cost effective. Sediment removal in the river does not address the actual sources of sediment, such as upland and bank 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 storm water best management practices (BMPs) that reduce erosive flows (see cost comparison in Table 2 below).

Table 2: Effectiveness of proposed restoration activities compared to Sediment Removal (Gleason 2017).

<table>
<thead>
<tr>
<th>Metric</th>
<th>HCP Sediment Removal To Date</th>
<th>Proposed Stream Restoration and Stormwater BMPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds of TSS Removed per year</td>
<td>159,780</td>
<td>1.5x More</td>
</tr>
<tr>
<td>Total Capital Cost</td>
<td>$744,292</td>
<td>Initial Investment 2x Greater</td>
</tr>
<tr>
<td>Annualized Cost ($/yr.)</td>
<td>$186,073</td>
<td>About Half the Cost</td>
</tr>
<tr>
<td>Annualized Cost per pound TSS removed</td>
<td>$1.16</td>
<td>About One-third the Cost</td>
</tr>
</tbody>
</table>

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 comment on the suite 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. The proposed restoration activities to proactively reduce sedimentation into the San Marcos river is included as a prioritized project under the COSM’s WQPP.

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 low-impact development (LID) and storm water 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 storm water control measures identified in the WQPP.

![Figure 2: 2017 New Braunfels Water Quality Protection Plan (Alan Plummer 2017)](attachment:image)

Specifically, the CONB WQPP identifies seven water quality projects (Figure 2) 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 CONB 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 storm water 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 Instream sediment removal for COSM & TXSTATE.

**PROPOSAL – SEDIMENT REMOVAL (§5.3.6 & §5.4.4)**

- *Current provision:*
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 City of San Marcos (COSM) & Texas State University (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.

**Proposed replacement:**
Sediment Removal measures (§5.3.6 & §5.4.4), 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 sediment management measures will be on implementing sediment mitigation and prevention strategies through the Impervious Cover/Water Quality Protection strategy.

**PROPOSAL – IMPERVIOUS COVER/WATER QUALITY PROTECTION (§5.7.6)**

**Current provision:**
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 City of New Braunfels (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.

**Proposed replacement:**
As stated above, in San Marcos, implementation of the Impervious Cover/Water Quality Protection measure will focus on sediment mitigation and/or prevention. This strategy, as discussed, will include the implementation of low impact development (LID) best management practices (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.
CONCLUSION
Considering the information provided, and the lack of progress made in effectively removing sediment from the San Marcos river, as well as incentivizing private landowners to invest in storm water protection measures on their property in and around the Comal and San Marcos Springs, the Science Committee finds that the proposed modifications meet the basic EAHCP objective for this Measure. Additionally, the Science Committee finds that the modifications represent a significant improvement over the current provisions for the Sediment Removal and Impervious Cover/Water Quality Protection Measures in the EAHCP. See specific discussion in the transcript below:

Transcript from Science Committee Meeting on August 7, 2017:
Mr. Pence discussed the structure, status, and strategy for implementing a nonroutine adaptive management proposal for sediment loading mitigation.

In Comal, the private landowner incentive program has had minimal interest. Thus, through the nonroutine adaptive management proposal, funding will be reassigned and applied to investing in BMPs on City property.

In San Marcos, sediment deposition can not only smother and displace, but also kill vulnerable stands of Texas wild-rice. Through the nonroutine adaptive management process, funding will be reassigned and applied to more proactive measures for managing sediment loading in the San Marcos River. Dr. Mace promoted the proactive approach and approved of AMP still allowing for hydrosuction if needed. Dr. Lamon stated that it’s a good approach to address the sedimentation issue closer to the source.

Dr. Duke noted that this measure is an excellent example of what the EAHCP is about. She also inquired about conservation measures for future development. Mr. Pence emphasized that the COSM and CONB watershed managers are working closely with the planning departments and have standards in place. Mr. Enders, CONB watershed manager, replied that they have restrictions for impervious cover on areas that are greater than or equal to 30 percent impervious cover or if the impervious area is equal to or greater than 5,000 m².
REFERENCES

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

ATTACHMENTS
- Attachment 1: Science Committee Agenda
- Attachment 2: Science Committee Minutes - Unofficial
NOTICE OF OPEN MEETING
Available at eahcp.org

As jointly determined by the Implementing Committee and the Program Manager (FMA §7.9.3.b), the San Marcos Water Quality Protection Work Group has been formed to provide scientific review and input on questions related to the City of San Marcos’ implementation of the Edwards Aquifer Habitat Conservation Plan (EAHCP) “Impervious Cover/Water Quality Protection” Measure (HCP §5.7.6). The San Marcos Water Quality Protection Work Group is comprised of members selected from the EAHCP Adaptive Management Science Committee as well as subject matter experts endorsed by the Science Committee for this purpose. A meeting of this Work Group for the EAHCP is scheduled for Tuesday, July 18, 2017, at 9 a.m. at the San Marcos Activity Center (Room 1), 501 E. Hopkins St., San Marcos, Texas 78666. Lunch will be provided; the meeting is expected to end by 4 p.m. Work Group members are asked to please RSVP to dlarge@edwardsaquifer.org.

Members of this Work Group include: Charlie Kreitler, Glenn Longley, Jackie Poole, Shaun Condor, Ben Schwartz, and Aarin Teague.

At this meeting, the following business may be considered and recommended for committee action:

1. Call to order.

2. Public comment.

3. Presentation of the San Marcos Water Quality Protection Work Group charge (Attachment 1).
   Purpose: To provide the Work Group with information on its charge.
   Action: None required.

4. Presentation and possible endorsement of EAHCP staff recommendation of the Sessom Creek watershed as the priority for the City of San Marcos’ “Impervious Cover/Water Quality Protection” (HCP §5.7.6) project implementation. (Attachment 2)
   Purpose: To obtain input from the Work Group on the proposal to prioritize the Sessom Creek watershed for project implementation and to possibly obtain their endorsement of said proposal.
   Action: To obtain Work Group input and to possibly endorse the proposed prioritization of the Sessom Creek watershed.

5. Presentation and possible endorsement of prioritizing the proposed list of water quality protection projects identified for implementation in the chosen watershed. (Attachment 2)
   Purpose: To obtain input from the Work Group on the proposed prioritization of water quality protection projects identified for implementation and to possibly obtain their endorsement of said proposal.
   Action: To obtain Work Group input and to possibly endorse the proposed prioritization of water quality protection projects

6. Questions and comments from the public.

7. Adjourn.
1. Call to order.
Nathan Pence called the meeting to order at 9:09. Mr. Pence provided opening comments and thanked the Work Group members for their participation and contribution to transparency and the public process.

2. Public comment.
There were no public comments.

3. Presentation of the San Marcos Water Quality Protection Work Group charge.
Alicia Reinmund-Martinez provided an overview of the Work Group charge, including an introduction to the EAHCP’s adaptive management process. Dr. Chad Furl presented a review of the physical and ecological impacts associated with increased rates of sedimentation that is being experienced in the San Marcos River. Melani Howard provided a presentation of the City of San Marcos and Texas State University’s performance data from EAHCP sediment removal efforts to date under measures 5.3.6 and 5.4.4. Dr. Furl and Ms. Reinmund-Martinez provided a summary stating that sediment removal efforts have proven time-intensive, costly, and problematic, and, overall, a reactive strategy to the problem of excessive sediment loading in the San Marcos. John Gleason introduced the Water Quality Protection Plan (WQPP) developed by his firm on behalf of the City of San Marcos in support of the City’s EAHCP water quality protection measure. This WQPP provided the original basis for some of the ideas for retrofits that are being considered today by the Work Group, specifically, stream restoration and BMPs in the Sessom Creek watershed.

4. Presentation and possible endorsement of EAHCP staff recommendation of the Sessom Creek watershed as the priority for the City of San Marcos’ “Impervious Cover/Water Quality Protection” (HCP §5.7.6) project implementation.
Dr. Furl provided an overview of the criteria used and analyses undertaken to prioritize which of the contributing watersheds to the San Marcos River (Sessom, Willow Springs, Purgatory, and Sink creek watersheds) should be targeted for EAHCP water quality protection implementation, identifying Sessom as exhibiting some of the highest problem indices (e.g., percent impervious cover, highly erodible land, average channel slope, etc.).

Dr. Ben Schwartz provided an overview of the nature of the watersheds in relation to the recharge zone as well as efforts to date to monitor sediment loading to the river. Dr. Schwartz did comment that in the lower Purgatory there is a well that gets inundated during large storm events in which endangered species have been recorded. Dr. Schwartz also commented that springs around lower Sessom discharge into a concrete channel which is not appropriate to be considered habitat; however, the springs do reflect connectivity into the aquifer (to a limited extent) suggesting this reach is not totally without habitat value.

Mr. Gleason introduced information on the existing conditions in the middle Sessom Creek watershed and presented his team members Pat Hartigan (primary white paper author and technical lead on the Sessom Creek analysis) and Lee Sherman (primary author of the retrofit section of the WQPP). Mr. Hartigan discussed exposed wastewater lines in the watershed and other geomorphological evidence observed in the watershed indicating major problems with instability and erosion.
Dr. Furl discussed the Sessom Creek confluence with the river, noting that the confluence flows into the Spring Lake dam reach which provides habitat for Texas wild-rice and is the only area of the river where the TPWD State Scientific Area stretches from bank to bank. Dr. Furl also presented the latest published bio-monitoring mapping for Texas wild-rice showing stands growing in the confluence area.

Mr. Hartigan provided an overview of the other watersheds, noting the Willow Springs, Purgatory, and Sink creek watersheds variously exhibit comparatively less instability and some retardation of flows from Soil Control Service dams.

Dr. Schwartz commented on Sink Creek, noting that the tributaries coming of Hillside Ranch Apartments (1 and 2; accessible off Ramsey Street) are like Sessom, rapidly downcutting and contributing to sediment flows to Spring Lake.

Shaun Condor commented that since the City will already be out working on the wastewater line project it would be good to get both projects (wastewater lines and water quality protection) done at the same time.

Charlie Kreitler commented that, although Sessom Creek watershed may be the priority for this exercise, the other watersheds should also be considered through the EAHCP process to head off the development of hydrologic problems in them that are like Sessom once they become more urbanized. Mr. Gleason commented that City of San Marcos land development regulations would govern this development.

Glenn Longley stated he has no problem prioritizing Sessom Creek watershed; Dr. Schwartz seconded Dr. Longley’s endorsement. There was no opposition.

5. Presentation and possible endorsement of prioritizing the proposed list of water quality protection projects identified for implementation in the chosen watershed.

Ms. Reinmund-Martinez presented the proposed list of water quality protection projects identified for implementation in the chosen watershed. Dr. Furl provided an overview of the prioritization of the middle reach of the Sessom Creek watershed over either the upper or lower reaches of the watershed.

Mr. Hartigan discussed the proposed stream restoration for “Reach 2” (the middle reach), noting that the project would be based on natural design principles and that fluvial geomorphology and equilibrium theory will be applied to create stable channels.

Dr. Longley asked what specific techniques would be used to stabilize the channel. Dr. Aarin Teague asked what the Rosgen stream classification is; Mr. Sherman explained they are not proposing to use the Rosgen model, but rather a process-based methodology focused on the end goal of establishing a channel in equilibrium.

Dr. Teague asked what the proposed riparian buffer width would be; Mr. Sherman replied they do not know yet. Dr. Schwartz mentioned that there is extensive Ligustrum [an invasive exotic species] growth in the watershed just upstream from LBJ, would part of the plan involve removal? Ms. Howard answered that, on a volunteer basis, off the Windmill Tributary, for about 6 months they’ve been removing Chinese tallow, Ligustrum, and Chinaberry, and spreading seed, and thus far, it has been working—so she’d envision continuing these volunteer efforts.

Mr. Hartigan brought up that while stream restoration is a major focus, drainage issues and public safety will also require attention in the scope of the project. Mr. Hartigan reviewed the evaluation criteria used in the assessment of various water quality protection projects under consideration
(sediment loads and load reductions, cost, and cost effectiveness). Mr. Hartigan proceeded to present each of the individual projects under consideration and the various performance metrics calculated for them.

Dr. Teague commented that the research that went into the WERF guidelines was highly variable and based on a wide variety of case studies, meaning that following these guidelines should be understood to involve a high degree of uncertainty.

Ben Schwartz asked if there were any opportunities to install BMPs upstream of the middle reach to preemptively mitigate erosive flows hitting the middle reach. Mr. Hartigan answered that there were around a half a dozen smaller scale opportunities, including some major ones (e.g., “The Gulch” and “Sessom Creek Wet Pond”) that are under consideration through the Water Protection Plan (WPP) process. Dr. Schwartz commented that Dr. Weston Nowlin’s class studied the pond and found that there was no loss of loading in the pond and the average residence time was 12 minutes, with the caveat that this was an unpublished class project.

Open Intermission for Comments and Questions from the Public and the Work Group
Dr. Longley asked what the wastewater renovations plans are for the City. Mr. Condor answered that the City will put a stub out to the west of LBJ, bore a sewer line all the way west. Existing sewer will be cut out and filled with foam. Dr. Teague asked if the City has an MS4 permit; Ms. Howard answered that yes. Dr. Teague asked if the streets in the area affected provide the conveyance; Mr. Condor answered that there are no streets around the wastewater line work.

Ken Diehl commented that there is an MS4, 319, HCP, and funds from City for sewer relocation; there has been a significant effort to delineate those costs and activities, and this collaboration needs to be clear. Mr. Pence responded that as Program Manager it falls to him to ensure that HCP funds are being used appropriately; while the collaboration is complex and challenging, the team has been holding bimonthly planning and coordination meetings. It is on us as project managers to observe and maintain appropriate boundaries. While a challenge, Mr. Pence expressed he feels that this will pay off in the end.

Dr. Teague asked if there is a delineated floodplain associated with the project area (“AE zone” in FEMA terminology); Mr. Sherman responded that he does not believe there is, Mr. Condor and Mr. Hartigan also added that there is not. Dr. Teague asked about permitting costs and whether a Nationwide 27 permit would be required. Shaun Payne answered that the EAHCP is consulting with HDR to assess whether this will be necessary and it appears to be likely. Ms. Reinmund-Martinez added that this will become more clear over the course of the Preliminary Engineering Report exercise. Dr. Teague also asked whether any cultural resources are expected to be encountered during the work, which will also have impact on permitting. Ms. Reinmund-Martinez answered that the EAHCP is consulting with Amaterra to consider this question.

Dr. Kreitler commented that stream restoration addresses Sessom Creek, but does not address the urban runoff problem above the creek. Alicia answered that in the previous discussion the City would be considering projects in other areas upstream through 319 processes. Dr. Longley added the question of whether there have been any efforts to capture rainfall onto new development. Mr. Hartigan responded that there are some options being considered through other processes (besides EAHCP) but that overall the strategy of achieving equilibrium is itself a response to the reality of limitations on controlling existing hydrology.

Dr. Kreitler asked about the issue of flow velocity in relation to Texas wild-rice. Mr. Sherman responded it is not clear whether high or low velocity is the issue, since wild-rice may benefit from
clearing sediment. Ms. Howard commented that the primary problem at the confluence is not scouring, but rather deposition of sediment that can bury wild-rice stands.

Dr. Teague asked what a flood looks like in Sessom Creek; does the creek overbank? Dr. Schwartz responded that it goes quickly from no or base flow to inundating the road. When it overbanks, it’s in the road in the lower reach. In the middle and upper reaches he has not observed how the creek behaves.

Mr. Diehl asked if there has been any consideration of land use restrictions associated with water quality protection (e.g., impervious cover limitations, conservation easements, etc.). Mr. Hartigan responded that the answer is yes in the recharge zone. The City has a 20% impervious cover limit in the recharge zone; San Marcos River Foundation (SMRF) also emphasizes land conservation. Dianne Wassenich stated the new Land Development Code which is being finalized should also include enhanced water quality protection measures, while SMRF is buying land above Spring Lake in rural areas. Mr. Hartigan commented that the City is adopting an increased focus on headwater protection which should play a role in preventing “future Sessoms.”

Dr. Kreitler asked whether the group had consulted the City of Austin Department of Watershed Protection. Mr. Sherman answered that he has professional connections with the director of the department and is in correspondence with him.

Dr. Teague asked the elevation of the watershed. Mr. Sherman and Mr. Hartigan answered that they could provide this information to Dr. Teague later in the day if it would be helpful.

Dr. Schwartz asked if the City had talked to any of the apartment complexes to inquire whether they would be interested in working with the City on some of the smaller BMPs. Ms. Howard answered that there have been beginning efforts to engage the apartments with other projects (litter, etc.) but had not begun conversations about BMP work. Mr. Sherman commented that the situation is somewhat fortunate in that there is a lot of development left to go, allowing for some problems to be avoided. Once urbanization takes place, then all that is left is redevelopment regulations. Mr. Sherman added that he guessed he is hopeful for the day when we all have flying cars and streets can be taken out. Ms. Wassenich discussed redevelopment districts in the Land Development Code process and the problem with that is that even old apartment complexes are too profitable to incentivize redevelopment.

Mr. Hartigan commented that rigorous study was conducted by HDR for the City of Austin based on critical shear stress value for central Texas streams; if you capture this much volume and hold it for 48 hours, you obtain a stream protection curve factoring volume and stream protection and to control it for urbanization. A study is available, which Alicia will send to the Work Group along with the thesis referenced in the white paper.

Mr. Gleason noted that the majority proportion of sediment coming out of the watershed comes from the instream load and not upstream runoff, hence the strategic emphasis on stream restoration rather than upland sources.

Dr. Schwartz asked about the bike lane project and its relation to this work. Mr. Condor answered that the bike sidewalk will not run through the Sessom Creek watershed. Ms. Wassenich asked about whether pervious pavement was being considered; Mr. Condor answered that the City has been experiencing maintenance issues with this material, but is open to considering it. Mr. Sherman noted that current formulations are tricky to implement and he is not aware of satisfactory, cost effective substitutes. Mr. Diehl mentioned that load bearing has also cropped up as an issue with certain pervious pavement materials in relation to accessibility for large fire trucks, and that this should be considered.
Dr. Kreitler asked whether it might be an option to leave out option 3A since it seems least effective. Dr. Schwartz commented what happens if certain options are left out; would the City pick up the bill on what is left out? Ms. Howard and Ms. Reinmund-Martinez answered that the EAHCP could cover the cost of projects 2 and 3B.

Mr. Condor motioned to endorse the proposed prioritization of water quality protection projects; Jackie Poole seconded the motion. There was no opposition.

Mr. Diehl asked what the monitoring expectations are for the EAHCP; Dr. Furl answered that this is already underway through Expanded Water Quality Monitoring operations, but a specific project will also be undertaken through the Applied Research Program.

Dr. Schwartz commented that this comes down to Texas State University and the City continuing to work together and with the apartment complexes to retrofit existing sources of impervious cover. With the steep narrow stream channel, the issue of fixing the hydrology will persist.

6. **Questions and comments from the public.**
   There were no public comments or questions.

7. **Adjourn.**
   Ms. Reinmund-Martinez adjourned the meeting at 11:48 a.m.
As required by Section 7.9.3 of the Funding and Management Agreement (FMA), an interlocal agreement made pursuant to Texas Government Code Chapter 791 by and among the Edwards Aquifer Authority (EAA), the City of New Braunfels (New Braunfels), the City of San Marcos (San Marcos), the City of San Antonio acting by and through its San Antonio Water System (SAWS), Texas State University, and the Guadalupe-Blanco River Authority (GBRA), a meeting of the Science Committee for the Edwards Aquifer Habitat Conservation Plan Program is scheduled for Monday August 7, 2017 at 9 a.m. at the San Marcos Activity Center (Multipurpose Room), 501 E. Hopkins, San Marcos, Texas, 78666. The meeting is expected to end by 3 p.m. and will include a 30-minute lunch break. Lunch will be provided. To provide a head count, all attendees are asked to please RSVP to ktolman@edwardsaquifer.org by Wednesday, August 2nd.

Members of this committee include: Tom Arsuffi, Janis Bush, Jacquelyn Duke, Charles Kreitler, Conrad Lamon, Glenn Longley, Robert Mace, Doyle Mosier, Chad Norris, Jackie Poole, and Floyd Weckerly.

At this meeting, the following business may be considered and recommended for committee action:

1. Call to order.

2. Public comment.

3. Approval of May 10, 2017 Science Committee meeting minutes (Attachment 1).

4. Receive report from the Program Manager.
   - Spring systems hydrologic update
   - Response to Science Committee member questions from last meeting
   - Hydro model update
   - Refugia operations update
   - National Academy of Science Report 2 Implementation Plan
   - Potential changes to Comal Springs riffle beetle bio-monitoring sampling
   Purpose: To present the results of the Applied Research project.
   Action: None required.

   Purpose: To provide the Science Committee the opportunity to review and comment on the science-related aspects of the 2018 Applied Research projects SOW.
   Action: None required.

7. Presentation of the Ecological Model (EcoModel) workshop and EAHCP Phase 2 considerations.
   Purpose: To provide the Science Committee with information on the EcoModel workshop and EAHCP Phase 2 considerations.
   Action: None required.

8. Presentation, discussion, and possible recommendation of the Nonroutine Adaptive Management proposal related to the City of San Marcos (COSM) and Texas State University’s Sediment Removal Measures (§§5.3.6 and 5.4.4) and the Impervious Cover/Water Quality Protection Measure (§5.7.6) (Attachment 4).
   Purpose: To provide the opportunity for the Science Committee to discuss and possibly recommend the Nonroutine Adaptive Management proposal to the Stakeholder Committee.
   Action: To possibly recommend the Nonroutine Adaptive Management proposal to the Stakeholder Committee.

9. Presentation and possible endorsement of an expedited process to prepare and to submit the Nonroutine Adaptive Management Scientific Evaluation Report, with Science Committee Chair and Vice-Chair approval, to the Stakeholder Committee.
   Purpose: To provide the opportunity for the Science Committee to discuss and possibly endorse a process to prepare and to submit the Nonroutine Adaptive Management Scientific Evaluation Report to the Stakeholder Committee.
   Action: To possibly endorse the expedited process for preparing the Nonroutine Adaptive Management Scientific Evaluation Report and for submitting it to the Stakeholder Committee.

10. Consider future meetings, dates, locations, and agendas.
    • Science Committee Meeting, November 8th, 2017, San Marcos Activity Center (Multipurpose Room).

11. Questions and comments from the public.

12. Adjourn.
1. Call to order.
Vice Chair, Dr. Weckerly called the meeting to order at 9:05 a.m. Members present include Janis Bush, Jacquelyn Duke, Conrad Lamon, Glenn Longley, Robert Mace, Doyle Mosier, Chad Norris, Jackie Poole, and Floyd Weckerly. Tom Arsuffi and Charles Kreitler advised prior to the meeting that they were unable to attend.

Dr. Weckerly proposed an agenda sequence change to move item 7 to the last item, due to the fact that a few members had already attended the previous EcoModel meetings and agenda adaptive management items 8 and 9 are require a quorum from the group.

2. Public comment.
No public Comment

3. Approval of May 10, 2017 Science Committee meeting minutes (Attachment 1).
Dr. Longley motioned to approve the minutes as written; Dr. Mosier seconded. No opposition.

4. Receive report from the Program Manager.
   - Spring systems hydrologic update
     Dr. Furl provided a presentation to the committee on recent hydrologic conditions at the spring systems including daily, monthly, and annual trends. The Edwards Aquifer region has received below average rainfall this year and is currently in Stage 1 Drought Restrictions. However, substantial flooding on the morning of this meeting may change aquifer levels in the coming days.

   - Response to Science Committee member questions from last meeting
     No pending questions from the prior meeting.

   - Hydrologic model update
     Dr. Furl presented a brief overview of the Edwards Aquifer Authority’s hydrologic modeling efforts. Their final interim report should be submitted in August 2017.

   - Refugia operations update
Dr. Furl presented a summary of Refugia collection and facility construction efforts. The construction request for proposals (RFP) are available on the FedConnect portal.

- **National Academy of Science Report 2 Implementation Plan**
  Mr. Pence presented the status and process for developing an EAHCP Implementation Plan based on the National Academy of Science Report 2 suggestions. The NAS 2 Work Group will present their Implementation Plan report to the Implementing Committee for potential adoption on August 17, 2017.

- **Potential changes to Comal Springs riffle beetle bio-monitoring sampling**
  Dr. Furl discussed the recent changes to the Comal Springs riffle beetle sampling procedures.

5. **Presentation of the 2016 Applied Research results: Evaluation of the trophic level status and functional feeding group categorization of larvae and adult Comal Springs riffle beetle (Attachment 2).**

Dr. Nowlin presented an overview of his 2016 applied research on the trophic level status and functional feeding groups of the Comal Springs riffle beetle (CSRB). Through complex isotope analyses, findings suggest that the CSRB prefer woody debris or coarse organic material and have similar food preferences between larvae and adults.

Dr. Weckerly noted that for complex invertebrates, they generally have different feeding preferences at different life stages. Dr. Nowlin replied that it depends on the species and habitat conditions. CSRB larvae may eat similar materials to that consumed by adults, but there are slight differences in that the larvae prefer finer gravel while the adults are found in slightly larger gravel.

Dr. Weckerly inquired about people finding CSRB in wells, whereas, we generally find them at the springs. Dr. Nowlin replied that although they are an aquifer-dependent species, they still have eyes and respond to light which infers that they are not entirely a subterranean species; it depends on where you are within the aquifer. The complexity of the Comal Springs food webs play an important role in the distribution of the CSRB.

6. **Presentation on 2018 Applied Research projects Scopes of Work (SOW) (Attachment 3).**

Dr. Furl presented a list and proposed scopes of work for the applied research program. The evaluation of SAV treatment has been removed from the list due to project design and lack of ability to isolate and control the variables within the river.

Mr. Pence discussed the ecosystem services of the EAHCP analysis. There is consensus from regional entities on the utility and need for one, however, the research project lacks the funding
necessary to conduct the analysis. The EAHCP supports research efforts if another entity finds the means to pay for the research.

Dr. Furl presented an overview of the new Sessom Creek scope of work. A new flow meter and radar station will be set-up on the creek to monitor and capture loading characteristics. Dr. Lamon noted the bias associated with load duration curves derived from short-term monitoring and suggested that the station be a more long-term installation to better assess general trends.

7. **Presentation, discussion, and possible recommendation of the Nonroutine Adaptive Management proposal related to the City of San Marcos (COSM) and Texas State University’s Sediment Removal Measures (§§5.3.6 and 5.4.4) and the Impervious Cover/Water Quality Protection Measure (§5.7.6).**

Mr. Pence discussed the structure, status, and strategy for implementing a nonroutine adaptive management proposal for sediment loading mitigation. In San Marcos, sediment deposition can not only smoother and displace, but also kill vulnerable stands of Texas Wild-rice. In Comal, the private landowner incentive program has had minimal interest. Through the nonroutine adaptive management process, funding will be reassigned and applied to more proactive measures instead of reactive.

Dr. Mace promoted the proactive approach and approved of AMP still allowing for hydrosuction if needed.

Dr. Lamon stated that it’s a good approach to address the sedimentation issue closer to the source.

Dr. Duke noted that this measure is an excellent example of what the EAHCP is about. She also inquired about conservation measures for future development. Mr. Pence emphasized that the COSM and CONB watershed managers are working closely with the planning departments and have standards in place. Mr. Enders, CONB watershed manager, replied that they have restrictions for impervious cover on areas that are greater than or equal to 30 percent impervious cover or if the impervious area is equal to or greater than 5,000 m².

Dr. Weckerly motioned to approve recommendation of the Nonroutine Adaptive Management proposal to the Stakeholder Committee; Glenn Longley seconded. No opposition.

8. **Presentation and possible endorsement of an expedited process to prepare and to submit the Nonroutine Adaptive Management Scientific Evaluation Report, with Science Committee Chair and Vice-Chair approval, to the Stakeholder Committee.**

Dr. Weckerly motioned to approve recommendation of the Nonroutine Adaptive Management proposal to the Stakeholder Committee; Dr. Mace seconded. No opposition.
9. Presentation of the Ecological Model (EcoModel) workshop and EAHCP Phase 2 considerations.

*Dr. Furl presented an overview of the EcoModel structure and utility. Dr. Lamon expressed concern about the need for an uncertainty analysis to help quantify the accuracy of the model. Mr. Pence explained that the model has been calibrated and the contract has expired, however, that does not preclude potential future improvements to the model if deemed necessary.*

10. Consider future meetings, dates, locations, and agendas.
   - Science Committee Meeting, November 8th, 2017, San Marcos Activity Center (Multipurpose Room).

11. Questions and comments from the public.
   *No questions or comments from the public.*

12. Adjourn: 1:40 p.m.
NOTICE OF OPEN MEETING
Available at eahcp.org

As required by Section 7.8.4 of the Funding and Management Agreement (FMA), an interlocal agreement made pursuant to Texas Government Code Chapter 791 by and among the Edwards Aquifer Authority (EAA), the City of New Braunfels (New Braunfels), the City of San Marcos (San Marcos), the City of San Antonio acting by and through its San Antonio Water System (SAWS), Texas State University, and the Guadalupe-Blanco River Authority (GBRA), a meeting of the Stakeholder Committee of the Edwards Aquifer Habitat Conservation Plan Program is scheduled for 9:00 am on Thursday, September 21st, 2017 at the City of San Marcos Activity Center (Room 1), 501 E. Hopkins, San Marcos, TX, 78666. Lunch will be provided for committee members at 12:00 p.m.

1. Call to order--Establish that all Committee members are present or represented- 9:00 a.m.

2. Public Comment.

3. Approval of minutes from the March 16th and June 15th Stakeholder Committee meetings (Attachment 1 & 2).

4. Receive report from the Program Manager on general updates about the Habitat Conservation Plan.
   - Springflow and Index Well levels
   - Collaboration in Grant Funded Projects
   - Hydrologic Modeling Workshop
   - Modeling and Phase II timeline
   - NAS Report 3 (Attachment 3)
   - 2018 SH and IC meeting dates (Attachment 4)
   - Zebra Mussel Monitoring

   Purpose: To provide an opportunity for the Stakeholder Committee to discuss a recommendation on the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine AMP Proposal.
   Action: To make a recommendation on the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine AMP Proposal to the Implementing Committee.

6. Discussion and decision regarding expedited process to develop and approve submission of the Nonroutine AMP Stakeholder Report to the Implementing Committee (Attachment 7).
Purpose: To present a potential expedited process to develop and submit the written report reflecting the Stakeholder Recommendation on the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine AMP Proposal.
Action: To approve a process to develop, approve, and submit the Stakeholder Report to the Implementing Committee.

7. Presentation and discussion regarding the Aquifer Storage and Recovery (ASR) Nonroutine Adaptive Management Process (AMP) and timeline.
   Purpose: To inform the Stakeholder Committee of the upcoming ASR AMP and to answer any questions the Committee may have.
   Action: No action required

8. Presentation of the Ecological Model workshop and EAHCP Strategic Adaptive Management considerations.
   Purpose: To provide the Committee an update on EAHCP staff’s progress and the Ecological Modeling workshop.
   Action: No action required

   Purpose: Present the Implementation Plan approved by the Implementing Committee.
   Action: No action required.

    Purpose: To provide the Implementing Committee information regarding issues from the NAS Report 2 recommendations
    Action: No action required.

    Purpose: To present the 2017 Budget Work Group report to the Implementing Committee for possible approval.
    Action: To approve the adoption of the 2017 Budget Work Group Report as presented

12. Consider future meetings, dates, locations, and agendas.
    * Next meeting will be held on December 14th at the Edwards Aquifer Authority.

13. Questions from the public.

14. Adjourn
1. **Call to order--Establish that all Committee members are present or represented- 9:06 a.m.**
   Steve Raabe, Chairman of the Stakeholder Committee, called roll. There was a quorum of the committee present.

2. **Public Comment.**
   No comment.

3. **Approval of minutes from the March 16th and June 15th Stakeholder Committee meetings.**
   Dianne Wassenich made a motion to approve. Myron Hess seconded the motion. There were no objections.

4. **Receive report from the Program Manager on general updates about the Habitat Conservation Plan.**
   - Springflow and Index Well levels
     Chad Furl, Chief Science Officer for the EAHCP, provided a summary of recent hydraulics for the springs and aquifer.
   - Collaboration in Grant Funded Projects
     Alicia Reinmund-Martinez, EAHCP Director, provided a brief presentation on some of the collaborative efforts to access some grants for EAHCP projects.
   - Hydrologic Modeling Workshop
     Nathan Pence, EAHCP Program Manager, mentioned that a Hydrologic Model Workshop for the Stakeholders and Science Committee members sometime in the fall of 2017.
   - Modeling and Phase II timeline
     Mr. Pence provided a brief description about the timeline regarding the hydrologic model and use through Phase II and Strategic AMP.
   - NAS Report 3
     Mr. Pence provided a brief description of the NAS Report 3 SRP membership, timeline, and scope of the final NAS report. Additionally, Mr. Pence describes how Report 3 will provide specific feedback on Biological Goals.
     Dianne Wassenich thanked EAHCP staff for including the Stakeholder Committee members in all NAS workshops and meetings.
   - 2018 Stakeholder and Implementing Committee meeting dates
     Mrs. Reinmund-Martinez presented the proposed dates for the Stakeholder Committee meetings for 2018.
   - Zebra Mussel Monitoring
     Mr. Pence discussed bringing together a group of Stakeholders that have jurisdiction in and around areas that are or could be affected by the presence of zebra mussels in the Guadalupe basin. Monitoring will be committed to but possibly proactive research could be a part of next
steps to protect the springs systems from future infection. There was a discussion regarding zebra mussel propagation and who are the agencies that currently monitor and research the zebra mussel. Todd Votteler, GBRA, mentioned the possible propagation issues through those who train for the Texas Water Safari. Additionally, Mr. Votteler mentioned a comprehensive look at this issues, including the quagga mussel.

Mr. Raabe mentioned that San Antonio River Authority will work with TPWD to start monitoring the San Antonio River.

- REI/LOOP Tour
  Shaun Payne, EAHCP staff, presented some photos from a recent tour of the San Marcos system.

Mrs. Reinmund-Martinez presented the details pertaining to the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine Adaptive Management Proposal. This proposal has been presented and approved by the Science Committee (resulting in the Scientific Evaluation Report). The full presentation can be found on eahcp.org.

Mr. Pence described that this AMP proposal includes limitation of sediment removal for “emergency” needs as well as expand sediment removal methods to include mechanical means not just suction dredge (as is currently stated in the EAHCP).

Carol Patterson asked about whether this cost, which is less annually than sediment removal, is also a shared cost between the City of San Marcos as well as utilization of other grant funds. Mrs. Reinmund-Martinez concurred. Mr. Pence clarified that this AMP proposal is not specifically about Sessom Creek or Landa Lake BMPs but rather a broader amendment that would affect LID work in San Marcos and New Braunfels. The specific details regarding these efforts will go through the proper annual Work Plan and Funding Application process.

One correction to the language in Nonroutine AMP Proposal to change “respected” to “respective.”

Dianne Wassenich made a motion to approve the AMP proposal. Carol Patterson seconded the motion. There were no objections.

6. Discussion and decision regarding expedited process to develop and approve submission of the Nonroutine AMP Stakeholder Report to the Implementing Committee.
Mrs. Reinmund-Martinez requested an action regarding the method of approval of the Stakeholder Report required to present to the Implementing Committee for final AMP approval.

Roger Biggers made a motion to approve the expedited process; Cindy Loeffler seconded the motion. There were no objections.

Mr. Pence provided a summary of the details associated with Sessom Creek restoration work intended to reduce sediment loading into the upper portion of the San Marcos River. Mr. Raabe
mentioned that the San Antonio River Authority has developed some regional material to restore watersheds much like Sessom Creek. Mr. Pence mentioned that Aarin Teague has volunteered to help develop some of the efforts in San Marcos.

Mr. Pence continued by explaining some of the WQPP efforts in New Braunfels that implement stormwater BMPs around Landa Lake. It was communicated that all efforts in both San Marcos and New Braunfels are above and beyond their MS4 requirements.

7. **Presentation and discussion regarding the Aquifer Storage and Recovery (ASR) Nonroutine Adaptive Management Process (AMP) and timeline.**

   Mr. Pence began the presentation by communicating that Myron Hess, Vice Chair, communicated that it will be important to keep the Stakeholders involved as the changes to ASR are developed so that everyone is informed and confident in the changes before it is presented. The full presentation can be found at eahcp.org.

   Tom Taggart asked how forbearance agreements, as expected to be implemented for future ASR water, can be regulated/enforced as well as the current lease structure is regulated. Mr. Pence communicated that permit forbearance agreements are enforced through typical well-logging and permitting regulation.

   Buck Benson mentioned those he represents often put aside 44% of their permitted water every year in order to prepare for the worst-case scenario. Mr. Benson wanted to encourage EAA to find out how to utilize the water set aside for Critical Period Management (CPM). Bruce Alexander described the situation a small municipality is in when attempting to plan for possible drought or CPM reduction as well as maintaining leases in ASR all while needing to provide water for their customers.

   Mr. Pence continued by presenting a tentative timeline to the ASR Adaptive Management Process. If all modeling checks-out, advertising of new product is planned to begin in 2018 and implementation in 2019.

   Mr. Taggart asked how the Hydrologic Modeling timeline fits into the ASR AMP timeline. Mr. Pence mentioned the Hydrologic Model Workshop is the starting point for the ASR AMP. Mr. Taggart asked if there is enough time to adequately communicate and develop the new ASR product and move it through the amendment process. Mr. Pence answered by communicating the aggressive timeline is simply a starting point.

   The committee had a 15-minute break.

8. **Presentation of the Ecological Model workshop and EAHCP Strategic Adaptive Management considerations.**

   Mr. Pence described the Ecological Model workshop and what the Ecological Model showed. Dr. Furl presented the information regarding the Ecological Model and what the uses and end results are. The full presentation can be found at eahcp.org.

   Mr. Pence communicated that the Ecological Model was developed for one reason, which was to test the numbers of fountain darters that survive through the drought of record due to our mitigation and minimization measures in the EAHCP. The model has shown exactly what the EAHCP hoped it would. Specifically, that our measures have provided the adequate protections to reach the goals established in the HCP.
Carol Patterson asked questions regarding the variations in the systems do not only include droughts, but also floods and periods of constant flow. Mrs. Patterson asked if this model can show effects of other extreme, or constant, springflow in regards to fountain darter numbers.

9. **Presentation regarding the NAS Report 2 Implementation Plan.**
Cindy Loeffler, TPWD and Chair of the NAS Report 2 Work Group, presented the details found in the NAS Report 2 Implementation Plan. Full presentation is available at eahcp.org.

Dianne Wassenich spoke about the NAS recommendation on ASR and why those recommendations are not the EAHCP’s responsibility. Mr. Pence reiterated that the specific recommendation was regarding ASR operations and not leasing. Patrick Shriver, SAWS, communicated that many of the concerns have been addressed and are being watched by SAWS staff.

Mr. Pence provided a summary of the next couple items. Lunch was provided and the committee took a break for 45 minutes.

10. **Presentation and discussion of the National Academy of Sciences Report 2 Recommendations Issues List.**
Mr. Pence presented a series of issues that were brought up in NAS Report 2. Full presentation can be found at eahcp.org.

Jim Bower asked how far along are the CSRB efforts in comparison to where we would like to be. Mr. Pence communicated that we are about half-way to where we should be to maintain a functioning population of CSRB in captivity.

There was a discussion regarding what a third-party audit would look like and what exactly would be audited. Mr. Pence communicated that much of what the EAHCP does on an annual basis through a multitude of mechanisms.

There was a discussion regarding how climate change, and what information we may need to inform the committee, to adequately prepare for addressing it at the ITP renewal. Myron Hess stated that we should be cognizant not to wait too long to get adequate time to plan for the ITP renewal. Cindy Loeffler reminded the committee of the August Implementing Committee discussion regarding bringing in experts to present information regarding the Edwards Aquifer region and what climate change can affect the roll-over of the ITP. Mr. Pence suggested we wait until Strategic Adaptive Management changes has been made then take time to focus on this next issue.

Con Mims asked what the specific reason we would invest time and money into an uncertainty analysis. Mr. Pence communicated it would help inform the Aquifer Science team to know more about the system and improve the Hydrologic model. Mr. Mims commented that the HCP seems to be spending a lot of money and this could be a place to save funds. Roland Ruiz, EAA, communicated that he does not disagree with Mr. Mims but emphasized that recharge, for example, is a place where the EAA can improve their understanding. Myron Hess communicated that when moving into a new permit having increased confidence in the protection of springflow required in the HCP would make the planning effort much more acceptable to USFWS. This could eventually save money in the long-term by not doing more than necessary by being more precise in protection measures to meet specific springflow goals.

11. **Presentation of the 2017 Budget Work Group Report.**
Mr. Pence presented the information regarding the 2017 Budget Work Group Report. Full presentation can be found at eahcp.org. Mr. Hess communicated about the importance of keeping an eye on VISPO/ASR triggers and the impacts to the budget.

12. **Consider future meetings, dates, locations, and agendas.**
   - Next meeting will be held on December 14th at the Edwards Aquifer Authority.
     - ASR AMP
     - NAS Report 3 update
     - Hydrologic Modeling workshop update
     - Refugia update
     - Officer elections

13. **Questions from the public.**
    No Comment from the public.

    Steve Raabe communicated that the San Antonio River (Authority) received an international award due to cultural, natural and historical conservation that has been devoted to the San Antonio River and a formal announcement will be made on September 25, 2017.

14. **Adjourn – 2:07 pm**


Dianne Wassenich, Secretary
NOTICE OF OPEN MEETING
Available at eahcp.org

As required by Section 7.7.4 of the Funding and Management Agreement (FMA), an interlocal agreement made pursuant to Texas Government Code Chapter 791 by and among the Edwards Aquifer Authority (EAA), the City of New Braunfels (New Braunfels), the City of San Marcos (San Marcos), the City of San Antonio acting by and through its San Antonio Water System (SAWS), Texas State University, and the Guadalupe-Blanco River Authority (GBRA), a joint meeting of the Implementing Committee of the Edwards Aquifer Habitat Conservation Plan Program is scheduled for 1:00 pm on Thursday, September 21st, 2017 at the City of San Marcos Activity Center (Room 1), 501 E. Hopkins, San Marcos, TX, 78666. Lunch will be provided for committee members at 12:00 p.m.

Members of this committee include: Tom Taggart (San Marcos), Roland Ruiz (EAA), Greg Malatek (New Braunfels), Darren Thompson (SAWS), Andrew Sansom (Texas State University), and Todd Votteler (GBRA). At this meeting, the following business may be considered and recommended for committee action:

1. Call to order--Establish that all Committee members are present or represented- 1:00 pm.

2. Public Comment.

3. Approval of minutes from the August 17th Implementing Committee meeting (Attachment 1).

4. Receive report from the Program Manager on general topics related to the Habitat Conservation Plan.
   • Budget Report (Attachment 2)
   • ASR Operations by SAWS & Injection Rate Change
   • 2018 SH and IC meeting dates
   • ASR AMP Update

5. Discussion and possible approval of the proposal for Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine Adaptive Management (AMP) Proposal submitted to the Implementing Committee in the Stakeholder Committee Report (Attachment 3-5).
   Purpose: To discuss and possibly approve the Stakeholder Committee Recommendation.
   Action: To approve the Stakeholder Committee Recommendation for the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine AMP Proposal.

6. Future agenda items and topics of discussion.
   • Next meeting will be held on October 19th at the Guadalupe-Blanco River Authority Annex Building.
     o Approval to submit the necessary documentation to USFWS based on the AMP Proposal.

7. Questions from the public.

8. Adjourn.
IMPLEMENTING COMMITTEE MEETING MINUTES
SEPTEMBER 21, 2017

1. Call to order--Establish that all Committee members are present or represented- 2:15 pm.
Members of this committee present include: Tom Taggart (San Marcos), Roland Ruiz (EAA), Mark Enders on behalf of Greg Malatek (New Braunfels), Darren Thompson (SAWS), Kimberly Meitzen on behalf of Andrew Sansom (Texas State University), and Todd Voteler (GBRA).

2. Public Comment.
Darren Thompson asked if there was any public comment. There was none.

3. Approval of minutes from the August 17th Implementing Committee meeting.
Darren Thompson noted that on Item 5; the 4th paragraph "not" should be "no."
Tom Taggart made a motion to approve with the amendment; Roland Ruiz seconded the motion.
There were no objections.

4. Receive report from the Program Manager on general topics related to the Habitat Conservation Plan.
   • Budget Report – Nathan Pence presented the EAHC budget report for August 2017. There were no questions.
   • ASR Operations by SAWS & Injection Rate Change
     Darren Thompson provided the committee with the following update: 32,500 acre-feet have been noticed to SAWS this year. Of that amount, 22,000 acre-feet have been stored, bringing the total HCP water stored to 73,000 acre-feet to date. SAWS is currently injecting about 41 MGD, which will add the remaining approximately 11,000 acre-feet of HCP water. This will bring close to 84,000 acre-feet of HCP water stored by the end of the year; totaling 150,000 acre-feet of water in the SAWS ASR facility – close to the 200,000 acre-feet capacity.
   • 2018 Stakeholder and Implementing Committee meeting dates – Alicia Reinmund-Martinez presented the proposed meeting dates for next year. There were no questions.
   • ASR Adaptive Management Process (AMP) proposal update – Nathan Pence presented a brief update on the status of this Nonroutine AMP. There were no questions.

5. Discussion and possible approval of the proposal for Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine Adaptive Management (AMP) Proposal submitted to the Implementing Committee in the Stakeholder Committee Report.
   No presentation was necessary.
   Tom Taggart made a motion to approve the Stakeholder Committee recommendation for the Sediment Removal and Impervious Cover/Water Quality Protection Nonroutine AMP Proposal. Roland Ruiz seconded the motion.
   There were no objections.
6. **Future agenda items and topics of discussion.**
   - Next meeting will be held on October 19th at the Guadalupe-Blanco River Authority Annex Building.
     - Approval to submit the necessary documentation to USFWS based on the AMP Proposal.
     - 2018 EAHCP Funding Applications

7. **Questions from the public.**
   No comment.

8. **Adjourn – 2:25pm**

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