Guadalupe-Blanco River Authority

Guadalupe River
Habitat Conservation Plan

Second Public Stakeholder Meeting

December 12, 2022

NATHAN PENCE
EXECUTIVE MANAGER OF ENVIRONMENTAL SCIENCE
Introductions: GBRA Staff and Consultants

- Nathan Pence
  Executive Manager of Environmental Science
  npence@gbra.org

- Chad Norris
  Deputy Executive Manager of Environmental Science
  cnorris@gbra.org

- Jana Gray
  HCP Coordinator
  jgray@gbra.org
Meeting Agenda

• Meeting Purpose / Overview of Agenda
• Fundamentals of Habitat Conservation Plans
• Follow-up from the First Stakeholder Meeting
• Update from the Technical Advisory Group
• GRHCP Covered Activities
• GRHCP Hydrologic Modeling Approach
  • Surface Water Quantity Modeling
  • Water Quality Modeling
• Input Session Explained
• GRHCP Website
• Next Stakeholder Meeting
Fundamentals of Habitat Conservation Plans

The Endangered Species Act prohibits take of listed species

- **Take**: action of or attempt to hunt, *harm*, harass, pursue, shoot, wound, capture, kill, trap, or collect a species
- **Harm**: any act that kills or injures species, including significant habitat modification or degradation
Fundamentals of Habitat Conservation Plans

• **Purpose of a Habitat Conservation Plan**
  - Allow GBRA to legally proceed with an activity that would otherwise result in the unlawful take of a listed species

• **What is it?**
  - A plan to mitigate for GBRA’s potential impacts to federally protected endangered species

• **What it is not?**
  - Not a re-do of the Environmental Flows planning process.
  - Not a general conservation planning process
  - Will not cover all GBRA’s conservation efforts
Follow-up from First Stakeholder Meeting

Revised GRHCP Plan Area
Follow-up from First Stakeholder Meeting

Species considered but not covered:
- American Eel
- Guadalupe Bass
- Sea Turtle
- Cagle’s Map Turtle
- Jaguarundi

On the Website:
- References and literature used in development of the GRHCP
- Provide links to other HCPs with 30 or 50 - year permit terms
- Recording of the meeting can be found at:
  https://www.gbra.org/environmental/habitat-conservation-plan/
Update from the Technical Advisory Group

Members:

Dan Opdyke
Chair of Committee
Anchor QEA
Water quality and hydromodeling

Cindy Loeffler
Retired TPWD
Texas Water Policy and HCPs

Webster Mangham
Trinity River Authority
Mussel Policy and River Authority operations

Ryan Smith
Texas Nature Conservancy
Texas water and ecosystems
Technical Advisory Group Activities

- TAG may review any and all draft technical memos and HCP chapters, but will focus on technical issues
- First formal meeting was held October 3, 2022
- Comments have been provided on the following memos
  - Project goals
  - Permit term
  - Covered species
  - Covered activities
  - Existing information on species
  - Hydrologic modeling needs
- Additional memos will be reviewed in the coming months
- Changes in response to TAG comments will be reflected in HCP chapters
<table>
<thead>
<tr>
<th>Location</th>
<th>Timing</th>
<th>Impact</th>
<th>Control</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the plan area</td>
<td>Within the permit term</td>
<td>Reasonable likelihood of resulting in take of ≥ 1 covered species</td>
<td>Is/could be, under direct control of GBRA (COI)</td>
<td>Sufficient information available to evaluate impact</td>
</tr>
</tbody>
</table>
## GRHCP Covered Activity Types – Preliminary List

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Supply Impoundment, Production, Diversion &amp; Delivery</strong></td>
<td>Use of water rights to divert, treat, and transport water to supply municipal, industrial, agricultural, and other water needs from GBRA-owned and/or operated facilities.</td>
</tr>
<tr>
<td><strong>Wastewater Treatment/Discharges</strong></td>
<td>Collection and treatment of wastewater and discharge of treated effluent from GBRA-owned and/or operated facilities.</td>
</tr>
<tr>
<td><strong>O&amp;M of Dam Facilities (and failed structures)</strong></td>
<td>In-stream dams and associated power-generation plants and other infrastructure from GBRA-owned and/or operated facilities.</td>
</tr>
<tr>
<td>GRHCP Covered Activity Types – Preliminary List</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Other In-stream Infrastructure</strong></td>
<td></td>
</tr>
<tr>
<td>Various localized infrastructure in the Guadalupe River or major tributaries owned and/or operated by GBRA.</td>
<td></td>
</tr>
<tr>
<td><strong>Water Management Activities</strong></td>
<td></td>
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<tr>
<td>Various activities related to managing water in the Guadalupe River or major tributaries from GBRA-owned and/or operated facilities</td>
<td></td>
</tr>
<tr>
<td><strong>Distribution and Utility Lines</strong></td>
<td></td>
</tr>
<tr>
<td>Underground and overhead pipelines and cables to transport water, wastewater, electricity, and other services from GBRA-owned and/or operated facilities.</td>
<td></td>
</tr>
</tbody>
</table>
## GRHCP Covered Activity Types – Preliminary List

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks/Recreation Facilities</td>
<td>O&amp;M of various parks and park facilities owned and/or operated by GBRA</td>
</tr>
<tr>
<td>Permitting</td>
<td>Issuance of GBRA permits for waterfront construction</td>
</tr>
<tr>
<td>Administration &amp; Maintenance of Buildings</td>
<td>Construction and O&amp;M of various administration and maintenance buildings/facilities owned and/or operated by GBRA.</td>
</tr>
<tr>
<td>GRHCP Implementation &amp; Other Conservation Activities</td>
<td>Habitat restoration, research/sampling/monitoring efforts, and other conservation measures with the primary purpose of mitigating impacts to species by covered activities</td>
</tr>
</tbody>
</table>
Why Model?

- Inform decision making for GRHCP
- Assess Impacts from Activities – Water Quantity and Quality
- Quantify take estimates for GBRA and 2nd party stakeholders
- Evaluate resiliency of conservation measures

\[ Q_{x,t} \] is flow estimate at time (t) and location (x)

\[ WQ_{x,t} \] is the value of the water quality parameter (i) at time (t) and location (x)
GRHCP Hydrologic Modeling Approach
Surface Water Quantity

General Approach:

- Use Water Availability Model (WAM) for the Guadalupe - San Antonio (GSA) River Basin
- Provide monthly (daily) regulated streamflow estimates at specific locations throughout the entire basin
- Simulate all existing surface water rights and major reservoir operations in the basin
- Simulate assumed hydrologic and water management conditions

\[ Q_{x,t} \] is flow estimate at time \( t \) and location \( x \)
Selected Streamflow Locations* for Model Output

1. Guadalupe River at Comfort
2. Guadalupe River at H5 Dam
3. San Marcos River at Luling
4. Plum Creek near Luling
5. Guadalupe River at Gonzales
6. Guadalupe River at Victoria
7. Guadalupe River near Tivoli

* USGS Gage Station
## GRHCP Hydrologic Modeling Approach

<table>
<thead>
<tr>
<th>Water Quantity Assumptions</th>
<th>Current (2020)</th>
<th>Future (2070)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRHCP</strong></td>
<td>Average of 2010-2020 reported surface water use</td>
<td>• Firm Yield of Canyon Lake under 2070 conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Full authorized consumptive use under all other GBRA water rights</td>
</tr>
<tr>
<td><strong>Non-GRHCP</strong></td>
<td>Average of 2010-2020 reported surface water use for all use types</td>
<td>• Municipal - using population/water use projections from 2022 State Water Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Industrial - No change from current use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Irrigation - No change from current use</td>
</tr>
<tr>
<td><strong>Return Flows</strong></td>
<td>Average of 2010-2020 reported surface water use</td>
<td>• Estimate using population projections from 2022 State Water Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Conservation assumption – 25% reduction from current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reuse assumption – 50% reduction of increased amount</td>
</tr>
</tbody>
</table>
## GRHCP Hydrologic Modeling Scenarios – Surface Water Quantity

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Purpose</th>
<th>Flow and Related Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Scenarios</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Determining Baseline</td>
<td>Current water management in the basin without GBRA + second parties covered activities</td>
</tr>
<tr>
<td>Covered Activities</td>
<td>Impact Analysis</td>
<td>Current water management in the basin with future GBRA + second parties covered activities.</td>
</tr>
<tr>
<td><strong>Subsequent Scenarios</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate Change</td>
<td>Evaluate resiliency of future</td>
<td>Use future evaporation, precipitation, and streamflow projections</td>
</tr>
<tr>
<td></td>
<td>mitigation efforts</td>
<td></td>
</tr>
<tr>
<td>Conservation Strategy (up to</td>
<td>Assess extent to which</td>
<td>Proposed future operational flows, conservation flows, and restoration</td>
</tr>
<tr>
<td>two scenarios)</td>
<td>conservation measures mitigate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>take</td>
<td></td>
</tr>
<tr>
<td>Supplemental (if needed)</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>
GRHCP Hydrologic Modeling Approach Overview

\[ Q_{x,t} \] is flow estimate at time \( t \) and location \( x \)

\[ WQ_{x,t}^i \] is the value of the water quality parameter \( i \) at time \( t \) and location \( x \)
GRHCP Hydrologic Modeling Approach

Water Quality

General Approach

• Water quality modeling will be used to assess how the predicted flows (streamflows and wastewater treatment plant return flows) can impact water quality in the basin.

• TCEQ’s standard model (QUAL-TX) will be used as the water quality modeling platform.

• QUAL-TX Models are used in permitting for TPDES outfalls and are used for determining effluent limits to protect dissolved oxygen standards in receiving stream.
GRHCP Hydrologic Modeling Approach

Water Quality

Key water quality constituents considered will be Dissolved Oxygen, Temperature, and Ammonia.

Assumptions

• Monthly flow estimates from WAM will be discretized into daily flows to calculate the 7Q2 critical flow.

• Each GBRA discharge in the future scenarios will have the same permit limits as they have today – excluding discharge volume.
GRHCP Hydrologic Modeling Approach

Water Quality

Five Water Quality Modeling Focus Areas

1. Canyon Lake/Upper Cibolo Creek Area
2. Sunfield/Buda Area
3. Plum Creek Area
4. Seguin/Gonzales Area
5. Coastal Estuary Area
GRHCP Hydrologic Modeling Approach Overview

\[ Q_{x,t} \] is flow estimate at time (t) and location (x)

\[ WQ_{x,t}^i \] is the value of the water quality parameter (i) at time (t) and location (x)
Why are we holding these input sessions?

• Give stakeholders an opportunity to provide input
• Add to our base of information
• Anticipate issues and refine our work
• Inform how information is communicated in final document
Input Session Explained

**Logistics**
- Break into four groups:
  - Go to easel pad with color indicated on your agenda
  - Each group will be facilitated by a Project Team member or GBRA staff
  - Experts will circulate among the groups
- Virtual participants will provide input on the virtual platform

**Discussion leaders will facilitate input on the following:**
- Comments on or concerns, or anything missed about the approach used for:
  - Covered Activities
  - Surface Water Quantity
  - Water Quality Modeling
Information available on GRHCP website:

- Upcoming and past meetings and events
- Proposed Covered Species
- Documents
  - Technical Memoranda that have completed the review process
  - TAG overview and review process
- Maps
- Frequently Asked Questions
  - References cited in Technical Memoranda
Next Public Stakeholder Meeting

Spring 2023

Topics of Discussion:
• Climate Change
• Species Impact Analysis