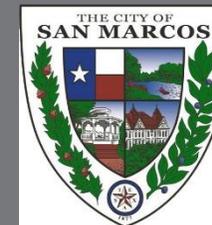




National Academy of Sciences First Report Review





EAHCP



- The purpose the Edwards Aquifer HCP was to obtain an Incidental Take Permit for endangered species at San Marcos and Comal Springs
- Our ITP allows the HCP Permittees to conduct lawful Covered Activities that cause Take, under the condition that mitigation is performed.
- The mitigation requires substantial dedication of resources:
 - \$\$\$
 - Staff Time
 - Withdrawal Reductions



The EARIP Steering Committee and EAHCP Implementing Committee committed to review of the EAHCP by the National Academy Sciences for two main purposes:

1. To improve the HCP and implementation methods therein
2. To validate the plan and resources being dedicated

NAS Contract



- Effective September 11, 2013; or upon execution by NAS
- Terminates on December 31, 2018
- NAS will select and form the National Research Council (NRC) Committee
- Deliverable - 3 independent scientific reports evaluating and reviewing select EAHCP programs will be published
- Not to exceed \$1,429,500

NAS Reports

The NAS Reports (deliverables) were sequenced in a manner to compliment the Adaptive Management Process, as the EAHCP transitions from Phase I to Phase II.

Report 1

1. Ecological Modeling
2. Hydrological Modeling
3. Biological and Water Quality Monitoring Programs
4. Applied Research



Report 2

1. Review of ongoing progress
2. Development of biological questions to be answered by developed models

Report 3

1. Do the conservation measures meet the biological objectives
2. Do the biological objectives meet the biological goals

Conservation Measures
(habitat restoration &
springflow protection)

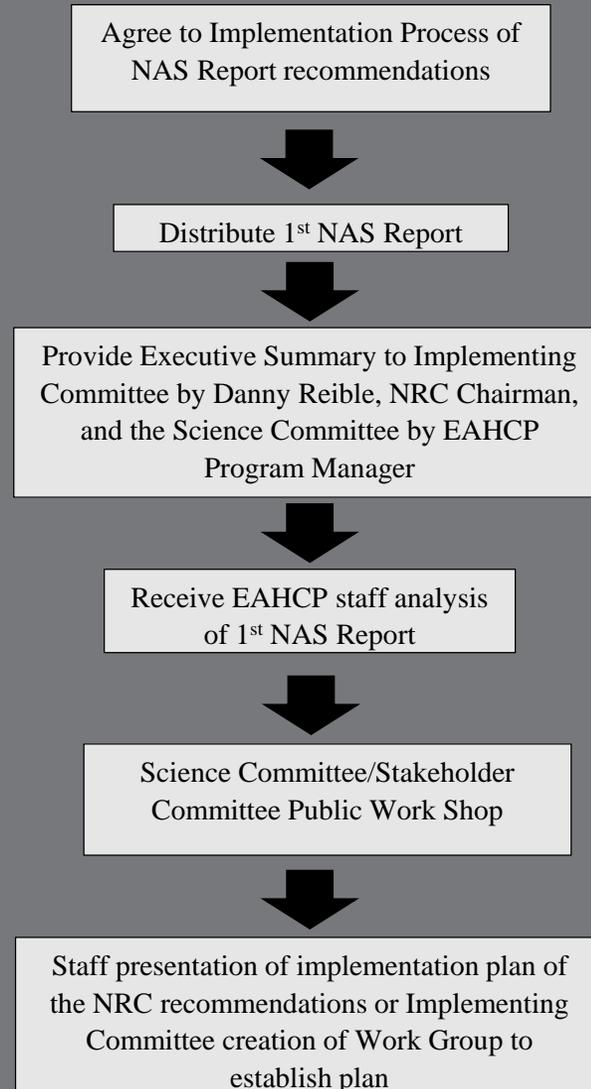


Biological Objectives
(flow rates, habitat
condition & WQ)



Biological Goals
(available habitat & species
population)

NAS Implementation Process adopted by the IC (1/15/2015)



Process and Timeline for Implementation



- January 15th: Implementing Committee (proposed implementation process)
- February 28th: Receive Report (distribute report)
- March 19th: Implementing Committee (Danny Reible presentation)
- **April 7th: Science Committee (Program Manager presentation)**
- April 16th: Implementing Committee (presentation of NAS report analysis)
- April 22nd: Science Committee/Stakeholder Committee Public Workshop
- May 21st: Implementing Committee (approve implementation plan)

Stakeholder & Science Committee Workshop



Purpose: to document comments/input relevant to the NAS Report from the Stakeholder Committee, Science Committee and Public. Input will be used by the Implementing Committee when deciding which NAS recommendations to implement and how best implement them.

Date: April 22, 2015

Location: SAWS Customer Service Building

Workshop Format *(for each Chapter/Topic):*

1. Information Presentation
2. Small Group Discussions
3. Formal Committee Comment
4. Written Comment
5. Public Comment



Charge (to be considered/approved at the 4/16/2015 IC meeting):

The specific charge of the RRWG is to review the staff drafted *Report 1 Implementation Plan*, modify it as necessary, and if appropriate recommend the Plan to the Implementing Committee for adoption and implementation.

Membership (approved at the 3/19/2015 IC meeting):

1. Cindy Loeffler
2. Juan Guerra
3. Darren Thompson
4. Mark Hamilton
5. Roger Biggers



- Received in late March 2015
- Included:
 - Chapter 1 – Executive Summary
 - Chapter 2 – Hydrologic Model
 - Chapter 3 – Ecological Model
 - Chapter 4 – Monitoring
 - Chapter 5 – Applied Research
 - Chapter 6 – Overarching Issues



Uncertainty analysis:

1. Not all uncertainties considered, just largest sources
2. Sensitivity analysis to elucidate parameter uncertainties
3. Validation of the MODFLOW model, including new validation metrics
4. PEST predictive uncertainty analysis
5. Ensemble method for understanding conceptual model uncertainty

Conclusions Hydrologic Modeling



- Gain efficiency by moving toward a single model (MODFLOW-USG)
- Model uncertainty needs to be quantitatively assessed and documented
- Validation of the groundwater model particularly important
- A shorter time step would better align with the HCP goals and ecological models
- Modeling conduits becomes more important as the time step is reduced

Ecological Modeling Conclusions (Chapter 3)



- Develop a conceptual model(s) showing how species, water quality and quantity, and M&M measures interact
- Clarify SAV modeling goal
- Update Habitat Suitability Analysis for TWR to consider additional factors
- FD model is sound but complex and uncertain
- Need much better understanding of CSRБ life history if it is to be an indicator organism

Monitoring Conclusions (Chapter 4)



- Monitoring programs well designed, comprehensive, likely to be effective in providing information for HCP
- Monitoring of index reaches (representative reach) needs to continue to assess trends and build on existing databases
- No clear mechanism to scale results to entire spring or reach system: special studies/randomized sampling
- Integrate biomonitoring & WQ monitoring programs
- Enhanced sampling for nutrients; lower detection limits for P, NO₃/NO₂, and TN to 2, 10, and 50 ug/l
- New quantitative methods needed for CSRB to improve upon the cotton lure approach



Applied Research Program Conclusions (Chapter 5)



- More transparent process for prioritizing and funding projects that includes stakeholder involvement and peer review
- Program would benefit from greater competition and collaboration with outside scientific experts through open and widely disseminated solicitations for research
- Offer some longer-term (2 to 5 year) projects
- Results should be provided in a form that ensures transparency and accessibility to other researchers and to the EAA

Overarching Issues (Chapter 6)



1. More formal integration of the many data sets emanating from the monitoring, modeling, and research efforts
2. Monitor performance of the mitigation and minimization measures
3. Undertake more formal and rigorous statistical analyses of its laboratory and field data
4. Think now about possible worst case scenarios and their potential implications for HCP:
 - Increased GW pumping from exempt/unregulated wells
 - Drought conditions exceed the drought of record
 - Climate changes faster than expected
 - Mismatch between conservation triggers and hydrologic changes
 - High court affirmation of Bragg
 - Subjugation to Aransas NWR issues

Conclusions



NAS Report:

“NAS finds that overall, the EAA and the other Permittees are doing an excellent job in implementing many aspects of a complex habitat conservation plan, and that addressing several overarching scientific and modeling issues would further strengthen the plan.”

Danny Reible, NAS Committee Chair:

The recommendations in the report should not be viewed as critiques of work already performed, but rather advise and suggestions to strengthen the program as we move into the future.



Conclusions

VALIDATION!