



Biological Goals Subcommittee

Report

2023

Report

To:	EAHCP Implementing, Stakeholder and Science Committees Permit Renewal Contractor - ICF
From:	EAHCP Biological Goals Subcommittee
Date:	March 16, 2023
Re:	EAHCP Biological Goals Subcommittee Report - 2023

1. Introduction

The Edwards Aquifer Habitat Conservation Plan (EAHCP) is currently in the process of renewing the Incidental Take Permit with the U.S. Fish and Wildlife Service. As part of that process, the existing components of the Habitat Conservation Plan (HCP) conservation strategy will be reassessed, new elements recommended, and modifications discussed. As a required component of habitat conservation plans, biological goals are a guide for quantified biological objectives and management actions taken through conservation measures to achieve the conservation strategy.

The joint 2016 U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service “Habitat Conservation Planning and Incidental Take Permit Processing Handbook” (HCP Handbook) defines biological goals as broad, succinct statements that work toward the vision of an HCP. Each goal can be habitat- and/or species-based. Biological goals are addressed by quantified biological objectives that are written to achieve the corresponding goal. This hierarchical process is described in Chapter 9 of the HCP Handbook which served as a reference in the development of the EAHCP biological goals.

The Plan Area (also the Permit Area) is the area in which pumping from the Aquifer is regulated by the EAA and affects the springs and spring ecosystems used by the proposed Covered Species. The Permit Area also includes recreational and other areas in which non-pumping related impacts to Covered Species will occur including the Comal Springs and River ecosystems and San Marcos Springs and River ecosystems that are under the jurisdiction of the City of New Braunfels, the City of San Marcos, and Texas State University.

2. Biological Goals Subcommittee Overview

The purpose of the Subcommittee was to review, discuss, and develop recommendations for biological goal(s) that should be considered for inclusion in the next EAHCP. The Subcommittee charge was approved by the EAHCP Stakeholder Committee on December 15, 2022 (**Appendix A**).

Throughout February and March 2023, four meetings were conducted in-person and virtually via Microsoft Teams. Meeting materials including meeting handouts, meeting agendas, presentations, and approved meeting minutes are in **Appendix B, C, D, and E**, respectively.

Members of the Biological Goals Subcommittee are:

- Mark Enders (Subcommittee Chair) – Stakeholder Committee (City of San Marcos)
- Rachel Sanborn – Stakeholder Committee (San Marcos River Foundation)
- Kimberly Meitzen – Stakeholder Committee (Texas State University)
- Kevin Mayes – Stakeholder Committee (Texas Parks and Wildlife Department)
- Charlie Kreidler – Science Committee (LBG-Guyton - Retired)
- Jacquelyn Duke – Science Committee (Baylor University)

3. Biological Goals Subcommittee Meetings

The Subcommittee convened four times to discuss the following:

- Current EAHCP biological goals.
- HCP Handbook guidance pertaining to biological goal development and structure (Chapter 9).
- Development of biological goals.
- Approval of the Biological Goals Subcommittee Report.

On February 16, 2023, the Subcommittee agreed, by consensus, to develop biological goals by reviewing the current biological goals to create new biological goals for the next EAHCP.

At this time, the San Marcos gambusia, endemic to the San Marcos River, is not considered in development of the biological goals due to its pending delisting from the Endangered Species Act (ESA). Moreover, in 2021, USFWS proposed a rule that San Marcos gambusia may be extinct (Federal Register; 86 FR 54298). The Comal Springs salamander was also not considered due to the recent removal of the petition for the species to be listed and covered by the ESA. The following are the Covered Species that were considered during the development of the biological goals:

- Texas blind salamander (*Eurycea rathbuni*)
- San Marcos salamander (*Eurycea nana*)
- Texas wild-rice (*Zizania texana*)
- Fountain darter (*Etheostoma fonticola*)
- Comal Springs riffle beetle (*Heterelmis comalensis*)
- Peck's cave amphipod (*Stygobromus pecki*)
- Comal Springs dryopid beetle (*Stygoparnus comalensis*)
- Texas troglobitic water slater (*Lirceolus smithii*)
- Edwards Aquifer diving beetle (*Haideoporus texanus*)

4. Biological Goals Recommendations

The following are the biological goals that the Biological Goals Subcommittee recommends the EAHCP Committees (Stakeholder, Implementing, and Science), Subcommittees (Biological Objectives and Conservation Measures), and Permit Renewal Contractor (ICF) consider for inclusion in the next EAHCP. Bolded key terms within the biological goals are described in the glossary.

A central tenet of these goals is that they are habitat-and species-based. Biological Objectives can and should consider both.

Goal 1: Conserve the quality and quantity of springflow and maintain **suitable** ecosystems within the **Plan Area** to provide for the **resiliency** of the **Covered Species**.

Reasoning: This goal is intended to serve as a broad, overarching goal that addresses water quality and quantity, springflow, and suitable ecosystems (aquatic, riparian, and watershed) not specific to any Covered Species; but rather, all the EAHCP Covered Species collectively in the Plan Area.

Biological Objectives: may include, but are not limited to, springflow, water quality and quantity, research, and overall ecosystem health.

Goal 2: Promote community engagement and awareness of the EAHCP, support land and water conservation, and mitigate **anthropogenic stressors** and **natural disturbances** within the **Plan Area** that will benefit the **Covered Species**.

Reasoning: This goal is intended to address societal interactions with the EAHCP, direct and indirect anthropogenic stressors (non-native species, recreational activities, pollution, climate change and regional population growth) and natural disturbances (e.g., droughts, floods, disease, and parasites) in the Plan Area.

Biological Objectives: may include, but are not limited to, community outreach on species and habitat sensitivity, mitigation/recovery from disturbances and stressors including maintaining refugia populations to address unpredicted events and impacts, and land and water conservation in the Plan Area.

Goal 3: Conserve habitats, diverse native **submerged aquatic vegetation** assemblages, and **resilient** fountain darter populations in the Comal and San Marcos spring and river systems.

Reasoning: This goal is specific to supporting habitat and resilient fountain darter populations in both the San Marcos and Comal spring systems. Additionally, this goal promotes native submerged aquatic vegetation diversity to prevent a monoculture of any single vegetation species.

Biological Objectives: may include, but are not limited to, recreation management, native submerged aquatic vegetation restoration, springflow, and water quantity and quality, and all known biotic and abiotic species needs.

Goal 4: Conserve and manage **resilient** Texas wild-rice populations in the San Marcos spring and river system.

Reasoning: This goal is specific to maintaining resilient Texas-wild rice populations. Management includes, but is not limited to, enhancement and restoration of Texas wild-rice.

Biological Objectives: may include, but are not limited to, genetically diverse Texas wild-rice (wild, captive, and repatriated), recreation management,

springflow, water quality and quantity, and all known biotic and abiotic species needs.

Goal 5: Conserve habitats to support **resilient** populations of Texas blind salamander, Comal Springs dryopid beetle, Peck’s cave amphipod, Edwards Aquifer diving beetle, and Texas troglobitic water slater in the **Plan Area**.

Reasoning: This goal is intended to ensure suitable habitat for the aquifer-dwelling Texas blind salamander, Comal Springs dryopid beetle, Peck’s cave amphipod, Edwards Aquifer diving beetle, and Texas troglobitic water slater populations.

Biological Objectives: may include, but are not limited to, aquifer levels, springflow, water quality and quantity , and all known biotic and abiotic species needs.

Goal 6: Conserve habitats to support **resilient** Comal Springs riffle beetle populations in the **Plan Area**.

Reasoning: This goal is specific to maintaining resilient Comal Springs riffle beetle populations.

Biological Objectives: may include, but are not limited to, aquifer levels, springflow, recreation management, water quality and quantity , and all known biotic and abiotic Comal Springs riffle beetle species needs.

Goal 7: Conserve San Marcos spring and river **habitats** and **resilient** San Marcos salamander populations in the **Plan Area**.

Reasoning: This goal is intended to ensure suitable habitat and support resilient San Marcos salamander populations.

Biological Objectives: may include, but are not limited to, springflow, water quality and quantity, riverine habitats, recreation management, and all known biotic and abiotic San Marcos salamander species needs.

5. Glossary of Key Terms

- **Anthropogenic stressors:** Pressures or dynamics that impact ecosystem components or processes caused by human-associated activities, including, but not limited to, non-native species, biological pathogens (disease and parasites), recreation, pollution, climate change and population growth.
- **Conserve:** The preservation, protection, restoration, and enhancement of the Covered Species and their habitats.
- **Covered Species:** Species for which incidental take is authorized in an incidental take permit and is adequately covered in a habitat conservation plan. (HCP Handbook)

- **Habitat:** The location where a particular taxon of plant or animal lives and its surroundings, both biotic and abiotic. The term includes the presence of a group of particular natural conditions surrounding an organism including air, water, soil, mineral elements, moisture, temperature, and topography. (Modified from the HCP Handbook)
- **Natural disturbances:** This term includes, but is not limited to, flood and drought events, and biological pathogens (disease and parasites).

Plan Area: The specific geographic area where Covered Activities described in the HCP, including mitigation, may occur. (HCP Handbook)

- **Resilient/Resiliency:** Includes, but is not limited to, maintaining genetic diversity, redundancy via refugia as available, and other population characteristics that support withstanding and recovery from disturbance (natural and anthropogenic). Moreover, resiliency includes the adaptive capacity of self-sustaining viable populations. Viable, meaning, the ability of a species to persist over the long term, and conversely, to avoid extinction over some time period. (Modified from the HCP Handbook)
- **Submerged aquatic vegetation (SAV):** Assemblages that have been recognized as native habitat that support viable fountain darter populations.
- **Suitable:** Right or appropriate for a particular species, purpose, or situation.

6. References

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 2016. Habitat Conservation Planning and Incidental Take Permit Processing Handbook. 361 pp + apps. https://www.fws.gov/endangered/what-we-do/hcp_handbook-chapters.html. (HCP Handbook)

APPENDIX A

Biological Goals Subcommittee Charge



Biological Goals Subcommittee Charge

The Edwards Aquifer Habitat Conservation Plan (EAHCP) is currently in the process of renewing the Incidental Take Permit with the U.S. Fish and Wildlife Service. As part of that process, the existing components of the Habitat Conservation Plan (HCP) conservation strategy will be reassessed, new elements recommended, and modifications discussed. As a required component of habitat conservation plans, biological goals are a guide for quantified biological objectives and management actions taken through conservation measures to achieve the conservation strategy.

The purpose of this Subcommittee is to review, discuss and develop recommendations for the biological goal(s) that should be considered for inclusion in the next EAHCP.

Specifically, the Subcommittee will:

- Review the current EAHCP biological goals and the HCP Handbook as it pertains to biological goals development and structure.
- Develop initial recommendations for deletions, additions, or other changes to current biological goals.
- Finalize biological goal recommendations to be considered in the next EAHCP.
- Approve a report setting out the biological goal recommendations to be provided to the EAHCP Permit Renewal contractor.

Members:

- **Chair:** Mark Enders (Stakeholder Committee)
- Rachel Sanborn (Stakeholder Committee)
- Kimberly Meitzen (Stakeholder Committee)
- Kevin Mayes (Stakeholder Committee)
- Jacquelyn Duke (Science Committee)
- Charlie Kreitler (Science Committee)

Subcommittee Organization:

Pursuant to Subsection 8.1 of the Stakeholder Committee's operational rules, the Biological Goals Subcommittee is authorized to meet entirely through virtual means, or any combination of virtual and in-person meetings, and to finalize previously discussed drafts through email communications. Because of the short duration, Subcommittee members are not required to appoint alternates. The Subcommittee shall strive to achieve consensus on its recommendations, but, if, in the opinion of the Chair, consensus cannot be achieved by the deadline, the recommendations and report may be approved by a majority vote of the full Subcommittee as long as any member dissenting from approval is provided a reasonable opportunity to provide a succinct summary of the objections to the recommendations, which shall be included in the report.

A Subcommittee report setting out the recommendations for biological goals should be completed by March 31, 2023 and provided to the EAHCP Permit Renewal contractor by that date, with copies to the Stakeholder Committee, the Implementing Committee, the Science Committee, and the Biological Objectives Work Group.

APPENDIX B
Meeting Handouts

**HABITAT CONSERVATION PLANNING
AND
INCIDENTAL TAKE PERMIT PROCESSING
HANDBOOK**



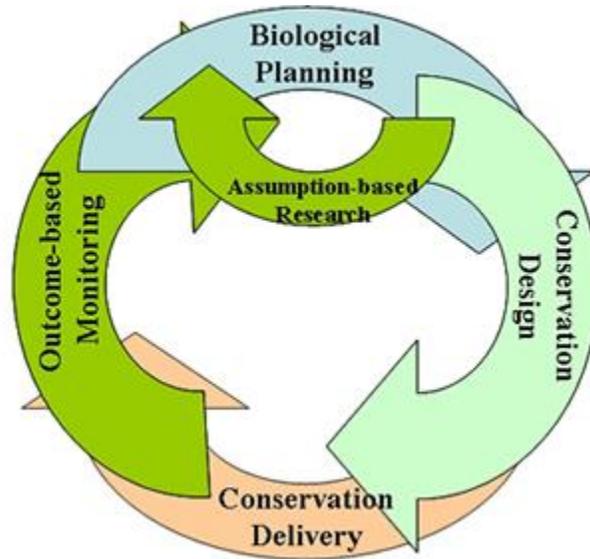
December 21, 2016

U.S. Department of the Interior
Fish and Wildlife Service

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

1. having an integrated framework to develop biological goals and objectives,
2. developing a monitoring framework to measure results,
3. developing an evaluation process to assess results, and
4. outlining a systematic learning process to use what will be learned to improve future decisions.

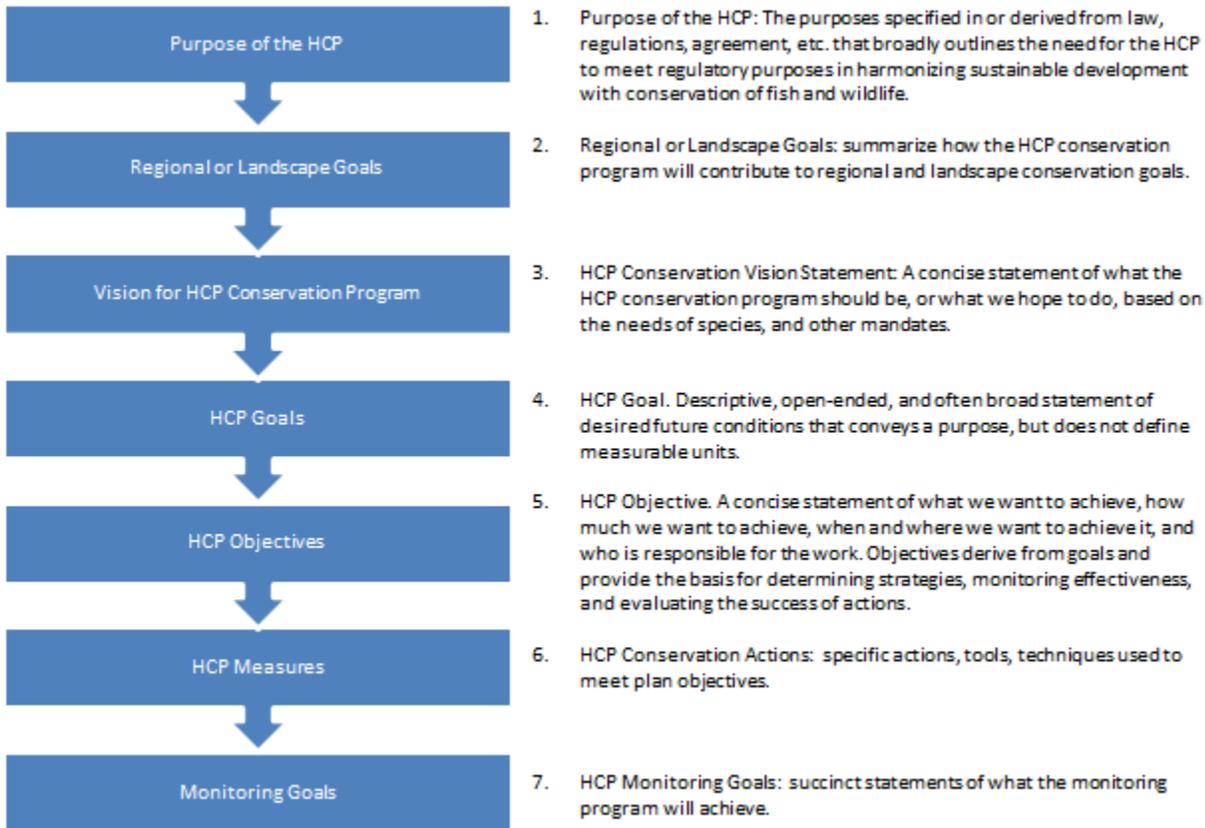
Figure 9.0a: Strategic Habitat Conservation



9.1 HCP Biological Goals

HCPs are but one conservation tool implementing conservation across different geographies at different sizes and scales. Development of the conservation strategy, including its goals, should be framed within this broader wildlife conservation context. HCP goals are built on the foundation of broader conservation efforts occurring at larger scales. Building upon the existing hierarchy of goals and purposes will improve conservation of species by allowing even modest implementation efforts to contribute to something bigger. See figure 9.1e.

Figure 9.1e: Hierarchy of Goals and Purposes



By framing HCP goals within the context of larger conservation efforts it should become clear how the HCP may:

- affect recovery of species,
- further progress on large scale planning efforts like Landscape Conservation Cooperatives (LCCs) and State Wildlife Action Plans,
- help build more resilience and adaptive capacity for species to withstand future climatic change,
- help protect large scale migration or movement corridors.

Helpful Hint: Consistent with agency policies and the use of the best available science, we integrate adaptation strategies for climate change effects into our planning, programs, and operations. As goals and objectives are developed we must ask if they are still attainable given the projected down-scaled effects of climate change in the HCP plan area. For example, the *Climate-Smart Conservation* guide calls for developing an initial set of goals through the lens of assessing climate impacts and vulnerability, and reviewing/revising conservation goals as needed. (See also section 9.3.2, below.)

Biological goals broadly describe the desired future conditions of an HCP in succinct statements. Each goal steps down to one or more objectives that define how to achieve these conditions in measurable terms. A well-written goal directs work toward achieving the vision and purpose of an HCP.

It takes careful thought to develop productive and meaningful goals, and it is a critical step. In a few concise statements, goals comprise the HCP's effort in pursuit of its vision and lay the foundation from which all conservation activities arise. Management activities result from goals, and not the other way around. Goals must be developed *before* developing objectives and conservation measures to orient management direction, both during plan development and throughout implementation.

Ideally, the applicant should develop HCP goals and objectives in close coordination with the Services as they are the foundation upon which the HCP is built. An excellent resource on developing goals and objectives is the FWS's document: "Writing Refuge Management Goals and Objectives: A Handbook" (see the [HCP Handbook Toolbox](#)).

Goals and objectives guide management actions taken for an HCP to meet its conservation vision. Well-developed goals and objectives are key in focusing actions to efficiently and effectively manage the landscape to achieve the desired condition and to ultimately conserve species.

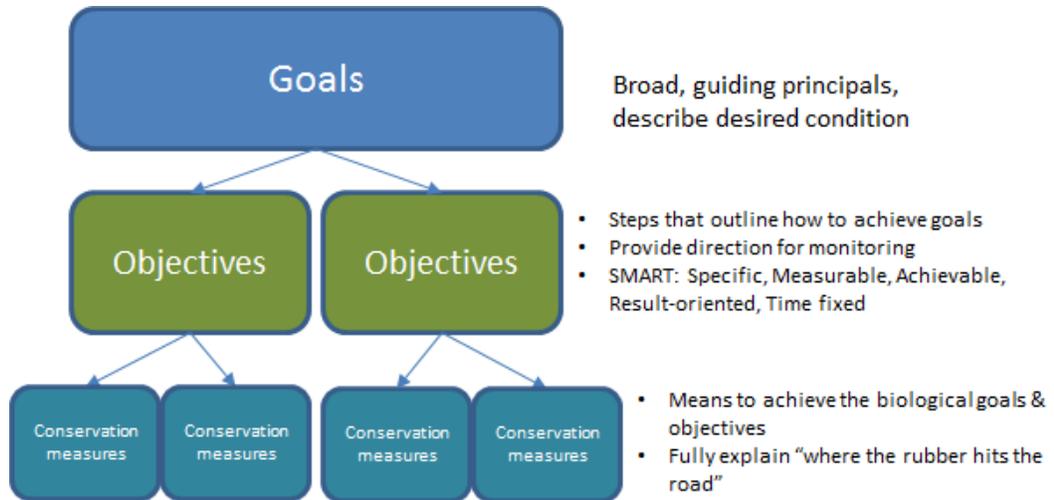
The first consideration when developing biological goals and objectives for an HCP is the scale of the plan. A biological goal for a small HCP (e.g., a single family residence) may be obvious (a well-known recovery plan objective) and simple – contributing to conservation. For example, a goal may be to contribute to the conservation of the covered species by either leaving and protecting (with a conservation easement in perpetuity) 8 acres of a 10-acre property in its natural state for the species or by purchasing the appropriate number of credits from a conservation bank before clearing and construction begins (objectives). Goals and objectives for a bigger HCP will likely require more consideration.

When developing biological goals and objectives, use existing conservation information to guide them, like: species recovery plans or outlines, 5 year status reviews, spotlight species actions plans, State Wildlife Action Plans, species status assessments, candidate conservation plans, and any other existing documents with conservation strategies for the covered species that are the best scientific information available. These plans often evaluate species' status and make recommendations about what it will take to get the population to a desired condition. To develop the most effective goals and objectives, relevant expertise (e.g., species experts, listing/recovery team members, climate change specialists, and State wildlife agencies) should be sought and included in their development.

The development of vision statements, goals, and objectives is iterative, and they may need to change during the HCP development process as the plan changes or as new information becomes available. However, it is critical that you initiate the process at the beginning and preserve the hierarchical nature of the relationship. It is important not to choose measures without objectives, develop objectives without goals, or establish goals without first articulating a vision for the HCP's conservation program. Building from the hierarchy of purpose and goals will allow you to

identify existing and future efforts that may need to be refocused or eliminated. Figure 9.1a shows the relationship between goals, objectives, and measures.

Figure 9.1a: Biological Goals and Objectives



9.1.1 Developing Useful Goals and Objectives

The applicant and the Services should collaborate to develop goals. These goals serve as the foundation of the conservation strategy and should be used to guide how the rest of the plan is developed and implemented.

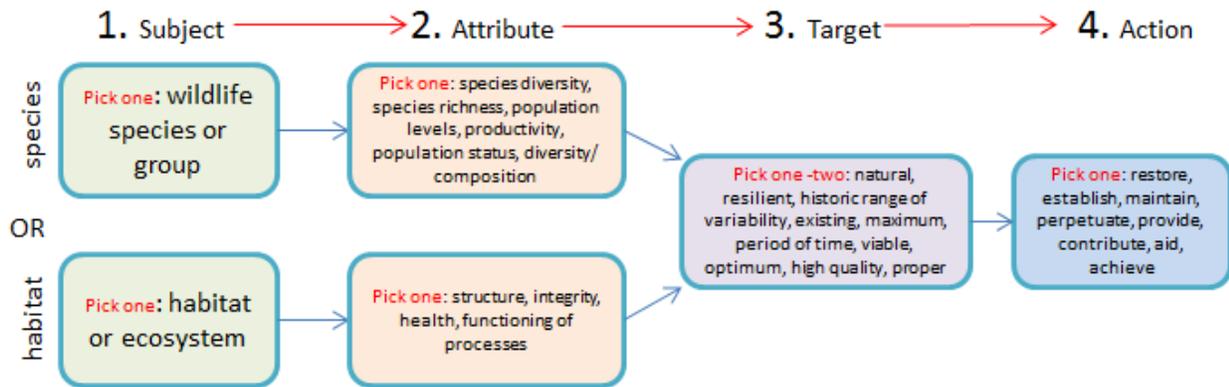
Goals must:

- broadly state desired future condition,
- be descriptive, and
- be clear and understandable to all, not just to those at the table developing them.

Figure 9.1b serves as a guide for developing and assessing biological goals. Each biological goal should contain these four elements:

1. the key **subject** of concern (e.g., a particular species or guild, a biotic community, or a habitat type);
2. the **attribute** of interest for that subject (e.g., population size, physical area covered, species composition);
3. the **target** or condition for the attribute (e.g., a number, period of time, historic condition). In selecting this, keep climate change effects in mind, since depending on the situation and timeframe for the HCP, it may or may not make sense for the target to involve the historic range of variability or existing conditions; and
4. the **action** or effort (e.g., restore, provide) that will be made to achieve the target.

Figure 9.1b: Four Elements of a Biological Goal



HCP goals should address the broad biological needs of the species. They can be focused on a number of species needs or reducing threats, such as:

- maintaining a specific species life history characteristic,
- providing conditions necessary for an important life history characteristic, or
- restoring something to historic or more desirable conditions, or establishing desirable conditions that facilitate transformation in response to effects of climate change or other stressors that cannot be addressed using traditional restoration approaches

All of these examples should be based on the specific needs of species in the plan area, but contribute to broader species needs.

These goals need to be forward thinking and “truthed” with a reasonableness of likely future climatic conditions. Depending on the local situation and time period covered, future-oriented goals can vary along a continuum from managing for persistence to managing for transformation, and shift over time from persistence to transformation. With climate change effects in mind, are the goals still achievable? If not, consider adjusting them to make them achievable with future climatic conditions in mind.

Example Goals:

Example goal 1: Bogus Bat: self-sustaining population of bogus bats in the preserve system that can withstand threats, is genetically representative of neighboring populations, and contributes to the overall recovery of the species.

Example goal 2: Swamp habitat: hydrologic integrity of the Mucky Swamp within the natural state of variability and function maintained within future climatic constraints.

9.1.1.1 Habitat-Based Goals vs. Species-Based Goals

HCPs that use habitat as a surrogate for species impacts can express conservation goals in terms of habitat area trends (objectives), but there must be an established correlation between species numbers, reproduction, and/or distribution and its habitat. In addition, there must be some way to reliably determine how effective the mitigation is for covered species.

For example: a species based goal might set specific population or life history targets for a covered species, such as percent of nestlings fledged or over-winter survival. In a habitat-based approach, the goal would be based on protecting, restoring, and establishing a specific type or amount of habitat for a covered species. In the case of the habitat based goal, the connection between habitat and covered species is really important to understand. Usually, protecting unoccupied habitat for a covered species does little for the species, however protecting a corridor that connects two important habitats can be important for the species' conservation.

Example habitat-based goal:

Goal: Maintain and enhance functional grassland communities that benefit covered species and promote native biodiversity.

Goal: Improve the quality of streams and the hydrologic and geomorphic processes that support them to maintain a functional aquatic and riparian community to benefit covered species and promote native biodiversity.

Goal: Maintain a functional riparian forest and scrub community at a variety of successional stages and improve these communities to benefit covered species and promote native biodiversity.

Considerations for inclusion with or as goals:

- building in fire resiliency for an area and covered species affected by increased fire
- connectivity to important habitat or populations
- climatic refugia for climate sensitive species/habitats
- building in resilience to extreme changing conditions (e.g. vegetative buffers against storm surge, restoration to stabilize habitat prone to flooding, etc.)

Example species-based goal:

Goal: Swainson's hawk: maintain or increase population size and distribution of Swainson's hawk in the inventory area

Goal: foothill yellow-legged frog: protect, maintain, or increase populations of foothill yellow-legged frog

9.1.2 Responsibility for Developing Biological Goals and Objectives

Development of goals and objectives should be done jointly with the Services and the applicant. Field Office staff should be involved and engaged in the process to develop goals and objectives as the goals and objectives will be used to guide development of the entire plan.

9.1.3 When to Develop Goals and Objectives

Once the applicant and the Services have completed the ‘Getting Started Questionnaire’ or similar guiding document, they should start developing the hierarchy of goals and purposes. Maintaining the order of the hierarchy is important in building a strong foundation for the HCP.

9.1.4 Number of Biological Goals

There must be sufficient specificity in the articulated goals to guide the conservation strategy development and implementation. In some cases, goals will be needed for each covered species. In other cases, groups of covered species can fall under the umbrella of a single goal. Each plan will be different.

9.2 Biological Objectives

Objectives are the incremental steps taken to achieve a goal. Objectives are derived from goals, and they provide a foundation for determining conservation measures, monitoring direction, and evaluating effectiveness of the conservation strategy. The number of objectives per goal will vary, but there should be enough to adequately describe how to achieve the goal. An implementation schedule may be beneficial if a goal has several objectives.

9.2.1 SMART

SMART is an important acronym for reminding us of the essential elements of a good objective. Objectives need to be:

- **Specific**
- **Measurable**
- **Achievable**
- **Result-oriented**
- **Time-fixed**

Specific: Objectives must clearly articulate what is to be achieved. Avoid ambiguity by phrasing objectives clearly. A clearly phrased objective is easy to understand and the meaning is difficult to misinterpret. Be as specific as possible. WHO will do the action? WHAT will they do? WHEN and WHERE will they do it? Avoid phrases that are subject to interpretation, like “maintain high-quality habitat.” “High-quality habitat” can be interpreted in many ways.

Measurable: Objectives should contain a measurable element that we can readily monitor to determine success or failure. First ask, “What would we monitor to assess progress toward achieving this objective?” Then ask, “How do we quantify it?” For example, to determine progress toward “high-quality habitat,” identify what defines “high quality.” That may mean having certain plant community composition, vegetative structure and density. Then to further define “high quality habitat,” quantify each component. In this example, you might list the desired proportion of each plant species, the height of a plant type, and number of individuals in a specified unit of area. The nature of the measurable element may vary, as might the difficulty in measuring it. Still, you must have something to indicate progress. While evaluating a water



Summary of the Current EAHCP Biological Goals

1. Fountain Darter – Comal System

- a. Quantified as areal coverage of aquatic vegetation (habitat) within four representative reaches of the Comal system and fountain darter density (population measurement) per aquatic vegetation type. (EAHCP Table 4-1)
- b. The population measurement goal is to maintain the median densities of fountain darters observed per aquatic vegetation type per system at a level greater than or equal to that observed over the past 10 years in the EAA Variable Flow Study monitoring.

2. Fountain Darter – San Marcos System

- a. Quantified as areal coverage of habitat within three representative river reaches of the San Marcos system and fountain darter density (population measurement) per aquatic vegetation type (EAHCP Table 4-21).
- b. The population measurement goal is to maintain greater than or equal to the median densities per aquatic vegetation type per system over the past 10 years in the EAA Variable Flow Study monitoring.

3. Comal Springs riffle beetle

- a. Maintain silt-free habitat conditions via continued springflow, riparian zone protection, and recreation control throughout each of the three sample reaches.
- b. Population measurement goals is to maintain greater than or equal to the median densities observed over the past six years of EAA Variable Flow Study monitoring.

4. Comal Springs dryopid beetle and Peck's Cave Amphipod

- a. Note: Grouped together as subterranean species inhabiting the Comal system.
- b. Water quality goal:
 - i. To not exceed a 10 percent deviation (daily average) from historically recorded water quality conditions (long-term average) within the Edwards Aquifer as measured issuing from the spring openings at Comal Springs.

5. Texas wild-rice

- a. Areal coverage (quantified) over a spatial extent of the San Marcos River (EAHCP Table 4-10).

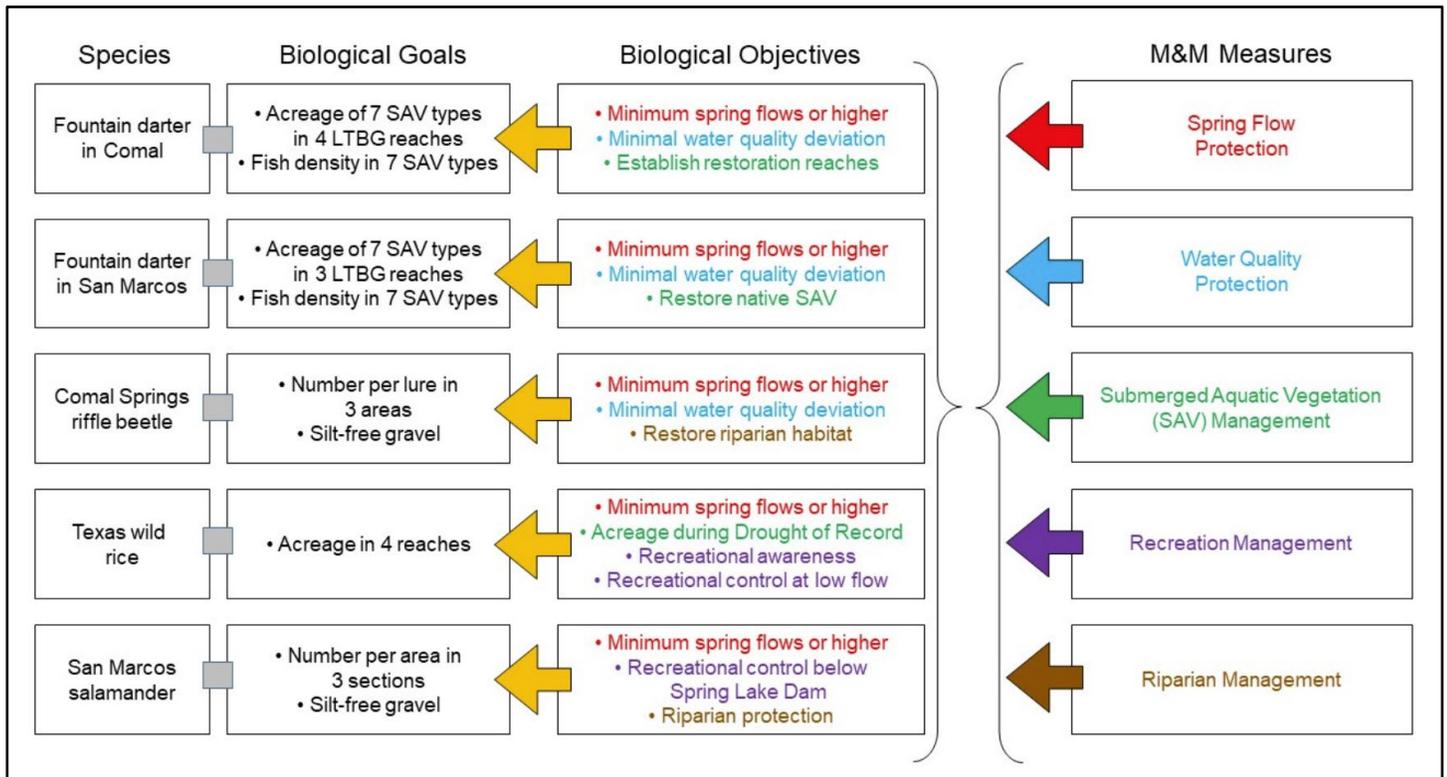
6. San Marcos salamander

- a. Note: Goals are similar to the fountain darter and Comal Springs riffle beetle approach.
- b. Habitat perspective: Goal is to maintain silt-free habitat conditions via continued springflow, riparian zone protection, and recreation control throughout each of the three representative reaches.
- c. Population measurement goal is to maintain greater than or equal to the median densities observed over the past 10 years of monitoring (EAHCP Table 4-25).

7. Texas blind salamander

- a. Note: Goals are similar to the Comal Springs dryopid beetle and Peck's Cave amphipod (subterranean species).
- b. Water quality goal:
 - i. Not to exceed a 10 percent deviation (daily average) from historically recorded water quality conditions (long-term average) within the Aquifer as measured issuing from the spring openings in Spring Lake.

Figure taken from the National Academies of Sciences Report 3.



APPENDIX C
Meeting Agendas

Biological Goals Subcommittee

Meeting 1 Agenda
February 2, 2023
2:00pm - 4:00pm

1. **Confirm attendance**
2. **Meeting logistics**
 - a. Virtual meeting logistics
 - b. Meeting POCs
 - c. Subcommittee logistics
3. **Overview of the Biological Goals Subcommittee Charge and meeting process.**
4. **Presentation on the USFWS Habitat Conservation Planning and Incidental Take Permit Processing Handbook - Chapter 9.1: Biological Goals.**
5. **Review and discussion of the current EAHCP Biological Goals.**
6. **Discussion to identify the type of Biological Goal(s) to proceed with.**
7. **Questions from the public**
8. **Future meetings**
9. **Adjourn**

Biological Goals Subcommittee

Meeting 2 Agenda
February 16, 2023
2:00pm - 4:00pm

1. **Confirm attendance**
2. **Meeting logistics**
 - a. Virtual meeting logistics
 - b. Meeting POCs
3. **Overview of Meeting #1 discussion.**
4. **Consider staff recommendation to develop new biological goals for the next EAHCP.**
5. **Discussion on the development of Biological Goals.**
6. **Questions from the public**
7. **Future meetings**
8. **Adjourn**

Biological Goals Subcommittee

Meeting 3 Agenda

March 2, 2023

2:00pm - 4:00pm

1. **Confirm attendance.**
2. **Meeting logistics.**
 - a. Virtual meeting logistics
 - b. Meeting POCs
3. **Approval of meeting minutes from February 2 and February 16, 2023.**
4. **Overview of Meeting #2.**
5. **Continued discussion on suggested Biological Goals.**
6. **Next steps of the Biological Goals Subcommittee.**
7. **Questions from the public.**
8. **Future meetings.**
9. **Adjourn.**

Biological Goals Subcommittee

Meeting 4 Agenda

March 16, 2023

2:00pm - 4:00pm

1. **Confirm attendance.**
2. **Meeting logistics.**
 - a. Virtual meeting logistics
 - b. Meeting POCs
3. **Approval of meeting minutes from March 2, 2023.**
4. **Review of final Biological Goal recommendations and Subcommittee Report.**
5. **Consideration to approve the Biological Goals Subcommittee Report.**
6. **Questions from the public.**
7. **Future meetings.**
8. **Adjourn.**

APPENDIX D
Presentations



EAHCP
EDWARDS AQUIFER
HABITAT CONSERVATION PLAN

Biological Goals Subcommittee – Meeting #1

February 2, 2023
Microsoft Teams

1



Meeting Logistics

- Meeting Materials available on the EAHCP website under – Biological Goals Subcommittee
- Contact Olivia Ybarra for more info:
oybarra@edwardsaquifer.org
- IT Support: Jesus Hinojosa:
jhinojosa@edwardsaquifer.org



2



Meeting Logistics

- Decisions made by consensus.
- If consensus cannot be achieved by the deadline, the recommendations may be approved by a majority vote of the full Subcommittee.
- Any dissension from a member will be included in the final report.



3



Members

- **Chair:** Mark Enders (Stakeholder Committee)
- Rachel Sanborn (Stakeholder Committee)
- Kimberly Meitzen (Stakeholder Committee)
- Kevin Mayes (Stakeholder Committee)
- Jacquelyn Duke (Science Committee)
- Charlie Kreidler (Science Committee)



4



Biological Goals Subcommittee Charge

- Review the current EAHCP biological goals and the HCP Handbook as it pertains to biological goals development and structure.
- Develop initial recommendations for deletions, additions, or other changes to current biological goals.
- Finalize biological goal recommendations to be considered in the next EAHCP.
- Approve a report setting out the biological goal recommendations to be provided to the EAHCP Permit Renewal contractor.



5

HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK



December 21, 2016

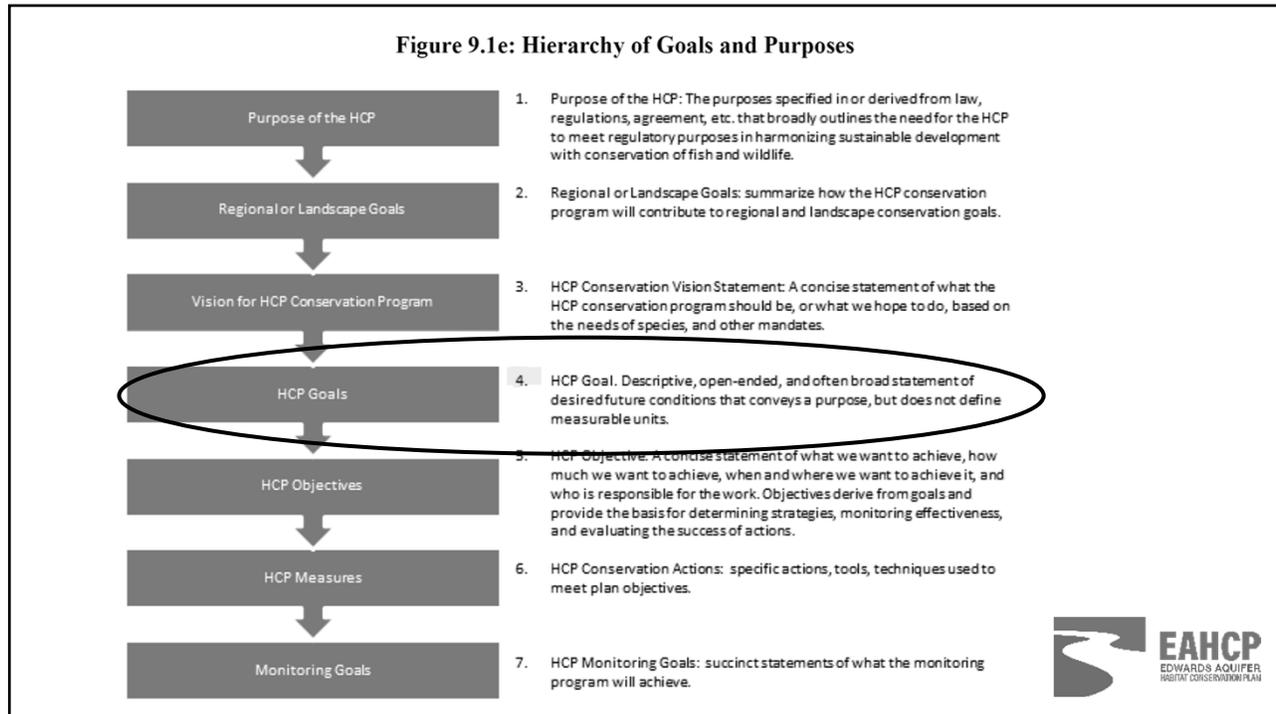
U.S. Department of the Interior
Fish and Wildlife Service

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service



6

Figure 9.1e: Hierarchy of Goals and Purposes



7

Handbook pg. 9-6

- Biological goals broadly describe the desired future conditions of an HCP in succinct statements.
- Each goal steps down to one or more objectives that define how to achieve these conditions in measurable terms.
- A well-written goal directs work toward achieving the vision and purpose of an HCP.

8



Biological Goals are not....

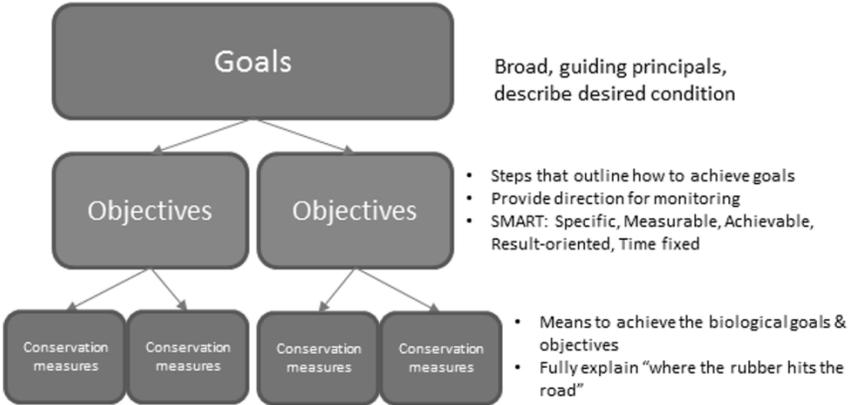
- An HCP is not a recovery plan (but should be consistent with existing recovery plans)
- They are not restatements of the issuance criteria in the ESA or the regulations
- They are not restatements of other regulations, policies, or guidance



9

Biological Goals

Figure 9.1a: Biological Goals and Objectives



Goals
Broad, guiding principals, describe desired condition

Objectives

- Steps that outline how to achieve goals
- Provide direction for monitoring
- SMART: Specific, Measurable, Achievable, Result-oriented, Time fixed

Conservation measures

- Means to achieve the biological goals & objectives
- Fully explain "where the rubber hits the road"



10

Goals must:

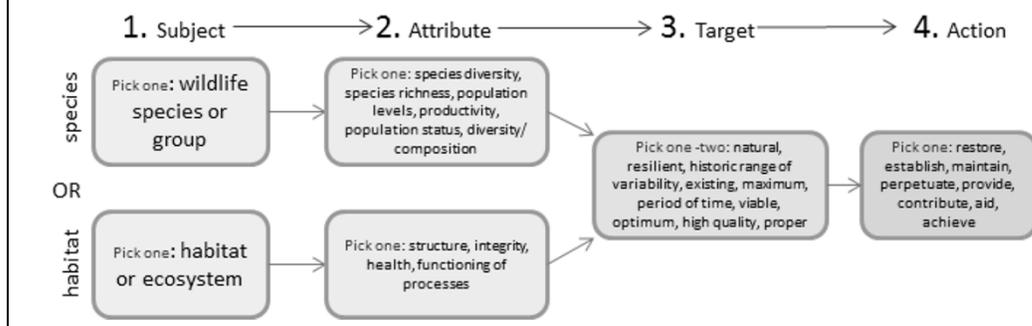
- broadly state desired future condition,
- be descriptive, and
- be clear and understandable to all, not just to those at the table developing them.



11

Elements of a Biological Goal

Figure 9.1b: Four Elements of a Biological Goal



12

Example Biological Goals



13

Example: Species Based Goals



Example species-based goal:

Goal: Swainson's hawk: maintain or increase population size and distribution of Swainson's hawk in the inventory area

Goal: foothill yellow-legged frog: protect, maintain, or increase populations of foothill yellow-legged frog



14

BSEACD HCP – Barton Springs Edwards Aquifer

The biological goals of the District HCP are to:

- Minimize drought-related decreases in size and health of the Barton Springs salamander population to the maximum extent practicable,
- Minimize drought-related decreases in size and health of the Austin blind salamander population to the maximum extent practicable, and
- Promote recovery of the populations from those decreases to levels required for their long-term viability.



15



Example: Habitat Based

Example habitat-based goal:

Goal: Maintain and enhance functional grassland communities that benefit covered species and promote native biodiversity.

Goal: Improve the quality of streams and the hydrologic and geomorphic processes that support them to maintain a functional aquatic and riparian community to benefit covered species and promote native biodiversity.

Goal: Maintain a functional riparian forest and scrub community at a variety of successional stages and improve these communities to benefit covered species and promote native biodiversity.



16

Upper Santa Ana River HCP

The HCP Goals will be accomplished within the HCP Preserve System and are as follows:

HCP Goal 1: Conserve Covered Species and manage their habitats to contribute to the recovery of listed species or those that may become listed under the Federal Endangered Species Act.

HCP Goal 2: Maintain or simulate natural ecological processes necessary to maintain the functionality of the natural communities and habitats upon which the Covered Species depend within the HCP Preserve System and to the greatest extent possible outside the HCP Preserve System.

HCP Goal 3: Maintain or increase habitat connectivity in the HCP Preserve System and to adjacent protected habitat areas to reduce isolation between metapopulations of Covered Species.

HCP Goal 4: Actively manage lands within the HCP Preserve System for the benefit of Covered Species to maintain or increase the health of populations.



17

Current Biological Goals



18

Comal System: Fountain Darter

Fountain Darter

Long-term Biological Goals

The long-term biological goals for the fountain darter at Comal Springs are quantified as areal coverage of aquatic vegetation (habitat) within four representative reaches of the Comal system (Upper Spring run [upstream most portion of the system to Spring Island], Landa Lake [Spring Island to the outflow to Old and New channels], Old Channel, and New Channel) and fountain darter density (population measurement) per aquatic vegetation type. (Figure 4-1). The habitat-based and population measurement goals are presented in Table 4-1 and include proposed aquatic vegetation restoration efforts. The population measurement goal is to maintain the median densities of fountain darters observed per aquatic vegetation type per system at a level greater than or equal to that observed over the past 10 years in the EAA Variable Flow Study monitoring.



19

Comal System: Habitat-based and population measurement goals for the Fountain Darter

TABLE 4-1²
TABLE 4-1 FOUNTAIN DARTER HABITAT (AQUATIC VEGETATION) IN METERS SQUARED (M²) AND FOUNTAIN DARTER MEDIAN DENSITY (NUMBER/M²) PER HABITAT TYPE

Study Reach	Fountain darter habitat (aquatic vegetation) goal in meters squared (m ²)					
	Bryophytes	<i>Potamogeton</i>	<i>Ludwigia</i>	<i>Cabomba</i>	<i>Sagittaria</i>	<i>Vallisneria</i>
Upper Spring Run Reach	1,750	0	25	25	850	0
Landa Lake	3,950	25	900	500	2,250	12,500
Old Channel	550	0	425	180	450	0
New Channel	150	0	100	2,500	0	0
TOTAL	6,400	25	1,450	3,205	3,550	12,500
	Fountain darter median density goal (number/m ²)					
	Bryophytes	<i>Potamogeton</i>	<i>Ludwigia</i>	<i>Cabomba</i>	<i>Sagittaria</i>	<i>Vallisneria</i>
	20	3.3	7	7	1	1



20

San Marcos System: Fountain Darter

Fountain Darter

Long-term Biological Goals

The long-term biological goals for the fountain darter are quantified as areal coverage of habitat within three representative river reaches of the San Marcos system (Figure 4-3) and fountain darter density (population measurement) per aquatic vegetation type. These habitat-based and population measurement goals are presented in Table 4-21. The population measurement goal is to maintain greater than or equal to the median densities observed per aquatic vegetation type per system over the past 10 years of EAA Variable Flow Study monitoring.



21

San Marcos System: Fountain Darter

TABLE 4-21⁵
FOUNTAIN DARTER HABITAT (AQUATIC VEGETATION) IN METERS SQUARED (m²) AND
FOUNTAIN DARTER DENSITY (NUMBER/m²) PER HABITAT TYPE

Fountain darter habitat (aquatic vegetation) in meters squared (m ²)							
Study Reach	Ludwigia	Cabomba	Potamogeton	Sagittaria	Hydrocotyle	Zizania	
Spring Lake Dam	100	50	200	200	50	700	
City Park	150	90	1,450	300	10	1,750	
IH-35	50	50	250	150	50	600	
TOTAL	300	190	1,900	650	110	3,050	
Fountain darter median density (numbers/m ²)							
	Ludwigia	Cabomba	Potamogeton	Sagittaria	Hydrocotyle	Zizania	
	7	7	5	1	4	5	



22

Comal Springs Riffle Beetle

Comal Springs Riffle Beetle

Long-term Biological Goals

The long-term biological goals for the Comal Springs riffle beetle involve a qualitative habitat component and quantitative population measurement. As with the fountain darter, a representative reach approach was employed. From a habitat perspective, the goal is to maintain silt-free habitat conditions via continued springflow, riparian zone protection, and recreation control throughout each of the three sample reaches (Spring Run 3, Western shoreline, and Spring Island area). (Figure 4-2). Additionally, the population measurement goal is to maintain greater than or equal to the median densities observed over the past six years of EAA Variable Flow Study monitoring..

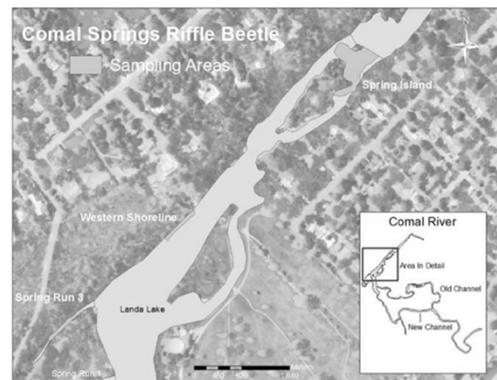


23

Comal Springs Riffle Beetle: Goals

TABLE 4-7
COMAL SPRINGS RIFFLE BEETLE LONG-TERM BIOLOGICAL GOALS

	Spring Run 3	Western Shoreline	Spring Island Area
Habitat	Silt-free gravel and cobble substrate $\geq 90\%$ of each study area		
Density (# of CSRB/Lure)	≥ 20	≥ 15	≥ 15



24

Comal Springs Dryopid Beetle and Peck's Cave Amphipod

Comal Springs Dryopid Beetle and Peck's Cave Amphipod

Long-term Biological Goal

The Comal Springs dryopid beetle and Peck's Cave amphipod are subterranean species inhabiting the Comal system. The subterranean nature and restricted range of the Comal Springs dryopid beetle (to the headwaters of the springs and spring upwelling areas) suggests that it does not require substantial surface discharge from springs to survive and presumes that springflow (of sufficient water quality) that continually covers the spring orifice should prevent long-term detriment to the population. EARIP (2009). Similarly, the Peck's Cave amphipod requirements include sufficient springflow covering the spring orifices and adequate water quality to prevent long-term adverse impacts to the species. (*Id.*).

As such, the long-term biological goal for these subterranean species focuses on Aquifer water quality as well as a springflow component. The water quality goal is:

- to not exceed a 10 percent deviation (daily average) from historically recorded water quality conditions (long-term average) within the Edwards Aquifer as measured issuing from the spring openings at Comal Springs.

This includes all water quality constituents currently measured in the EAA Variable Flow Study. This goal assumes that a 10 percent deviation would be acceptable; however, more extensive work to evaluate and assess water quality tolerances of these species will be addressed as part of the AMP.



25

Texas wild-rice

Long-term Biological Goal

The long-term biological goal for Texas wild-rice has been determined by an evaluation of: (1) the maximum occupied area of Texas wild-rice that has been present in the San Marcos system over time; (2) TPWD analysis of the Hardy (2010) physical habitat modeling; and (3) the 1996 USFWS recovery plan goals.

The long-term biological goal for Texas wild-rice is presented in Table 4-10 and subsequent discussion.

Flow-related Objectives

The long-term biological goals for Texas wild-rice are defined as areal coverage over a spatial extent of the San Marcos River (*see* Table 4-10). However, because of the uncertainty associated with the long-term biological goals, the associated management objectives necessitate the flow-related objectives presented above in Table 4-13.



26

Texas wild-rice

**TABLE 4-10
LONG-TERM BIOLOGICAL GOAL FOR TEXAS WILD-RICE**

River Segment	Areal Coverage (m ²)	Reach Percentage of Total Areal Coverage
Spring Lake	1,000 – 1,500	n/a
Spring Lake Dam to Rio Vista Dam	5,810 – 9,245	83 – 66
Rio Vista Dam to IH-35	910 – 1,650	13 – 12
Downstream of IH-35	280 – 3,055	4 – 22
TOTAL	8000 – 15,450	100



27

San Marcos salamander

San Marcos Salamander

Long-term Biological Goals

The long-term biological goals for the San Marcos salamander include a qualitative habitat component and a quantitative population measurement. As with the fountain darter and riffle beetle, a representative reach approach was employed. From a habitat perspective, the goal is to maintain silt-free habitat conditions via continued springflow, riparian zone protection, and recreation control throughout each of the three representative reaches (Hotel area, Riverbed area, and eastern spillway below Spring Lake Dam) (Figures 4-3, 4-4). Additionally, the population measurement goal is to maintain greater than or equal to the median densities observed over the past 10 years of monitoring. Table 4-25 summarizes long-term biological goals.

**TABLE 4-25
SAN MARCOS SALAMANDER LONG-TERM BIOLOGICAL GOALS**

	Hotel Area (Spring Lake)	Riverbed Area (Spring Lake)	Eastern Spillway below (Spring Lake)
Habitat	Silt-free gravel and cobble substrate \geq 90% of each study area		
Density (# of salamanders/m ²)	\geq 15	\geq 10	\geq 5



28

Texas Blind-Salamander

Texas Blind Salamander

Long-term Biological Goal

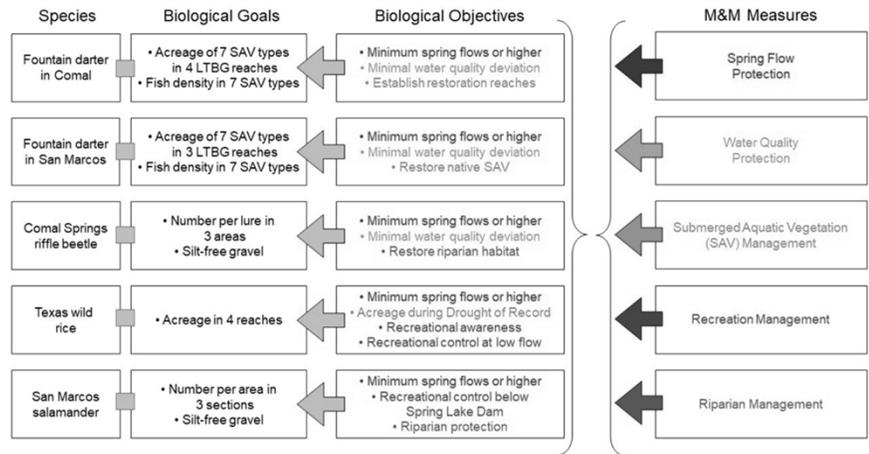
Similar to the Comal Springs dryopid beetle and Peck's Cave amphipod, the Texas blind salamander is a subterranean species. An assumption of the HCP is that as subterranean species, mechanisms exist for these species to retreat into the Aquifer should springflows cease at the spring outlets at San Marcos Springs. As such, the long-term biological goal for this subterranean species relates to Aquifer water quality. The water quality goal for the Texas blind salamander is:

- Not to exceed a 10 percent deviation (daily average) from historically recorded water quality conditions (long-term average) within the Aquifer as measured issuing from the spring openings in Spring Lake.

This includes water quality constituents currently measured in the EAA Variable Flow Study. (See Section 5.7.2). To be conservative, the long-term goal assumes that a 10 percent deviation would be acceptable; however, more extensive work to evaluate and assess the validity of that assumption and the water quality tolerances of the Texas blind salamander will be considered in the AMP.



NAS Report 3



Biological Goals Subcommittee

Meeting 1 Agenda
February 2, 2023
2:00pm - 4:00pm

1. **Confirm attendance**
2. **Meeting logistics**
 - a. Virtual meeting logistics
 - b. Meeting POCs
 - c. Subcommittee logistics
3. **Overview of the Biological Goals Subcommittee Charge and meeting process.**
4. **Presentation on the USFWS Habitat Conservation Planning and Incidental Take Permit Processing Handbook – Chapter 9.1: Biological Goals.**
5. **Review and discussion of the current EAHCP Biological Goals.**
6. **Discussion to identify the type of Biological Goal(s) to proceed with.**
7. **Questions from the public**
8. **Future meetings**
9. **Adjourn**



31

Covered Species

- Fountain Darter
- Comal Springs riffle beetle
- Comal Springs dryopid beetle
- Peck's Cave Amphipod
- Texas wild-rice
- ~~San Marcos gambusia~~
- ~~Comal Springs salamander~~
- Texas blind salamander
- San Marcos salamander
- Edwards Aquifer diving beetle
- Texas troglobitic water slater



32

Suggestion: Group by Species Type

Macroinvertebrates

- Peck's Cave amphipod
- Edwards Aquifer diving beetle
- Texas troglobitic water slater
- Comal Springs riffle beetle
- Comal Springs dryopid beetle

Salamanders

- Texas blind salamander
- San Marcos salamander

Texas wild-rice

Fountain darter



33

Suggestion: Group Species by Habitat

Subterranean Species (Aquifer Dwelling)

- Edwards Aquifer diving beetle
- Texas troglobitic water slater
- Texas blind salamander

Spring/River Dwelling

- Texas wild-rice
- Fountain darter

Both Subterranean and Spring/River Dwelling

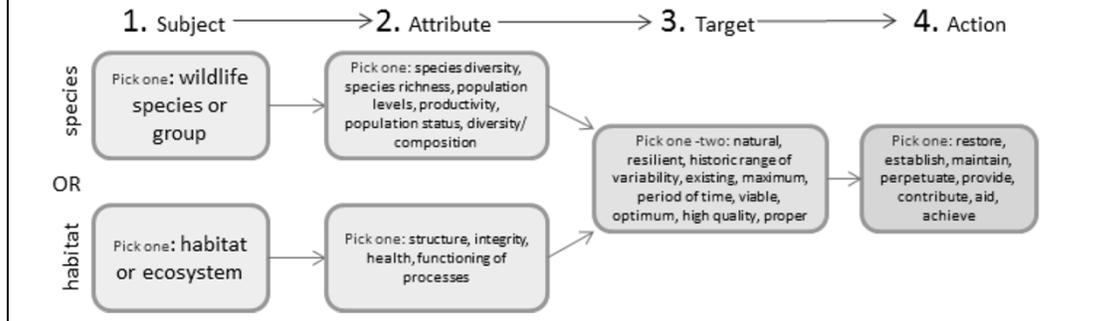
- Peck's Cave amphipod
- Comal Springs riffle beetle
- Comal Springs dryopid beetle
- San Marcos salamander



34

Elements of a Biological Goal

Figure 9.1b: Four Elements of a Biological Goal



35

Questions?



36

Suggestions from the Listen & Learn Report

- Maintain springflow conducive to the protection of **Covered Species**.
- Extend the area of habitat restoration for the **Covered Species** further downstream.
- Maintain or create informed users of the Comal and San Marcos Springs.



37

Suggestion: Goal(s) per group

- Maintain genetically diverse populations of **Texas wild-rice** in the San Marcos River.
- Provide and maintain a diverse native aquatic vegetation community to support viable **fountain darter** populations in the spring systems.
- Maintain adequate water quality standards and springflow for **macroinvertebrate** and **salamander** populations in the spring systems.
- Contribute to the education of Comal and San Marcos River recreators on the importance of habitat conservation in relation to the **Covered Species**.
- Support land conservation over the Edwards Aquifer recharge zone.



38



EAHCP
EDWARDS AQUIFER
HABITAT CONSERVATION PLAN

Biological Goals Subcommittee – Meeting #2

February 16, 2023

Meadows Center for Water and the Environment & Microsoft Teams

1



Meeting Logistics

****This meeting is being recorded****

- Meeting Materials available on the EAHCP website under – Biological Goals Subcommittee
- Contact Olivia Ybarra for more info:
oybarra@edwardsaquifer.org
- IT Support: Jesus Hinojosa:
jhinojosa@edwardsaquifer.org



2



Overview of Meeting #1

- Subcommittee introductions
- Current Biological Goals
- HCP Handbook – Chapter 9 and other meeting materials.
- Discussion on proposed Biological Goals and species categories.



3



Biological Objectives Work Group

• Fountain Darter/ Texas wild-rice:

- Tom Arsuffi
- Megan Bean
- Jason Martina
- Tim Bonner

• Salamanders:

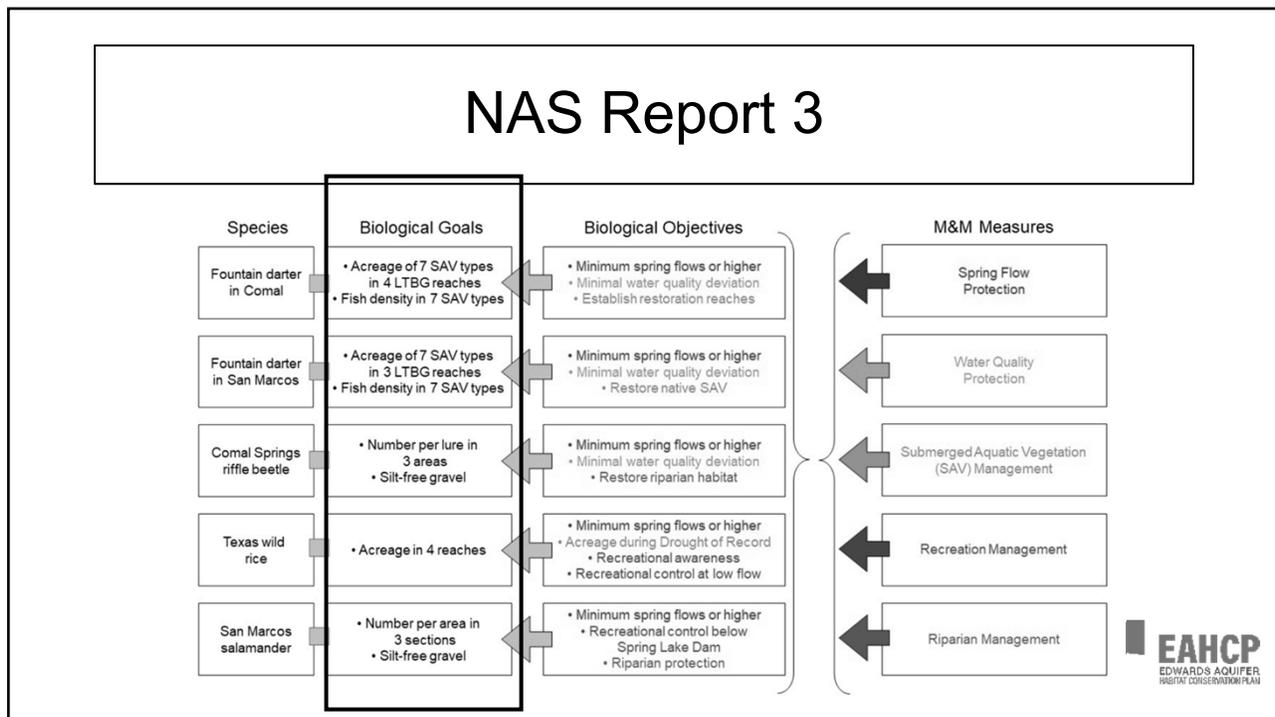
- Justin Crow
- Pete Diaz
- Nate Bendik

• Macroinvertebrates:

- Butch Weckerly
- Chad Norris
- Randy Gibson



4



5



Action Item:

Consider staff recommendation to develop new biological goals for the next EAHCP.



6

Developing Biological Goals



7

Handbook pg. 9-6

- Biological goals **broadly describe** the desired future conditions of an HCP in **succinct statements**.
- Each goal steps down to one or more **objectives that define how to achieve** these conditions in measurable terms.
- A well-written goal directs work toward achieving the **vision and purpose of an HCP**.



8

Examples



9

Thurston County HCP (updated 2022)

5.2 Biological Goal and Conservation Objectives

The Biological Goal, Conservation Objectives, and Conservation Measures are intended to illustrate the vision and commitments of the Conservation Program. The Biological Goal describes what the Conservation Program will accomplish by the end of the incidental take permit duration. The Conservation Objectives serve as benchmarks by which to measure progress in achieving goals for each Covered Species, across temporal and spatial scales. Conservation Measures are specific measurable actions that will be implemented to meet the Conservation Objectives and achieve the Biological Goal.

The Biological Goal of the HCP is to:

Maintain, in perpetuity, populations of each of the Covered Species within Thurston County, through strategic habitat acquisition, conservation, enhancement, and management in advance of, unavoidable impacts to the Covered Species from the Covered Activities.



10

Maricopa Sun Solar Complex Project HCP (2021)

The goals and objectives developed for each of the Covered Species are similar, as is the rationale for their importance as part of the conservation strategy. The Project's primary biological goals are to preserve Covered Species and provide Covered Species habitat within the Permit Area by:

1. Preserving populations of Kern mallow within the Permit Area.
2. Increasing the ability of San Joaquin kit fox to disperse through the Permit Area and providing habitat within the region.
3. Preserving existing populations of the Tipton kangaroo rat within the Permit Area and providing habitat for the Tipton kangaroo rat within the Permit Area.
4. Preserving existing populations of Nelson's antelope squirrel within the Permit Area and providing habitat for Nelson's antelope squirrel within the Permit Area.
5. Preserving existing populations of the western burrowing owl within the Permit Area and providing habitat for the western burrowing owl within the Permit Area.
6. Providing habitat for the blunt-nosed leopard lizard within the Permit Area.



11

Bitter Ridge Indian Bat and Northern Long-Eared Bat HCP (2020)

5.1 Biological Goals and Objectives

These biological goals are the guiding principles for this HCP's conservation program. The biological objectives are meant to clarify the purpose and direction of the conservation measures through specific, measurable, achievable targets. While measures to conserve or recover an endangered or threatened species are not required under § 10 of the ESA, the biological goals and objectives of this HCP are consistent with actions to promote the recovery of the Indiana bat and northern long-eared bat.

Goal 1: Contribute to maintaining the integrity of the populations of the Covered Species in Indiana by minimizing mortality of the Covered Species in the Permit Area.

Objective 1: Implement an operational strategy in each permit year that will decrease Covered Species' fatality rates by at least 60% compared to levels of projected take without minimization for the Project, as well as implementing a monitoring and adaptive management strategy (with potential for additional minimization measures to be put in place) in order to maintain take at or below the permitted levels over the 35-year term of the ITP (Sections 4.1 through 4.3).



12

HCP for the Hine's Emerald Dragonfly, Blanding's Turtle, Spotted Turtle, Leafy Prairie Clover, and Lakeside Daisy (2021)

The biological goals for this HCP are:

- To meaningfully contribute to the conservation of the Covered Species found in the Permit and Planning Area;
- Protect Covered Species and habitat by avoiding and minimizing take of Covered Species and impacts to their habitat to the maximum extent practicable; and
- To restore, enhance, and preserve Covered Species habitat as mitigation for impacts to habitat.



13

Aera Block 12 Development Project – HCP (2020)

Goal 1. Avoid or minimize disturbance to or loss of Covered Species habitat within the Project Area to the maximum extent practicable, emphasizing avoidance of habitat occupied by Covered Species.

Objective 1.1. Minimize disturbance of suitable habitat during project construction, production O&M, and well plugging and abandonment by implementing best management practices.

Objective 1.2. Minimize disturbance of suitable habitat occupied by Covered Species by conducting preconstruction surveys for Covered Species and implementing species-specific avoidance measures to protect occupied habitat to the maximum extent practicable.

Objective 1.3. Reclaim areas of temporary disturbance after construction activities are completed to reestablish suitable habitat conditions for the Covered Species.



14

Lake States HCP (2023)

<p>Biological Goal 3: Promote stewardship on other nonfederal lands.</p>	<p>Objective 3.1: Increase bat conservation by providing the Landowner Enrollment Program on eligible lands throughout the permit term.</p> <p>Objective 3.2: Develop and implement a communication plan for educating the public on covered bats and their conservation.</p>	<ul style="list-style-type: none"> Provide opportunity to eligible forest owners to receive take authorization through the Lake States HCP in exchange for improving bat conservation on their lands. ^a Develop a communication plan about bats. Implement the communication plan through publication of press releases, development and publication of web content, development of a brochure, speaking engagements, webinars, and other public outreach.
--	---	--



15

Biological Goals

Figure 9.1a: Biological Goals and Objectives



```

graph TD
    Goals[Goals] --> Obj1[Objectives]
    Goals --> Obj2[Objectives]
    Obj1 --> CM1[Conservation measures]
    Obj1 --> CM2[Conservation measures]
    Obj2 --> CM3[Conservation measures]
    Obj2 --> CM4[Conservation measures]
            
```

Goals

Broad, guiding principals, describe desired condition

Objectives

- Steps that outline how to achieve goals
- Provide direction for monitoring
- SMART: Specific, Measurable, Achievable, Result-oriented, Time fixed

Conservation measures

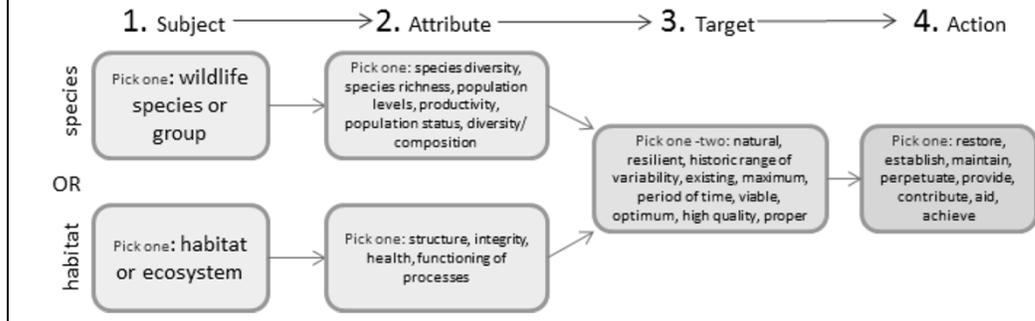
- Means to achieve the biological goals & objectives
- Fully explain "where the rubber hits the road"



16

Elements of a Biological Goal

Figure 9.1b: Four Elements of a Biological Goal



17

Suggested Biological Goals



18

Covered Species

- Fountain Darter
- Comal Springs riffle beetle
- Comal Springs dryopid beetle
- Peck's Cave Amphipod
- Texas wild-rice
- ~~San Marcos gambusia~~
- ~~Comal Springs salamander~~
- Texas blind salamander
- San Marcos salamander
- Edwards Aquifer diving beetle
- Texas troglobitic water slater



19

Suggested Goals

Goal 1: Maintain resilient **Texas wild-rice** populations in the San Marcos River and Spring Lake.

Goal 2: Provide and maintain native habitat to support **fountain darter** populations in the Comal and San Marcos spring systems.

Goal 3: Maintain covered **macroinvertebrate** species populations in the Edwards Aquifer, and the Comal and San Marcos spring systems. (Comal Springs riffle beetle, Comal Springs dryopid beetle, Peck's Cave Amphipod, Edwards Aquifer diving beetle, and Texas troglobitic water slater)

Goal 4: Maintain healthy **salamander** populations in the Edwards Aquifer and San Marcos spring systems. (San Marcos salamander and Texas blind salamander)



20

Suggested Goals

Goal 5: Maintain healthy populations of each of the **Covered Species**, within the **Permit Area**, through habitat conservation, enhancement, and management.

Goal 6: Contribute to maintaining springflow in the Comal and San Marcos spring systems for the **Covered Species**.

Goal 7: Maintain good water quality in the Comal and San Marcos spring systems for the **Covered Species**.



21

Suggested Goals

Goal 8: Promote the importance of **habitat conservation** in the Edwards Aquifer region.

Goal 9: Support **land conservation** in the Edwards Aquifer region.

Goal 10: Manage **recreational impacts** to the Covered Species and their habitat.



22



Thank You!

- Public Comment
- Next Meeting:
 - Date: March 2, 2023
 - Time: 2:00PM – 4:00PM
 - Location: Pauline Espinosa Community Hall – San Marcos, TX and Microsoft Teams
- Adjourn





EAHCP
EDWARDS AQUIFER
HABITAT CONSERVATION PLAN

Biological Goals Subcommittee – Meeting #3

March 2, 2023

Pauline Espinosa Community Hall & Microsoft Teams

1



Meeting Logistics

****This meeting is being recorded****

- Meeting Materials available on the EAHCP website under – Biological Goals Subcommittee
- Contact Olivia Ybarra for more info:
oybarra@edwardsaquifer.org
- I.T. Support: Jesus Hinojosa:
jhinojosa@edwardsaquifer.org



2



Approval of Meeting Minutes

- February 2, 2023
- February 16, 2023



3



Overview of Meeting #2

- Introduction of the Biological Objectives Subcommittee members.
- Continued discussion on biological goals per the HCP Handbook and examples from other HCPs.
- Motion to revise existing and develop new biological goals.
- Discussion on suggested biological goals.



4



Next Steps

- **March 6:** Draft Biological Goals Subcommittee Report sent to members for review.
- **March 6 – 9:** Report review and comment period.
- **March 10:** EAHCP staff addresses report comments/edits.
- **March 13:** Final report sent to Subcommittee Members
- **March 16:** Consideration to approve the Biological Goals Subcommittee Report.



5



Thank you!

- Public Comment
- Next Meeting:
 - Date: March 16, 2023
 - Time: 2:00PM – 4:00PM
 - Location: Meadows Center and Microsoft Teams



6



EAHCP
EDWARDS AQUIFER
HABITAT CONSERVATION PLAN

Biological Goals Subcommittee – Meeting #4

March 16, 2023

Meadows Center for Water and the Environment & Microsoft Teams

1



Meeting Logistics

****This meeting is being recorded****

- Meeting Materials available on the EAHCP website under – Biological Goals Subcommittee
- Contact Olivia Ybarra for more info:
oybarra@edwardsaquifer.org
- I.T. Support: Jesus Hinojosa:
jhinojosa@edwardsaquifer.org



2



Approval of Meeting Minutes

- March 2, 2023



3



Overview of Meeting #3

- Motion to approve meeting minutes from February meetings.
- Continued discussion on Biological Goals.



4



Final Review of Biological Goals Subcommittee Report

Report	
To:	EAHCP Implementing, Stakeholder and Science Committees
From:	Permit Renewal Contractor - ICF
Date:	EAHCP Biological Goals Subcommittee
By:	March 23, 2023
Subject:	EAHCP Biological Goals Subcommittee Report - 2023

1. Introduction
The Branch Aquatic Habitat Conservation Plan (EAHCP) is currently in the process of renewing the Incidental Take Permit with the U.S. Fish and Wildlife Service. As part of that process, the essential components of the Habitat Conservation Plan (HCP) conservation strategy will be reassessed, new elements recommended, and modifications determined. As a required component of habitat conservation plans, biological goals are a guide for quantified biological objectives and management actions taken through conservation measures to achieve the conservation strategy.

The joint 2016 U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service "Habitat Conservation Planning and Incidental Take Permit Processing Handbook" (HCP Handbook) defines biological goals as broad, succinct statements that work toward the vision of an HCP. Each goal can be habitat- and/or species-based. Biological goals are addressed by quantified biological objectives that are metrics to achieve the corresponding goal. This hierarchical process is described in Chapter 9 of the HCP Handbook which served as a reference in the development of the EAHCP biological goals.

2. Biological Goals Subcommittee Overview
The purpose of the Subcommittee was to review, discuss, and develop recommendations for biological goals that should be considered for inclusion in the next EAHCP. The Subcommittee charge was approved by the EAHCP Stakeholder Committee on December 15, 2022 (Appendix A).

Throughout February and March 2023, four meetings were conducted in-person and virtually via Microsoft Teams. Meeting materials including meeting handouts, meeting agendas, presentations, and approved meeting minutes are in Appendix B, C, D, and E, respectively.

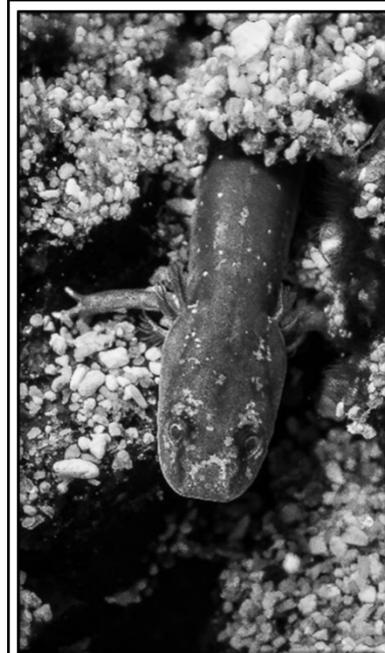
Members of the Biological Goals Subcommittee are:

- Mark Bowers - Subcommittee Chair - Stakeholder Committee (City of San Marcos)
- Rachel Sabinos - Stakeholder Committee (San Marcos River Foundation)
- Kathleen Metzner - Stakeholder Committee (Texas State University)
- Kevin Moran - Stakeholder Committee (Texas Parks and Wildlife Department)
- Charlie Kautler - Science Committee (BGC Guyton - Retired)

Approved by the Biological Goals Subcommittee - March 2023



5



Consideration to approve the final Biological Goals Subcommittee Report.

• Motion:

- Move the Biological Goals Subcommittee approve the Biological Goals Subcommittee Report and submittal to the EAHCP Committees (Stakeholder, Implementing, and Science), Permit Renewal Contractor (ICF), and the Biological Objectives Subcommittee.



6



Thank you, Subcommittee!



APPENDIX E

Approved Meeting Minutes

Biological Goals Subcommittee

Meeting #1
Meeting Minutes
February 2, 2023

1. Confirm attendance

All Subcommittee members were in attendance via Microsoft Teams.

2. Meeting logistics

Mark Enders, Biological Goals Subcommittee Chair, provided an overview of meeting logistics, points of contact and introduced the members of the Subcommittee.

3. Overview of the Biological Goals Subcommittee Charge and meeting process.

Mark Enders presented the charge and the major elements of the Subcommittee. The primary focus of this Subcommittee is to: 1) Review the current EAHCP Biological Goals and the HCP Handbook; 2) Develop initial biological goal recommendations; 3) Finalize biological goal recommendations and 4) Approve the Biological Goals Subcommittee Report for the EAHCP Permit Renewal Contractor (ICF) and the EAHCP Committees.

4. Presentation on the USFWS Habitat Conservation Planning and Incidental Take Permit Processing Handbook – Chapter 9.1: Biological Goals.

Olivia Ybarra, HCP Coordinator, provided an overview of the HCP Handbook as it pertains to the development of biological goals. Olivia highlighted the hierarchy of biological goals, biological objectives, and conservation measures in the context of the EAHCP. Additionally, Olivia noted that, in accordance to the HCP Handbook, biological goals should be broad, succinct statements that reflect the purpose and vision of the EAHCP. Examples of species and habitat based biological goals were also provided.

5. Review and discussion of the current EAHCP Biological Goals.

The Subcommittee received a summary of the current EAHCP Biological Goals. It was noted that the current goals are very quantified, measurable, and specific. According to the HCP Handbook, the current biological goals reflect the elements of a biological objective rather than a goal. Chad Furl, EAHCP Chief Science Officer, reminded the Subcommittee that the details of the biological objectives will be discussed at a subsequent Biological Objectives Work Group. Myron Hess asked if there were any specific recommendations on the Covered Species that will be included in the renewed Incidental Take Permit. Chad Furl responded that, for the purpose of the biological goals development exercise, the current

Covered Species will be the primary focus, with the exception of the San Marcos Gambusia and the Comal Springs salamander. If additional species are added to the Covered Species list after the biological goals are developed, the Biological Goals Subcommittee may reconvene to consider those species as they relate to the biological goals.

EAHCP staff provided suggested biological goals developed using the guidelines from the HCP Handbook and several biological goals that were provided during the Listen and Learn Workshop series. Olivia Ybarra noted that Covered Species can be grouped into categories to help develop broad biological goal statements.

Chad Furl added that the HCP Handbook does not specify the number of goals an HCP should contain. Grouping species, rather than developing a goal per species, may be a more efficient and effective approach. The Biological Objectives Work Group will then review these goals and expand on the approach to achieve each goal.

6. Discussion to identify the type of Biological Goal(s) to proceed with.

The HCP Handbook suggests biological goals can be habitat or species based. Olivia Ybarra presented examples of each type of goal that are currently being implemented in other HCPs.

Jacquelyn Duke noted that the recommendations of “genetically diverse population of Texas wild-rice” might be too specific. Chad Furl reminded the group that the Biological Objectives Work Group will add the details of how to achieve the Biological Goals.

Kevin Mayes suggested adding a geographic component to a biological goal statement. For example, “maintaining Texas wild-rice in the San Marcos River from Spring Lake to the confluence with the Guadalupe River”. Kevin also noted that when using words like “adequate” in reference to water quality standards, it is important to reference the TCEQ water quality guidelines.

Kimberly Meitzen noted the successes of the fountain darter and Texas wild-rice and suggested goals that go beyond the current geographic range for the Covered Species and suggested that future biological goals acknowledge the current long-term biological goal reaches.

The Subcommittee was reminded that the current biological goals that were originally approved by the USFWS do not align with the structure of a biological goal as described in the most up to date HCP Handbook. In summation, the current biological goals are written closer to what biological objective statement.

7. Questions from the public

There were no questions from the public.

8. Future meetings

Meeting #2 will be held on February 16, 2023, from 2:00PM - 4:00PM at the Meadows Center for Water and the Environment.

9. Adjourn

Biological Goals Subcommittee

Meeting #2

Meeting Minutes

February 16, 2023

1. Confirm attendance

Mark Enders, Charlie Kreitler, Rachel Sanborn, Kimberly Meitzen and Kevin Mayes attended the meeting in-person. Jacquelyn Duke attended virtually via Microsoft Teams.

2. Meeting logistics

Mark Enders, Biological Goals Subcommittee Chair, noted that the meeting materials are available online and acknowledged EAA I.T. support should anyone need technical assistance.

3. Overview of Meeting #1 discussion.

Mark Enders provided a review of the first meeting's discussion regarding subcommittee introductions, the current biological goals, and the HCP handbook.

4. Consider staff recommendation to develop new biological goals for the next EAHCP.

Charlie Kreitler noted that since the current biological goals were approved by USFWS, was there a need to change them. USFWS staff responded that it is recommended that the EAHCP biological goals be updated to reflect lessons learned and reiterated that the current goals are written as objectives.

Kevin Mayes suggested adding "revise current biological goals" to the action item. A revision was made to the action item presented to the subcommittee.

A motion was made by Rachel Sanborn, seconded by Charlie Kreitler, to approve of the revision of current biological goals and/ or the development of new biological goals for the next EAHCP. The Subcommittee approved this upon consensus. There were no objections.

5. Discussion on the development of Biological Goals.

Olivia Ybarra reminded the Subcommittee of the HCP Handbook guidelines on the elements of a biological goal and provided examples of broad biological goals from HCPs that were recently approved by USFWS.

Kevin Mayes noted that although San Marcos Gambusia was not included in the list of species to consider in the development of the biological goals, it should be

noted it was not included due to its pending delisting from the Endangered Species Act (ESA). The Comal Springs salamander was also not considered due to the recent removal of the petition for the species to be added to the ESA.

EAHCP staff provided ten suggested biological goals for the Subcommittee to review and discuss. Olivia Ybarra noted that these suggested goals were based on the current biological goals and lessons learned throughout ten years of EAHCP implementation.

Goal 1: Maintain resilient Texas wild-rice populations in the San Marcos River and Spring Lake.

Goal 2: Provide and maintain native habitat to support fountain darter populations in the Comal and San Marcos spring systems.

Goal 3: Maintain covered macroinvertebrate species populations in the Edwards Aquifer, and the Comal and San Marcos spring systems. (Macroinvertebrates: Comal Springs riffle beetle, Comal Springs dryopid beetle, Peck's Cave Amphipod, Edwards Aquifer diving beetle, and Texas troglobitic water slater)

Goal 4: Maintain healthy salamander populations in the Edwards Aquifer and San Marcos spring systems. (San Marcos Salamander and Texas blind salamander)

Goal 5: Maintain healthy populations of each of the Covered Species, within the Permit Area, through habitat conservation, enhancement, and management.

Goal 6: Contribute to maintain springflow in the Comal and San Marcos spring systems for the Covered Species.

Goal 7: Maintain good water quality in the Comal and San Marcos spring systems for the Covered Species.

Goal 8: Promote the importance of habitat conservation in the Edwards Aquifer region.

Goal 9: Support land conservation in the Edwards Aquifer region.

Goal 10: Manage recreational impacts to the Covered Species and their habitat.

In their discussions, the Subcommittee considered grouping several suggested goals into one broad goal. Another Subcommittee consideration was to develop a very broad goal that reflects the vision of the EAHCP and could potentially encompass several biological objectives that would not be appropriate in a goal focused on a specific species. Kevin Mayes noted that goals that reflect human mediated concepts and have recreation components should be considered as a biological goal. The general purpose of the Subcommittee was to develop an overarching, broad goal with several additional goals related to each species or habitat grouping.

The Subcommittee discussed doing some homework to revise the suggested biological goals or develop new proposed goals to email out or bring to the next subcommittee meeting for further discussion.

The Subcommittee will continue their discussion on revisions and groupings of the suggested biological goals at the next meeting.

6. Questions from the public

There were no questions from the public.

7. Future meetings

Meeting #3 will be held on March 2, 2023, from 2:00PM - 4:00PM at the Pauline Espinosa Community Hall.

8. Adjourn



Biological Goals Subcommittee

Meeting #3
Meeting Minutes
March 2, 2023

1. Confirm attendance

Mark Enders, Charlie Kreitler, Rachel Sanborn, Kimberly Meitzen, Jacquelyn Duke and Kevin Mayes attended the meeting in-person.

2. Meeting logistics

Mark Enders, Biological Goals Subcommittee Chair, noted that meeting materials are available online and acknowledged EAA I.T. support should anyone need technical assistance.

3. Approval of meeting minutes from February 2 and February 16, 2023.

A motion was made by Rachel Sanborn and seconded by Charlie Kreitler, to approve the meeting minutes from the February 2 and February 16, 2023 Biological Goals Subcommittee meetings. There were no objections.

4. Overview of Meeting #2 discussion.

Olivia Ybarra provided a review of the second meeting's discussion including an introduction to the Biological Objectives Subcommittee, continued discussion on biological goals per the HCP Handbook and additional examples from other HCPs.

5. Continued discussion on suggested biological goals.

The Biological Goals Subcommittee was provided draft goals that were submitted to EAHCP staff. The Subcommittee reviewed and revised the draft goal submissions. Key terms were defined to reduce ambiguity. The Subcommittee agreed to define "Conserve" as a means to protect, restore, and enhance the Covered Species and their habitats. Additional key terms were described and intended to be included in the Biological Goals Subcommittee Report. The following are the biological goals the Biological Goal Subcommittee generated as a product of their discussion.

Goal 1: Conserve the quantity and quality of springflow and ecosystem characteristics within the Plan Area to provide for the resiliency of the Covered Species.

Goal 2: Promote environmental outreach, support land and water conservation, and mitigate anthropogenic and environmental disturbances within the Plan Area for the benefit of the Covered Species.

Goal 3: Conserve habitats and diverse native aquatic vegetation assemblages to support resilient fountain darter populations in the Comal and San Marcos spring and river systems.

Goal 4: Conserve and manage a resilient Texas wild-rice population in the San Marcos spring and river system.

Goal 5: Conserve habitats to support resilient Texas blind salamander, Comal Springs dryopid beetle, Peck's cave amphipod, Edwards Aquifer diving beetle, and Texas troglobitic water slater populations in the Plan Area.

Goal 6: Conserve habitats to support resilient Comal Springs riffle beetle populations in the Plan Area.

6. Next steps of the Biological Goals Subcommittee.

Olivia Ybarra described the next steps of the Subcommittee. A draft report will be prepared by EAHCP staff and submitted to the Subcommittee on March 6 for review and comment. The fourth and final meeting will include the consideration to approve the Biological Subcommittee Report.

7. Questions from the public

There were no questions from the public.

8. Future meetings

Meeting #4 will be held on March 16, 2023, from 2:00PM - 4:00PM at the Meadows Center for Water and the Environment.

9. Adjourn



Biological Goals Subcommittee

Meeting #4
Meeting Minutes
March 16, 2023

1. **Confirm attendance.**
Mark Enders, Charlie Kreidler, Rachel Sanborn, Kimberly Meitzen and Kevin Mayes attended the meeting in-person. Jacquelyn Duke attending the meeting virtually via Microsoft Teams.
2. **Meeting logistics.**
Mark Enders noted that meeting materials were available online on the EAHCP website under Biological Goals Subcommittee and I.T. support for virtual attendees.
3. **Approval of meeting minutes from March 2, 2023.**
A motion was made by Kevin Mayes and seconded by Rachel Sanborn to approve the meeting minutes from the March 2, 2023 Biological Goals Subcommittee meeting. There were no objections.
4. **Review of final Biological Goal recommendations and Subcommittee Report.**
The Biological Goals Subcommittee reviewed and edited the draft Subcommittee Report. The final report contains all edits, comments, and suggestions provided by the Subcommittee members.
5. **Consideration to approve the Biological Goals Subcommittee Report.**
A motion was made by Jacquelyn Duke, seconded by Kimberly Meitzen, to approve the Biological Goals Subcommittee Report and submittal to the EAHCP Committees (Stakeholder, Implementing, and Science), Permit Renewal Contractor (ICF), and all relevant Subcommittees. There were no objections.
6. **Questions from the public.**
There were no questions from the public.
7. **Future meetings.**
None.
8. **Adjourn.**