

BAT Recommendations for the SEP-HCP Conservation Program

While the following document represents the BAT discussions and recommendations made over the past 2 months, a procedural error in a motion made on Nov 4th requires that some items be noted as DRAFT (and italicized). The BAT will entertain a more comprehensive motion on Wednesday, Nov 17 to finalize this document as presented below. At that time, it is expected that the italicized draft items will become final.

Some items are presented as (required) and some as (recommended). In the final document, Plan Applicants have an option to specify items as either Requirements or Goals. The BAT makes a distinction thusly.

GCW Conservation Program

Summary:

The BAT recommends that GCW take occurring in Bexar County be mitigated at a ratio of 3:1 (acres of mitigation : acres of take), with at least 60% of the mitigation located within Bexar County or a 5-mile buffer around Bexar County. The remaining 40% of the mitigation may occur elsewhere within the Plan Area.

The BAT recommends that GCW take occurring outside of Bexar county be mitigated at a ratio of 2:1 (acres of mitigation : acres of take). Mitigation for take occurring outside of Bexar County may be located anywhere within the Plan Area.

The BAT recommends that no more than 10% of the GCW conservation credits be generated from public lands that were protected as of November 4, 2010.

Rationale:

Mitigation Ratios – The HCP requires that mitigation must be commensurate with the take, both in size and location. The GCW is experiencing a severe amount of habitat loss in Bexar County and, therefore, the degree of threat to the species is greater in Bexar County than in more rural counties. This higher degree of threat to the species warrants a higher mitigation ratio for take. Habitat outside of Bexar County is less threatened by habitat loss and may not require as much mitigation to offset the impacts of take.

Bexar County Mitigation – To help address the severe threat of habitat loss in Bexar County, it is appropriate to require a substantial portion of the mitigation for Bexar County take to be located in or just outside of the county boundary. This requirement also addresses the community's desire to help protect the mission at Camp Bullis and protect the biological integrity of previous public conservation investments (i.e., Government Canyon and other City of San Antonio preserves). Conserving additional lands that expand and/or connect these currently protected properties is necessary to ensure the long-term conservation value of these properties for the GCW.

Scenarios:

The BAT presents two examples for the amount of authorized take and the corresponding mitigation under the recommended approach described above (see attached Table). The amount of mitigation needed for the plan must correspond to the amount of authorized take. Scenario 1 illustrates the amount of incidental take that might be authorized via the mitigation formula recommended above, if the goal is to achieve a preserve size that represents the BAT's previous recommendation of 85,000 acres. Scenario 2 illustrates the amount of mitigation that would be required by the recommended mitigation formula for a more modest level of incidental take authorization.

1. Mitigation Ratio

- 1.1 Incidental Take of GCW Habitat in Bexar County should be mitigated at a ratio of 3:1 (acres of mitigation : acres of take), with at least 60% of the mitigation located within Bexar County plus a buffer around Bexar County. The remaining 40% of the mitigation may occur elsewhere within the Plan Area.
- 1.2 The BAT recommends that GCW take occurring outside of Bexar county be mitigated at a ratio of 2:1 (acres of mitigation : acres of take). Mitigation for take occurring outside of Bexar County may be located anywhere within the Plan Area.

2. Preserve Configuration (DRAFT)

- 2.1. Create preserves composed of individual parcels or clusters of adjacent parcels that include at least 500 acres of GCW habitat. Smaller parcels may be obtained to contribute to the preserve, but no credit is awarded unless the parcel contributes to a block of habitat that is 500 acres or greater (See Figure 1)
- 2.2. Prioritize the creation of a preserve system composed of conservation areas for the GCW that each contains approximately 5,000 to 10,000 acres of protected lands, which includes GCW habitat. These conservation areas will likely include currently protected parcels.

Rationale: Patch size of 500 acres is an important predictor of habitat occupancy (Magness et al. 2006, Groce et al. 2010). Large contiguous patches of GCW habitat are distributed throughout several subregions of the Plan Area, in varying sizes, watersheds, and geologic types. Preserve units on the order of 5,000 to 10,000 acres are achievable and would be sufficiently large to reduce habitat threats, given appropriate management.

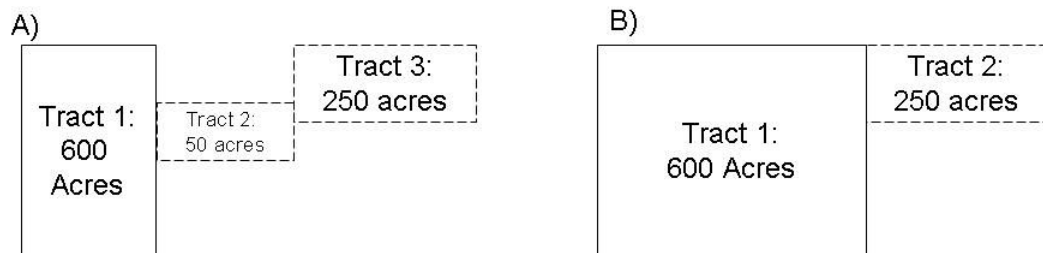


Figure 1. Solid border depicts protected lands with a legally binding conservation easement. Dashed lines represent properties being considered for enrollment in the Preserve. A) Tract 2 and 3 may be purchased at any time for the Preserve, but will not contribute to mitigation credits until the block meets or exceeds 500 acres. Tract 2 is eligible at any time for credit. Tract 3 will not contribute to credit until it is connected to an additional 250 acre block. (In this scenario, when Tract 2 is obtained. B) Tract 2 is immediately eligible for credit because it is adjacent to a block with at least 500 acres under protection.

3. Preserve Distribution

- 3.1. Lands mitigated for Take occurring in Bexar County must be mitigated 60% within Bexar County or a buffer around Bexar County (Required)
- 3.2. The buffer for Bexar County mitigation extends 5 miles from the County line. (recommended)
- 3.3 *DRAFT: Prioritize the protection of focal areas for the GCW in each of the Plan Area counties, except for Blanco County. (recommended)*
- 3.4 Prioritize the acquisition of preserve parcels that expand upon or help connect existing conserved lands and parks within the Plan Area (recommended)

Rationale: Protection of additional habitat in and adjacent to Bexar County is needed to conserve the species in that part of the species' range, prevent range contraction, and alleviate the threat of habitat loss to the species. Protection of several focal areas throughout the Plan Area is important for maintaining multiple subpopulations,

connected through a preserve system that protects major blocks of habitat, prevents susceptibility to disease, and limits habitat degradation from encroachment, predators, and human disturbance. Planning future land conservation around currently existing protected lands would help ensure the most effective use of financial resources to achieve biologically significant, regional conservation of endangered species and complement other conservation efforts in the region, such as aquifer protection.

4. Use of already protected public lands

- 4.1 No more than 10% of the preserve system should consist of land publicly owned as of November 4, 2010. To qualify as a preserve component, a new conservation easement must be developed for GCW conservation and management. (required)
This requirement should not be perceived to influence the spatial arrangement of the preserve system.

Rationale: Preserve size was calculated based on the harm to the species by new incidental take activities, so the bulk of the mitigation lands should consist of new lands not already protected in the public trust.

5. Mitigation (DRAFT)

- 5.1 *Mitigate for impacts of GCW take resulting from participating projects by permanently protecting GCW habitat in the Plan Area at a rate proportional to the relative severity of the impact or degree of harm to the species.*
- 5.2 *Secure the mitigation to offset the impact to the GCW of take from participating projects before such take occurs.*

6. Management and Biological Monitoring (DRAFT)

- 6.1 *Manage protected GCW habitat within preserves for the benefit of the GCW by minimizing threats and maintaining, restoring, or enhancing high quality habitat for the GCW.*
- 6.2 *Monitor GCW populations and habitats to track the status of the species within the preserve system and to inform the adaptive management process.*

7. Research: Contribute to the body of scientific knowledge to benefit the recovery of the GCW (DRAFT)

Karst Conservation Program

The BAT recommends approaching the karst conservation program using an “Upfront Conservation with In-Lieu Fee Approach”, whereby:

- Karst participation is applicable for participating projects that occur within Karst Zones 1 – 4 (i.e., the “karst region”, mostly occurring in Bexar and Medina counties). The karst region is divided into 6 distinct “Karst Faunal Regions.”
- The Plan will offer incidental take authorization for the covered karst species only in KFRs where at least 3 caves (or “Karst Faunal Areas”) have been permanently protected for these species. At least one of these protected KFAs must meet the standards for a “high quality” preserve and the remaining 2 must meet the standards for a “medium quality” preserve. The Plan will not be able to provide take authorization for covered karst species within a KFR until this upfront mitigation has occurred.
- The Plan will then contribute to the creation of at least 2 high quality Karst Faunal Areas and 4 medium quality KFAs for each of the covered karst species in each of the KFRs (Total of 6 KFAs per KFR per species)
- In KFRs where take authorization is allowed, plan participants will provide mitigation fees to the Plan to offset the impacts of the project on karst species. The Plan will collect and

use karst mitigation fees to protect caves in other KFRs to expand opportunities for take coverage.

- Based on current information, the BAT believes this approach assures that regional recovery of the covered species is possible in a KFR (thereby avoiding a jeopardy situation) prior to authorizing take in that KFR.

Rationale:

This approach addresses aspects of karst preserve size, configuration, and location. The recommendation for the establishment of 6 KFAs per KFR per species is based on substantial uncertainties regarding the taxonomic status of these poorly known species, persistence of the species within preserves under changed circumstances, and the paucity of basic biological and habitat/range information for these species.

Taxonomic uncertainty associated with cave organisms: Cave species are exceptionally difficult to differentiate because of convergent evolution. Similar ancestors invade caves and experience the same selection pressures (lack of light, near constant temps, high humidity, paucity of food, periodicity of nutrients), and this tends to make them morphologically indistinguishable. For this reason it is common for cave species to become "split" as more detailed research is performed. If the species are split, then their range is also reduced and they may be limited to fewer KFR's, in which case recovery can no longer be reached and therefore participation permits will be halted.

Uncertainty regarding the persistence of cave preserves based on the potential for natural or man-made catastrophic events: To actually reach recovery, the recovery plan calls for substantial additional research to demonstrate the adequacy of the recovery criteria. Since very little is known about the biology and needs of cave organisms, many of these research objectives include gathering basic information on efficacy of different preserve sizes, vegetation components, and connectedness with other preserve areas. Because of this inherent uncertainty about these species, the plan also calls for monitoring to demonstrate population viability for at least thirty years. Since all of those additional actions will not necessarily be done in the timeframe of this plan, this plan proposes three additional preserves in each KFR as a 'buffer' to make up for that lack of information.

Lack of recent information about species boundaries: Most of the species boundaries given in the recovery plan are based on a single paper that was authored decades ago, and these papers may have been based on as few as one specimen. In general there is an extreme lack of verification of this information, partially based on a paucity of specimens available and a lack of taxonomists qualified to do the work. In some cases there is evidence for potential habitat barriers within the range of a species, and these barriers may in fact turn out to divide populations that are considered species (given an evolutionary species concept). In these cases, the recovery criteria would jump from 3 caves per KFR to 6, and the preserve goal would be met by this plan.

The BAT recommends the following criteria or standards for a Karst Preserve (i.e., a KFA):

- Protected caves may qualify as a KFA suitable for meeting the upfront conservation commitment if:
 - KFAs must be permanently protected for the benefit of the species through an appropriate legal mechanism. Appropriate management of protected habitats must also be assured.

- High quality KFAs be sufficient to maintain the following habitat elements, as described in the Bexar County Karst Invertebrates Draft Recovery Plan (date March 2008):
 - High humidity
 - Stable temperatures
 - High water quality of surface drainage basin
 - High water quality of subsurface drainage basin
 - Low red-imported fire ant (RIFA) predation
 - Healthy cave cricket population
 - Natural quantities of native vertebrate matter input
 - Natural quantities of native plant matter input
 - Healthy native surface arthropod community
 - Healthy native surface plant community
 - Adjacent karst features for cave cricket metapopulations
 - Good connectivity with mesocaverns for population dynamics of troglobites
 - *Acreage is $\geq XXX$ (to be determined)*
- Medium quality KFAs must maintain most of the following elements identified for a high quality KFA. *The acreage needed for a medium quality KFA is $\geq XX$ (to be determined).*
- Previously protected caves may count towards the upfront conservation commitment if they meet the standards for high or medium quality KFAs.

The BAT recommends the following process for assessing karst impacts and mitigation requirements. However, this process does not substitute for any other local, state, or federal rules or regulations.

- For participating projects in Karst Zones 1 – 4, conduct karst surveys in accordance with the process described in USFWS (2006), as summarized below.
 - Step 1: Conduct an Initial Karst Feature Survey. It is preferred that geologists performing these surveys have experience conducting karst invertebrate habitat surveys with a permitted biologist.
 - **NOT CONFIRMED PRESENT:** If no features are identified from the surface assessment, then the assessment process is complete and mitigation fees are assessed on a per-acre basis (see mitigation fee structure below). The per-acre assessment addresses potential impacts to undetected sub-surface karst features that may be occupied by the covered karst species and encountered during construction. The per-acre assessment also addresses general, indirect impacts to karst habitat (including features outside of the project area).
 - Per-Acre Karst Mitigation Fees (no known occupied caves):
 - Karst Zones 1 and 2 = \$x per-acre within the project area
 - Karst Zones 3 and 4 = \$x per-acre within the project area

- CONFIRMED PRESENT: If karst features are identified, then additional work is needed to determine if the features may provide habitat for karst invertebrates.
 - Step 2: Conduct a suitable habitat determination. It is preferred that geologists performing these surveys have experience conducting karst invertebrate habitat surveys with a permitted biologist.
 - NOT CONFIRMED PRESENT: If identified karst features do not represent suitable habitat for karst invertebrates, then the assessment process is complete and mitigation fees are assessed on a per-acre basis, as described above in Step 1.
 - CONFIRMED PRESENT: If identified karst features do represent suitable habitat for karst invertebrates, then additional work is needed to determine if endangered karst invertebrates are present.
 - Step 3: Conduct a Karst Invertebrate Study.
 - NOT CONFIRMED PRESENT: If suitable habitat is not found to be occupied by endangered karst invertebrates (including the covered karst species and the Category 2 karst species), then the assessment process is complete and mitigation fees are assessed on a per-acre basis as described above.
 - CONFIRMED PRESENT: If endangered karst invertebrates are present, then the participant begins informal consultations with the Service to identify which avoidance or mitigation options are available.
 - Avoid Impacts: To avoid impacts you must avoid actions within one or more of the following areas, with case-by-case Service approval:
 - Surface drainage basin
 - Subsurface drainage basin
 - Cricket foraging range (105m)
 - Cave footprint
 - Mitigation Credit: Establish a high or medium quality KFA around the cave suitable for use as mitigation for impacts to karst species. Mitigation may be used by the plan participant to offset other karst impacts within the same KFR or may be acquired by the Plan to help achieve the goals and objectives of the Plan. Per-acre mitigation fees for karst species on other areas outside of the KFA will be waived for the project. If creating a high or medium quality KFA is not possible given the available acreage, the Service can evaluate the on-site mitigation on a case-by-case basis.
 - Karst Impact Mitigation Fees: Only applicable for projects that occur in KFRs where the upfront conservation commitments have been achieved. Is not applicable for any caves that contain Category 2 karst species (these species are not covered for incidental take). Mitigation fees within Karst Impact Areas will be assessed based on the acreage of surface disturbance within the karst area of impact. Per-acre mitigation fees, as described above) for areas outside of the karst area of impact will also be assessed.

- Impact Area 1 (0 – 150 feet from the cave entrance) - \$xxxx per acre of surface disturbance within the zone
- Impact Area 2 (150 – 345 feet from the cave entrance) - \$xxx per acre of surface disturbance within the zone.
NOTE: The BAT is still reviewing the 345 ft designation and will clarify soon.
- Alternate Survey Zones: Delineate the cave footprint, surface drainage basin, and subsurface drainage basin of the cave.
 - Cave Footprint = \$xxxx per acre of surface disturbance within the area
 - Surface Drainage Basin = \$xxx per acre of surface disturbance within the area
 - Cave cricket foraging area = \$xxx per acre of surface disturbance within the area
 - Subsurface Drainage Basin = \$xxx per acre of surface disturbance within the area

BAT Considered Scenarios for GCW Take and Mitigation Levels under the Recommended Mitigation Ratios.

The BAT considered the following scenarios for GCW take and mitigation under the recommended mitigation ratios and locations. These examples use the same numerical formulas, but illustrate how adjusting the level of authorized take affects the corresponding amount of required mitigation. The CAC may choose to adjust the amount of take authorization to target a larger or smaller preserve size.

Scenario	Available Habitat		Anticipated Habitat Loss		Proposed Amount of Authorized Take			Acres of Mitigation (habitat acres)			Total Preserve Size (incl. non-habitat buffers)				
	Bexar	Other	Total	Bexar	Other	Total	Bexar	Other	Total	Bexar	Other	Total			
Scenario 1	59,300	613,988	673,288	15,285	44,066	59,351	12,000	16,000	28,000	21,600	46,400	68,000	27,000	58,000	85,000
Scenario 2							8,000	7,361	15,361	14,400	24,322	38,722	18,000	30,403	48,403

Notes:

Available Habitat and Anticipated Habitat Loss -- Available habitat estimates based on the results of 2005-2006 GCW habitat model "Model C2LOD" prepared by MoRAP. Anticipated Habitat Loss based on land development projections revised as of September 27, 2010. Estimates of available habitat and anticipated habitat loss are being refined and are subject to change.

Amount of Authorized Take (Scenario 1) -- Illustrates the amount of incidental take that could be authorized for the GCW by following the recommended mitigation ratios, if the goal is to achieve an 85,000-acre preserve. The BAT previously suggested that the plan should seek to protect approximately 85,000 acres for the GCW as a substantial contribution to recovery of the species, which the BAT defined as achieving 75% of the recovery targets for 2 GCW recovery units.

Amount of Authorized Take (Scenario 2) -- The proposed take authorization is based on a sector-level assessment of the severity of anticipated habitat loss. The amount of take authorized varies with the relative severity of the loss in that sector. For Low Severity sectors, the plan would cover 20% of anticipated habitat loss. For Medium Severity sectors, the plan would cover 40% of anticipated habitat loss. For High Severity sectors, the plan would cover 70% of anticipated habitat loss.

Total Preserve Size - Includes an additional 25% land area to accommodate habitat buffers or other areas of non-habitat typical of the mosaic of habitat types in the Plan Area.