UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al.	§	
Plaintiffs,	§	
	§	
v.	§	No. 1:15-cv-01174-LY
	§	
UNITED STATES FISH & WILDLIFE SERVICE, et al.	§	
Defendants.	§	

PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT

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To the Honorable Lee Yeakel, United States District Judge:

Come now, Plaintiffs American Stewards of Liberty; Charles and Cheryl Shell; Walter Sidney Shell Management Trust; Kathryn Heidemann; and Robert V. Harrison, Sr., to file this Motion for Summary Judgment ("Motion") pursuant to Rule 56 of the Federal Rules of Civil Procedure.

Plaintiffs respectfully move this Court for an order granting summary judgment in favor of Plaintiffs. Plaintiffs have concurrently filed a memorandum in support, declarations, and a proposed order granting Plaintiffs' Motion. This Motion is made on the grounds that: (1) Defendants applied an unlawful, overly burdensome standard of review in making its May 4, 2017 "not substantial" 90-day finding ("2017 Finding") on a petition to delist the endangered Bone Cave harvestman (*Texella reyesi*) ("BCH"); (2) Defendants failed to consider claims in the petition that BCH was listed in error, as required by 50 C.F.R. 424.11(d)(3); (3) Defendants misapplied their own regulations in making the 2017 Finding; and (4) Defendants' unlawfully judged the petition based on whether it proved that non-mandatory recovery "criteria" for the BCH had been met. Plaintiffs' Motion is based on the administrative record filed by Defendants on August 14, 2017 (ECF No. 122), pleadings and papers filed in this action and this Motion, as well as the accompanying memorandum, declarations, and any additional response, evidence, or argument that counsel will make at or before the hearing.

Plaintiffs move for summary judgment invalidating the 2017 Finding, and declaratory judgment by this Court that Defendants make a new 90-day finding in which the U.S. Fish and Wildlife: (1) determines whether the petition includes "substantial scientific and commercial information indicating that" delisting "may be warranted"; (2) actually analyzes whether BCH was listed in error, as provided in the petition; (3) applies the standard set forth by Defendants' own petition review regulations, as interpreted by federal courts; and (4) recognizes that the recovery plan covering the BCH, as well as other sources relied upon by Defendants in making the 2017 Finding merely serve as guidance and do not hold the force of law, and failure to meet such guidance, in any event, does not prohibit delisting.

MEMORANDUM IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT

I. INTRODUCTION

Plaintiffs American Stewards of Liberty ("ASL"), Charles Shell, Cheryl Shell, Walter Sidney Shell Management Trust, Kathryn Heidemann, and Robert V. Harrison, Sr. (collectively, "Plaintiffs") move this court to set aside the U.S. Fish and Wildlife Service's ("FWS") 90-day Finding on a Petition to Remove the Bone Cave Harvestman from the List of Endangered and Threatened Wildlife ("2017 Finding").[1] 82 Fed. Reg. 20,861 (May 4, 2017), M003523–25.[2]

Plaintiffs are among those who, on June 2, 2014, submitted a petition ("Petition") to delist the Bone Cave harvestman ("BCH") pursuant to section 4(b)(3)(A) of the Endangered Species Act ("ESA"), which provided FWS substantial scientific and commercial information indicating that the BCH should be removed from the list of endangered and threatened wildlife because: (1) the original listing was in error; and (2) in any event, the species has recovered and listing is no longer warranted. M000185-249; *see also* 16 U.S.C. § 1533(b)(3)(A); 50 C.F.R. § 424.14(b)(1) (2014).[3]

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[1] The 2017 Finding published in the Federal Register explained that "[t]he basis for our finding on this petition, and other information regarding our review of this petition can be found as an appendix at ***http://www.regulations.gov*** under Docket No. FWS-R2-ES-2017-0018 in the Supporting Documents section." For the purposes of this Motion, we refer to the 2017 Finding and Supporting Documents collectively as the "2017 Finding." *See* M003523-25; M003393–424; M003425–442.

[2] Where Plaintiffs cite to the Administrative Record lodged by Defendants, citations beginning with an "R" refer to References and Literature Cited, whereas citations beginning with an "M" refer to the Main Index and PDFs.

[3] In 2016, USFWS published in the Federal Register "Revisions to the Regulations for Petitions" (the "2016 Petition Review Regulations"). 81 Fed. Reg. 66,462 (Sept. 27, 2016). The 2016 Petition Review Regulations bore an effective date of October 27, 2016. *Id*. USFWS indicated in the 2017 Finding that because the agency received the Petition prior to the effective date of the 2016 Petition Review Regulations, the Petition was reviewed pursuant to the petition review regulations that were in place at the time the Petition was received ("Former Petition Review Regulations"). Plaintiffs make no claim with respect to whether the Petition should have been reviewed pursuant to the 2016 Petition Review Regulations; however, as is discussed in section V(D)(3) *infra*, it is Plaintiffs contention that despite its claim that FWS reviewed the Petition pursuant to the Former Petition Review Regulations, the agency, in fact, reviewed the Petition pursuant to the 2016 Petition Review Regulations.

Among other things, the Petition pointed out that the number of caves known to be occupied by BCH has increased more than 30-fold, from five or six at the time of listing to more than 170 today, that more than 90 of the known locations are protected, including more than 20 that are permanently protected and/or are under long-term management for the benefit of the species, and that multiple state and local regulatory mechanisms were adopted after the BCH was listed that provide benefits to the species. M000207–8; M000219–23. Additionally, the known range of the species had more than doubled since the 1988 Listing Rule. M000207. There are no data or analyses that provide any indication that there has been a decline in the abundance of BCH or that the species' range has diminished over time. The only scientific information that bears upon abundance and range are the data set forth above. Nonetheless, FWS concluded that the Petition did not "present substantial scientific and commercial information indicating the petitioned action may be warranted." M003524. In making the 2017 Finding, however, FWS made four critical errors.

First, FWS unlawfully applied to the 2017 Finding an overly burdensome standard of review. *See, e.g.*, 16 U.S.C. § 1533(b)(3)(A); 50 C.F.R. § 424.14(b)(1) (2014). The record in this case clearly demonstrates that rather than apply the proper, limited standard of review at the 90-day finding stage, FWS applied an exacting standard, attempting to disprove every element of the Petition and dismissing the strongest inferences to be drawn from the best scientific and commercial data available. Moreover, while the only demographic data available with respect to this species are the number of known, occupied caves and those data have grown dramatically over the 30-year period since the species was listed, FWS repeatedly insisted that because there is a lack of population trend data, the Petition did not present substantial scientific and commercial information indicating delisting *may be* warranted.

Second, while Defendants recognized that the Petition asserted that the BCH was listed in error, Defendants nevertheless failed to analyze at the 90-day finding stage whether the species was, in fact, listed in error. Rather, Defendants improperly reviewed species status information against documents and guidance, such as the BCH 5-year Review ("5-year Review") and

Recovery Plan for Travis and Williamson County Karst Invertebrates ("Recovery Plan"), which never would have existed or applied to the BCH had the species not been listed in the first place.

Third, even though Defendants stated the Petition was reviewed in light of FWS' Former Petition Review Regulations, it is apparent that, in fact, Defendants reviewed the Petition against the standard set forth in 2016 Petition Review Regulations. Whichever Petition Review Regulations FWS applied were applied incorrectly because: (1) the agency used at the 90-day finding stage an overly burdensome evidentiary standard; and (2) FWS dismissed the information provided in the Petition out of hand as information that was not "new," despite clear language in the agency's own regulations to the contrary.

Finally, the 2017 Finding was unlawful because it was based primarily on Defendants' assertion that the Petition did not present substantial information indicating that (non-mandatory) recovery "criteria" established in the Recovery Plan and other (non-mandatory) guidance, such as FWS' Karst Preserve Design Recommendations, had been met. M003405–07.

II. LEGAL BACKGROUND

Congress enacted the ESA in 1973 in order to "provide a means whereby the ecosystems upon which endangered species…depend may be conserved" and to "provide a program for the conservation of . . . endangered species . . . ." 16 U.S.C. § 1531(b).[4] The ESA defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range . . . ." *Id*. at § 1532(6).

Pursuant to section 4 of the ESA, Defendants have the statutory authority to list a species as either endangered or threatened when specific criteria are met. *See* 16 U.S.C. § 1533(a)(1). The term "species" includes "any subspecies of fish or wildlife or plants, and any distinct

[4] Although the ESA is administered by both the Secretary of the Interior and Secretary of Commerce, because the BCH is a species over which only the Secretary of the Interior has jurisdiction, Plaintiffs refer only to the Secretary of Interior ("Secretary") and, specifically, to FWS, as the agency to whom the Secretary has delegated its authority, when discussing the ESA and relevant regulations.

population segment of any species of vertebrate fish or wildlife . . . ." *Id*. at § 1532(16). Defendants are required to make listing determinations "solely on the basis of the best scientific and commercial data available to [them] after conducting a review of the status of the species . . . ." *Id*. at § 1533(b)(1)(A).

Section 4 of the ESA authorizes "interested persons" to submit to FWS petitions requesting that a species be placed on the list of endangered or threatened species ("listed"), removed from such list ("delisted"), or reclassified from threatened to endangered or vice versa. 16 U.S.C. § 1533(b)(3)(A). Section 4 further directs FWS, to the maximum extent practicable, with 90 days of receiving a petition, to make a finding as to whether it "presents substantial scientific or commercial information indicating that the petitioned action may be warranted." *Id*.

FWS' Former Petition Review Regulations, which were in place at the time the Petition was submitted to FWS, defined "substantial information" as "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted." 50 C.F.R. § 424.14(b)(1) (2014). FWS' 2016 Petition Review Regulations define "substantial scientific or commercial information" as "credible scientific or commercial information in support of the petition's claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted." 50 C.F.R. § 424.14(h)(1)(i) (2016). A more detailed discussion of the substantial information standard prescribed by the 2016 Petition Review Regulations is set forth in section V(D)(2) *infra*.

ESA section 4 requires that within 12 months of receiving a petition that FWS determines to present substantial scientific or commercial information indicating the petitioned action may be warranted, Defendants are required to make a finding ("12-Month Finding") that (i) the petitioned action is not warranted; (ii) the petitioned action is warranted; or (iii) the petitioned action is warranted but precluded by other higher priority actions. 16 U.S.C. § 1533(b)(3)(B).

FWS regulations explain that "[t]he principal goal of [FWS] is to return listed species to a point at which protection under the [ESA] is no longer required." 50 C.F.R. § 424.11(d)(2). According to the same FWS regulations, delisting is appropriate where:

> the best scientific and commercial data available…substantiate that the species is neither endangered nor threatened for one or more of the following reasons:
>
> (1) Extinction . . .
>
> (2) Recovery . . . A species may be delisted on the basis of recovery only if the best scientific and commercial data available indicate that it is no longer endangered or threatened.
>
> (3) Original data for classification in error. Subsequent investigations may show that the best scientific or commercial data available when the species was listed, or the interpretation of such data, were in error.

Id. at § 424.11(d)(1)-(3).

The ESA identifies five listing factors ("Listing Factors") on which it may base a decision to list (or delist) a species. 50 C.F.R. § 424.11(c), (d). These factors are: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) Over utilization for commercial, recreational, scientific, or educational purposes; (3) Disease or predation; (4) The inadequacy of existing regulatory mechanisms; or (5) Other natural or manmade factors affecting its continued existence.16 U.S.C. § 1533(a)(1); *see also* 50 C.F.R. § 424.11(c).

III. STATEMENT OF FACTS

A. Bone Cave Harvestman Listing History

The BCH is a pale, orange, eyeless harvestman (spider-like) species that is evolutionarily adapted to spending its entire life in caves. R000023; R005238. Very little is known about the species despite the fact that it has been listed for nearly 30 years. For example, scientists do not understand its reproductive habits, its life span, or the size of the species' historical and contemporary populations. Further, there exists no data or analyses providing any indication whether the populations of the species are growing or in decline or whether the species' range has expanded or contracted over time other than data regarding simple presence or absence in known caves. Even species presence or absence is viewed by FWS as uncertain, as evidenced by new survey protocols adopted by FWS in 2015, which require 14 separate visits to a cave before

one may determine "probable absence" of a listed karst invertebrate. FWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys for Endangered Karst Invertebrates in Central Texas, FWS (May 21, 2015) ("2015 Survey Protocols"), https://www.fws.gov/southwest/es/Documents/R2ES/Karst_Survey_Procedures_20150528.pdf at 1. FWS first listed BCH as endangered under the ESA in 1988 under the name Bee Creek Cave harvestman (*Texella reddelli*). 53 Fed. Reg. 36,029 (Sept. 16, 1988) ("1988 Listing Rule"); R004780–84. In 1993, FWS recognized BCH as a separate species and published a final rule listing the BCH. 58 Fed. Reg. 43,818 (Aug. 18, 1993) ("Taxonomic Split and Technical Correction"); R004882–4884.

1. Original Listing (1988)

In 1988, FWS extended the protection of the ESA to five species of karst invertebrates known, at that time, to occur only in five or six caves in Travis and Williamson Counties, Texas ("1988 Listing Rule", including the Bee Creek Cave harvestman (*Texella reddelli*)). R004780–84. In the 1988 Listing Rule, FWS stated that "[u]rban, industrial, and highway expansion are planned or ongoing in the area containing the cave habitat of these species." *Id.* FWS deemed threats to the five species so severe that the agency waived the typical 30-day delay between publication of the final rule to list the species and the rule's effective date. R004781.

As the Petition pointed out, the 1988 Listing Rule was based on precious little data: FWS relied on merely seven referenced data sources to substantiate the 1988 Listing Rule. M000196; R004780–84. Further, of the seven referenced data sources, only one was less than ten years old at the time of the 1988 Listing Rule, and only one had a specific reference to *Texella reddelli* (which was ultimately split into two species: *Texella reddelli* and BCH). *Id*. As noted above, and as evidenced by the 1988 Listing Rule and 1993 Taxonomic Split and Technical Correction, neither FWS nor the scientific community understood even the most basic life history of the BCH at the time the species was listed—including its taxonomy. *See, e.g.*, R004780-84;

R004882–84. Indeed, in the 1988 Listing Rule, FWS did not appear to contemplate the possibility that additional locations of the BCH may exist. *See generally*, R004780–84.

2. 1993 Taxonomic Split and Technical Correction

In 1993, FWS determined that *Texella reddelli* was, in fact, two distinct species, and proceeded to extend the full protection of the ESA to a "new" species, BCH, through the Taxonomic Split and Technical Correction. R004882–84. In the Taxonomic Split and Technical Correction, FWS acknowledged that the known range of the BCH had expanded since listing. R004882–83. FWS did not, at that time, analyze whether the species was listed in error.

3. 1993 Petition to Delist and Negative 90-day Finding

On June 7, 1993, Judge John C. Doerfler, representing the Williamson County Commissioners Court, submitted a petition to FWS requesting the agency delist seven karst invertebrate species, including BCH. R005051. On March 14, 1994, FWS made a negative 90-day finding ("1994 Finding") on that petition, concluding that despite the fact that known locations of the BCH had increased from approximately 6 to approximately 69, an analysis of the listing factors indicated that the BCH was still endangered. R005051–54. FWS did not consider in the 1994 Finding whether BCH may have been listed in error.

B. Recovery Plan and 5-year Status Review

1. Endangered Karst Invertebrates Recovery Plan (1994)

In 1994, FWS completed its Recovery Plan. R00002. The Recovery Plan addresses seven karst invertebrate species and, perhaps most notably, relies on the "Karst Fauna Region" ("KFR") hypothesis described by George Veni and Associates in 1992[5] as the basis for the

[5] According to Veni's KFR hypothesis, there are 11 distinct KFRs within Burnet, Travis, and Williamson Counties, Texas, which are based on "geologic continuity, hydrology, and the distribution of 38 rare troglobites." R000075. The Recovery Plan states that the species covered by the Plan will be "considered for downlisting when three karst fauna areas ["KFAs"] (if at least three exist) within each KFR in each species' range are protected in perpetuity." R000084. The BCH was, at that time, known from six KFRs: North Williamson County; Georgetown; McNeil/Round Rock; Cedar Park; Jollyville Plateau; and Central Austin. R000087.

recovery "criteria" established therein. *See generally*, R00005. The Recovery Plan includes "criteria" for downlisting the species to threatened status, and does not elucidate guidance on how the seven species covered by the Plan would cease to require the protections of the ESA. *Id.* The Recovery Plan did not contain an analysis of the BCH status despite the fact that the Plan acknowledged a tenfold increase in the number of known locations in the six years since the species was listed. R000046. Remarkably, even though five of the seven species covered by the Recovery Plan were known to occur in only four to seven caves and the BCH was known to occur in 69 caves, FWS nevertheless assigned BCH the same recovery priority number (that is, recovery priority number 2C) as four of the five rare species. *See* R000013–15; R000016–18, R000019–22; R000023–25; R000032–34. The Recovery Plan neither contemplates nor analyzes whether the original data and analysis relied upon in the 1988 Listing or Taxonomic Revision and Technical Correction were in error.

2. 5-Year Status Review (2009)

In 2009, FWS completed the 5-year Review and, despite new data documenting an increase in both the number of known locations and protected locations of the BCH (including pursuant to two FWS-approved habitat conservation plans that included conservation measures specifically addressing that species), determined that no change in listing status for the BCH was warranted. R005238. FWS indicated that the 5-year Review "mostly relied on information summarized and cited in [a 2009] Balcones Canyonlands Preserve (BCP) Annual Report and [a 2009] BCP cave assessment." R0005237. While FWS referenced other sources of information, it failed to refer to or describe whether and how the FWS-approved Williamson County Regional Habitat Conservation Plan ("Williamson County RHCP"), developed specifically to meet the recovery "criteria" for BCH established by the Recovery Plan, would benefit the BCH. *See, e.g.*, R004139; R004141–42; R004147–48; R004155–56. Moreover, the 5-year Review failed to mention that through the Balcones Canyonlands Conservation Plan ("BCCP"), which FWS approved in 1996, the City of Austin and Travis County made a commitment to protect 35 of 39

listed karst invertebrate caves known at that time, including 20 in which BCH had been confirmed. R003681–85; *see also* R002971–78.

In its 5-year Review, FWS did not undertake an analysis of the listing factors set forth in ESA section 4, as it was required to do by ESA section 4(c). 16 U.S.C. § 1533(c). Rather, the document primarily recited known BCH locations and provide no assessment of the species' status relative to the listing criteria. Moreover, there was no analysis in the 5-year Review as to whether BCH may have been listed in error.

C. Conservation efforts affecting BCH

The Petition identified approximately 94 BCH-occupied caves locations that, as of the date of the Petition, were under "some form of protection from land development and/or receive regular management," noted that this number represents more than half of all known occupied BCH localities, and pointed out that FWS has recognized and approved four KFAs. M000218. The Petition also directed FWS to several regulations and ordinances that provide direct or indirect benefit to the BCH and that would apply even if the BCH were delisted. These measures include: a number of regulations and ordinances found in the City of Austin's Environmental Criteria Manual (collectively, "Austin Regulations"); City of Georgetown Water Quality Management Plan ("Georgetown Plan"); Texas Commission on Environmental Quality ("TCEQ") regulations governing development over the Edwards Aquifer ("Edwards Aquifer Rules"); and the ESA itself (because at least nine BCH-occupied caves would continue to be protected due to the presence of other listed species in the same cave). M000219–23.

D. Species-specific data remains limited

In the nearly 30 years since BCH was listed, only limited progress has been made to obtain species-specific data for the BCH. R004780–84; R004882–84; M003408–09. Plaintiffs' review of the record indicates that experts tend to agree that once BCH presence is documented,

the species is presumed to persist, even where only one specimen is found.[6] Indeed, in the Bexar County Karst Invertebrates Recovery Plan, FWS noted

> Population estimates are unavailable for any of these species due to lack of adequate techniques, their cryptic behavior, inaccessibility to mesocaverns, and difficulty accessing cave and karst habitat. In known locations, one or two individuals are typically observed per survey event, and it is not uncommon to observe none at all . . .

R000814. So elusive is the BCH, as noted above, that FWS requires completion of 14 surveys of a cave in order to determine probable absence and even then FWS does not consider such surveys to "provide sufficient data to determine population size or structure nor to determine absence from locations where endangered species have been previously found." 2015 Survey Protocols at 1. FWS' Bexar County Karst Invertebrates Recovery Plan (2011), which does not include BCH but on which FWS relied in its 2017 Finding, notes that troglobitic species "may spend the majority of their time" in "small mesocavernous spaces connected to caves" and that such spaces "may be occupied, though they are extremely difficult to sample . . . ." R000816.

Because the BCH spends its entire life underground and apparently does not move from cave to cave (or cave cluster to cave cluster), each cave or cave cluster, then, operates as a separate and distinct demographic unit. *See, e.g.*, R005238. The concept of KFAs adopted by FWS in the Recovery Plan and followed in more recent documents such as the Bexar County Karst Invertebrates Recovery Plan, Karst Preserve Design Recommendations, and the 5-year Review, indicate that FWS' view each cave or cave cluster precisely in this manner. *See, e.g.*, R000084–93; R000825–26; R000292–93; R005240; M003399–3402. For example, in the 5-year Review, FWS explained "a KFA . . . is distinct in that it acts as a system that is separated from other KFAs by geologic and hydrologic features and/or processes that create barriers to the movement of water, contaminants, and troglobitic fauna." R005240. The fact that the species

[6] Plaintiffs note that there is one circumstance in which a species was originally identified from a particular cave (Barker Cave) as BCH, but later was reexamined and confirmed to be of a different species. M000351.

does not move from cave to cave necessarily separates the species into multiple units, which is a factor FWS has identified as improving species viability by reducing the potential for catastrophic events to lead to extinction (known as "redundancy"). *See, e.g.*, *USFWS Species Status Assessment Framework: an integrated analytical framework for conservation*, U.S. Fish & Wildlife Service ("SSA Framework") (August 2016) https://www.fws.gov/endangered/improving_ESA/pdf/SSA%20Framework%20v3.4-8_10_2016.pdf at 4, 6, and 13. Surveys for presence or absence in caves have demonstrated over time that BCH is far more abundant than was believed at the time of listing.

IV. STANDARD OF REVIEW

The Administrative Procedure Act ("APA") mandates that "[a]gency action made reviewable by statute and final agency action for which there is no other adequate remedy in a court are subject to judicial review." 5 U.S.C. § 704. ESA section 4(b)(3)(C)(ii) explicitly makes "not substantial" 90-day findings reviewable by federal courts. 16 U.S.C. § 1533(b)(3)(C)(ii) ("Any negative finding described in subparagraph (A) and any finding described in subparagraph (B)(i) or (iii) shall be subject to judicial review."). Therefore, this case is properly brought pursuant to the APA and ESA section 4.

Pursuant to the APA, a court shall "hold unlawful and set aside agency action, findings, and conclusions found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law . . . ." 5 U.S.C. § 706(2). The APA requires agencies to "examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43("*State Farm*") (1983). Where "the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise," it has violated the APA. *Id.* Although this Court's

ultimate review is narrow, it nevertheless "must be searching and careful . . ." *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 378 (1989) (internal quotations and citations omitted).

V. ARGUMENT

A. Plaintiffs Have Standing to Bring this Action.

Plaintiffs, some of whom were among the parties that submitted the Petition and some of whom own property on which the BCH may or does occur, plainly have standing to bring this action.

1. Constitutional standing under Article III.

Article III of the Constitution limits federal judicial power to cases or controversies. U.S. Const., art. III, § 2, cl.1. In order to state an Article III case or controversy, a plaintiff must satisfy three elements to establish standing: (1) injury-in-fact; (2) a causal connection such that the injury is "fairly traceable" to the challenged action of the defendant; and (3) a "likelihood" that the injury will be redressed by a favorable decision, as opposed to a mere speculation of redressability. *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 560-61 (1992). Where multiple plaintiffs bring suit in federal court, only one plaintiff must demonstrate standing. *Rumsfeld v. Forum for Academic & Institutional Rights, Inc.*, 547 U.S. 47, 52 n. 2, (2006) ("[T]he presence of one party with standing is sufficient to satisfy Article III's case-or-controversy requirement.").

a) Injury in fact.

Plaintiffs have suffered an injury in fact, which is an invasion of a legally protected interest that is: (1) concrete and particularized; and (2) actual or imminent, not conjectural or hypothetical. *See Lujan*, 504 U.S. at 560-61. Plaintiffs have suffered an injury in fact due to the continued, unlawful maintenance of the BCH on the list of endangered species and, most recently, the failure of FWS properly to consider the Petition submitted by individual Plaintiffs, as required under the ESA and FWS' own petition review regulations.

Members of ASL—including Plaintiffs Charles and Cheryl Shell, Walter Sidney Shell Management Trust, Kathryn Heidemann, and Robert V. Harrison, Sr.—own property within

areas identified as potential BCH habitat where the species likely occurs, and some members' properties are affirmatively documented to contain occupied BCH habitat. ECF No. 19-1, Decl. of Dan Byfield in Support of Plaintiffs' Opposition to Defendants' Motion to Dismiss ("Byfield Decl."), ¶¶ 3–7; ECF No. 19-2, Decl. of John Yearwood in Support of Plaintiffs' Opposition to Defendants' Motion to Dismiss ("Yearwood Decl."), ¶¶ 1–6; ECF No. 132-1 Decl. of Robert V. Harrison, Sr. in Support of Plaintiffs' Motion for Summary Judgment ("Harrison Decl."), ¶¶ 1–11. Those portions of Plaintiffs' lands that have been surveyed and confirmed as occupied or potential BCH habitat are now diminished in value and cannot be used without either risking an enforcement action by FWS or a citizen suit alleging incidental take of BCH, incurring the expense of seeking an incidental take permit from FWS, or incurring the expense of complying with state and local measures FWS has deemed sufficient to avoid "take" of BCH. Byfield Decl., ¶¶ 5–6; Yearwood Decl., ¶¶ 3–6; Harrison Decl., ¶¶ 3–11.

Continued maintenance of BCH on the list of endangered species exposes Plaintiffs to unwarranted regulation and current and ongoing injury to their economic interests. Plaintiffs are unable to use and enjoy their real property without threat of enforcement or a citizen suit absent either expenditure of financial resources to seek an incidental take permit or compliance with certain state and/or local measures deemed to avoid "take," which also inherently limit land uses. Byfield Decl., ¶¶ 5–6; Yearwood Decl., ¶¶ 3–6; Harrison Decl., ¶¶ 9–11. Further, the known presence of BCH or suitable BCH habitat on Plaintiffs' lands has injured Plaintiffs due to decreased property values. Yearwood Decl., ¶ 5; Harrison Decl., ¶¶ 5–11. Plaintiffs' property values are diminished as a result of confirmed presence of BCH and potentially suitable BCH habitat within those lands, and the Fifth Circuit has previously recognized that the "stigma" associated with ESA-listed species and their habitats can result in decreased property values sufficient to establish injury-in-fact. *See Markle Interests, LLC v. U.S. Fish & Wildlife Serv.*, 827 F.3d 452, 463 (5th Cir. 2016), *petitions for cert. docketed*, No. 17-71 (U.S. Jul. 13, 2017), No. 17-74 (U.S. Jul. 14, 2017).

Plaintiffs are injured on a current and ongoing basis by the maintenance of BCH on the list of endangered species—which drives the continued application of the ESA regulatory regime (including potential for civil and criminal enforcement for violations of the ESA take prohibitions) and the associated valuation stigma based on constrained future land uses—where BCH does not now and never did warrant listing under the ESA. BCH, which has never met the ESA criteria for listing, continues to depress Plaintiffs' property values and invade Plaintiffs' legally protected interest to use and enjoy their property. By virtue of the ongoing listing of BCH (and, specifically in this action, Defendants' failure to review the Petition requesting delisting in accordance with the standards required by FWS' own regulations and the ESA itself), the Plaintiff landowners continue to be subject to regulatory burdens and thus actually and imminently injured. *See Markle Interests, LLC v. U.S. Fish & Wildlife Serv.*, 40 F.Supp.3d 744, 757 (E.D. La. 2014) (rejecting as "utterly frivolous" federal defendants' assertion that plaintiffs owning land designated as critical habitat for an endangered species lacked standing because they failed to establish actual or imminent injury sufficient to challenge the critical habitat designation), *aff'd*, 827 F.3d 452 (5th Cir. 2016), *petitions for cert. docketed*, No. 17-71 (U.S. Jul. 13, 2017), No. 17-74 (U.S. Jul. 14, 2017). Here, because Plaintiffs are continually burdened by unwarranted regulation and devaluation of their private lands under the ESA, and because that regulation hinges upon the listing status of BCH, Plaintiffs have standing to contest the FWS' 90-day finding that maintains that listing status.

b) Causation.

There exists a direct causal connection between the Plaintiffs' injuries and the FWS conduct complained of, namely, failure of FWS properly to apply the relevant petition review criteria at the 90-day finding stage. Plaintiffs' injuries are fairly traceable to the challenged action of FWS and are not the result of the independent action of some third party not before this Court. *See Lujan*, 504 U.S. at 560-61. FWS is the federal agency charged with implementing the ESA, and Plaintiffs' injuries are directly attributable to FWS' original listing of the BCH in

error and the FWS' erroneous 2017 Finding. A direct consequence of the flawed 2017 Finding is the continued listing of the BCH that injures Plaintiffs. Therefore, there can be no question that Plaintiffs' injuries are fairly traceable to the FWS' arbitrary and capricious 2017 Finding. If FWS had reached a positive 90-day finding, concluding that the petition presented substantial information that delisting was warranted, there is a high probability that FWS would proceed toward delisting the BCH and the cessation of regulation of this species under the ESA.

c) Redressability.

It is "likely," as opposed to merely "speculative," that the Plaintiffs' injuries will be redressed by a favorable decision of this Court. *See Lujan*, 504 U.S. at 561. It is likely, as opposed to speculative, that the requested injunctive and declaratory relief directing the FWS to reconsider its 2017 Finding would redress Plaintiffs' injuries. The Petition not only demonstrates that there is substantial scientific and commercial information indicating that delisting may be warranted, but also that the best available scientific information establishes that the BCH was listed in error and does not warrant continued listing under the ESA. A judgment in favor of Plaintiffs would require the FWS to reconsider the Petition and to publish a new 90-day finding indicating whether delisting may be warranted. Because a judgment in Plaintiffs' favor would result in one of two possible outcomes, and because the best available scientific and commercial information provided in the Petition strongly indicates that delisting is warranted, it is likely that FWS would reach a positive 90-day finding and progress toward delisting the BCH.

2. Associational standing.

In addition to named individual Plaintiffs' standing to bring this suit in their own right, any one of which is sufficient to establish this Court's jurisdiction, Plaintiff ASL as an organization also demonstrates Article III standing by meeting the test for associational standing, which requires that: (1) the protected interest is germane to the purpose of the organization; (2) the organization's members have standing in their own right; and (3) the participation of individual members is not required. *See La. Sportsmen All., L.L.C. v. Vilsack*, 583 Fed. App'x

379, 380 (5th Cir. 2014) (citing *Hunt v. Wash. Apple Adver. Comm'n*, 432 U.S. 333, 343 (1977)); *see also* ECF No. 19, Pls.' Opp'n to Defs.' Mot. to Dismiss at 14–19. "[I]n determining whether an association has standing to bring suit on behalf of its members, neither unusual circumstances, inability of individual members to assert rights nor an explicit statement of representation are requisites." *Church of Scientology of Cal. v. Cazares*, 638 F.2d 1272, 1279 (5th Cir. 1981). Again, ASL members own property within the areas designated as BCH habitat, BCH is documented to occur on some members' property, and these members' interests are directly harmed by the land use restrictions that flow from regulation of the BCH under the ESA. Byfield Decl., ¶¶ 1–7.

These harms to ASL's members—some of whom are named parties in this suit and have standing in their own right (see Section 5(A)(1), above)—are germane to and directly tied to ASL's purpose, which includes supporting protection of private property rights, fiscal responsibility, and environmental policy based on principles of sound science and "advocate[ing] for a balanced approach to environmental regulation with respect to the administration of the ESA and property rights." ECF No. 125, Second Amended Complaint for Declaratory Judgment and Injunctive Relief ("Compl."). While the participation of ASL members was not required for ASL to bring suit, individual ASL members Charles and Cheryl Shell, Kathryn Heidemann, and Robert V. Harrison, Sr. chose to participate in this suit as named Plaintiffs. *See* Compl., ¶¶ 7–11.

3. Prudential standing.

Plaintiffs' grievances fall within the zone of interests protected by the ESA, and therefore Plaintiffs are able to demonstrate prudential standing. Prudential standing is a judicially self-imposed limit on the exercise of federal jurisdiction that supplements Article III standing and requires that plaintiffs' grievances arguably fall within the zone of interests protected or regulated by the statutory provision invoked in the suit. *Bennett v. Spear*, 520 U.S. 154, 162-63 (1997). The breadth of the zone-of-interests test varies according to the provisions of law at issue and is considered "generous" under the APA. *Id.* at 163. Further, Plaintiffs' grievances

fall within the zone of interests protected by ESA section 4, which specifically provides that negative 90-day findings on petitions to list, delist, and reclassify species are judicially reviewable. 16 U.S.C. § 1533(b)(3)(C)(ii). Similar to the circumstances described in *Bennett v. Spear*, where the Supreme Court opined that the ESA establishes an expansive zone of interest for parties that file an action under the citizen suit provision, here the ESA establishes an expansive zone of interest for parties that file an action challenging a negative 90-day finding. *Bennett*, 520 U.S. at 165.

B. USFWS applied an unlawfully stringent standard at the 90-day finding stage

In its 2017 Finding, FWS rejected the Petition primarily for the following reasons: the Petition failed to provide population trend data concerning the BCH (M003408–10; M003417; M003420); the Petition did not provide data rebutting FWS' former characterization of threats to the species (such as their susceptibility to red imported fire ants) (M003413–14); and the Petition did not provide information establishing that there are a sufficient number of KFAs in each KFR. M003405–07. In making its 2017 Finding, FWS ignored the standards of review established by ESA section 4 and FWS' own regulations.

As described in detail above, Section 4 of the ESA sets forth FWS' obligations with respect to petitions to list or delist a species. At the 90-day finding stage, FWS must make a finding as to whether the petition presents substantial scientific or commercial information indicating that the petitioned action *may be* warranted. 16 U.S.C. § 1533(b)(3)(A)-(B). At the 12-month stage, which commences upon a positive 90-day finding, FWS must make a finding that the petitioned action *is or is not* warranted. *Id*. The U.S. Supreme Court has made clear that "the plain meaning of legislation should be conclusive, except in the rare cases in which the literal application of a statute will produce a result demonstrably at odds with the intentions of its drafters." *United States v. Ron Pair Enters., Inc.*, 489 U.S. 235, 242-43 (1989) (internal quotations and citations omitted). Here, Congress has established a two-part process by which petitions to list and delist species should be subjected. First, FWS is to review a petition to

determine whether it presents "substantial scientific and commercial information indicating" that the requested action "may be warranted." 16 U.S.C. § 1533(b)(3)(A). A second, more searching "review of the status of the species" commences upon a positive 90-day finding, the purpose of which is for the agency to determine whether the petitioned action actually is or is not warranted, as opposed to determining merely whether the action may be warranted. *Id*. at § 1533(b)(3)(B). It is clear, then, that Congress intended the 90-day finding stage to serve a gate-keeping role, weeding out petitions that present no substantial scientific or commercial information and ensuring that petitions presenting substantial scientific or commercial information receive a searching and careful review. This intent is all the more clear when one considers that Congress allows FWS a full year to conduct a thorough, determinative status review and only three months to conclude the gate-keeping function of the 90-day finding.

FWS' Former Petition Review Regulations defined "substantial information" as "that amount of information that would lead a *reasonable person* to believe that the measure proposed in the petition *may be* warranted." 50 C.F.R. § 424.14(b)(1) (2014) (emphasis added). The same regulations further explain that in making a determination on petitions to list or delist species, FWS must consider, among other things, whether the petition "[c]ontains detailed narrative justification for the recommended measure, describing, *based on available information*, past and present numbers and distribution of the species involved and any threats faced by the species" and "[p]rovides information regarding the status of the species over all or a significant portion of its range." *Id*. at § 424.14(b)(2) (2014) (emphasis added). With respect to the BCH, the Petition did precisely as the regulations requested by, among other things, providing a detailed description of the known status of BCH, including information concerning past and present numbers of BCH *available at the time the Petition was submitted*. FWS rejection of the Petition on the basis that the Petition did not provide population trend data that the agency itself noted was unavailable at the time the Petition was submitted, and remains so, clearly was improper. The only available and relevant demographic data for BCH are the number of known caves inhabited by the species. Whereas at the time of the original listing in 1988, FWS believed that

BCH only occupied a handful of caves, FWS now recognizes that the species occupies at least 170. This information, together with other facts presented in the Petition, unquestionably would lead a *reasonable person* to *believe* that delisting *may be* warranted.

Case law reinforces the plain language and structure of the ESA, establishing that a lower standard of evidence is required to reach a positive 90-day finding than is required for FWS to reach a positive 12-month finding. *See, e.g.*, *Humane Soc'y of the U.S. v. Pritzker*, 75 F.Supp.3d 1, 14–15 (D.D.C. 2014) (holding as arbitrary and capricious NMFS' application of an "inappropriately high standard of evidence" at the 90-day finding stage and that evidence provided in the petition "more than meets that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted.") Where FWS has required conclusive evidence at the 90-day finding stage, courts have routinely held the agency applied too high a burden on petitioners, in violation of the APA. *Id.*; *see also Moden v. U.S. Fish & Wildlife Serv.*, 281 F.Supp.2d 1193, 1204 (D. Or. 2003) ("the standard for evaluating whether substantial information has been presented by an 'interested person' is not overly-burdensome, does not require conclusive information, and uses the 'reasonable person' to determine whether . . . action [to delist] may be warranted"); *Ctr. for Biological Diversity v. Kempthorne*, Case No. CV 07-0038-PHX-MHM, 2008 WL 659822, at *12 (D. Ariz. Mar. 6, 2008) (concluding that, where there is reasonable disagreement among FWS scientists, the "may be warranted" standard is met, and FWS should proceed with a status review in which FWS may "employ the more-searching 'is warranted' standard" and reiterating that conclusive evidence is not required at the preliminary stage); *Ctr. for Biological Diversity v. Morgenweck*, 351 F.Supp.2d 1137, 1141–44 (D. Colo. 2004) (setting aside negative 90-day finding where the agency applied an incorrect standard to require conclusive evidence that the petitioned-for action was warranted); *Colo. River Cutthroat Trout v. Kempthorne*, 448 F.Supp.2d 170, 176–77 (D.D.C. 2006) (holding that the 90-day finding stage is intended to be a "threshold determination" and a "less searching review").

With respect to the 2017 Finding, the Record is clear that FWS failed to apply the correct evidentiary standard as required by its own regulations at the 90-day finding stage. Indeed, FWS' Regional Director flagged this issue, as evidenced by an email from FWS' Assistant Regional Director for the Southwest Region to the Field Supervisor for FWS' Austin Ecological Services Office: "[The Regional Director] was asking critical questions about our proposed negative 90-day finding for bone cave harvestman delisting petition. He correctly pointed out that making a positive 90-day finding is a pretty low bar, and that this species is somewhat controversial." M003019–20. Moreover, the Record is devoid of any substantive analysis or discussion of any materials cited in support of the Petition. Rather, FWS apparently viewed its task at the 90-day finding stage as to "refute" each claim in the Petition. M003044 ("Only use information in our files to refute petition claims"); M003088–90 (PowerPoint needs to include FWS info to "refute theirs"). The Record demonstrates that FWS staff viewed their task as to defend their prior listing determination rather than conducting an even-handed assessment of the Petition in light of the low evidentiary standard applicable at the 90-day finding stage.

For example, while FWS acknowledged in the 2017 Finding that "[i]t may be infeasible to assess karst invertebrate population trends in any statistically significant manner given their association with humanly inaccessible cave habitat such as mesocaverns," (M003408–09) and admitted on multiple occasions that the agency itself had no such data, FWS repeatedly relied upon the fact that the Petition did not include population trend data that does not exist for the species. *See, e.g.*, M003408 ("[BCH] may be declining or threatened even though they are observed at a . . . site. The [P]etition did not provide adequate information to detect population trends . . . and it is not available from other sources . . . . [w]e indicated in the [1994 90-day Finding] that more time was needed to detect if the species is declining; however . . . we are still lacking adequate data to conduct a trend analysis."); M003409 (" . . . the [P]etition failed to provide data adequate to assess trends in the karst invertebrate populations since the development occurred."); M003409–10 ("[t]he [P]etition failed to provide any data adequate to assess trends in the karst invertebrate population in relation to the time (duration and frequency)

that [BCH] have been exposed to the artificial lighting."); M003420 ("The [P]etition provided no trend analysis to indicate that this species can withstand the threats associated with development or climate change over the long term.").

C. Defendants failed to consider the Petition's well-documented assertion that the original listing was in error

Plaintiffs challenge FWS failure to analyze in the 2017 Finding whether delisting was warranted on the basis that the BCH was originally listed in error. *See* 50 C.F.R. § 424.11(d)(3). Despite the fact that FWS acknowledged that the Petition claimed the BCH was listed in error (M003425), FWS judged only whether or not BCH had recovered pursuant to the species' Recovery Plan, the Karst Preserve Management and Monitoring Recommendations, and other FWS guidance.

In 1988, when FWS listed what is now the BCH, very little was known about the species. In applying the Listing Factors, FWS lumped all five species addressed in the 1988 Listing Rule (including what later became BCH) together and stated that "[t]he primary threat to the five species comes from potential loss of habitat owing to ongoing development activities." R004782. Specifically, FWS noted that a "major residential, commercial, and industrial development has been proposed, and preliminary clearing and digging" had begun that would impact six caves known to contain one or more of the species addressed by the 1988 Listing Rule. *Id*. In its 2017 Finding, FWS

> acknowledge[d] that there are more known locations since the time [the 1988 Listing Rule and 5-year Review] documents were completed and that the increase is likely an *increase in our knowledge*, not a true increase in the number of populations or range . . .

M003404 (emphasis added). FWS' statement belies the fact that the species never should have been listed in the first place—the species range and base population likely have not changed, but FWS' knowledge of those data has changed significantly. Indeed, FWS has delisted species in the past under nearly identical circumstances.

As the Petition pointed out, in 1983 FWS delisted the Pine Barrens tree frog based on the fact that the original data for classification were in error. *See* R004776–78. Like the BCH, FWS had listed the tree frog based "primarily on factor number one, 'the present or threatened destruction, modification, or curtailment of its habitat or range.'" R004777. At the time the species was listed, "the only known existing breeding sites were limited to seven small areas" in one Florida county. R004777–78. After the species was listed, however, it was discovered that the species was located in more than 150 sites in multiple counties. *Id*. In that case, FWS noted that "[a]lthough the species appears to be limited to only four counties in Florida, it is of widespread occurrence within this area." *Id*. And in response to a comment from a member of the public that the species should not be delisted for 10 more years to ensure that its restoration was permanent, FWS tellingly replied " . . . it has not been a matter of restoring the species, *but a matter of discovering unknown populations* which, for the most part, have undoubtedly existed in the past." R004777 (emphasis added). As set forth in the Petition, here, the discovery of many previously unknown populations of BCH arguably demonstrate that the listing was in error and undoubtedly demonstrate that delisting "may be" warranted.

Like the Pine Barrens tree frog, the number of known locations has gone from five or six to more than 170—a more than 30-fold increase. M000208. Despite decades of development in Travis and Williamson Counties, BCH populations continue to persist, even in caves that have been impacted by development. M000212–15. FWS regulations establish that a species may be delisted on the basis that the original listing was in error, if the best scientific and commercial data available substantiate that "the best scientific or commercial data available when the species was listed, or the interpretation of such data, were in error." 50 C.F.R. § 424.11(d)(3). It is clear that the "best scientific or commercial data available when [BCH] was listed, or the interpretation of such data, were in error." *Id*. FWS cannot escape that fact by applying recovery criteria developed for a species that should never have been listed in the first place.

FWS asserts in the 2017 Finding that the recovery "criteria" in the BCH Recovery Plan were not met. But that is beside the point; FWS had a duty to evaluate whether the Petition

presented substantial scientific or commercial information that the BCH was listed in error. The Record is devoid of any evidence that FWS undertook such an evaluation. Remarkably, only the long-form finding, included as a Supporting Document in the 2017 Finding, references the increase in known locations. M003425–42; M003404. As a result, and regardless of whether FWS' finding with respect to the recovery standard was appropriate, the 2017 Finding clearly was arbitrary and capricious.

D. Defendants misapplied the Former and 2016 Petition Review Regulations

The Petition also presented scientific and commercial information indicating that the BCH has achieved recovery under the ESA. See M000212–228. FWS acknowledged in the 2017 Finding that the Petition was received prior to the effective date of the 2016 Petition Review Regulations and, as a result, indicates that the agency reviewed the Petition against the Former Petition Review Regulations. M003524. Despite the agency's claim that it reviewed the Petition under the Former Petition Review Regulations, FWS, in fact, reviewed the Petition, at least in part, pursuant to the 2016 Petition Review Regulations. Whether this court examines the 2017 Finding against the Former or 2016 Petition Review Regulations, the 2017 Finding is arbitrary and capricious.

1. Improper application of the evidentiary burden

As noted above, courts have consistently held with respect to the Former Petition Review Regulations that the evidentiary threshold at the 90-day finding stage is low. *See, e.g., Moden*, 281 F.Supp.2d at 1203–05; *Morgenweck*, 351 F.Supp.2d at 1141; *Colo. River Cutthroat Trout*, 448 F.Supp.2d at 176–77; *Ctr. for Biological Diversity v. Kempthorne*, 2008 WL 659822 at *12; *Humane Soc'y of the U.S.*, 75 F.Supp.3d at 10–11. Nevertheless, FWS applied an evidentiary standard that would have been better suited, if at all, at the 12-month finding stage. The Former Petition Review Regulations set forth certain criteria against which FWS was required to evaluate petitions to delist an endangered or threatened species and, specifically defined "substantial information" as "that amount of information that would lead a *reasonable person* to

believe that the measure proposed in the petition *may* be warranted." 50 C.F.R. § 424.14(a)-(b)(1) (2014) (emphasis added).

Perhaps the best example of the unlawful standard applied to the Petition is the agency's claim that Petitioners did not provide FWS with population trend data for the BCH, as discussed in section V(B), *supra*. With respect to such data, while FWS acknowledges that population trend data other than the number of occupied caves (or habitat patches) may be infeasible to obtain (M003408–09), FWS nevertheless dismissed the Petition out of hand due to the alleged lack of population trend data. *See, e.g.*, M003408–10; M003417; M003420. This action is notable since neither the Former Petition Review Regulations nor federal jurisprudence requires such data and in light of the fact that the Petition Review Regulations require FWS to judge a petition based on *available* data. 50 C.F.R. § 424.11(d).

FWS' application of an unlawfully stringent evidentiary burden is also apparent in its dismissal of information provided by the Petition that BCH continue to persist even where caves have been impacted by development. Petitioners provided FWS with several specific examples where BCH have been shown to persist (and, in some cases, increase in abundance) despite development activities, including in Inner Space Caverns, which are situated underneath and adjacent to Interstate Highway 35. M000212–13. The Petition points to studies conducted in 2007 showing BCH not only continue to occupy the cave system, but appear to be more abundant in areas that contain artificial lighting, walkways, and tourist traffic. *Id*. In response to that information, FWS stated that "[a]lthough the BCH may be present . . . this does not ensure its populations are robust and secure," points to the existence of blue-green algae ("lampenflora'") growing near cave lights, and cites two sources for the proposition that this algae "favors surface-dwelling invertebrate species that can out-compete karst invertebrate species (Mulec and Kosi 2009, p. 109; Culver 1986, p. 438), such as the [BCH]." M003409; M003430. Neither manuscript cited by FWS includes any data or analyses regarding the effects of lampenflora on BCH or other karst invertebrates. Instead, Mulec and Kosi (2009) assert generally, and without reference to data and analyses, that higher nutrient input associated with

lighting favors newcomers as compared to cave fauna. R001146. Likewise, Culver (1986) asserts generally, and without reference to data and analyses, that illumination of caves almost completely eliminates cave fauna due to competition from surface species. R000736. These assertions made with respect to cave dwelling fauna in general and without reference to scientific information (that is, data and analyses) cannot countermand actual, available, and specific data regarding the BCH set forth in the Petition.

Whether or not the Petition provided conclusive data, including population trend data, that would "prove" the BCH has recovered since the time of listing or was listed in error, is irrelevant at the 90-day finding stage. Rather, it is clear that, through the Petition, FWS was provided "substantial information" that should have led FWS, if acting "reasonabl[y],"to "believe" that delisting "may be warranted." 50 C.F.R. § 424.14(b) (2014).

2. FWS misapplied 2016 Petition Review Regulations

Despite FWS' assertion that it reviewed the Petition pursuant to the Former Petition Review Regulations, FWS dismissed the information contained in the Petition in large part because the agency believed that the Petition did not meet the standards set forth in the 2016 Petition Review Regulations. M002434; M003413–14; M003420. Like the Former Petition Review Regulations, the 2016 Petition Review Regulations proscribe the standard by which FWS is to review petitions to delist. The 2016 Petition Review Regulations define "substantial scientific or commercial information" as "credible scientific or commercial information in support of the petition's claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted." 50 C.F.R. § 424.14(h)(1)(i) (2016). The Regulations go on to explain that:

> [w]here the prior review resulted in a final agency action, a petitioned action generally would not be considered to present substantial scientific and commercial information indicating that the action may be warranted unless the petition provides *new information not previously considered*.

Id. (emphasis added).

Much of the information provided by the Petition was dismissed by FWS because the agency alleged to have "previously considered" much of the information submitted in the Petition and, as a result, such information did not constitute "new information." However, the preamble to the 2016 Petition Review Regulations' preamble explained that the new information presumption does not apply where "the previous status review did not result in a final agency action." 81 Fed. Reg at 66,474, 66,480. Here, FWS violated its own regulations by applying the presumption against the Petition despite the fact that the "previous consideration" given the information included in the Petition was, by FWS' own admission, given in the Bexar County Karst Invertebrates Recovery Plan and the Karst Preserve Management and Monitoring Recommendations—neither of which constitute "final agency actions." M003414.

For example, where the Petition cited to a 2002 study by Morrison, et al., for the assertion that, contrary to older literature, red imported fire ants ("RIFA") may not, in fact, pose as significant a threat to BCH as once believed, FWS countered with the following statement:

> [T]his is not "new information" as we have already reviewed these articles and considered the information they provided in the Bexar County Karst Invertebrates Recovery Plan (Service 2011, p. 12) and in our Karst Preserve Management and Monitoring Recommendations (Service 2014, p. 3) . . .

Id.[7]

In addition to its explicit reliance on documents that did not constitute final agency action as the basis for applying the "new information" presumption against the Petition, FWS also relied heavily on the 5-year Review in an attempt to "disprove" significant elements of the Petition. However, the 2016 Petition Review Recommendations clearly prohibit FWS from forgoing an analysis of a petition on the basis that the agency has reviewed the same data in an

[7] Notably, FWS was previously warned in 2010 by one of the authors of the Bexar County Karst Invertebrates Recovery Plan not to "go[] overboard on RIFA direct effects on karst inverts [because] all of our work in 2003 basically showed this was a small component of the overall effects which are mainly indirect." R001039.

earlier 5-year review. As FWS explained in the preamble to the 2016 Petition Review Regulations:

> In conducting status reviews, the Services *may reevaluate data* they already considered *in previous status reviews*. Petitioners may similarly present a new analysis of existing data in support of their requests, and the Services will evaluate such requests on that basis. A petitioned request could be based on discovery of an error in research regarding information previously considered by the Services.

81 Fed. Reg. at 66,474 (emphasis added). In addition to the explicit statements contained in the preamble that 5-year status reviews do not constitute final agency action, at least one federal court has come to the same conclusion. *Am. Forest Res. Council v. Hall*, 533 F.Supp.2d 84, 89-94 (D.D.C. 2008) (5-year status review is not final agency action challengeable under the APA.)

FWS' finding that the Petition did not present "new information" not "previously considered" by FWS in its 5-year Review, Bexar County Karst Invertebrates Recovery Plan, and Karst Preserve Management and Monitoring Recommendations was arbitrary and capricious because none of the aforementioned documents constituted final agency actions, and because Petitioners presented new analyses of data existing at the time of the previous, non-final reviews that FWS failed to analyze in its 2017 Finding.

E. Defendants' use of Recovery Plan as binding was improper

The 2017 Finding also relies on FWS' assertion that the more than 90 BCH-occupied caves that currently are protected fail to meet the preserve design criteria established by either the Recovery Plan or by the Karst Preserve Design Recommendations. *See, e.g.*, M003405-07; M003409; M003415. However, FWS unlawfully relied on these documents in judging whether BCH had recovered.

Numerous courts have held that although the ESA mandates FWS to prepare species recovery plans, such plans serve as guidance for the agency and do not carry the force of law in an agency's determination as to whether or not a listed species has recovered (and necessitates delisting). *See Friends of Blackwater v. Salazar*, 691 F.3d 428, 434 (D.C. Cir. 2012) (recovery "plan is a statement of intention, not a contract"); *Fund for Animals, Inc. v. Rice*, 85 F.3d 535,

547 (11th Cir. 1996) (holding that 16 U.S.C. § 1533(f) makes plain that recovery plans are merely for guidance purposes); *Conservation Cong. v. Finley*, 774 F.3d 611, 614 (9th Cir. 2014) (holding that recovery plans provide guidance for species conservation and are not binding authorities); *Friends of Animals v. U.S. Fish & Wildlife Serv.*, Case No. 6:14-cv-01449, 2015 WL 4429147, at *5 (D. Or. July 16, 2015) (holding that recovery plans do not mandate that the agency implement any suggestions contained therein), *appeal docketed* No. 15-35639 (9th Cir. Aug. 7, 2015). Indeed, in *Friends of Blackwater*, FWS itself argued successfully in the D.C. Circuit Court that the "criteria in the Recovery Plan, unlike the factors in § 4(a)(1) of the [ESA], are not binding upon the agency in deciding whether a species is no longer endangered and therefore should be delisted." 691 F.3d at 432.

The Petition provides information indicating that a significant number (more than half) of the more than 170 BCH-occupied caves are under some form of protection and/or management, including some that are under permanent protection. M000218. The Petition also indicates that 28 "de facto KFAs [were] acknowledged by FWS" in the 5-year Review.[8] *Id.* FWS essentially begins its review of the information provided by the Petition by noting that the Recovery Plan covering BCH includes criteria adequate only for downlisting—not delisting—and proceeds to undertake a broad comparison of the BCH locations described by the Petition against the preserve design criteria established by the Recovery Plan and the more recent Karst Design Preserve Recommendations. M0003402; M003405-06; M003409-10. Specifically, FWS noted:

> The petition states that 94 karst preserve areas are currently providing significant conservation. While these karst preserve areas are an important tool for preserving the current population of [BCH], many of the existing protected areas referenced in the petition are too small to meet [FWS'] preserve design recommendations.

M003405.

[8] FWS explained in the 2017 Finding that it had recognized 21 potential KFAs, not 28 potential KFAs, and that the discrepancy was due to the fact that the 5-year Review considered closely located caves to be part of the same KFA. M003405

The ESA does not identify a minimum population, range, or preserve number or size that must be achieved, maintained, and/or managed in order to warrant delisting. Rather, the determination whether to delist on the basis of recovery (as opposed to listing in error) must be based entirely on the risk of extinction from any one or a combination of the five Listing Factors. 50 C.F.R. § 424.11(d). As described in the Petition, that distinction is "critical because even in cases where there is only one known locality for a given species, if that locality is not subject to any of the five listing factors, listing under the ESA is not warranted." M000211. Whether or not a species has achieved the goals set forth in a recovery plan ultimately is irrelevant because "It is the [ESA's] definitions of endangered (i.e., "in danger of extinction throughout all or a significant portion of its range") and threatened (i.e., "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range") that provide the applicable standards for determining whether a species has "recovered." R003269. BCH is distributed across more than 170 caves, or separate habitat patches, across its range and there is no evidence of a decline in the number of occupied caves; therefore, any claim that the species is at risk of extinction is specious.

VI. CONCLUSION

For the foregoing reasons, Defendants' 2017 Finding violated the APA and ESA. Therefore, Plaintiffs pray this Court would declare that Defendants violated the APA and ESA with respect to the 201 Finding, set aside the 2017 Finding, direct Defendants to remedy their violations of the APA and ESA, retain jurisdiction over this matter until Defendants have fully complied with the APA and ESA, and award Plaintiffs costs of litigation pursuant to ESA section 11(g) (16 U.S.C. § 1540(g)) or, alternatively, 28 U.S.C. § 2412, and grant award of any additional relief this Court deems just and proper.

Dated: October 5, 2017

Respectfully submitted,

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. Plaintiff,	§ § §	
v.	§ § §	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. Defendants.	§ § §	

DECLARATION OF ROBERT V. HARRISON, SR. IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT

I, Robert V. Harrison, Sr., affirm and declare as follows:

1. I am over the age of 18 and am competent to testify in this matter. I have personal knowledge of the facts set out in this declaration and, if called as a witness, I could testify competently to those facts.

2. I am a member of the American Stewards of Liberty and reside in Georgetown, Texas.

3. I own a 209-acre parcel of real property along Lake Georgetown in Williamson County, Texas, within the area identified as possessing karst formations occupied by *Texella reyesi*.

4. I currently ranch and live on my property.

5. A cave and related karst formations occur on my property that have been professionally surveyed, identified as suitable habitat for *Texella reyesi*, and may be occupied by *Texella reyesi*.

6. My property value and the salability of my property have been directly harmed by the listing of *Texella reyesi*.

7. One contract to purchase my property, including the area identified as possessing karst formations that provide suitable habitat and may be occupied by *Texella* reyesi, fell through after 90 days of due diligence, in significant part due to limitations on development that are imposed by the endangered status of *Texella reyesi.*

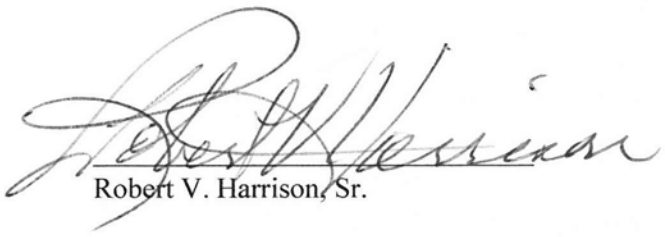
8. Other prospective purchasers have elected not to present an offer to purchase my property after the realtor explained the limitations on development imposed by the endangered listing status of *Texella reyesi.*

9. If I or a prospective purchaser desire to develop my property, the developer will need to seek coverage under the Williamson County Habitat Conservation Plan, comply with the Edwards Aquifer enhanced avoidance measures for karst-dwelling invertebrates, seek an individual incidental take permit, or risk facing criminal and/or civil enforcement for "take" of *Texella reyesi*.

10. The potential presence of *Texella reyesi* on my property has decreased the economic value of my property and has impeded my efforts to sell my property.

11. The continued listing of *Texella reyesi* injures me because it has and will continue to inhibit the use and enjoyment of my property, imposes economic costs on me, hinders the sale of my property, and causes me ongoing economic injury. If *Texella reyesi* were delisted, my injuries would be redressed.

I declare under penalty of perjury under the laws of the State of Texas and the United States that the foregoing is true and correct, and that this declaration was executed on this _5_th day of October, 2017, at Georgetown, Texas.



Robert V. Harrison, Sr.

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. *Plaintiffs,*	§ § §	
v.	§ §	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. *Defendants.*	§ § §	

MASTER INDEX OF PLAINTIFFS' EXCERPTS OF ADMINISTRATIVE RECORD ("AR")

VOLUME 1

No.	Document Description	AR Pages
1	Petition to delist the Bone Cave harvestman, June 2, 2014	M000185
2	Email from J. Wilson to C. Watson, November 21, 2014	M000351
3	Email from T. Koch to A. Zerrenner, March 13, 2017	M003019

VOLUME 2

No.	Document Description	AR Pages
4	Presentation titled "Briefing: 90-day Finding to Delist the Bone Cave harvestman," April 14, 2017 (Excerpt)	M003044
5	Presentation titled "Briefing: 90-day Finding to Delist the Bone Cave harvestman," April 17, 2017 (Excerpt)	M003088

VOLUME 3

No.	Document Description	AR Pages
6	Pre-publication version of Bone Cave harvestman 90-day finding, March 20, 2017	M003393
7	Petition Review Form for 90-Day Finding on Petition to Delist the Bone Cave harvestman, March 20, 2017	M003425

No.	Document Description	AR Pages
8	82 FR 20861 - Bone Cave Harvestman 90-day Finding to Delist, May 4, 2017	M003523
9	USFWS Recovery Plan for Endangered Karst Invertebrates in Travis and Williamson Counties, Texas, August 25, 1994 (Excerpt)	R000001
10	USFWS Karst Preserve Design Recommendations, 2011 (Excerpt)	R000290
11	Culver article – Conservation Biology – The Science of Scarcity and Diversity, 1986 (Excerpt)	R000728

VOLUME 4

No.	Document Description	AR Pages
12	USFWS Bexar County Karst Invertebrates Recovery Plan, 2011	R000799
13	Email from J. Krejca to C. Watson, September 21, 2010	R001039
14	Mulec and Kosi article - Lampenflora algae and methods of growth control, 2009 (Excerpt)	R001146
15	Balcones Canyonlands Preserve Karst Monitoring and Management FY 2004 Annual Report (Excerpt)	R002969
16	Goble article – Recovery, 2010 (Excerpt)	R003267
17	USFWS Final Environmental Impact Statement/Habitat Conservation Plan for proposed Issuance of a Permit to allow Incidental take of the Golden Cheeked Warbler, Black Capped Vireo, and Six Karst Invertebrates in Travis County, Texas, 1996 (Excerpt)	R003443
18	Williamson County Regional Habitat Conservation Plan, 2008 (Excerpt)	R004128
19	USFWS Final Rule To Delist the Florida Population of the Pine Barrens Tree frog To Rescind Previously Determined Critical Habitat, 1983	R004776
20	USFWS Final Rule To Determine Five Texas Cave Invertebrates To Be Endangered Species, 1988	R004780
21	USFWS Final Rule To Determine Coffin Cave Mold Beetle and the Bone Cave Harvestman To Be Endangered Species, 1993	R004882

VOLUME 5

No.	Document Description	AR Pages
22	USFWS 90-day Finding on a Petition To Delist Seven Texas Karst Invertebrates, 1994	R005051
23	USFWS Bone Cave harvestman 5-Year Review: Summary and Evaluation, 2009 (Excerpt)	R005236

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Petition to delist the Bone Cave harvestman (*Texella reyesi*) in accordance with Section 4 of the Endangered Species Act of 1973

PETITION TO DELIST THE BONE CAVE HARVESTMAN (*TEXELLA REYESI)* IN ACCORDANCE WITH SECTION 4 OF THE ENDANGERED SPECIES ACT OF 1973

Petitioned By:

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Kathryn Heidemann

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Walter Sidney Shell Management Trust

American Stewards of Liberty

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June 02, 2014

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EXECUTIVE SUMMARY

The federally endangered Bone Cave harvestman (*Texella reyesi*) is a terrestrial karst invertebrate that occurs in caves and voids north of the Colorado River in Travis and Williamson counties, Texas. The U.S. Fish and Wildlife Service (USFWS) listed *T. reyesi* as endangered in 1988 on the basis of only five to six known localities that occurred in a rapidly developing area. Little was known about the species at the time, but the USFWS deemed listing was warranted to respond to immediate development threats. The current body of information on *T. reyesi* documents a much broader range of known localities than known at the time of listing and resilience to the human activities that USFWS deemed to be threats to the species.

Status of the Species

- An increase in known localities from five or six at the time of listing to 172 today.
- Significant conservation is in place with at least 94 known localities (55 percent of the total known localities) currently protected in preserves, parks, or other open spaces.
- Regulatory protections are afforded to most caves in Travis and Williamson counties via state laws and regulations and local ordinances.
- Biologists continue to discover new, occupied localities and this trend is likely to continue as more areas are explored and more caves are discovered.

Review of Endangered Species Act Listing Factors

- Development activities on the surface may not result in the significant loss or degradation of habitat for *T. reyesi* as originally thought. Several examples of continued species persistence in developed areas include: Inner Space Caverns, Sun City caves, Three-Mile Cave, Four-Mile Cave, and Weldon Cave.
- Inner Space Caverns demonstrates that the species can persist in caves with frequent human visitation and may be more tolerant of related habitat modifications than originally believed.
- Recent studies suggest that fire ants may not present as significant or as lasting of a threat to the species as originally believed.
- The regulatory landscape includes a number of measures contributing to the conservation of the species outside of the protections afforded by the Endangered Species Act of 1973, as amended.
- The use of small voids or "mesocaverns" within the geologic formations known to support occupied caves mitigates the potential threat of climate change.

This petition provides several examples of other delisting actions by the USFWS in recent years, highlighting the rationale behind these prior actions and identifying similarities with the circumstances of *T. reyesi*. These provide historical evidence that the USFWS has delisted species on the basis of the original data in the listing rule being in error, as a result of new information demonstrating that the true range and population of the species is more expansive than previously known, and on the basis of species recovery, even if the criteria in published recovery plans were not fully met.

The Petitioners believe that delisting *T. reyesi* is warranted on the basis of both 1) significant conservation efforts achieving recovery, 2) significant increases in the number of known localities and the size of the species' range, and 2) new information and analysis indicating the existence and/or magnitude of previously identified threats do not support a conclusion that the species is at risk of extinction now or in the foreseeable future.

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We, the Petitioners, respectfully submit this petition to delist the federally endangered Bone Cave harvestman *(Texella reyesi)* to the U.S. Fish and Wildlife Service (USFWS) for consideration pursuant to Section 4 of the Endangered Species Act (ESA) of 1973, as amended.

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1.0 PETITIONED ACTION

The Petitioners respectfully submit this petition to delist the federally endangered Bone Cave harvestman *(Texella reyesi*) to the U.S. Fish and Wildlife Service (USFWS) for consideration pursuant to Section 4 of the Endangered Species Act (ESA) of 1973, as amended.

Since the 1988 listing, under the name *Texella reddelli,* a substantial amount of new scientific and commercial information has become available that demonstrates that *T. reyesi* is not at risk of extinction now or in the foreseeable future and that the protections of the ESA were not and are not warranted. The Petitioners request that the Secretary of the Interior (Secretary), acting by and through the USFWS, evaluate this petition to delist the *T. reyesi* on the basis of the best available scientific and commercial data pursuant to Section 4 of the ESA.

Several of the Petitioners believe that species inappropriately receiving the protections of the ESA cause significant economic harm to landowners who are prevented from using their land and to local governments who need to provide necessary community services. Others believe that the objectives of the ESA are best served by focusing limited conservation resources on species that truly warrant the protections of the ESA. All Petitioners believe that *T. reyesi* should no longer be listed as threatened or endangered under the ESA.

Pursuant to ESA section 4(b)(3)(A), the question USFWS must determine at this stage is "whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted." This is a relatively low-threshold burden of proof. For the purposes of this decision, "'substantial information' is that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted." 50 CFR 424.14(b)(1).

2.0 BONE CAVE HARVESTMAN SPECIES OVERVIEW

In the 25 years since the final rule listing *T. reyesi* as endangered in 1988, there has been much progress toward developing a scientific basis for understanding the biology and ecology of troglobitic species in Texas. Much of the available scientific data have been developed through monitoring activities associated with preserve management and project reviews related to ESA Section 10 permits and Section 7 consultations. While much of this research is site specific, it provides the basis for the current scientific and commercial data on, and understanding of, *T. reyesi*.

T. reyesi is a pale orange harvestman with absent retina. The species was identified by Ubick and Briggs (1992:211) as extremely polymorphic, particularly in its troglomorphic characteristics. For example, *T. reyesi* may have well developed cornea or the cornea may be reduced or absent altogether. Ubick and Briggs (1992:211) identified that the species is more troglomorphic in the northern reaches of its distribution. In other words, in the southern part of the range individuals have partial corneas, while in the north morphological evidence of any remnants of eye development is completely absent.

3.0 BONE CAVE HARVESTMAN REGULATORY HISTORY

The USFWS first listed *T. reyesi* as endangered under the ESA in 1988 under the name Bee Creek Cave harvestman (*T. reddelli*) (53 Fed. Reg. 36029). In 1993, the USFWS recognized *T. reyesi* as a separate species and published a final rule extending the endangered listing to this new species (56 Fed. Reg. 43818). This section is provided as a historical and regulatory overview of these and subsequent actions describing USFWS accepted data pertaining to *T. reyesi*. The justification for delisting, including an assessment of the current status, range, and distribution of the species, is provided in Section 5.0 of this Petition.

3.1 FINAL LISTING RULE (1988)

On September 6, 1988, the USFWS published a final rule to list as endangered five species of karst invertebrates known to occur only in Travis and Williamson counties, Texas (53 Fed. Reg. 36029). This final rule, which became effective on the date of publication, extended the protection of the ESA to the Tooth Cave pseudoscorpion *(Microcreagris texana)*, the Tooth Cave spider *(Leptoneta myopica)*, the Bee Creek Cave harvestman *(Texella reddelli)*, the Tooth Cave ground beetle *(Rhadine persephone)*, and the Kretschmarr Cave mold beetle (*Texamaurops reddelli)*.

Pursuant to the listing factors identified in the ESA, the USFWS provided the following justifications for the listing of these species as endangered (which now also pertain to *T. reyesi*) (53 Fed. Reg. 36031):

- **Listing Factor A (the present or threatened destruction, modification, or curtailment of its habitat or range):** "The primary threat to the five species comes from the potential loss of habitat owing to ongoing developmental activities." At that time, the USFWS assessment was directly related to "a major residential, commercial, and industrial development" that affected the entire known range of several of the species and a large portion of the habitat of the species we know today as *T. reyesi*. The USFWS described the potential threats from development activities as including collapsing or filling in caves during construction; the alteration of drainage patterns to caves (either increasing or decreasing water flow); increasing the flow of sediment, pesticides, fertilizers, and general urban run-off into caves; and increased human visitation and vandalism.

- **Listing Factor B (overutilization for commercial, recreational, scientific, or educational purposes):** The USFWS determined that "no threat from overutilization of these species is known to exist" at the time of listing; however, collection for scientific or educational purposes could become a threat if localities become generally known.

- **Listing Factor C (disease or predation):** The USFWS determined that increased human population increases the "problems of predation by, and competition with, exotic (non-native) species," including sowbugs, cockroaches, and fire ants.

- **Listing Factor D (the inadequacy of existing regulatory mechanisms):** The USFWS determined that these species were threatened by a lack of existing regulatory protections, based on a finding that "there are currently no laws that protect any of these species or that directly address protection of their habitat."

- **Listing Factor E (other natural or manmade factors affecting its continued existence):** USFWS discussed the limitations placed on these species by a lack of mobility from one habitat to another and stated "moisture regimes, food supply, and other factors may also limit subsurface migrations." The USFWS identified changes to inner-cave climate from surface alterations and vandalism of caves as potential threats.

In support of the 1988 final listing rule, the USFWS relied on only seven referenced data sources to substantiate the listing of the five species. Of these sources, only one source was less than ten years old at the time of the final rule, and only the Goodnight & Goodnight paper (1967) had any reference specific to *T. reddelli*. In the final rule, *T. reddelli* was confirmed from only five caves and believed to exist, but not confirmed, in a sixth. The known range of the species extended a distance of approximately 21 miles along the edge of the Edwards Plateau (75 square miles). The USFWS decision to list *T. reddelli* (later identified as *T. reyesi; see* Section 3.2) was based on very limited information about the species (including basic taxonomy) and was prompted by concerns about potential adverse effects of development activities at a time when the link between such activities and actual effects on the species was largely unknown.

3.2 TAXONOMIC SPLIT AND TECHNICAL CORRECTION (1993)

In response to a published taxonomic study by Ubick and Briggs in 1992, the USFWS determined in 1993 that *T. reddelli* was actually two distinct species (56 Fed. Reg. 43818). The newly identified species, *T. reyesi*, was afforded the same protections under the ESA as *T. reddelli*. In this final rule (identified as a "technical correction"), the USFWS states that "both of these species continue to face the same general threats identified in the original listing of the Bee Creek Cave harvestman [*T. reddelli*]" (56 Fed. Reg. 43819). The USFWS acknowledged that by "including newly discovered localities" of the *T. reyesi* the known range of the species expanded from 21 miles to 31 miles along the edge of the Edwards Plateau. However, the USFWS did not elaborate on the number or significance of these newly discovered localities.

Ubick and Briggs (1992:207; 211) identified 24 known *T. reyesi* locations and four *T. reddelli* locations. Of the caves in the original listing, only one of those locations (Bee Creek Cave) ultimately contained *T. reddelli* and the other four or five localities (Tooth Cave, McDonald Cave, Weldon Cave, Bone Cave, and potentially in Root Cave) contained the species now known as *T. reyesi*. The 1993 technical correction does not include an analysis of the ESA listing factors specifically applicable to *T. reyesi* nor the expanded range and distribution information. In its decision to list this newly identified species as endangered with extinction, the USFWS did not assess any new scientific or commercial data on the species beyond the taxonomic revision.

In the 1993 final rule, the omission of any assessment of available substantive scientific data beyond Ubick and Briggs (1992) was an oversight of substantial significance to the actual appropriateness of the listing. At the time the final rule was published, progress was well underway toward developing the 1994 Endangered Karst Invertebrates (Travis and Williamson counties, Texas) Recovery Plan (1994 Recovery Plan). The 1994 Recovery Plan (which addresses *T. reyesi* and six other listed karst invertebrates) includes an extensive nine-page list of references, including 32 publications and reports that are of relevance to *T. reyesi*. None of these sources were explicitly considered in the determination to extend the protections of the ESA to *T. reyesi*. This means that at the time of the 1993 technical correction, a substantial body of new information was available to the USFWS that was not considered or analyzed in the final listing rule for *T. reyesi*, indicating that the decision was not fully supported by the application of the best available scientific data available at the time.

3.3 PETITION TO DELIST AND NEGATIVE 90-DAY FINDING (1994)

On June 7, 1993, a petition to delist seven Texas karst invertebrates, including *T. reddelli,* (and later clarified to include *T. reyesi)* was submitted to the USFWS. In 1994, the USFWS issued a 90-day finding on that petition and determined that the petition, submitted by Judge John C. Doerfler of Williamson County, did not present substantial scientific data to support the delisting of any of the seven species identified.

In its 90-day finding, the USFWS determined that *T. reyesi* "is currently known from about 69 locations (60 confirmed, 9 tentative)" in Travis and Williamson counties (59 Fed. Reg. 11755). Of these localities, nine were protected at the time of the negative 90-day finding, including "three [that] are TSNL (Texas System of Natural Laboratories) caves, two [that] are in City of Austin preserves, two [that] are in City of Georgetown preserves, and two [that] were acquired as mitigation for a development project" (59 Fed. Reg. 11755). The 90-day finding includes multiple references to a review of the petition conducted by James Reddell (foremost expert on Texas cave fauna, Interim Curator of Entomology at the Texas Memorial Museum) entitled "Response to the Petition to Delist Seven Endangered Karst Invertebrates."

In the 90-day finding, the USFWS provided an assessment of the five listing factors previously identified in the ESA in reaching their finding. The USFWS maintained that "the primary threat to these species

comes from loss of habitat due to development activities" (59 Fed. Reg. 11756). The finding defers to the 1988 final rule for a specific discussion of the potential impacts of development activities. While the 90-day finding acknowledges that the known localities of *T. reyesi* have increased in the six years between 1988 and 1994, the USFWS concludes that "the degree of threat of habitat destruction or modification remains significant, and may have increased, throughout the range of each species" (59 Fed. Reg. 11756). USFWS provides this generalization without citing any scientific or commercial data to support the assertion, and without providing any specific examples of karst invertebrate habitat actually being lost to development activities. The USFWS did not cite any census data specific to *T. reyesi* populations that would have provided a quantitative basis for the continued support of the agency's original assertions.

Interestingly, the 1994 delisting petition included a list of known occupied caves that had been impacted by development activities yet continued to support the presence of listed species. The USFWS was not swayed by these data. However, the USFWS "agrees with the Petitioners that there is little quantitative data available on the direct effects" of these activities (59 Fed. Reg. 11756). It is important to note that the finding does not *disagree* with the list of examples presented in the petition. Rather, the USFWS states its surmise that "in most cases, not enough time has elapsed since the disturbance to detect an effect on the karst invertebrates." The USFWS seemingly makes the assumption that population declines will occur over time, but implies that if an adequate amount of time can be shown to have passed since the onset of these activities without recordable decline in the species at these sites, it could be concluded that these threats are not as severe as anticipated in the 1988 final rule and subsequent findings (59 Fed. Reg. 11756).

In the 90-day finding, the USFWS re-emphasized the threat presented by red imported fire ants (RIFA). The USFWS references Porter and Savignano (1990) to support the statement that "overall arthropod diversity drops" where RIFA are present (59 Fed. Reg. 11757). The USFWS also references a list developed by James Reddell and included in his review of the petition identifying nine cave-dwelling species known to have been preyed on by RIFA, none of which are *T. reyesi*. The USFWS concluded that controlling RIFA is a challenging yet necessary component to ensuring the continued viability of cave-dwelling species.

In the 90-day finding, the USFWS briefly discusses existing regulatory mechanisms relevant to the petitioned species and concludes that they were not sufficient to protect the species. The USFWS concluded that the known preserves identified in the petition did not include the entire extent of the drainage basins supplying moisture to the caves or did not have protections afforded in perpetuity. The USFWS did not identify any concerns relating to other natural or manmade factors specific to *T. reyesi*, but did identify a loss of genetic diversity as a concern for some of the other species included in the finding. The USFWS concluded that "these species continue to require the protection of the Act because of their extremely small, vulnerable, and limited habitats located within an area that is experiencing continued pressures from economic and population growth" (59 Fed. Reg. 11758). However, an "extremely small, vulnerable, and limited" habitat or range is not one of the listing factors identified in the ESA. It is the burden of the USFWS to identify how the listing factors threaten the species with extinction in the foreseeable future, and simply identifying that economic and population growth is likely to continue does not accomplish that task without specific examples of declining populations due to these activities.

Moreover, in his review of the delisting petition, James Reddell specifically states that "an argument could perhaps be made that because of its greater range *Texella reyesi* is not endangered" (Reddell 1993:11). This statement is completely ignored in the USFWS discussion on Reddell's response to the petition.

3.4 ENDANGERED KARST INVERTEBRATES RECOVERY PLAN (1994)

Section 4(f)(1) of the ESA requires that the Secretary "develop and implement plans… for the conservation and survival of endangered and threatened species listed" pursuant with the ESA, "unless he finds that such a plan will not promote the conservation of the species." Consistent with these definitions, the goal of recovery plans is to achieve a level of conservation for a listed species that removes the need for protection under the ESA. Section 4(f)(1)(B)(ii) states that recovery plans shall, to the maximum extent practicable, set "objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of [the ESA], that the species be removed from the list."

The status of *T. reyesi* was addressed in the 1994 Recovery Plan approved by the USFWS. At the time of the 1994 Recovery Plan, *T. reyesi* was confirmed in 60 caves with an additional nine pending confirmation and a geographic range including 135 square miles. This significant increase in known localities and range from the time of the 1988 listing (from 6 to 60–69 caves and 75 to 135 square miles) is consistent with the range and distribution known and discussed by the USFWS in its 90-Day Finding response to the 1993 delisting petition and in James Reddell's response to the delisting petition.

Since the 1994 Recovery Plan addresses seven invertebrate species, much of the analysis is general in nature in an attempt to encompass all the species represented in the Plan. Referring to all of the included species, the USFWS summarizes that "no population estimates are currently available for any of the species due to their secretive habits, rarity, and inaccessibility" (USFWS 1994:27).

Other than general taxonomic descriptions, the species-specific biological information and data relating to threats to the species that are provided for *T. reyesi* pertain solely to monitoring data gathered from Lakeline Cave and Temples of Thor Cave and is not representative of the status of the complete population. In evaluating the listing factors in relation to *T. reyesi*, the USFWS states that four known occupied caves had been filled, one of which was later reopened. The USFWS describes other related threats to the covered species including the alteration of drainage patterns, the alteration of surface plant and animal communities, contamination, human visitation and vandalism, the invasion of fire ants, and mining activities. While the USFWS provides examples of *T. reyesi*-occupied caves that occur in the vicinity of these threats, they do not provide data on any measurable negative impacts to *T. reyesi* resulting from this proximity. Nor does the USFWS consider in the listing factor analysis the beneficial conservation actions implemented for the species.

Karst Fauna Regions, Karst Zones, and Karst Fauna Areas

The 1994 Recovery Plan is heavily dependent upon the Karst Fauna Region (KFR) hypothesis developed by George Veni and Associates in 1992 (Veni and Associates 1992). The KFR principle was developed through a study conducted with ESA Section 6 funding to assess "geologic controls on cave development and distribution of karst fauna in the vicinity of Travis and Williamson counties" (USFWS 1994:67). The result was the delineation of 11 distinct areas named "karst fauna regions" within Travis, Williamson, Hays, and Burnet counties based on "geologic continuity, hydrology, and the distribution of 38 rare troglobites" (USFWS 1994:67). When the 1994 Recovery Plan was developed, *T. reyesi* was known from six KFRs: the North Williamson County, Georgetown, McNeil/Round Rock (originally identified as two distinct KFRs, but considered as one in the 1994 Recovery Plan), Cedar Park, Jollyville Plateau, and Central Austin KFRs.

In addition to delineating the KFRs, Veni and Associates (1992) identified zones in Travis and Williamson counties that estimated the relative likelihood that listed karst invertebrate species were present in each zone. These "Karst Zones" are described as follows in the 1994 Recovery Plan:

> Zone 1: Areas in the Edwards Group limestones that are known to contain listed species;

Zone 2: Areas that may contain listed species or other endemic fauna;
Zone 3: Areas that probably do not contain any listed species or their habitat; and
Zone 4: Areas of non-cavernous rock and thus do not contain caves or other karst features.

The 1994 Recovery Plan identifies the known distribution of each of the included species by occupied cave. This effectively demonstrates that the known range of *T. reyesi* far exceeded the known range for the other six species addressed in the recovery plan (Table 1). This distribution information further demonstrates the significant increase in known localities, from the five confirmed localities in 1988 to the 69 confirmed and pending localities known at the time the 1994 Recovery Plan was approved. Despite the acknowledgment of these new data, including the fact that *T. reyesi* occurs in six of the eight KFRs, there was no discussion on how the information may warrant unique consideration in determining appropriate recovery criteria for *T. reyesi*.

Table 1. Endangered karst invertebrate locations as of 1994 in Travis and Williamson Counties as Identified by William Elliot and James Reddell for Inclusion in the 1994 Recovery Plan (USFWS 1994:29)

Karst Invertebrate Species	Occupied Localities Travis County	Occupied Localities Williamson County	Total
Texella reyesi	19	50	69
Texella reddelli	7	0	7
Tartarocreagris texana	4	0	4
Neoleptoneta myopica	4	0	4
Rhadine persephone	12	15	27
Texamaurops reddelli	4	0	4
Batrisodes texanus	0	5	5

The 1994 Recovery Plan bases the downlisting criteria for the Travis and Williamson counties karst invertebrates on the permanent protection of Karst Fauna Areas (KFAs) within each of the KFRs where a species is known to occur. The 1994 Recovery Plan states that KFAs should be selected on the "ability to ensure long-term protection, current level of habitat disturbance, past and present land use, presence of other rare or candidate species, ease of protection (landowner cooperation), and, where applicable, importance to the regional groundwater system" (USFWS 1994:80). At the time the 1994 Recovery Plan was written, there was no specific design for the size and configuration of a KFA. The 1994 Recovery Plan instead provided that those specific determinations should be site-specific, but should include an area large enough to "maintain the integrity of the karst ecosystem on which each species depends" (USFWS 1994:82).

The 1994 Recovery Plan recommends that downlisting of any of the listed karst invertebrates be considered when three KFAs within each KFR where the species is known to occur (if opportunities for at least three exist) are protected in perpetuity (USFWS 1994:76). However, where opportunities for three KFAs per KFR are not known to exist, the USFWS indicates that two protected KFAs (or even only one, if it is the only one available) could be sufficient for downlisting, provided that at least two KFAs for that species are protected range wide (USFWS 1994:77). Given that *T. reyesi* clearly has the most known localities of the species included in the 1994 Recovery Plan, occurring across six KFRs and at 172 known localities, this species would require more protected KFAs (18 total) than the other species in order to warrant downlisting under the recovery guidelines (USFWS 1994:79), even though the 1994 Recovery Plan indicates that a lesser standard could be sufficient for protection of the species.

Requiring the species with the most known localities and widest distribution to also have the most formally protected KFAs provides a level of conservation that exceeds what is necessary to ensure the perpetual protection of the species, particularly when compared to the recovery guidelines provided for the rarest of the species. The 1994 Recovery Plan does not provide any biological evidence why having more than two KFAs for a more abundant species is necessary for the species' long-term survival, when the USFWS does not require this level of conservation for species that are considered to be rarer. Nor does the USFWS provide evidence regarding how the determination of three KFAs within each KFR is necessary to contribute to long-term recovery. Rather, it seems logical that if rare species with only two known localities can be feasibly protected to the point of downlisting when those two localities are protected, then the dozens of protected localities for *T. reyesi* that are distributed across six KFRs should also warrant downlisting consideration.

Implications of the Bexar County Recovery Plan Minority Report

In 2009, during the drafting of the Bexar County Karst Invertebrate Recovery Plan, the use of KFRs was chosen as the preferred method for assessing the recovery of related karst invertebrates in the greater San Antonio area. A minority report was provided to the USFWS by Dr. Kemble White, who served as a member of the Recovery Team that outlined scientifically supported counter arguments to the use of KFRs in the Bexar County Recovery Plan. The minority report cited a body of peer-reviewed literature that was not included for consideration by the Bexar County Recovery Team. In summation, this literature shows that actual species distribution is not represented by the KFR hypothesis and encourages the USFWS to consider alternative methods for determining appropriate distribution for recovery. While White does not argue that distinct regions cannot be delineated to measure recovery, he clarifies that "they are likely different for each species group" rather than uniform as described through the KFRs (White 2009:3).

According to White (2001; 2006; 2009) the weakness behind the KFR concept in the Bexar County system is based on insufficient sampling efforts to substantiate the KFR delineation, boundaries being developed without definitive taxonomic evidence to support those boundaries, a complete failure to consider alternative ways to define species boundaries, and biased data in the endemism index. White argues that given the normal trajectory of a significant increase in available species data following a listing action by the USFWS, and that a "great majority of useful data have been generated and published since the nine Bexar County karst invertebrates were listed," those data should be applied to revise or discard the existing KFR concept in Bexar County (White 2009:5). This is based on scientific literature that shows that "the KFR hypothesis has been retested, both directly and indirectly, and the new data consistently demonstrate that the KFR concept does not explain the biogeographical origins or distribution of the Bexar County troglobites" (White 2009:5). The Petitioners encourages the USFWS to consider the peer-reviewed data regarding the use of KFRs in determining recovery that is referenced in this petition.

While most of the available literature on this subject involves research specific to Bexar County, the same logic can be applied to the KFRs used in Williamson and Travis counties. This is supported by the consideration of the Bexar County Karst Invertebrate Recovery Plan in the 5-Year Status Review for *T. reyesi* completed by USFWS in 2009. Peer-reviewed literature that refutes the relevance and scientific application of the current KFRs must be considered in this petition. This literature demonstrates that within the body of best available scientific and commercial data there are supported arguments against the use of KFRs as the primary tool for measuring species recovery. Given this documented uncertainty, if the data demonstrate a significant increase in a species' range and this increase is accompanied by a sustaining number of protected populations and a reduction of the impacts resulting from potential threats, that species should be delisted regardless of the distribution of those protected localities. This is

consistent with the regulatory definition of recovery as described in the ESA and outlined in listing decisions approved by the USFWS (some examples are provided in Section 4 of this petition).

Challenges Associated with Multi-Species Recovery Plans

The 1994 Recovery Plan is a multi-species plan that includes little species-specific information pertaining to *T. reyesi*. While the USFWS regularly develops multi-species recovery plans in an effort to achieve high efficiency and more cohesive strategies to address threats to species, there are several studies that have determined that the current protocol for developing multi-species plans, especially the monitoring and adaptive management component of these plans, is not in the best interest of the individual species or in meeting the conservation objective of the ESA for individual species (Boersma et al. 2001; Clark et al. 2002).

A study conducted in 2001 by Boersma et al., "found that species from single-species plans were four times more likely to be improving in status than species from multi-species plans" (Clark et al. 2002:656). Clark et al. (2002) subsequently developed a statistical method for evaluating multi-species and single-species plans to test the findings of Boersma et al. (2001). The Clark study overwhelmingly confirmed the work of Boersma et al., concluding that "by nearly all measures in this and other papers analyzing the recovery plan project database, single-species recovery plans provide a better foundation for recovery efforts than multi-species plans" (Clark et al. 2002:660). In an effort to identify why there exists such a significant difference in the success rate, the Clark study identified two primary potential causes: (1) the effectiveness of the plans is directly related to the biological nature of the species and (2) by lumping multiple species into one plan, there is no attention focused to individual species' needs and therefore the recovery goals may not be equally appropriate or beneficial to each species in the plan.

Clark assesses that "the extent of species-specific biological understanding is greater in single-species than multi-species plans," which is supported by the idea that "the USFWS has lumped species into multi-species plans simply because it had insufficient information about the individual listed species to draft adequate single-species plans" (Clark et al. 2002:660).

Given these assumptions, it is reasonable to assume that the 1994 Recovery Plan does not include a complete consideration of the unique biological needs of *T. reyesi*. Evidence indicates that a species benefits from being considered independently and not as part of a multi-species effort. There has been a significant increase in the available information relating to *T. reyesi* since the development of the 1994 Recovery Plan that indicates that the levels of recovery applied generally for all seven species does not translate into appropriate recovery guidelines for *T. reyesi*.

The introductory section of the 1994 Recovery Plan includes a disclaimer that concludes "approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks" (USFWS 1994:i). This disclaimer explicitly acknowledges that should a preferred method for evaluating recovery or new analysis of the listing factors utilizing new available scientific data become available, downlisting/delisting should be considered regardless of progress towards achieving the specific conservation objectives outlined in the 1994 Recovery Plan.

3.5 5-YEAR STATUS REVIEW (2009)

Fifteen years after the release of the 1994 Recovery Plan, the USFWS completed a 5-year status review (Five-Year Review) of *T. reyesi* in 2009 and, remarkably, in spite of new data documenting the increased number of protected locations for the species, arbitrarily determined that no change in listing status was warranted. The Five-Year Review does not evaluate any of the ESA listing factors and provides no analysis of new scientific or commercial data in relation to those factors. While it does confirm that there were 168 known occupied caves containing *T. reyesi* distributed across all KFRs, a substantial increase

over those known at the time of the 1994 Recovery Plan, it does not evaluate the implications of these additional known localities on the species' risk of extinction.

While the Five-Year Review does incorporate several new references into its works cited, the resources provided are primarily related to various Section 10 consultations that have occurred relative to the species, primarily in Travis County. It is likely that the resources included in the Five-Year Review could have yielded an assessment of the species' status in relation to the listing criteria, but the USFWS made no effort to do so in their assessment. As a result, the Five-Year Review is ultimately a listing of known cave locations that fails to provide any scientific or quantitative assessment of the species' status in relation to the listing criteria, even though abundant data were available.

Inadequate Consideration of Protected or Stable Sites

In the Five-Year Review, the USFWS exclusively based its evaluation of species status on the progress (or not) towards attaining the recovery criteria outlined in the 1994 Recovery Plan, which are based on the acquisition and management of a certain number of KFAs. It acknowledges that while there was one KFA for *T. reyesi* recognized by the USFWS (Priscilla's Well KFA), an additional 28 areas were potentially eligible as KFAs. These tracts were not recognized by the USFWS as KFAs at the time of the Five-Year Review due to a lack of information regarding surface/subsurface drainage basins, insufficient protected acreages around features, and/or lack of commitments for ongoing management activities. The Five-Year Review provides an overview of each of these 28 opportunities and the known information that may warrant their consideration as a KFA. Caves identified as having KFA potential in the Five-Year Review are identified in Appendix A and section 5.2.4 of this petition. These 29 approved, potential, or de facto KFAs are locations where the effective threats to the species are sufficiently low as to warrant consideration as "recovery quality" conservation areas. The number of these essentially stable sites is in excess of the number of protected sites deemed necessary for the species in the 1994 Recovery Plan and are distributed across five of the KFRs known to include *T. reyesi*.

Inappropriate Reliance on a Narrow Set of Data

The Five-Year Review states that the USFWS "mostly relied on information summarized and cited in Balcones Canyonlands Preserve (BCP) Annual Report and the BCP cave assessment" (USFWS 2009:1). Other predominant references include the draft Bexar County Karst Invertebrate Recovery Plan and the 1994 Recovery Plan. The stated reliance on these information sources is problematic since a strong majority of the known occupied caves for *T. reyesi* are located in Williamson County and not represented in the BCP reports which cover Travis County. Further, there are no known locations of *T. reyesi* in Bexar County, which represents an altogether different karst system inhabited by an altogether different group of karst invertebrate species. The 1994 Recovery Plan, as described above, includes very little species-specific information about *T. reyesi* and relies on a recovery framework (the KFR and KFA constructs) that may not accurately reflect the conservation needs of the species.

Climate Change

The Five-Year Review briefly considers the potential threat of climate change in its analysis. Climate change is not addressed as a direct threat in either the 1988 or 1993 listing rules for *T. reyesi* and its discussion in the status review is minimal. The USFWS states that "to date, these changes do not appear to have had a negative impact on *T[exella] reyesi*" (USFWS 2009:18). The USFWS acknowledges that potential impacts of climate change are unknown and that they "lack sufficient certainty to know how climate change will affect this species" (USFWS 2009:18). Since the discussion on climate change is speculative and completely lacks supportive data, it is not a substantive argument for continued listing.

3.6 ESA SECTION 7 AND SECTION 10 CONSULTATIONS

The USFWS has issued or completed several ESA Section 10 incidental take permits and Section 7 consultations that address *T. reyesi*. Some (but certainly not all) of these actions include:

- Four Points Property Section 10 Permit (PRT-808694)
- Grandview Hills Property Section 10 Permit (PRT-815447)
- Comanche Canyon Ranch Section 10 Permit (TE-004683-0)
- Sultan and Kahn Section 10 Permit (TE-035525-0)
- Russell Park Estates Section 10 Permit (TE-051567-1)
- Simon Lakeline Mall Section 10 Permit (TE-762988)
- Williamson County Regional Habitat Conservation Plan Section 10 Permit (TE-181840-0)
- Balcones Canyonlands Conservation Plan Section 10 Permit (PRT-788841)
- Hart Triangle (GDF Realty Investments) Section 10 Permit (TE-027690-0)
- Shadow Canyon (San Gabriel Harvard Limited Partnership) Section 10 Permit (TE-116313-0)
- State Highway 195 in Williamson County Section 7 Consultation (21450-2006-F-0132)
- Brushy Creek MUD Section 7 Consultation (2-15-F-2002-0453)

Each of these consultations resulted in the establishment of mitigation preserve land that includes the protection in perpetuity of known *T. reyesi* localities. These represent part of the at least 8,413 acres of protected lands with 94 *T. reyesi* occupied caves discussed further in Section 5.2.4 and Appendix B of this petition.

4.0 DELISTING CRITERIA, PROCESS, AND HISTORICAL PRECEDENTS

Delisting a species from the protections of the ESA may occur as a result of achieving recovery, species extinction, or new analysis that otherwise indicates that the original listing was in error. Since 1967, 59 species have been delisted (51 domestic and 8 foreign species). Of these, 18 were delisted because the original data were found to be in error, 31 have been recovered, and 10 have gone extinct (USFWS 2013a; NOAA 2013).

4.1 RECOVERY AND RELATIONSHIP TO RECOVERY PLANS

The Policy and Guidelines for Planning and Coordinating Recovery issued by the USFWS in 1990 defines recovery as "the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self-sustaining wild populations of the species" (USFWS 1990:1). While there is a regulatory basis for the development of recovery plans, there is no requirement that recovery plans be implemented. **It is also important to recognize that neither the ESA nor the USFWS regulation establishes that recovery plans act as the sole determinant of a species' progress towards achieving recovery.**

For example, in its final rule to delist the Lake Erie water snake in 2011, the USFWS states that "recovery plans are intended to provide guidance to the USFWS, States, and other partners… they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under 4(a)(1) of the Act" (76 Fed. Reg. 50681). In regard to implementation of recovery plans, the USFWS identifies that "there are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met" (76 Fed. Reg. 50681). Moreover, "the determination to remove a species from the Federal List of Endangered and Threatened Wildlife is ultimately based on an

analysis of whether a species is no longer endangered or threatened" (76 Fed. Reg. 50681). Therefore, a species may be delisted on the basis of recovery even if the specific recovery criteria identified in the species' recovery plan have not been met.

Other examples of species that have been delisted on the basis of recovery not necessarily defined by strict adherence to published recovery plan criteria include the following:

- **Columbian White-tailed Deer (*Odocoileus virginianus leucurus*), Douglas County distinct population segment) (68 Fed. Reg. 43647) -** In 2003, the Douglas County distinct population segment of the Columbian white-tailed deer (distinguished in the 1983 revision to the recovery plan) was delisted due to recovery. Prior to listing, the species had declined by 1970 to just two known populations representing approximately 400–500 individuals. Largely as a result of conservation efforts and regulations on hunting, by 2002, the species increased to over 6,000 known individuals (68 Fed. Reg. 43651). This represents a population increase of 1,417.5% (based on a starting value of 400 known individuals). Despite this population increase, there remained only two known populations of the species at the time of delisting, and the range of the delisted population segment included only one county in Oregon. The basis for delisting the distinct population segment was the establishment of secure habitats. The recovery plan "did not define secure habitat to include only publically owned lands; rather, it provided further guidance on secure habitat by stating that local entities, including planning commissions, county parks departments, and farm bureaus could secure habitat through zoning ordinances, land-use planning, parks and greenbelts, agreements, memoranda of understanding, and other local jurisdictions" (68 Fed. Reg. 43651). They additionally encouraged conservation organizations to contribute through "easements, leases, acquisitions, donations, or trusts" (68 Fed. Reg. 43651).

- **Robbins' Cinquefoil (*Potentilla robbinsiana*) (67 Fed. Reg. 54968) -** In 2002, the Robbins' Cinquefoil was delisted due to recovery. This determination was based on the application of protective conservation actions and the addition of new viable populations. At the time of the listing in 1980, there was only one known population of the species that had been transected by development associated with the Appalachian Trail. Within that population, approximately 2,000 individual plants were known to occur. By the time the species was delisted, more than 14,000 individual plants were known to occur at two naturally occurring localities and two transplanted localities (67 Fed. Reg. 54968). This represents a known population increase of 600%. While the recovery plan initially called for four new transplant sites, it was later determined that only two of these sites needed to be viable. In response to comments received relating to the separation from the objectives outlined in the recovery plan, the USFWS iterated that "the objectives identified during the recovery planning process provide a guide for measuring the success of recovery, but are not intended to be absolute prerequisites, and should not preclude a reclassification or delisting action if such action is otherwise warranted" (67 Fed. Reg. 54972).

- **Aleutian Canada goose (*Branta canadensis leucopareia*) (66 Fed. Reg. 15643) -** In 2001, the Aleutian Canada goose was delisted due to recovery. In 1975, 790 individuals of the species were known to exist. By 1989, the population had increased to 5,800 known individuals (an increase of 634%). As a result of that increase, the species was down-listed to threatened. In 2000, there were 36,978 known individuals (an increase of an additional 537%) and the species was delisted (66 Fed. Reg. 15643). This represents a cumulative population increase of 4,580% from the time of listing. The species was determined to be recovered due to the discovery of new localities, the introduction of captive-bred individuals that led to an expanded range, and the elimination of threats like hunting by establishing closed hunting areas.

These are just a handful of examples where species have been delisted on the basis of recovery. In these cases, the USFWS determined that the threat of extinction and decline of the species had been reversed.

In many cases, the conditions considered for recovery were different from those outlined in the initial recovery planning process as new scientific information became available. In all cases, some forms of perpetual protective measures were implemented in support of continued species security.

As described in detail in Section 5.2.4 of this petition and consistent with these examples, a substantial level of conservation has been achieved for *T. reyesi*. These efforts have been accomplished through the establishment of permanent preserves dedicated to the protection and management of the species and more generally through the implementation of local and state regulations that minimize adverse effects on *T. reyesi* habitat across the range of the species. When coupled with the knowledge of a significantly expanded range and known distribution of the species and evidence that the threats to the species may not be as severe as originally assumed, these conservation measures sufficiently assure the continued survival of the species and avert the risk of extinction in the foreseeable future.

4.2 EXTINCTION

To date, 10 species have been delisting under the ESA due to extinction. While this is a warranted justification for the removal of a species from the protections of the ESA, it is not relevant to the *T. reyesi* and therefore not discussed further in this petition.

4.3 ORIGINAL DATA IN ERROR

The third acceptable criteria for delisting are instances where the original data used to support the listing is determined to be in error. In such cases, **delisting may be warranted if the analysis of new information or a reanalysis of the original information indicate that the existence or magnitude of threats to the species, or both, do not support a conclusion that the species is at risk of extinction now or in the foreseeable future**. Examples of species that have been delisted on the basis of an erroneous listing include:

- **Pine Barrens treefrog *(Hyla andersonii)* (48 Fed. Reg. 52740) -** In 1983, the Florida population of the Pine Barrens treefrog was delisted due to a finding that the original data were in error. The USFWS stated "recent evidence indicates that the species is much more widely distributed than originally known" (48 Fed. Reg. 52740). At the time of the listing, there were only seven known localities of this species in Florida and the predominant threat was cited as "the present or threatened modification, or curtailment of its habitat or range" (48 Fed. Reg. 52741). By 1979, several more populations were identified, and by 1980 there were over 150 confirmed occupied locations for the species (an increase of at least 2,042%). The final rule noted that while the overall distribution of the species was relatively limited, the likelihood of discovering more known localities in consideration with the additional new sites discovered indicated that "the Florida population is relatively secure for the immediate future" (48 Fed. Reg. 52741).

- **Rydberg Milk-Vetch (*Astragalus perianus)* (54 Fed. Reg. 37911) -** In 1989, the Rydberg Milk-Vetch was delisted on the basis of erroneous data. At the time when this species was listed, there was only one known locality. The subsequent delisting was based on the discovery of 11 additional localities over nine years of research (an increase of 1,100%). This delisting was supported by the existence of regulatory mechanisms that minimized the impacts of the threats identified in the initial listing factors.

- **McKittrick pennyroyal *(Hedeoma apiculatum)* (58 Fed. Reg. 49244)** - In 1993, the McKittrick pennyroyal was delisted because of "the number of newly discovered populations and the remote and inaccessible nature of the habitat" (58 Fed. Reg. 49244). This species was at the time of listing and continues to be only known from two counties, one each in Texas and New Mexico. At the time of listing, there were 7 known localities of the species. At the time of delisting, there

were 36 known populations of the species (an increase of 414%) (58 Fed. Reg. 49245). The USFWS determined that since this plant species occurs in hard-to-reach habitats, it is likely that its distribution is even broader than the confirmed locations, and that its natural preferred habitat limits the likelihood of human-related impacts.

- **Utah (Desert) Valvata snail *(Valvata utahensis)* (75 Fed. Reg 52272) –** In 2010, the Utah Valvata snail was delisted on the basis of new information. At the time of listing in 1992, the species was believed to occur in only "a few springs and mainstream Snake River sites" at, isolated points along the Snake River. The species was delisted after data showed that the species range extended an additional 122 miles beyond the initially identified range (an increase in the known range of 118.5%). The USFWS determined that due to the increased range of the species, the listing factors would not contribute to the likelihood of the species being threatened with extinction in the foreseeable future. Among the threats discussed, impacts to its habitat from agricultural and industrial purposes were excluded as threats because "the species persists in these varied mainstem Snake River systems, including impounded reservoir habitats" (75 Fed. Reg. 52280). **This distinction is critical because despite the continued presence of previously perceived threats, the proven ability of the species to continue to thrive in those conditions supported delisting.**

Since listing in 1998, a significant amount of new scientific and commercial information has become available that demonstrates *T. reyesi* occurs in significantly more locations than originally believed. Given the vastly increased number of known localities occupied by the species, many of which are protected, the perceived threats believed to apply to the species are not of a magnitude or intensity that is likely to cause the extinction of the species now or in the foreseeable future. The circumstances of *T. reyesi* are similar to those in the examples above, where the consideration of new populations or occupied sites prompted the USFWS to delist. Like the Utah Valvata snail, *T. reyesi* has also demonstrated the ability to persist and thrive in conditions where the USFWS assessment of threats should indicate a decline or extirpation (*see* section 5.2.1 for examples). This new information supports the conclusion that the protections of the ESA are no longer warranted for *T. reyesi* since the existence or magnitude of threats to the species, or both, do not support a conclusion that the species is at risk of extinction now or in the foreseeable future.

5.0 JUSTIFICATION FOR THE PETITIONED ACTION

Herein, the Petitioners present and analyze the credible scientific or commercial information that would lead a scientifically accurate species status review to conclude that delisting of *T. reyesi* may be warranted. The following assessment shows that *T. reyesi* is not at risk of extinction in the foreseeable future and therefore should be delisted.

5.1 DISTRIBUTION AND RANGE

The known distribution and range of *T. reyesi* has increased substantially since the time of the 1988 listing. At the time of listing, *T. reddelli* was known to occur in five or six caves (Tooth Cave, Bee Creek Cave, McDonald Cave, Weldon Cave, Bone Cave, and possibly Root Cave; of these, all but Bee Creek Cave were later confirmed to contain *T. reyesi*) with a range that included approximately 75 square miles (21–31 linear miles). By the release of the 1994 Recovery Plan, the USFWS recognized 60 caves with confirmed occupancy by *T. reyesi*, and nine additional caves believed to be occupied by *T. reyesi* pending taxonomic confirmation. These caves represented a range of 135 square miles, an increase of 60 square miles. By 2009 when the Five-Year Review was completed, the USFWS recognized 168 known localities for *T. reyesi* with an approximate range of 190 square miles (Figure 1).

One cave, the Barker Ranch Cave No. 1 has been identified by the USFWS as being occupied with *T. reyesi*. However, for the purpose of this petition and the scientific record for the species, this cave should not be considered a *T. reyesi* site location. Given the distribution of other occupied *T. reyesi* caves, Barker Ranch Cave No. 1 is a clear outlier, being found 16.5 miles farther south than any other known occupied cave. Further, and most importantly, the specimen was likely misidentified. The identification was based on the collection of a single juvenile specimen collected in 2000 (Ubick and Briggs 2004:108). Ubick and Briggs specifically state in their report that records of females and juveniles are only tentatively identified to species. Without DNA verification, which Ubick and Briggs did not perform, it is not possible to determine that a juvenile specimen is in fact *T. reyesi*. Given these factors, it is extremely unlikely that this specimen is *T. reyesi*. It is more likely that this juvenile belongs to the species *Texella mulaiki* which Ubick and Briggs identify as being the predominate species in southern Travis County in the vicinity where this juvenile specimen was collected. While further investigation is certainly warranted at this site, the Barker Ranch Cave No. 1 record for *T. reyesi* should be considered in error and is excluded from the analysis of the species' current status in this petition.

Nevertheless, the current body of scientific and commercial information indicates that *T. reyesi* is widely distributed across a range that is now known to encompass approximately 148 square miles, 5 KFRs, and at least 172 known localities (167 confirmed in the Five-Year Review, excluding Barker Ranch Cave No. 1, and including an additional five sites verified by ZARA in 2010). Therefore, the known distribution of *T. reyesi* (as measured by the number of known occupied localities) has expanded by approximately 3,340% over a period of 25 years. The discovery of new localities has occurred at an average rate of approximately 7.59 new sites per year (based on 167 new localities discovered between 1988 and 2010). This increase in range and known localities is depicted in Table 2 and Figure 1.

Table 2. *T. reyesi* Known Localities and Range Over Time.

Year and Source Document	Known Occupied Caves	Known *T. reyesi* Range
1988 (Final Rule)	5-6	75 square miles
1994 (1994 Recovery Plan)	60-69	135 square miles
2009 (Five-Year Review)	168	190 square miles
2014 (Delisting Petition)	172	148 square miles

Appendix C includes a comprehensive list of known occupied caves with *T. reyesi* as of the 2009 Five-Year Review or that have been subsequently confirmed to contain the species. Most of these currently known localities are shown in Figure 1. However, the precise locations of some occupied localities are no longer known or are not publicly available and are either not included on Figure 1 or are shown as only approximate locations.

This increase in known distribution clearly represents an expansion of our understanding of the species range rather than a true expansion of the *T. reyesi* population. Consequently, we now know that the analysis of threats in the 1988 final listing rule was based on extremely limited information that was premised on an erroneous understanding of the species' range as being restricted to no more than five or six locations distributed across approximately 75 square miles along the edge of the Edwards Plateau (the only known occurrences of the species at that time, one of which was actually *T. reddelli*).

The significant increase in known localities of *T. reyesi* is a consequence of increased survey effort over areas of potential habitat. The full extent of potential habitat for *T. reyesi* where the species has a possibility for occurrence may be approximated by the area of Karst Zones 1 and 2 delineated by Veni (1992, as updated in 2007). These karst zones encompass approximately 125 square miles across the

known range of the species and it is extremely likely that within this area, more caves will be discovered. Further, this area supports extensive mesocavernous space (interstitial space) likely occupied by the species in areas not accessible to biologists. The USFWS provided a 100-acre buffer around occupied caves in the critical habitat designation for karst invertebrates in Bexar County to account for "subsurface karst deposits, the cave footprint, surface and subsurface drainage areas, a cave cricket foraging area, and, where possible, at least 100 acres (40 ha) of undisturbed or restorable vegetation" (77 Fed. Reg. 8461). This represents an area designed to include mesocavernous space under the ground that is not included in the cave footprint itself and therefore, should be included in calculations of available habitat. Given the use of mesocavernous space in regulatory considerations, these areas must be considered in the evaluation of occupied habitat.

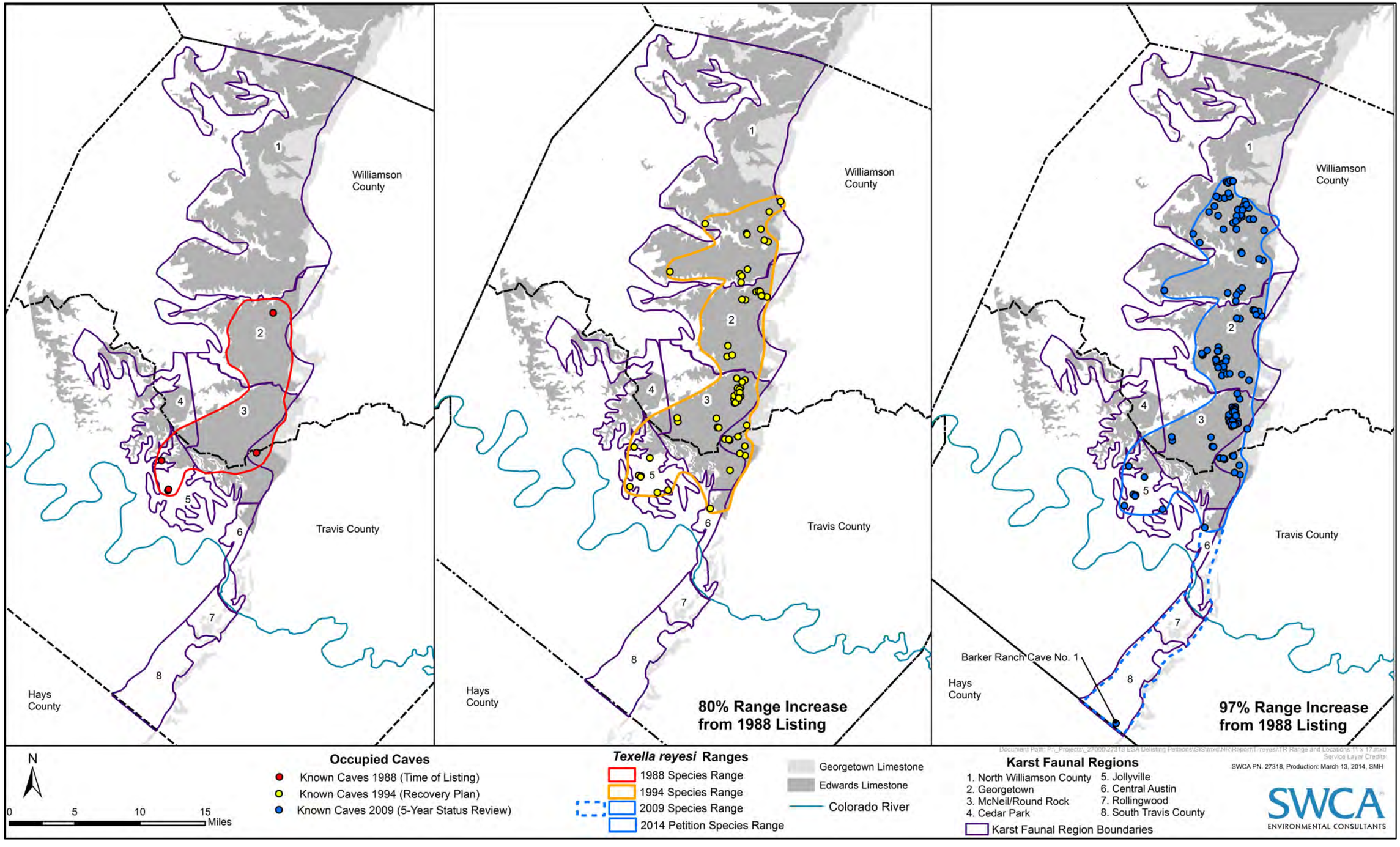

Figure 1. *T. reyesi* known localities and distribution over time.

Therefore, a review of the best available scientific and commercial data indicates that *T. reyesi* is not restricted to a small number of isolated caves as purported in the 1988 listing rule, but is instead a relatively wide-ranging occupant of karst habitats across at least 148 square miles of Travis and Williamson counties. The species has been and continues to be found in new locations across areas of potential habitat as more survey work is conducted, both within known caves subject to additional survey effort and within newly discovered caves across its range. While much of this distribution and range information is acknowledged by the USFWS in various publications, the USFWS has failed to quantify and address the implications of this increasing body of information in any status review completed subsequent to the final listing rule. The heavy reliance of the USFWS on this "extremely limited" range and distribution to justify the final listing rule substitutes surmise and opinion for scientific data.

The Petitioners believe that the new distribution and range information available since the time of listing warrants a complete reevaluation of the relevance of the listing factors and the magnitude of the threats to the species to reach an appropriately informed decision about whether or not the continued protection of the ESA is necessary to prevent the extinction of *T. reyesi*.

5.2 ANALYSIS OF LISTING FACTORS

As previously discussed, known populations of *T. reyesi* have increased from five confirmed locations to at least 172 known locations—an increase of 3,340 percent. This increase in known population is comparable in extent to delisting examples described earlier for several other species. However, when conducting the 2009 Five-Year Review of *T. reyesi*, the USFWS completely failed to evaluate these new scientific and commercial data in light of the listing factors.

Analysis Framework and Examples

The ESA does not identify a minimum population or range size that must be achieved and maintained to warrant delisting. A listing or delisting determination is to be based entirely on the risk of species extinction from any one or a combination of the five factors provided in the ESA. This distinction is critical because even in cases where there is only one known locality for a given species, if that locality is not subject to any of the five listing factors, listing under the ESA is not warranted. For example, in 2005, the USFWS made the determination not to list the greater and lesser Adams cave beetles (*Pseudanopthalus cataryctos)* after a Candidate Conservation Agreement with Assurances (CCAA) (TE-088168-0) was approved by the USFWS that effectively eliminated all concerns that may have been realized pursuant with the listing factors. This determination was made despite the two beetles only having one known locality and the CCAA only including 1 acre of land.

The CCAA, approved by USFWS, states that "contributions to this CCAA are expected to alleviate these threats by controlling the identifiable, potential sources of those threats" (Southern Conservation Corp. 2005:3). The USFWS determined that "these conservation efforts will reduce or eliminate the threats to the survival of the two beetle species, precluding the need for listing them under the ESA" (MacKenzie 2005). In this case, the USFWS determined that because the species were protected under a conservation agreement, none of the listing factors were considered likely to result in extinction for the species in the foreseeable future despite there being only one known occurrence of the two species. This example shows how species that do not meet any of the listing factors must be delisted regardless of the known range of the species.

In 2006, the USFWS made the controversial decision not to list the Cerulean warbler. While conservation groups lead by the Southern Environmental Law Center and the National Audubon Society cited concerns that habitat had been lost and modified enough to warrant listing, the USFWS ultimately determined that listing was not necessary because "the species is unlikely to be in danger of extinction in the foreseeable future" (Parham 2006). This determination acknowledged that the population of the species is declining,

however similarly determined that the rate of decline was slow enough that the species population would ultimately "number in the tens of thousands 100 years [from the time of the ruling]" (Parham 2006).

The example of the Cerulean warbler and others enforces the application of the definitions and terms outlined in the ESA. "It is the Act's definitions of endangered (i.e., "in danger of extinction throughout all or a significant portion of its range") and threatened (i.e. "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range") that provide the applicable standards for determining whether a species has "recovered" (Goble 2010:72). Critical to note is that the Cerulean warbler was shown to be declining but deemed not warranted for listing. In contrast, the known localities for *T. reyesi* have increased substantially without any indication of species decline, which should similarly support a determination that the protections of the ESA are not warranted. If the listing factors do not indicate that a species is likely to be threatened with extinction in the foreseeable future, the species should not be listed.

Listing Factor Analysis

Since the Five-Year Review failed to adequately address the listing factors, the Petitioners provide the following analysis of the listing factors as they apply to the *T. reyesi* based on the best currently available scientific and commercial data. This analysis conclusively shows that the listing factors when discussed in the specific context of *T. reyesi* do not warrant the continued listing of the species. Previous actions by the USFWS, such as the decisions not to list the Adams Cave beetle and Cerulean warbler, support the petitioned action as consistent with the application of the ESA and similar consideration should be afforded *T. reyesi.*

5.2.1 Listing Factor A: The present or threatened destruction, modification, or curtailment of habitat or range

The 1988 Final Rule states that "the primary threat to the five species comes from potential loss of habitat owning to ongoing development activities" (53 Fed. Reg. 36031). In listing this threat, the final rule provides no evidence supporting this claim. While there has been minimal scientific research on the actual impacts of development on cave habitats, there are many examples where *T. reyesi* has continued to persist alongside development activities. There is no evidence that development activities have led to a significant reduction in the population size or distribution of *T. reyesi* across all or a significant portion of its range. In fact, despite development, the number of known localities of the species has steadily increased since listing. This refutes the USFWS assertion that development, particularly given the number and distribution of currently protected *T. reyesi* localities, is a threat to the continued existence of the species.

There are at least five well-studied examples of occupied caves that have remained occupied despite occurring near areas with typical development. The caves include Inner Space Caverns, Sun City (multiple caves), Weldon Cave, Three-Mile Cave, and Four-Mile Cave. In these instances, biologists have observed that development has not resulted in a decrease in *T. reyesi* abundance, and in some instances, it appears that human activities may have had a positive impact on population numbers. At the very least, these examples show that in lieu of peer-reviewed scientific studies demonstrating significant negative effects of development on cave habitats and occupancy by *T. reyesi*, there is ample documentation that the extreme caution recommended by the USWFS is not warranted. It is critical to note that these examples represent only a few of the known caves that occur in and around developed areas and support the ability of *T. reyesi* to persist despite proximity to these activities.

- *Inner Space Caverns:* Inner Space Caverns in Williamson County was discovered in 1963 during construction of Interstate 35 when a core drilling team for the Texas Highway Department drilled

through 40-feet of limestone to discover the cave. In 1966 the cave was opened to visitors and currently receives approximately 100,000 visitors annually for guided tours throughout various reaches of the cave. The cave has been equipped with walkways, electrical lighting, and other conveniences for visitors.

In 2007, biologists surveyed the cave for troglobitic species (SWCA 2007, unpublished data). From previous surveys (Reddell and Finch 1963, Elliott and Reddell 1989 and 1991, Chandler 1992, Gertsch 1992, Ubick and Briggs 1992) it was known that at least ten troglobites were found in the cave, including *T. reyesi*. Given the assumptions identified by the USFWS in its final rule, the discovery, modification, and commercialization of Inner Space Caverns should have resulted in the extirpation of *T. reyesi* from this location. Contrarily, surveys conducted in 2007 showed a continued presence of *T. reyesi* at the site and SWCA Environmental Consultants (SWCA) biologists noted that the species appeared to be more abundant in the "developed" parts of the caves where there has been artificial lighting, walkways, and a constant flow of tourist traffic for more than forty years.

While no formal survey effort has occurred at Inner Space since 2007, SWCA-permitted biologists have observed *T. reyesi* occupying a light fixture control box in the cave during every visit these biologists have made to the cave (at least annually), with the most recent observation occurring in the spring of 2013 (Dr. Kemble White, personal communication 2014). **Therefore, there is no evidence that 40 years of access to, and modification of, the cave environment presents a direct threat to the species in the cave.**

While the Petitioners do not intend to imply that all caves should be developed and/or used for commercial activities, it should be acknowledged that human presence in and around a cave alone does not necessarily result in discernible threats to the species. Inner Space Caverns provides a strong example since this cave has experienced extensive development—it is located under a road, under train tracks, the inside of the cave has been paved, it receives significant human visitation, it has electrical lines that have been installed throughout to power lights, etc., and biologists continue to identify *T. reyesi* on every visit to the cave.

- *Sun City:* In 1995, development began on a residential subdivision known as Sun City, Texas. Development activities at Sun City were expected to last for twenty years and include 5,600 acres. The development is currently on-schedule with its construction goals. The Sun City property includes 95 caves, of which 26 are known to contain federally listed species. All of the caves on the property have been inspected for karst fauna. *T. reyesi* occurs in at least 25 of these caves. In 1995, the USFWS approved a management plan for a complex preserve system on the property that includes regular management, monitoring, and biological inspections. No Incidental Take Permit was provided by the USFWS for the development. Rather, the preserve management system supported the use of an avoidance plan that facilitated a no-take determination from the USFWS. Eleven caves have been monitored regularly since 1995 and data through 2000 are currently available to the Petitioners. In 2000, after five years of development activity, an additional survey of all the caves was conducted.

  Interestingly, the 2000 survey found that one cave located in the center of the golf course with extensive development all around (Kiva Cave No. 1) showed a "slight (but probably not statistically significant) increase in fauna" and has consistently been the most dependable cave for *T. reyesi* surveys (Reddell 2000:3; Dr. Kemble White, personal communication 2014). Another cave in a developed area (Holler Hole Cave) showed some minor signs of decline that were attributed to a prolonged period of drought and the presence of Ashe juniper above the cave. The remaining caves are outside of the developed areas of the property, and have shown variability in the amount of fauna detected throughout the years of monitoring. Ultimately, monitoring reports

indicate that there has not been any substantial negative change in the populations of cave fauna across the entire property since the monitoring began, despite an increase in nearby development activities. "The conclusion to be drawn from these studies is that the fauna of the caves has not been adversely affected by construction or other activities on Sun City. Biodiversity in many cases has increased and in none is there any indication that is has decreased" (Reddell 2000:4). This clearly supports the no-take determination made by the USFWS prior to the project beginning.

Looking toward the future, Reddell additionally determined that "there is no reason to believe that development of Sun City will lead to harm to the cave fauna" (Reddell 2000:4). While more recent survey data is not publically available, biologists working in Sun City continue to regularly observe *T. reyesi* during annual surveys on the property (Dr. Kemble White, personal communication 2014).

- *Weldon Cave:* At the time of the 1988 listing, concern was expressed over Weldon Cave, a known occupied cave for *T. reddelli* (and later identified as a *T. reyesi* occupied site), that due to a recent road extension and neighboring residential development, the cave "may no longer exist" (53 Fed. Reg. 36031). Despite these identified threats in 1988, in 2009 when developing the Five-Year Review, USFWS identified Weldon Cave as a high potential KFA site. This was the only example of potential development related impacts to the *T. reddelli* presented in the final rule and after 25 years, these threats have not been realized and Weldon Cave remains a viable cave for the species. This cave alone provides ample evidence that the threats leading to listing were seriously overstated at the time.

- *Three-Mile Cave and Four-Mile Cave:* Both of these caves are located under State Highway 29 west of Georgetown in Williamson County, and both were confirmed as occupied by *T. reyesi* through survey efforts conducted by SWCA in 2008 and 2009 respectively. The entrances to both of these caves are in close proximity to the highway, and the features themselves extend below the highway in both cases. Four-Mile Cave was inaccessible prior to 2009 survey efforts as the entrance had been blocked off with large boulders, likely to deter vandalism and trespassing. The interior walls of the cave have been covered in historic graffiti (estimated to be from the 1890s, 1920s, and 1950s) showing that prior to the entrance being blocked off it was frequented by human visitors. Despite this confirmed historical use and close proximity to the five-lane highway (the entrance is within the drainage ditch of the east bound lanes of the highway), the cave remains occupied by *T. reyesi* (Dr. Kemble White, personal communication 2014).

The initial determination provided in the 1988 final rule for the species provided an extremely limited and unsupported case for the impacts caused by development. The one example that was provided in 1988 has been disproven. If one considers the current evidence regarding this listing factor, there are several examples that show the species' ability to coexist with development. The 26 years since the initial listing have offered several opportunities for there to be quantifiable evidence to show the impacts of development, and no strong negative correlations have been confirmed. Examples like Inner Space Caverns, Sun City, and Weldon Cave are only a few showing that impacts of development are likely not as significant to the species as was anticipated in the 1988 final rule.

The lack of legitimate threats is further supported by the use of mesocavernous space by the species. *T. reyesi* is consistently found in the dark parts of caves. According to Ubick and Briggs (1992:211), "in all instances they have been found only in the more remote parts of the caves, [and] none have been found in twilight, with the exception of the single juvenile from Comanche Trail Cave." This supports the results of surveys conducted in Sun City that have shown that the species seems likely to retreat deeper into caves under dry surface conditions such as the presence of drought and excessive drying vegetation (like juniper). It is likely that this behavior has limited the amount of available scientific data on the species as

much of the available *T. reyesi* habitat is not accessible to biologists. While *T. reyesi* has been documented as occurring at 172 localities, the true extent of the habitat for this species is likely to include much of the 125 square miles of Karst Zones 1 and 2 mapped within the range of the species.

This use of mesocavernous spaces by karst invertebrates was not considered at the time of the 1988 listing. At that time, it was believed that each of the species listed occurred in "small, shallow, dry caves" (53 Fed. Reg. 36029). The final rule additionally described the occupied caves as "isolated islands" indicating that they were "separated from one another when stream channels cut through the overlying limestone to lower rock layers" (53 Fed. Reg. 36030). While this continues to be a growing area of study, there is evidence that supports the characterization of mesocavernous spaces as occupied habitat. This concept is supported in the Five-Year Review by the USFWS claim that "troglobitic habitat includes caves and mesocavernous voids in karst limestone (USFWS 2009:2).

Monitoring activities on the Sun City Preserve have "demonstrated that opening of previously filled caves leads to an increase in population size for troglobitic species" (Reddell 2000:4). Monitoring activities also indicate that at any given cave, *T. reyesi* may not always be identified during a survey. Sun City surveys indicated that in some cases, "one or more species may be extremely abundant on one date but rare or absent on another. At the same time, other species on the same dates may be rare or absent." (Reddell 2000:4). With this in mind, it is critical to note that simply because one survey does not produce any specimens of *T. reyesi*, a negative survey result does not preclude that cave from being occupied habitat. Research at Sun City found that it was less likely that *T. reyesi* would be detected in caves during dry seasons or periods of drought. Reddell posits that *T. reyesi* retreats deeper into the caves and/or utilizes the mesocavernous spaces where the habitat maintains more moisture. This trait not only complicates routine surveys for the species, but mitigates many potential threats to the species since they are able to retreat to other habitats as climactic and surface conditions warrant.

USFWS karst invertebrate collection protocols were developed specifically with this behavior in mind. According to existing karst invertebrate survey requirements, "notable differences in species abundance have been observed within as little as a week within caves that cannot be accounted for by rainfall or other surface condition" (USFWS 2011:11). For this reason, survey protocols include multiple survey efforts (a minimum of 3 as of 2011) to determine presence/absence.

The documented use of mesocavernous space by *T. reyesi* is significant because the full range and extent of these underground habitats cannot be fully known by scientists. Further, these areas are significant in relation to species survival because they are geologically protected from development and other activities that may occur on the surface or near the humanly accessible openings of occupied caves. Given the approximately 125 square miles of potential underground mesocavernous space within Zones 1 and 2 of the species' range, it is extremely likely the species is able to retreat into these mesocavernous spaces to avoid unfavorable conditions and continue to thrive (Veni and Associates 1992; USFWS 2009). This is further supported by the presence of *T. reyesi* in caves that were previously unoccupied or sealed (for example, caves previously discussed in Sun City).

5.2.2 Listing Factor B: Overutilization for commercial, recreational, scientific, or educational purposes

Overutilization was not considered a significant threat at the time of listing and there is no evidence that a current threat of this sort exists. Rather, the continued presence of the species in well-documented caves (such as Inner Space Caverns which is subject to extensive use for commercial purposes with an arguably positive benefit to the species) supports the premise that overutilization is not a current or potential threat to the species.

5.2.3 Listing Factor C: Disease or predation

In Texas, no endangered species have been known to become extinct because of red imported fire ants (RIFA) (Drees 2002). Without significant evidence, RIFA have been generally considered a major threat to endangered karst invertebrates in Bexar, Travis, and Williamson counties. Long-term impacts of RIFA on karst invertebrates or their habitat have never been quantified or scientifically tested, instead, they have simply been assumed to have a major impact. The literature related to the interaction of RIFA and karst invertebrates is based solely on anecdotal evidence, professional opinion, unpublished technical reports, and other non-peer-reviewed literature of questionable reproducibility.

Short-term impacts on RIFA on some invertebrate communities have however been reported. In response to the delisting petition in 1993, the USFWS cited a 1990 study showing the disruption of above ground arthropod communities by RIFA that was conducted during the initial invasion of RIFA in Travis County, Texas by Porter and Savignano. Porter and Savignano (1990) demonstrated that RIFA dramatically reduce arthropod abundance and species richness soon after infestation of RIFA to an area. They found that native ant species richness was 70 percent less in infested areas and overall arthropod species richness was 40 percent less in infested areas than un-infested areas. While the results of this study would seem to indicate that RIFA do have a negative impact on the species, a subsequent study by Morrison in 2002 revisited the Porter and Savignano (1990) study area 12 years later and replicated their study. Morrison (2002) found that arthropod communities had rebounded to pre-RIFA-invasion levels and that all measures of native ant and other arthropod species' diversity had returned to pre-invasion levels. RIFA were still the most abundance ant species, but not nearly as abundant as during the initial RIFA infestation. He concluded that the impacts to arthropod communities by RIFA might be greatest during and shortly after the initial RIFA invasion but long-term impacts are likely not as significant as once believed. This subsequent study is not acknowledged by the USFWS in any of their evaluation of the status of *T. reyesi*, but represents new scientific information, including refutation of previous conclusions regarding the susceptibility of *T. reyesi* to RIFA infestations.

RIFA have been in found in parts of Bexar and Bell counties since about 1960, Comal County since about 1976, and Travis, Williamson, and Hays counties since about 1980. All of these counties contain caves with karst invertebrate species. No doubt RIFA, along with other native species occasionally forage on *Ceuthophilus* cave crickets, and on rare occasions, karst invertebrates. Despite this, as previously discussed, Morrison found that surface arthropods communities in Travis County are able to successfully rebound after the initial infestation. Moreover, after approximately 45 years of infestation of RIFA in Bexar County, karst invertebrates are still present in Bexar County karst preserves.

A biological study of karst features on Sun City, Texas in 2000 conducted by James Reddell observed that RIFA had invaded every cave on the property, however Reddell determined that "no direct predation has been observed on either *T. reyesi* or the Coffin Cave mold beetle (*Batrisoides texanus*), but ants have been observed feeding on cave cricket nymphs and both species of troglobitic millipede" (Reddell 2000:8). Despite RIFA being present, there has not been a decline in the known populations of *T. reyesi* on the property.

In 2006, SWCA conducted an investigation in an attempt to describe cave cricket, RIFA, and other species interactions at potential food sources around caves within six of the seven La Cantera preserves. This was based on the assumption that even if RIFA do not actively feed on the troglobitic *Cicurina* species in Bexar County, they may still be threatened through competition created between RIFA and the cricket food source. To conduct this study, freeze-killed crickets (*Acheta domestica*), Texas persimmon (*Diospyros texana*) fruit, store-bought spinach, native organic matter, and water bait stations were used to observe forage preferences of cave crickets and other species.

Arthropods observed foraging around cave entrances at bait stations are listed from most common to least common and included big-headed ants (*Pheidole dentata*), carpenter ants (*Camponotus castaneus*) (ant identification confirmed by Texas A&M), cave crickets (*Ceuthophilus* spp. mostly *secretus*), daddy long-legs (*Leiobunum townsendii*), RIFA, and various beetle species. Freeze-killed crickets were favored by big-headed ants, carpenter ants, daddy long-legs, cave crickets, and RIFA. Texas persimmon fruit was the next most favored food item and was primarily favored by big-headed ants, carpenter ants, cave crickets, and various beetles. Big-headed ants were usually the first to arrive at bait stations.

At bait stations, competition between cave crickets and daddy long-legs was sometimes observed, especially when daddy long-legs emerged first from a cave and "beat" cave crickets to bait stations. Competition was also observed between big-headed ants and carpenter ants. No major competition between RIFA and other arthropods was observed; though, this was likely due to low RIFA numbers and would have very likely been observed if RIFA numbers were higher. Interestingly, RIFA were only observed at freeze-killed cricket bait stations on the largest 75-acre preserve; though, RIFA were outnumbered by big-headed ants.

Competition was commonly observed between native big-headed ants and cave crickets. If freeze-killed crickets were placed at stations too early in the evening before the cave cricket emergence, big-headed ants would remove all of the freeze-killed crickets and leave nothing for cave crickets or other animals. If no big-headed ants were foraging at freeze-killed cricket bait stations, cave crickets would "casually" graze at the stations. When big-headed ants arrived at bait stations occupied by cave crickets, cave crickets would be "chased off". If the cave cricket was large enough, it would often leave with a freeze-killed cricket in its mandibles when it was chased off. When big-headed ants were occupying freeze-killed cricket bait stations before cave crickets (as was the case most of the time), larger cave crickets would sometimes jump in and "steal" a freeze-killed cricket (sometimes unsuccessful) and immediately jump away from the big-headed ant infested bait station. Smaller cave crickets, though often attempted to grab a freeze-killed cricket, were often not large enough to grab a freeze-killed cricket and were "chased off" by big-headed ants. What these observations indicate is 1) many organisms, including native species, compete with cave crickets, 2) cave crickets can cope with competition by leaving with or "stealing" food items from competitors, and 3) availability of food sources for cave crickets, such as dead and dying arthropods and other high protein food sources, is dependent on the availability of food sources at the time of the cave cricket emergence—food items available too early may be foraged upon by diurnal or crepuscular species and not available for cave crickets.

In San Antonio, SWCA has been actively managing the La Cantera cave preserves since their protection in 2001. One management objective has involved regular monitoring of RIFA and bi-annual biological surveys of cave fauna at each cave on the preserve. For the 2012 La Cantera Preserve Annual Report (submitted to the USFWS), SWCA (2013) conducted an evaluation of over ten years of collected scientific data, not finding any correlation between the rate of occurrence of RIFA and the populations of cave crickets or federally listed *Cicurina* spiders identified during surveys, refuting arguments that RIFA is a significant threat.

In summary, predation or competition by RIFA has not been shown to have a lasting negative impact on populations of *T. reyesi* or the ability of the species to persist in areas that also contain RIFA. Therefore, this purported threat is not of significant magnitude to push the species towards extinction in the foreseeable future.

5.2.4 Listing Factor D: The inadequacy of existing regulatory mechanisms

In 2003, the USFWS published in the Federal Register its final Policy for Evaluation of Conservation Efforts When Making Listing Decisions, the "PECE Policy" (68 Fed. Reg. 15100, March 28, 2003). The PECE Policy is the USFWS guide on how to evaluate formalized conservation efforts (e.g., conservation

agreements, conservation plans, management plans, and similar documents approved by Federal agencies, state and local agencies, businesses, organizations, or individuals) when deciding whether or not to list a species. As defined by the PECE Policy, "conservation efforts" are "specific actions, activities, or programs designed to eliminate or reduce threats or otherwise improve the status of a species. [They] may involve restoration, enhancement, maintenance, or protection of habitat; reduction of mortality or injury, or other beneficial actions" (68 Fed. Reg. 15113).

Existing Preserves and Protected Habitats

A desktop review of existing public and private preserve lands, lands protected via Section 10 and Section 7 consultations, and other relevant land management activities identified approximately 94 occupied caves for the *T. reyesi* that are currently under some form of protection from land development and/or receive regular management. This represents more than one-half of all known occupied localities of the species recognized by the USFWS, and includes protected caves throughout the entire known range of the species. Among these protected caves are three additional KFAs recognized and approved by the USFWS since the Five-Year Review of *T. reyesi*. The four currently recognized KFAs that fully protect *T. reyesi* are the Twin Springs Preserve, Cobbs Cavern Preserve, Priscilla's Well Preserve, and Karankawa KFA.

In addition to the four accepted KFAs, there are 28 de facto KFAs acknowledged by the USFWS in the Five-Year Review. These caves have the potential to meet the minimum geographic requirements for a KFA but may not have the required management structure. Some meet both criteria but have yet to be formally accepted as KFAs.

- Polaris Cave
- Shaman Cave
- Pow Wow Cave
- Red Crevice Cave
- Temples of Thor Cave
- Thor Cave
- Jensen Cave
- Lobo's Lair
- Wolf's Rattlesnake Cave
- Round Rock Breathing Cave
- Steam Cave
- Fence-line Sink
- Blessed Virgin Cave
- Raccoon Lounge Cave
- WS-54
- WS-71a
- WS-65310
- Chaos Cave
- Rockfall Cave
- Weldon Cave
- Gallifer Cave
- Tooth Cave
- McDonald Cave
- Stovepipe Cave
- MWA Cave
- Eluvial Cave
- Jollyville Plateau Cave
- Beard Ranch Cave

The significant number of permanently protected *T. reyesi* localities indicates that the species is not likely to return to a vulnerable status following delisting.

The current KFAs have been recognized through regulatory action by the USFWS. For example, in the 2011 Biological Opinion for State Highway 195 in Williamson County (Consultation No. 21450-2006-F-0132) incidental take of six *T. reyesi* occupied caves was authorized following the determination that no jeopardy of the species would occur. This decision depended upon the existence of previously preserved caves, specifically within the North Williamson County KFR. The USFWS determined that "if Cobbs Cavern is purchased and preserved, there will be three KFAs within this KFR, meeting recovery criterion 1 for this species" (Mowad 2011). At the time, the acquisition of Cobbs Cavern was underway and has since been finalized. This conclusion by the USFWS confirms that the presence of preserved areas eliminates the threat of jeopardy to the species.

Including the approved KFAs and the recognized de facto KFAs, there are at least 94 occupied caves spanning the entire range of the species that are currently afforded protection. It is likely that more known localities are protected through efforts not identified in the initial desktop review. Caves identified during the desktop review with protections and management activities are indicated in Figure 2 and described in Appendix A. These are not exhaustive lists, as more caves with undisclosed locations and management activities likely exist across the region.

City of Austin Regulations

The City of Austin has in place regulatory programs/mechanisms for protection of water quality, recharge features, and karst areas which have the benefit of providing protection of suitable habitat for karst invertebrates, including *T. reyesi*. These protections cover approximately 63,344 acres (approximately 67 percent) of currently known *T. reyesi* range.

Pursuant with Section 1.3.0 of the City of Austin Environmental Criteria Manual, an environmental assessment and City developed Critical Environmental Feature Worksheet is required any time proposed development activities occur near a karst feature. These activities require the identification of proposed protective measures for the feature, including proposed setbacks from the feature. Caves are defined by the Manual as "underground voids large enough for an adult to enter" and a standard setback of a 150- to 300-foot radius around the feature is required. Further, any activities must preserve all natural characteristics of the feature. The same regulations apply to sinkhole and recharge features.

To ensure compliance with these regulations, "all work must stop if a void in the rock substrate is discovered which is; one square foot in total area; blows air from within the substrate and/or consistently receives water during any rain event" for the completion of a geological assessment (P-1). These measures offer protection to karst features and *T. reyesi* habitat throughout the City of Austin in both known occupied and presumably unoccupied caves, and this protection will still be enforced regardless of the listing status of *T. reyesi*. The use of buffer zones protects the cave habitats from exposure to contaminants and disruption from direct development activities.

The City of Austin further expanded this ordinance in 2008 through the Void and Water Flow Mitigation Rule (adopted April 22, 2008) requiring that a licensed geologist be present at least once per day during all trenching operations and to inspect sites for sensitive features prior to any backfilling. In the event a feature is discovered, prior to any work proceeding, mitigation must be proposed and approved by the City of Austin through a permitting process. Void mitigation was adopted by the City of Austin to "preserve the hydrologic function of the void, maintain recharge paths to springs, creeks and wells, isolate the void from potential contaminants, maintain the structural integrity of the void and adjacent utilities and buildings, and to protect the Edwards Aquifer" (Pope 2009). These efforts offer protection and mitigation for all void spaces meeting the specifications and therefore afford protection to the mesocavernous spaces that may potentially be occupied by *T. reyesi* as well as open caves.

Section 1.3.4 requires that a Pollution Attenuation Plan be completed for all industrial development projects "not enclosed in building" (Section 1.3.4). The City of Austin requires the Pollution Attenuation Plan in addition to other state and federal permitting requirements (such as the TPDES permit and other related TCEQ permits). This provides an extra level of review to ensure that implemented procedures are conducted in the most environmentally sustainable way.

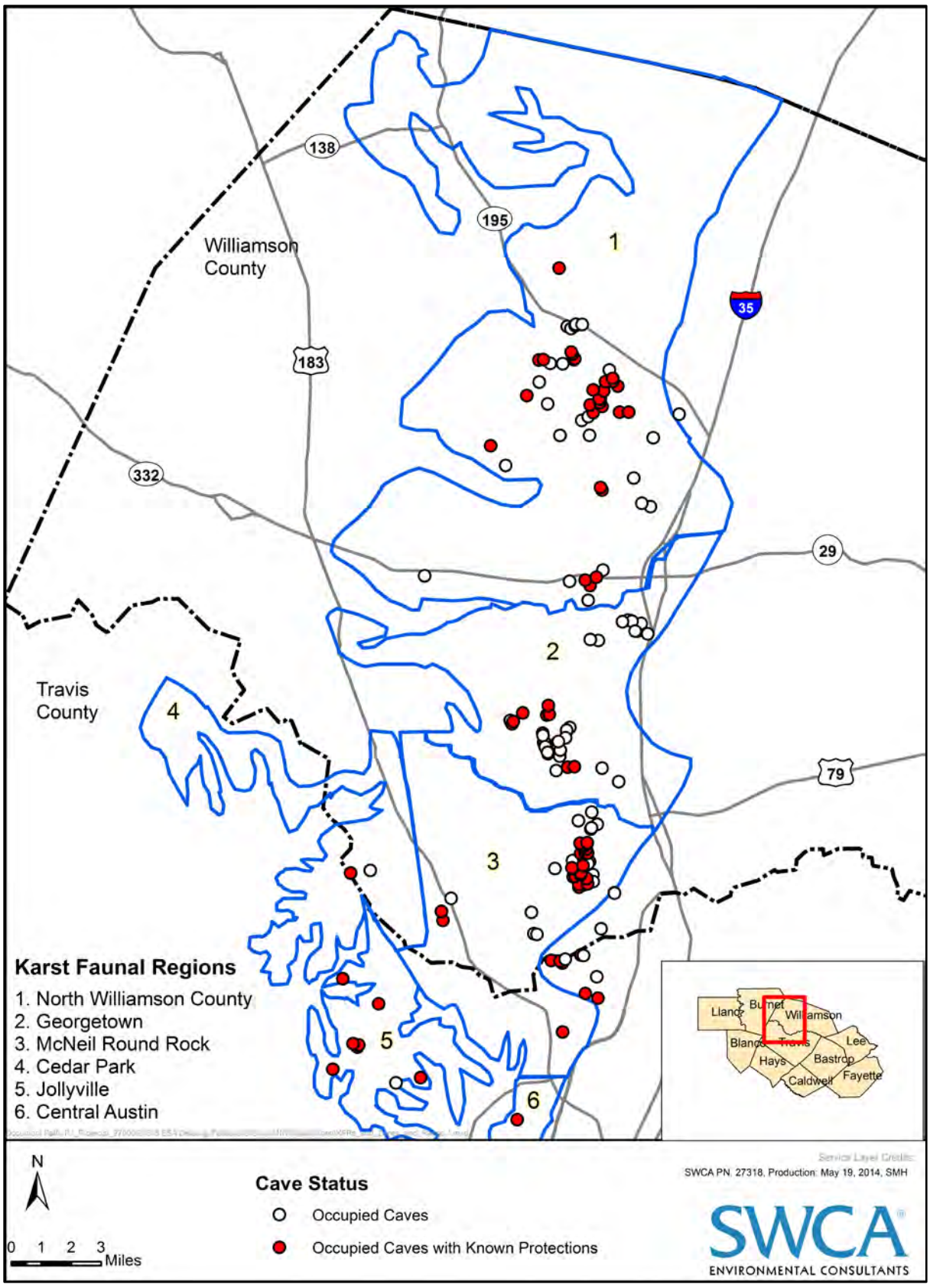

Figure 2. Occupied *T. reyesi* caves with known protection and/or management activities.

Collectively, these measures reduce potential impacts to *T. reyesi* that may arise from pollution run-off into sensitive features in and around the City of Austin. The City of Austin also has an active Stormwater Management Plan that establishes criteria for the use of best management practices (BMPs) to minimize stormwater run-off into sensitive features. These measures reduce potential impacts to *T. reyesi* that may arise from pollution run-off into sensitive features in and around the City of Austin and provide regional protection to the species that extends beyond known occupied sites.

City of Georgetown Water Quality Management Plan

On December 20, 2013, the City of Georgetown adopted Resolution No. 122013-C adopting a Water Quality Management Plan (the "Management Plan") for the City. The goal of the Management Plan is specifically to protect the Georgetown Salamander and its habitat, but the benefits will extend to *T. reyesi* through measures across the City that will improve water quality. These measures include public education, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and re-development, and pollution prevention and good housekeeping for municipal operations. This plan provides further detail on how the City will comply with its MS4 permit, thereby reducing threats from the ongoing effects of urbanization and hazardous materials spills. This program also reduces sediment discharges and water quality.

These measures, like the City of Austin regulations, encourage the use of best management practices focused on preventing harmful materials from reaching known and potential *T. reyesi* habitat. The measures of the Management Plan afford protections to approximately 10,223 acres within the known range of *T. reyesi*.

Texas Commission on Environmental Quality Regulations

The Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules (the "Edwards Rules") were enacted to prevent water quality degradation within the Edwards Aquifer and, thereby, to benefit public health, aquatic and terrestrial life, and the Texas economy. The stated purpose of the Edwards Rules is:

> that the existing quality of groundwater not be degraded, consistent with the protection of public health and welfare, the propagation and protection of *terrestrial* and aquatic life, the *protection of the environment*, the operation of existing industries, and the maintenance and enhancement of the long-term health of the state.

30 TAC § 213.1(1) (emphasis added). This set of rules includes a number of specific measures that significantly reduce threats to *T. reyesi* related to urbanization and construction activities; pollution of karst habitats from pesticides, fertilizers, and hazardous materials; and physical modification of surface habitats. Since the surface-connected caves and mesocavernous spaces that provide habitat for *T. reyesi* are also considered significant recharge features to the Edwards Aquifer, the conservation measures required by the Edwards Rules also directly benefit *T. reyesi*. The Edwards Aquifer Rules were significantly modified in 1999 to increase the protections afforded through these regulations. These amended rules reflect new conservation measures that have been implemented since *T. reyesi* was listed.

Among other things, the Edwards Rules require that for any construction-related activity occurring over the Edwards Aquifer, detailed studies and reports must be made and submitted, and certain BMPs be implemented. The BMPs under the Edwards Rules are specific measures designed to prevent pollution of surface and groundwater, maintain flow to naturally-occurring sensitive features, and provide erosion and sediment control. The BMPs include measures such as storm water detention ponds, grassy swales, buffers, and setbacks. The benefits to the *T. reyesi* from implementation of the Edwards Aquifer Rules

include the development and implementation of Edwards Aquifer Protection Plans (such as water pollution prevention plans, sewage collection system plans, and underground and aboveground storage tank facility plans), wastewater treatment and disposal system permits, optional enhanced measures for water quality protection, revised BMPs for quarry operations, measures for plugging abandoned wells and borings, prohibitions on certain types of activities over the recharge zone, and Contributing Zone plans. Each program is administered and enforced by the TCEQ and includes requirements for monitoring and reporting necessary to ensure that measures are implemented as required by the rules, with schedules and defined standards for implementation.

TCEQ's Texas Pollution Discharge Elimination System (TPDES) permitting program is designed to minimize sedimentation and contamination in surface waters by regulating stormwater runoff from construction sites. TPDES is authorized by the EPA as part of its National Pollution Discharge Elimination System (NPDES) for regulating point source pollution to waters of the United States. To be covered under the TPDES Construction General Permit, anyone disturbing 1 acre or more of land or part of a larger common plan of development that will disturb 1 acre or more of land must prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) before discharging stormwater to any surface water in the State of Texas. The plan must describe the intended sequence of major activities that disturb soils for major portions of the site, estimate the total area of the site and the total area of the site that is expected to be disturbed, and describe which BMPs will be used to minimize pollution in runoff before, during, and after construction.

Development and implementation of a site-specific SWPPP minimizes the potentially adverse effects of surface runoff from construction. These plans significantly reduce the amount of sedimentation and related pollutants carried in stormwater runoff and thereby significantly reduce threats to the *T. reyesi* related to urbanization, hazardous materials spills, and construction activities. TCEQ assures the implementation and effectiveness of this program by required regular inspections for proper application of BMPs, personnel training for those working on construction sites, record keeping, and formal certification of BMPs implemented on-site.

Under the TPDES permitting program, TCEQ also administers EPA's Municipal Stormwater Program. Phase I of this program, begun in 1990, requires Municipal Separate Storm Sewer Systems (MS4s) in medium and large cities (or certain counties with populations of 100,000 or more) to obtain NPDES permit coverage for their stormwater discharges. Phase II, begun in 1999, requires regulated small MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by TCEQ, to obtain NPDES permit coverage for their stormwater discharges. Each regulated MS4 is required to develop and implement a Stormwater Management Program (SWMP) to reduce the contamination of stormwater runoff and prohibit illicit discharges. Each SWMP must address six minimum control measures: public education; public involvement; illicit discharge elimination; construction sites; post construction pollution; and pollution prevention for municipal operations. The SWMP describes in detail which BMPs will be implemented to meet permit requirements.

The MS4 program reduces threats to *T. reyesi* from the ongoing effects of urbanization and hazardous materials spills by helping to ensure that stormwater runoff is relatively free from pollutants, including sediment from post-construction developments, illicit discharges of hazardous materials from individuals or businesses, and operations of municipal properties. This program also reduces physical threats to surface habitats in the form of reduced sediment discharges. The TCEQ has the authority to issue significant penalties (up to $27,500 per day) for non-compliance with MS4 permits.

Endangered Species Act

At least nine caves known to be occupied by the *T. reyesi* will continue to be afforded protections under the ESA, including all currently recognized KFAs, due to the presence of other listed species within the

same cave. In these instances, even if delisted, *T. reyesi* will benefit from the protections of the other listed species present in that locality. Caves that will continue to be afforded protection from the ESA after a delisting are included in Table 3.

Table 3. Caves Occupied by *T. reyesi* and Other Federally Listed Species

Species known to occupy along with *T. reyesi*	Occupied Caves
Tooth Cave Ground Beetle *(Rhadine persephone)*	Hide-Away Cave
	Lakeline Cave
	Raccoon Cave
	Testudo Tube Cave
Coffin Cave Mold Beetle *(Batrisodes texanus)*	Cobbs Cavern Cave
	Inner Space Caverns
	Off-Campus Cave
	On-Campus Cave
	Red Crevice Cave
	Deliverance Cave No. 2*
	Dragonfly Cave*
	Electro-Mag Cave*
	Hourglass Cave*
	Karankawa Cave*
	Medicine Man Cave*
	Pricilla's Well Cave*
	Rattlesnake Inn Cave*
	Shaman Cave*
	Unearthed Cave*
	Viper Cave*

*These sites are likely to be classified as occupied by *Batrisodes cryptotexanus* pending a taxonomic revision of *B. texanus*. If renamed, it is likely that the new species will remain protected under the ESA.

5.2.5 Listing Factor E: Other natural or manmade factors affecting its continued existence

While climate change was not listed as a threat in the Final Rule in 1998 or 1993, it is introduced as a potential threat in the Five-Year Review, although the USFWS acknowledges a lack of evidence showing a direct correlation to species impacts.

While it has been assumed that caves are less susceptible to changes occurring on the surface of the earth, some more recent data suggests that climactic changes on the surface may have an impact on cave ecosystems. Ultimately, while climate change may introduce changes to the climate of caves that could potentially impact *T. reyesi*, given the unique layout and nature of all caves, it is not possible to quantify those impacts or the effect of regional climate changes on them. Studies do suggest that cave conditions become less responsive to surface conditions the further one travels away from the cave entrance. For *T. reyesi*, this would indicate that by traveling to further depths within a cave, it would be possible to avoid the impacts of climate change. The known use of mesocavernous spaces by *T. reyesi* indicates that this is a probable natural protective mechanism for the species. Additionally, given examples like the Inner Space Caverns where the cave climate was changed considerably by the introduction of artificial entrances, light stations, and human visitation (all contributors of increased cave temperature and modified cave climate), it appears that *T. reyesi* is able to adapt to changing climactic conditions within a cave.

6.0 STATUS OF THE SPECIES

Since 1988, the known localities of the *T. reyesi* have increased from five to 172 known caves, and additional caves are regularly being discovered. For example, in 2010 biologists working with Travis County discovered five previously unknown occupied caves within the BCP preserve in Travis County: Cortana Cave, Geode Cave, F-12 Cave, IV-3 Cave, and Pond Party Pit Cave (Travis County, et. al. 2012:6, ZARA 2010:9). These additional five caves are not included in the 168 caves identified by the USFWS Five-Year Review as they were discovered after that review was complete. It is highly likely that more occupied caves will be discovered as research continues throughout Travis and Williamson counties. A timeline of the regulatory history and population milestones that support this petition is identified in Figure 3.

With each new *T. reyesi* locality found and protected, the species baseline is increased and the magnitude of the potential threats to the species is reduced. **The perceived imminent threat of development that was relevant to a known population of only five caves at the time of listing is no longer relevant given the expanded range and distribution of the species, and the known protected localities.** Even if natural or man-induced events caused the destruction of several *T. reyesi* caves, the number of protected preserve caves and the likely occupied habitat present in mesocaverns and other undiscovered void spaces would continue to support the species.

Based on the prior actions taken by the USFWS, *T. reyesi* benefits from a level of recovery comparable to that achieved for other species in previous delisting actions. In many cases, the recovery level for *T. reyesi* exceeds the acceptable recovery criteria approved by the USFWS. While known localities alone may not constitute recovery, the added benefit of extensive preserves and other regulatory actions that offer at least some protection to the species across its range further supports delisting. How the status of *T. reyesi* compares to six other species that have been delisted is represented in Table 4.

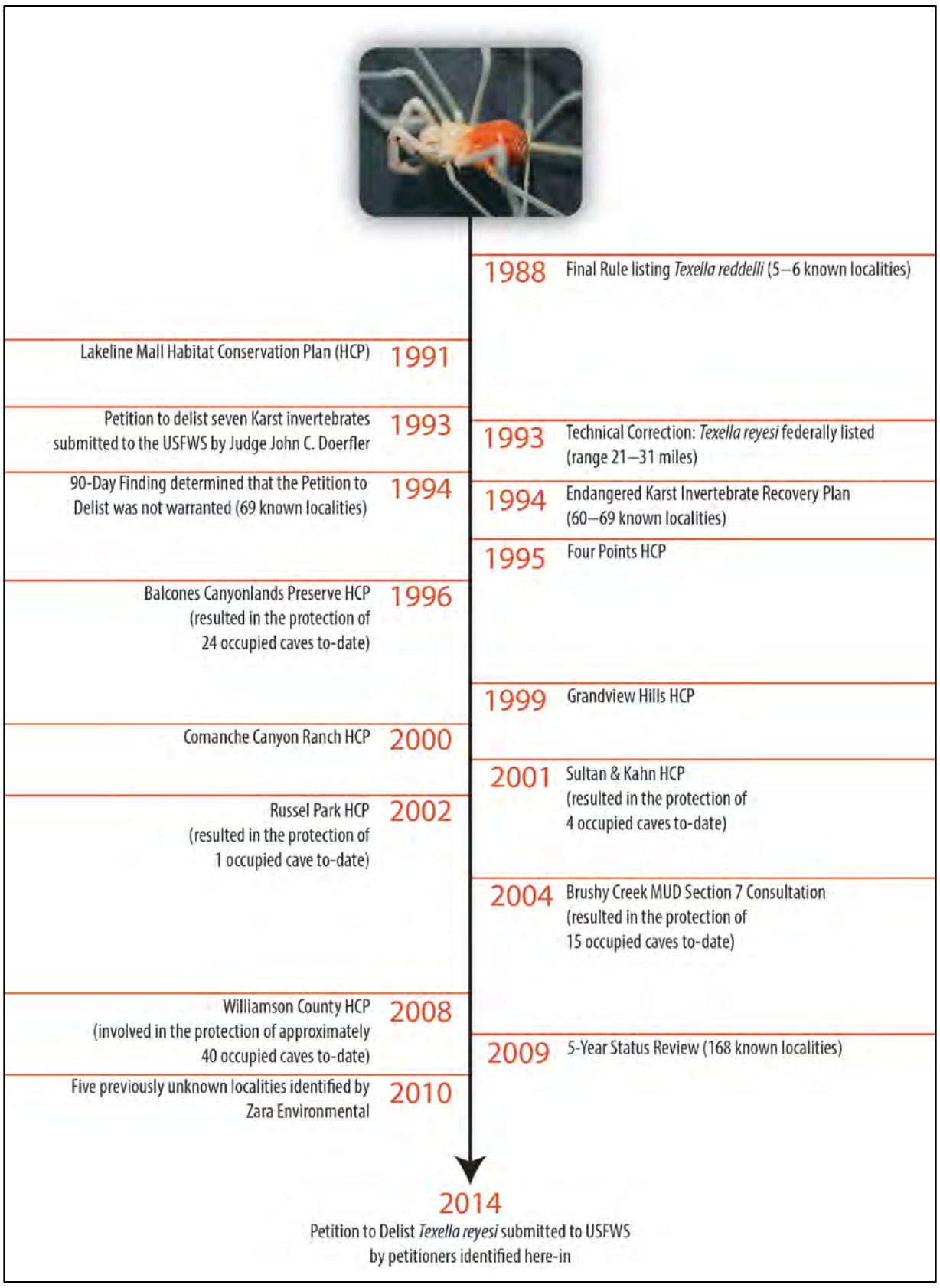

Figure 3. Timeline of regulatory actions for *Texella reyesi.*

Table 4. Comparison of *T. reyesi* to Six Prior Delisting Actions by the USFWS.

Species	Known Status at Listing	Known Status at Delisting	Reason for Delisting	Percent Increase
Pine Barrens treefrog *(Hyla andersonii)*	7 localities	150 localities	New Information	150%
Rydberg Milk-Vetch (*Astragalus perianus)*	1 locality	11 localities	New Information	1,106%
McKittrick pennyroyal *(Hedeoma apiculatum)*	7 localities	36 localities	New information	414%
Columbian White-tailed Deer (*Odocoileus virginianus leucurus*,	400-500 individuals	6,000 individuals	Designation of secure habitat zones	1,417.5%
Aleutian Canada goose (*Branta canadensis leucopareia*)	790 individuals	36,978 individuals	Increased number of individuals, threats not as severe as originally believed	4,580.75%
Robbins' Cinquefoil (Potentilla robbinsiana)	2,000 individuals	4,000 individuals	Increased number of individuals, threats not as severe as originally believed	600%
Bone Cave Harvestman *(Texella reyesi)*	5-6 localities (one *T. reddelli* and not *T. reyesi* , so actually 4-5)	Currently 172 localities; not currently delisted.	Potentially, increased number of localities, threats not as severe as originally believed, new information	3,340%

The 1994 Recovery Plan begins with a disclaimer that "recovery plans delineate the reasonable actions that are believed to be required to recover and/or protect listed species" and "approved recovery plans are subject to modification as dictated by new findings, changes in species' status, and the completion of recovery tasks" (USFWS 1994:i). These statements by the USFWS acknowledge that while recovery plans may be effective guidance tools, they are still subject to the requirements of the ESA regarding the use of the best available scientific and commercial data, and the application of the listing factors identified in Section 4(a)(1) of the ESA.

The recovery criteria identified in the 1994 Recovery Plan may be appropriate for some of the seven species included in that plan; however, the application of available scientific and commercial data indicates that those recovery criteria may be superfluous with respect to reasonably assuring the continued existence of *T. reyesi*. The establishment of USFWS-approved KFAs may require an unnecessary time and financial commitment given that the existing distribution of the species already represents a high number of protected populations, an increasing number of known localities, and a lack of significant evidence that the listing factors warrant keeping *T. reyesi* listed. While there are currently only four approved KFAs for *T. reyesi*—which is less than the minimum number of KFAs identified in the 1994 Recovery Plan, current scientific data strongly supports that the species will not become threatened with extinction in the foreseeable future.

It is not consistent with the objectives of the ESA to keep *T. reyesi* listed simply because it does not meet the specific criteria outlined in the 1994 Recovery Plan. Doing so perpetuates the trend that species included in multi-species plans are four times less likely to be improving in status *administratively* regardless of their status *biologically*. It is in the best interest of the USFWS to delist species that are

biologically recovered so that available resources can be better used to contribute to the recovery and study of species that are actually threatened with extinction.

Another standard for measuring species status is provided by the NatureServe Conservation Status guidelines (NatureServe 2014). Generally a species with five or fewer known localities is considered critically imperiled under the system; effectively justifying the listing action in 1988 when the known distribution of the species included only five to six known localities. NatureServe further classifies species as "imperiled," "vulnerable," "apparently secure," and "secure." NatureServe currently lists *T. reyesi* as imperiled. This determination is dependent upon data available only up to 1994 and cites only 64 known localities. We know now that the species has nearly three times as many known localities today. This increase in range clearly qualifies the species for reevaluation as "apparently secure," or, indeed "secure." Species with over 100 locations that may be uncommon are generally considered "apparently secure" under the NatureServe conservation status guidelines, which would make this the appropriate status for *T. reyesi.*

7.0 CONCLUSION

The listing of *T. reyesi* in 1988 was based on a woefully incomplete scientific understanding of the species that precluded a truly informed analysis of the threats to the species and the relevance of the ESA listing factors. In the 26 years since the species was originally listed, the available scientific and commercial data has been significantly expanded and clearly supports delisting of *T. reyesi*.

The likelihood of *T. reyesi* becoming threatened or endangered with extinction in the *foreseeable future* has been disproven due to:

1) the substantial increase in known localities since the time of listing,

2) the likelihood of identifying more occupied caves as research progresses,

3) the 94 known localities with some sort of protective measures, and

4) current regulatory water quality protection measures that provide both direct and indirect benefit to all known localities.

If the USFWS can accept that a species in decline is not threatened with extinction, it is logical to rule that a species with secure populations and showing a steady increase in known localities over time is not threatened with extinction in the foreseeable future. This being the case, it is the obligation of the USFWS, pursuant with the terms provided in the ESA, to delist the species.

Although the Petitioners believe the case for delisting *T. reyesi* presented in this petition is compelling, compelling support for delisting is not necessary in order to require the USFWS to make a positive 90-Day finding that the petitioned action may be warranted. Indeed, it is not even necessary that a petition present the bare minimum of evidence necessary to support a decision to implement the petitioned action. Therefore, USFWS could not legally deny this or any other petition on the basis that it fails to present the scientific evidence and analysis needed to justify a decision to implement the petitioned action. Rather, pursuant to ESA section 4(b)(3)(A), the question USFWS must determine at this stage is "whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted." This is a relatively low-threshold burden of proof. As USFWS has explained, for the purposes of this decision, "'substantial information' is that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)(1)). Given the information and analysis presented in this petition, no reasonable person could believe otherwise—the delisting of *T. reyesi* unquestionably *may* be warranted. Hence, even if USFWS believes the petition has not presented sufficient support for that action, USFWS must open a status

review of the species in connection with the required process for making a 12-month finding under ESA section 4(b)(3)(B).

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APPENDIX A

CURRENTLY PROTECTED OCCUPIED CAVES AND KNOWN MANAGEMENT ACTIVITIES

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
Beck Preserve	Beck Bat Cave (TCC 2012)	Yes	5/15/1996 (Cokendolpher & Reddell 2004)	41 Acres (USFWS)			Managed by the Texas Cave Conservancy consistent with management and monitoring guidelines established in the Williamson County RHCP. Management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. Also includes Crevice Cave.
	Beck Crevice	Yes	9/13/1991 (Cokendolpher & Reddell 2004)				
	Beck Horse Cave (TCC 2012)	Yes	1991 (Cokendolpher & Reddell 2004)				
	Beck Pride Cave (TCC 2012)	Yes	1996 (Cokendolpher & Reddell 2004)				
	Beck Tex 2 Cave (TCC 2012)	Yes	1991 (Cokendolpher & Reddell 2004)				
Big Oak Cave Preserve	Big Oak Cave	Yes		10 Acres			Currently managed by the WCCF on behalf of TxDOT according to conditions of the Sec 7 BO
Brushy Creek MUD Preserves (Section 7)	Beck Ranch Cave	Yes	Unknown	≥100 acres	Brushy Creek MUD	Yes--Prepared by Texas Cave Conservancy annually for the USFWS; available online	Managed by the Texas Cave Conservancy consistent with management and monitoring plans developed by the Bushy Creek MUD management plan.
	Beck Rattlesnake Cave	Yes	1993 (Cokendolpher & Reddell 2004)				
	Broken Zipper Cave	Yes	1993 (Cokendolpher & Reddell 2004)				
	Joint Effort Cave	Yes	6/25/1997 (Cokendolpher & Reddell 2004)				
	O'Connor Cave	Yes	3/31/1993 (Cokendolpher & Reddell 2004)				
	Snowmelt Cave	No--believed to be occupied	Unknown				
	Beck Bridge Cave	Yes	1995 (TCC 2009; Cokendolpher & Reddell 2004)				
	Black Cat Cave	Yes	1995 (Cokendolpher & Reddell 2004)				
	Cat Hollow Bat Cave	Yes	1995 (Cokendolpher & Reddell 2004)				
	Cat Hollow Cave no. 1	Yes	1992 (Cokendolpher & Reddell 2004)				
	Cat Hollow Cave no. 2	Yes	1992 (Cokendolpher & Reddell 2004)				
	Cat Hollow Cave no. 3	Yes	Unknown				
	El Tigre Cave	Yes	1995 (Cokendolpher & Reddell 2004)				
	Formation Forest Cave	Yes	3/31/1993 (Cokendolpher & Reddell 2004)				

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
	Zapata Cave	Yes	March 1994 (Cokendolpher & Reddell 2004)				
Chaos Cave Preserve	Chaos Cave* (TCC 2012) Poison Ivy Cave (TCC 2012) Under the Fence Cave (TCC 2012)	Yes Yes Yes	2000 (Cokendolpher & Reddell 2004) 4/14/2000 (Cokendolpher & Reddell 2004)	35 Acres (USFWS)			Managed by the Texas Cave Conservancy consistent with management and monitoring guidelines established in the Williamson County RHCP. Management activities include: perimeter fencing and cave gating, cricket and other biota surveys, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. Includes a buffer zone around cave openings and restrictions on herbicide and pesticide use within the vicinity of the protected caves. Biological monitoring conducted annually by SWCA Environmental Consultants.
Cobbs Cavern KFA	Cobbs Cavern	Yes		163.15 Acres (SWCA)			Part of the Williamson County RHCP, managed in accordance with their management plan including: perimeter fencing and cave gating, cricket and other biota surveys, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. Includes a buffer zone around cave openings and restrictions on herbicide and pesticide use within the vicinity of the protected caves.
Godwin Ranch Karst Preserve	Red Crevice Cave* (TCC 2012, TCMA 2013) Temples of Thor Cave* (USFWS 2009; TCMA 2013)	Yes Yes	5/13/1991 (Cokendolpher & Reddell 2004)	105 acres (TCMA 2013)	Texas Cave Management Association	Yes--TCMA website	Owned by the Texas Cave Management Association; managed with assistance from Zara Environmental. Management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. 2013 Annual Report very minimal; identifies 20 visits for cave monitoring and RIFA control in 2013, planned activities for 2014 include increased signage and development of a draft management plan (TCMA 2013).
Hidden Glen Karst Preserve	Tres Amigos Cave	Yes	Apr-94	2.6 acres (TCC website)			Managed by the Texas Cave Conservancy; management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy.

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
Karankawa KFA	Karankawa Cave* (CC/KW 2006; USFWS 2009)	Yes	4/20/1994 (Cokendolpher & Reddell 2004)	83.3 Acres			Part of the Williamson County RHCP, managed in accordance with their management plan including: perimeter fencing and cave gating, cricket and other biota surveys, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. Includes a buffer zone around cave openings and restrictions on herbicide and pesticide use within the vicinity of the protected caves.
	Polaris Cave* (CC/KW 2006; USFWS 2009)	Yes	4/19/1994 (Cokendolpher & Reddell 2004)				
	War Party Cave (CC/KW 2006)	Yes	4/20/1994 (Cokendolpher & Reddell 2004)				
Millennium Preserve	Little Demon Caves (TCC 2012)	Yes		90 acres; 52 acres (TCC 2012)			Any future property uses must be approved by USFWS, regular on-site monitoring for vandalism, fire ants, and necessary cave-gate maintenance. Biological surveys will be conducted every three years. **Proposed KFA
	Millennium Cave (TCC 2012)	Yes					
Russell Park—Rockledge HCP Mitigation; Twin Springs Preserve KFA	Sunless City Cave (TCC 2012)	Yes		145 acres; Twin Springs Preserve 57 Acres (TCC 2012)			Includes designated Conservation Area, with a minimum 165 feet set-back from cave opening for construction, prohibition of clearing native vegetation, restrictions on use of herbicides, pesticides, and fertilizers. Managed by the Texas Cave Conservancy consistent with management and monitoring guidelines established in the Williamson County RHCP. Management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy.
	Whitney West Cave (TCC 2012)	Yes					
Shadow Canyon Preserve	Three-Mile Cave	Yes	(USFWS 2009)	43.84 acres	Shadow Canyon Owners' Association		Management activities outlined in HCP agreement.
	Salt Lick Cave	Yes	(USFWS 2009)				
	Lizard Lounge Cave	Yes	(USFWS 2009)				
	Dwarves Delight Cave	Yes	(USFWS 2009)				
Sun City Mitigation Preserves	Apache Cave (Reddell 2000; CC/KW 2006)	Yes	December 1993 (Reddell 2000)	321.5 acres	Sun City, Del Webb Corporation	Yes--Only 9 caves are extensively monitored regularly; the rest are surveyed less frequently	Managed by the Texas Cave Conservancy consistent with management and monitoring guidelines established in the Williamson County RHCP. Management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy.
	Choctaw Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	August 1994 (Reddell 2000)				
	Deliverance Cave No. 1 (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
	Deliverance Cave No. 2 (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	November 1994 (Reddell 2000)				
	Do Drop In Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Double Dog Hole Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Dragonfly Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	July 1994 (Reddell 2000)				
	Electro-Mag Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Holler Hole Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	December 1999 (Reddell 2000)				
	Kiva Cave No. 1 (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Medicine Man Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Prairie Flats Cave (Reddell 2000; CC/KW 2006)	Yes	April 2000 (Reddell 2000)				
	Shaman Cave* (Reddell 2000; CC/KW 2006; USFWS 2009; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Trail of Tears Cave (TCC 2012; Reddell 2000; CC/KW 2006)	Yes	April 1994 (Reddell 2000)				
	Turner Goat Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Unearthed Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	UTE Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
	Venom Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Viper Cave (Reddell 2000; CC/KW 2006)	Yes	December 1996 (Reddell 2000)				
	Woodruffs' Well Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	April 2000 (Reddell 2000)				
	Yellow Hand Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	March 1994 (Reddell 2000)				
	You-Dig-It Cave (Reddell 2000; CC/KW 2006; TCC 2012)	Yes	December 1993 (Reddell 2000)				
	Duckworth Bat Cave (CC/KW 2006)	Yes	1999 (Cokendolpher & Reddell 2004)				
	Pow Wow Cave* (Reddell 2000; CC/KW 2006; USFWS 2009; TCC 2012)	Yes	April 2000 (Reddell 2000)				
Testudo Preserve	Testudo Tube Cave	Yes		26 acres			De facto KFA; managed by the Texas Cave Conservancy on behalf of the City of Cedar Park. Activities include land management, fire ant control, restricted access, and regular cave monitoring.
Travis County Balcones Canyonlands Preserve (BCP)	Beard Ranch Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994	7,019-9,298 acres	**City of Austin Owned:** Beard Ranch Cave, Stovepipe Cave, Cotterel Cave, Fossil Cave, Spider Cave, IV-3 Cave, Pond Party Pit Cave, Cortana Cave; **Travis County Owned:** Gallifer Cave, McDonald Cave, Tooth Cave, New Comanche Trail Cave, North Root Cave, Root Cave, Geode Cave, F-12 Cave; **Privately Owned:** Eluvial Cave, Jollyville Plateau Cave, MWA Cave, Cold Cave, Fossil Garden Cave,	Yes: developed annually as a reporting requirement. Available on the BCCP website.	Once acquisition is complete, will protect between 7,019 and 9,298 acres, and 18 of 21 occupied caves. Includes individual cave preserves and three cave clusters (McNeil, Northwood, and Four Points). Additionally includes consideration for newly discovered occupied caves which may be acquired in the future. Management activities include: maintenance of native vegetation, imported fire ant control, control of disturbance by humans, and protection of water quality and nutrient input. The surface and sub-surface environments must be maintained in their natural condition with minimal vegetation disturbances. City of Austin and Travis County owned caves are either on preserves or parkland; no public access is permitted for ANY of the BCP designated caves.
	Eluvial Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Gallifer Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Jollyville Plateau Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994, Cokendolpher and Reddell 1995				

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
	McDonald Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994		Hole-In-The-Road Cave, McNeil Bat Cave, No Rent Cave, Weldon Cave (Travis County et al. 2012)		
	MWA Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012))	Yes	Elliot 1992, USFWS 1994, Cokendolpher and Reddell 1995				
	Stovepipe Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012))	Yes	Elliot 1992, USFWS 1994				
	Tooth Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012))	Yes	Elliot 1992, USFWS 1994				
	Cold Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Cotterell Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Fossil Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Fossil Garden Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	Hole-In-The-Road Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994, September 1998 (Cokendolpher & Reddell)				
	McNeil Bat Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	New Comanche Trail Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	No Rent Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	North Root Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				

Preserve/ Conservation Area	Occupied Cave Names	Confirmed Occupied BCH	Date BCH Last Observed	Preserve Acreage	Owner	Annual Reports Available	Notes
	Root Cave (RECON 2006; Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
	IV-3 (Travis County et al. 2012)	Yes	2012 (Travis County et al. 2012; Zara)				
	Pond Party Pit (Travis County et al. 2012)	Yes	2012 (Travis County et al. 2012; Zara)				
	Cortana Cave (Travis County et al. 2012)	Yes	2012 (Travis County et al. 2012)				
	Geode Cave (Travis County et al. 2012)	Yes	2012 (Travis County et al. 2012)				
	F-12 (Travis County et al. 2012)	Yes	2012 (Travis County et al. 2012)				
	Weldon Cave* (RECON 1996; USFWS 2009, Travis County et al. 2012)	Yes	Elliot 1992, USFWS 1994				
Wilco Cave Preserve	Mongo Cave (TCC 2012)	Yes	Apr-99	130 acres; 65 acres (TCC 2012)			Managed by the Texas Cave Conservancy consistent with management and monitoring guidelines established in the Williamson County RHCP. Management activities include: perimeter fencing and cave gating, routine monitoring of preserve integrity (and development of annual report), control of red imported fire ant, and use of adaptive management as necessary to ensure most successful management strategy. **Pending KFA
	Rock Ridge Cave (TCC 2012)	Yes					
	Wilco Cave (TCC 2012)	Yes					
	Wild West Cave (TCC 2012)						
Priscilla's Well KFA	Priscilla's Cave (Reddell 2000; TCC 2012)	Yes	April 2000 (Reddell 2000)	51 acres			Maintenance of fencing, quarterly site visits, conduct annual cave fauna surveys; plans to acquire 700 acres of KFAs and manage that land in perpetuity. Each KFA will be a minimum of 40-90 acres and will be submitted to the USFWS for consideration along with a detailed management and monitoring plans for the KFA. Will additionally include management of 10 conservation areas in perpetuity--may be selected from caves included in this list.
	Priscilla's Well Cave* (Reddell 2000; USFWS 2009; TCC 2012)	Yes	April 2000 (Reddell 2000)				

* Indicates designation as a "potential KFA" in the Five-Year Review for the Bone Cave harvestman (USFWS 2009).

APPENDIX B

ESA SECTION 7 AND SECTION 10 CONSULTATIONS RELATED TO TEXELLA REYESI

HCP Name	Permit No.	Date of Issuance	Covered Species	Covered Activities	Estimated Take	Mitigation
Comanche Canyon Ranch	TE 004683-0	July 17, 2000	Golden-cheeked warbler, Tooth Cave pseudoscorpion, Kretschmarr Cave mold beetle, Bee Creek Cave harvestman, Bane Cave harvestman, Tooth Cave spider, and Tooth Cave ground beetle	Construction and operation of Comanche Canyon Ranch w/ associated roads and utilities on 110 acres of a total 446 acres.	63 ac of GCWA habitat; 26 ac directly modified, and 37 ac indirectly impacted due to urbanization. A total of 5 warbler territories taken. No impacts to karst invertebrates expected.	During land clearing/excavation in zones 1&2, a qualified geologist will remain on-site to ensure detection of any karst features. If any features are found, all construction w/in 500 feet will cease until all necessary evaluations completed.
Sultan & Kahn	TE 035525-0	May 31, 2002	Bone Cave harvestman	Construction and operation of 3 unspecified commercial developments w/associated driveways, parking lots, landscaping, utilities, and other associated infrastructure on 3.53 ac.	No direct take expected. Indirect impact to 2.585 ac of surface habitat contributing to the degradation of Beck Bat/Beck Crevice Cave to the extent that they could cease providing habitat for the BCH.	On-site minimization of impacts to the BCH by conservation measures such as native plant landscape buffers and use of Integrated Pest Management on-site. Funding for acquisition & management of one cave w/in a preserve system w/an area of at least 70 ac in Williamson or Travis Co.
Russell Park Estates	TE 051567-1	July 1, 2005	Golden-cheeked warbler	Construction of a residential development of 35-40 home sites w/attendant roads and utilities on 53.5 ac of the property.	53.5 ac of GCWA habitat directly modified, 34.4 indirectly affected by development. Will adversely impact 3-4 GCWA territories. No take for BCH is authorized.	Preservation in perpetuity of ~139.4 ac containing portions of the property identified as potentially high quality GCWA habitat; managed by applicant. Deer and bird feeders prohibited in residential yards and preserve areas. Free-roaming dogs and cats prohibited. This area contains Sunless City Cave; no impacts to karst invertebrates anticipated.
Four Points Property	PRT-808694	March 12, 1996	Golden-cheeked warbler, Tooth Cave ground beetle, and Bone Cave harvestman	Development of ~138 ac for a combination of mixed uses and residential construction w/attendant widening of Four Points Drive and utilities construction.	Puzzle Pits Cave would be covered over and surface water runoff into Twisted Elm Cave would be altered in quantity and quality. Direct modification of 138 ac of GCWA habitat, and 65 ac negatively affected. Parts of 13 warbler territories will be affected.	52 ac would be preserved and maintained; contains 5 caves known to be inhabited by Tooth Cave ground beetle and/or Bone Cave harvestman. Kretschmarr Cave mold beetle and Tooth Cave pseudoscorpion may be present in these caves. This area also contains GCWA habitat.
Grandview Hills	PRT-815447	August 27, 1999	Golden-cheeked warbler, Black-capped vireo, Tooth Cave pseudoscorpion, Kretschmarr Cave mold beetle, Bee Creek Cave harvestman, Bone Cave harvestman, Tooth Cave spider, Tooth Cave ground beetle, Jollyville Plateau salamander, and Bifurcated Cave amphipod	Construction of residential and commercial development with attendant roads and utilities on portions of the 550.3-ac Grandview Hills property.	Direct modification of 4.1 ac of potential black capped vireo (BCV) habitat. Negative impacts to 0-1 territories. Direct modification of 59.4 ac of GCWA habitat; 19 ac of habitat eliminated. Negative impacts to 6-9 territories.	**GCWA**: 313.3 ac set aside in perpetuity as a preserve for GCWA, protecting 266 ac of GCWA habitat; managed by Travis Co. for the BCP. **BCV:** 15.3 ac of potential habitat will be restored. A ~600-foot buffer to the west and southwest of Amber Cave will be provided to protect the Tooth Cave pseudoscorpion and Kretschmarr Cave mold beetle and other karst invertebrates. Amber Cave is within the 313.3 ac preserve. Greenbelt areas will provide buffers, and surface water runoff from developed areas will enter drainages downstream of the area known to contain Jollyville Plateau salamanders, and no surface water runoff from developed areas into Talus Springs Cave.
Lakeline Mall			Tooth Cave ground beetle and Bee Creek Cave Harvestman	Development of 116 ac for the construction of a regional mall and additional commercial development with attendant parking facilities.	No greater than 62 ac on the eastern portion of the site. Impacts to Underline Cave, Well Trap location #6, and Lakeline Cave are expected.	*Acquisition of karst preserve lands and known cave location for the Tooth Cave ground beetle and Bee Creek Cave harvestman. Preserve will be funded, investigated, and characterized by the applicant. Management annuity will amount to $50,000 for the life of the permit. *Contribution of $40,000 to the BCCP. *Karst ecosystem exhibit for educational purposes. *Fire ant control within the preserve.
Williamson County	TE-181840-0	October 21, 2008	Bone Cave harvestman, Coffin Cave mold beetle, golden-cheeked warbler, and black-capped vireo	Public and private development activities including road construction/maintenance, utility installation/ maintenance, pipelines, plants, schools, and land clearing.	210 caves over the life of the permit (based on average caves expected to be discovered per year over 30-year permit)	Acquisition and management of 9-15 40-to-90 acre KFAs across the KFRs, assume management of 10 existing karst conservation areas.

HCP Name	Permit No.	Date of Issuance	Covered Species	Covered Activities	Estimated Take	Mitigation
Travis County	TE-788841	May 2, 1996	Black-capped vireo, golden-cheeked warbler, Tooth Cave pseudoscorpion, Tooth Cave spider, Tooth Caveground beetle, Kretschmarr Cave mold beetle, Bone Cave harvestman, and Bee Creek Cave harvestman.	Development of residential, commercial, or industrial construction and infrastructure projects and their indirect impacts.	Loss of up to half of the known occupied BCV habitat; Loss of up to 71% of potential GCWA habitat; Loss of up to 84% of karst invertebrate habitat.	Preservation of a minimum of 30,428 ac of BCV and GCWA habitat; provide maintenance, patrol, and biological management of preserved area, and conduct biological monitoring and research activities; includes known *T. reyesi* occupied caves.
Brushy Creek MUD (Section 7)	Consultation # 2-15-F-2002-0453	September 9, 2004	Bone Cave harvestman	Development and construction of diversion and raw water transmission pipelines and associated facilities.	May occur in any occupied caves bisected by the pipeline. Take will be in the form of killing of individuals occupying areas directly adjacent to the trenching and harm due to habitat alteration.	Work with WCKF to identify and preserve additional KFAs; revegetation of disturbed areas and silt barriers up-gradient of karst openings; use of hazardous/toxic substances will be minimized; construction equipment inspected daily for leaking fluids; vehicle fueling/maintenance limited to areas away from construction areas; written contingency plan in place for hazardous/toxic substance spills; and if karst features are encountered during construction, they will be protected from adverse impacts and evaluated for potential habitat.

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APPENDIX C

KNOWN OCCUPIED *T. REYESI* CAVES

Known Occupied *T. reyesi* Caves

Abused*
Abyss
Apache*
Barker Ranch No. 1
Beard Ranch**
Beck Bat Cave*
Beck Blowing Well
Beck Bridge*
Beck Crevice*
Beck Horse*
Beck Pride*
Beck Ranch*
Beck Rattlesnake*
Beck TEX-2*
Beck Tin Can/Sewer
Bee Creek
Beer Bottle
Big Oak Cave*
Black Cat*
Blessed Virgin Cave**
Bone Cave
Broken Zipper*
Browns' Cave
Buzzard Feather
Cassidy
Cat Cave
Cat Hollow Bat
Can Hollow Cave No. 1*
Cat Hollow Cave No. 2*
Cat Hollow Cave No. 3*
Cave Coral
Chaos Cave**
Choctaw*
Cobb Drain
Cobbs Cavern***
Coke Box
Cold Cave*
Coon Scat Cave
Cortana Cave*
Cotterell Cave*
Crescent
Deliverance No. 1*
Deliverance No. 2*
Do-Drop-In*
Double Dog Hole*
Dragonfly*
Duckworth Bat*
Dwarves Delight Cave*
Easter
El Tigre*
Electro-Mag*
Elm
Eluvial**
Ensor
Eulogy
F-12*
Fence Line Sink**
Flat Rock
Flint Wash
Flowstone Rift
Formation Forest*
Fortune 500
Fossil*
Fossil Garden*
Gallifer**
Geode*
Hatchi
Hide-Away
Hole-In-The-Road*
Holler Hole*
Hollow Oak
Hourglass Cave
Inner Space Caverns
IV-3*
Jack Hammer
Jensen**
Joint Effort*
Joker
Jollyville Plateau**
Karankawa***
Killian Kavern
Kiva Cave No. 1*
Lakeline
Leachate
Lineament
Little Demon**
Little Lake
Lizards Lounge Cave*
Lobos' Lair**
Man with a Spear
Mayfield
Mayor Elliot
McDonald**
McNeil Bat Cave*
McNeil Quarry
Medicine Man*
Millennium**
Millipede
Mongo*
Mosquito
Mustard
MWA**
Near Miss
New Comanche Trail*
No Rent*
North Root Cave*
O'Connor*
Off Campus
Ominous Entrance
On-Campus
Onion Branch

*Protections afforded as described in Appendix A
**De facto KFA as acknowledged in the 5-Year Review or by Permitted Biologists
***Cave location part of an approved KFA

Outlaw
Pecan Gap
Pencil Cactus
Poison Ivy**
Polaris***
Pond Party Pit*
Posh
Pow Wow**
Prairie Flats*
Price-is-Right
Pricilla's***
Pricilla's Well***
Purple Glass
Pussy Cat
Racine Park
Raccoon Cave
Raccoon Lounge**
Rattlesnake Inn
Red Crevice**
Rock Fall**
Rock Ridge*
Rocky Horror Cave
Root*
Rootin Tootin
Round Rock Breathing**
Salt Lick*
Sam Bass Hideaway
Scoot-Over
Serta
Shaman**
Short Stack
Sierra Vista
Six Meter Sink
Snake Dancer
Snowmelt Cave*
Sore-Ped
Spider
Stalagroot
Steam**
Step Down
Step Stone
Stonewall Ranch
Stovepipe**
Sunless City Cave***
Swarm
Temples of Thor**
Testudo Tube*
Texella
Thin Top
Three Mile*
Through Trip
Tooth Cave**
Trail of Tears*
Tres Amigos*
Turner Goat*
Twin Springs
Twisted Elm
Under the Fence Cave**
Underdeveloped
Underline
Undertaker
Unearthed*
Unemployment
Ute*
Vault
Veniuri
Venom*
Vericose
Viper*
War Party***
Waterfall Canyon
Weldon**
Weldon Rattlesnake
West Rim
Whislin Dixie
Whitney West***
Wilco*
Wild Card
Wild West*
Williams
Williams No. 1
Wolfs' Rattlesnake**
Woodruffs' Well*
WS-54**
WS-71a**
WS-65310**
Yamas
Yellow Hand*
You-Dig-It*
Zapata*

*Protections afforded as described in Appendix A
**De facto KFA as acknowledged in the 5-Year Review or by Permitted Biologists
***Cave location part of an approved KFA

From: Wilson, Jenny
To: Watson, Cyndee
Cc: LeBlanc, Darren
Subject: Re: Barker Ranch Cave No. 1
Date: Friday, November 21, 2014 1:29:02 PM

For NDD, I would contact Bob Gottfried. bob.gottfried@tpwd.texas.gov

On Fri, Nov 21, 2014 at 2:18 PM, Watson, Cyndee <cyndee_watson@fws.gov> wrote:

> Yes, I was going to talk to her about updating the karst database but I didn't think of the NDD.
>
> Thanks,
> Cyndee
>
> On Fri, Nov 21, 2014 at 2:14 PM, LeBlanc, Darren <darren_leblanc@fws.gov> wrote:
>
> > You can let Ben know. We should probably find out if it is on the NDD incorrectly and if so have it removed. Jenny should have a contact to do that.
> >
> > On Fri, Nov 21, 2014 at 2:11 PM, Watson, Cyndee <cyndee_watson@fws.gov> wrote:
> >
> > > I don't think so. Would you prefer to let them know or should I? If you want me to I would notify their entomologist Ben Hutchins but are there others that should be notified?
> > >
> > > On Fri, Nov 21, 2014 at 2:08 PM, LeBlanc, Darren <darren_leblanc@fws.gov> wrote:
> > >
> > > > Does TPWD know also?
> > > >
> > > > On Fri, Nov 21, 2014 at 2:04 PM, Watson, Cyndee <cyndee_watson@fws.gov> wrote:
> > > >
> > > > > Yes, I told them yesterday at the meeting we had.
> > > > >
> > > > > Thanks,
> > > > > Cyndee
> > > > >
> > > > > On Fri, Nov 21, 2014 at 1:57 PM, Sommer, Tanya <tanya_sommer@fws.gov> wrote:
> > > > >
> > > > > > Does the BCCP know?
> > > > > >
> > > > > > On Fri, Nov 21, 2014 at 9:36 AM, Watson, Cyndee <cyndee_watson@fws.gov> wrote:
> > > > > >
> > > > > > > Hello folks,
> > > > > > >
> > > > > > > I am just letting you all know that Darrel Ubick (*Texella* taxonomist) has confirmed that his original confirmation of *Texella reyesi* in Barker Ranch Cave No. 1 was in error. That endangered species does not occur in this cave.
> > > > > > >
> > > > > > > Thanks,
> > > > > > > Cyndee
> > > > > > >
> > > > > > > --

> Cyndee Watson
> Wildlife Biologist
> US Fish and Wildlife Service
> Ecological Services
> 512-490-0057 ext. 223
>
> Adopt the pace of nature: her secret is patience. -- Ralph Waldo Emerson

--
Tanya Sommer
U.S. Fish and Wildlife Service
10711 Burnet Road
Austin, TX 78758
512-490-0057 x 222

--
Cyndee Watson
Wildlife Biologist
US Fish and Wildlife Service
Ecological Services
512-490-0057 ext. 223

Adopt the pace of nature: her secret is patience. -- Ralph Waldo Emerson

--
Darren LeBlanc
Texas Transportation Liaison
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10711 Burnet Rd, Suite 200
Austin, TX 78758
512-490-0057 ext 247
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--
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> --
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--
Jenny Wilson
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10711 Burnet Road, Suite 200
Austin, TX 78758
Phone: 512-490-0057, ext 231
Fax: 512-490-0974
Email: jenny_wilson@fws.gov

From: McGee, Brady
To: Susan Jacobsen
Subject: Re: Bone Cave Harvestman 90-day
Date: Wednesday, March 15, 2017 1:14:54 PM

The RD approved this package on 2/23....formal package has been in HQ ever since along with RSOL surname.

Thanks,

Brady

Brady McGee, Ph.D.
Branch Chief, Recovery and Restoration
U.S. Fish and Wildlife Service
Southwest Regional Office
P.O. Box 1306
Albuquerque, NM 87103
505-248-6657; cell 505-908-8491

On Wed, Mar 15, 2017 at 10:33 AM, Susan Jacobsen <susan_jacobsen@fws.gov> wrote:

> Not sure where this stands
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> **From:** Adam Zerrenner <adam_zerrenner@fws.gov>
> **Date:** March 13, 2017 at 6:12:55 PM CDT
> **To:** "Koch, Ted" <ted_koch@fws.gov>
> **Cc:** Susan Jacobsen <susan_jacobsen@fws.gov>, Shawn Sartorius <shawn_sartorius@fws.gov>
> **Subject: Re: Bone Cave Harvestman 90-day**
>
> Hi Ted,
>
> I'm available tomorrow and Wednesday as well to talk. Is there a time that works best for all or would you prefer I just give you a call?
>
> Thanks,
>
> Adam
>
> Sent from my iPhone
>
> On Mar 13, 2017, at 5:21 PM, Koch, Ted <ted_koch@fws.gov>

wrote:

Adam et al.-

Benjamin was asking critical questions about our proposed negative 90-day finding for bone cave harvestman delisting petition. He correctly pointed out that making a positive 90-day is a pretty "low bar," and that this species is somewhat controversial.

Can we get on the phone to discuss? I'm on my cell tomorrow, and at my desk again Wednesday.

Thanks,

Ted

--

Ted Koch

Assistant Regional Director, Ecological Services

U.S. Fish and Wildlife Service, Region 2

P.O. Box 1306

Albuquerque, NM 87103-1306

505-248-6644

CERTIFICATE OF SERVICE

I hereby certify that on October 5, 2017, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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Chance D. Weldon
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Attorneys for Amicus Curiae State of Texas

/s/ Alan M. Glen
Alan M. Glen

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. *Plaintiffs,*	§ § §	
v.	§ §	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. *Defendants.*	§ § §	

INDEX OF PLAINTIFFS' EXCERPTS OF ADMINISTRATIVE RECORD ("AR")

VOLUME 2

No.	Document Description	AR Pages
4	Presentation titled "Briefing: 90-day Finding to Delist the Bone Cave harvestman," April 14, 2017 (Excerpt)	M003044
5	Presentation titled "Briefing: 90-day Finding to Delist the Bone Cave harvestman," April 17, 2017 (Excerpt)	M003088

Dated: October 5, 2017

Respectfully submitted,

NOSSAMAN LLP

By: */s/ Alan M. Glen*

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Attorneys for Plaintiffs
American Stewards of Liberty; Charles and Cheryl Shell; Walter Sidney Shell Management Trust; Kathryn Heidemann; and Robert V. Harrison, Sr.

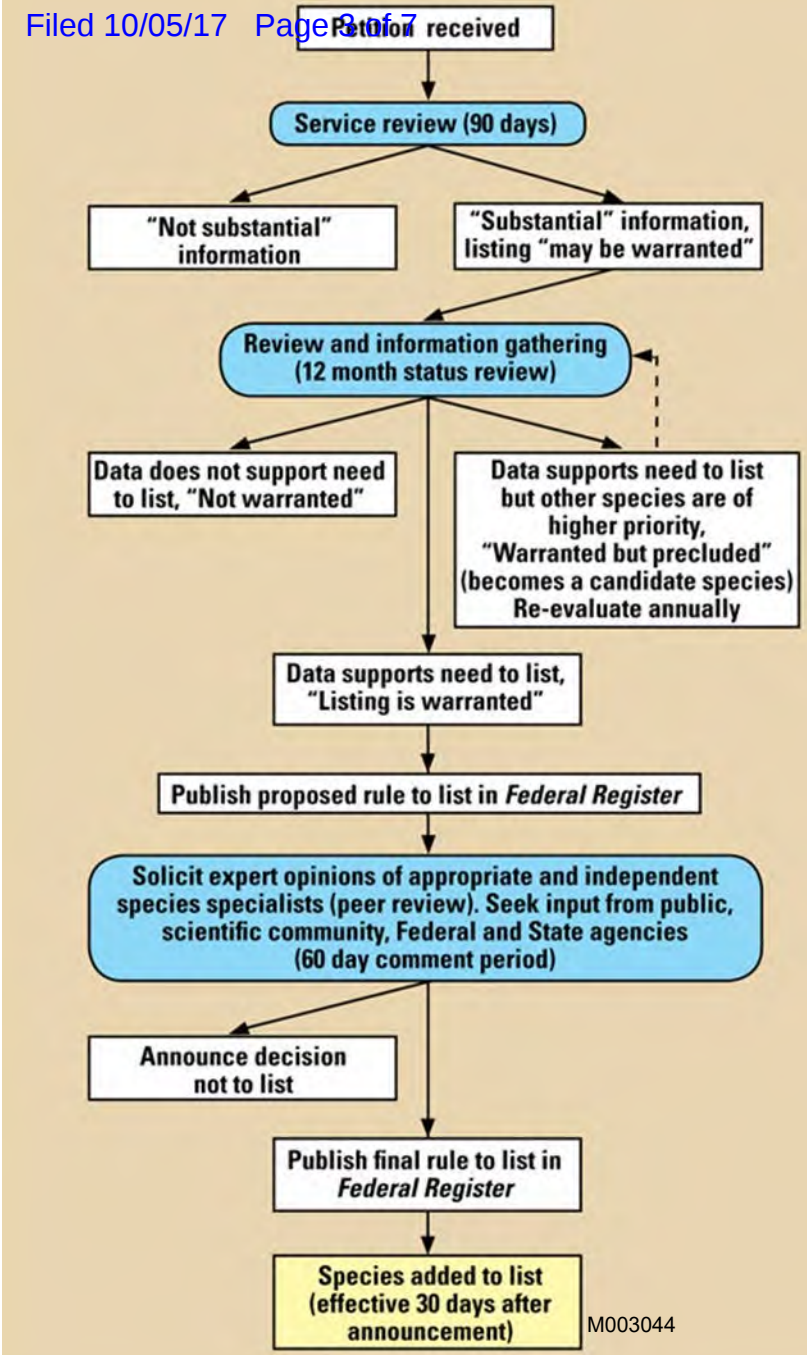
Endangered Specie Act

Petition Process – Section 4(b)(3)

- Section 4(b)(3) of ESA allows public participation in Service's listing /delisting/ reclassification process
- List, delist, or reclassify species (Sec 4(b)(3)(A))
- Revise critical habitat (Sec 4(b)(3)(D))
- Defined statutory time-frames for processing

90-day Evaluation

- Limit evaluation to information provided by the petitioner ("Four Corners" of the petition)
- Only use information in our files to refute petition claims
- Do not actively search for or solicit outside data at the 90-day stage



Briefing: 90-day Finding to Delist the Bone Cave Harvestman

Southwest Region, Austin Ecological Services Field Office

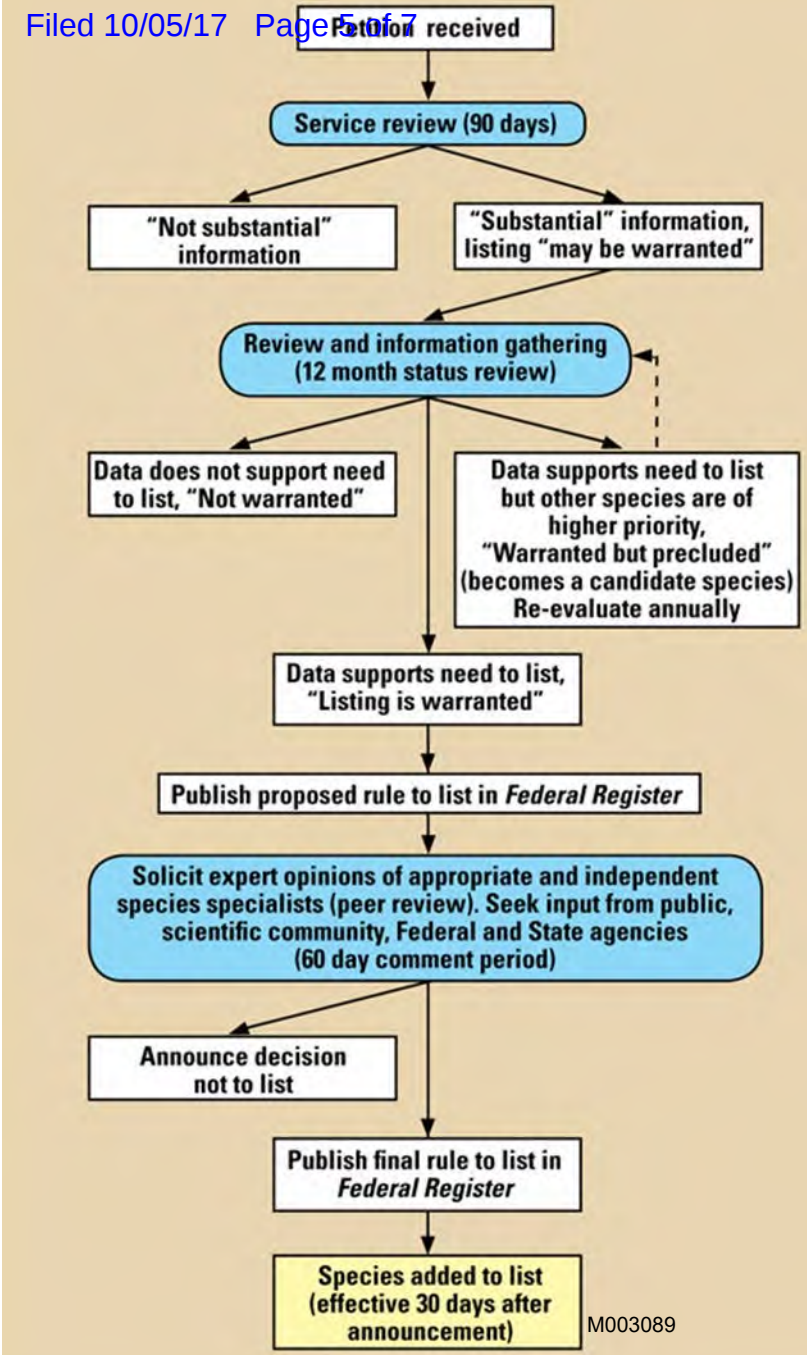
Endangered Species Act

Petition Process – Section 4(b)(3)

- Section 4(b)(3) of ESA allows public participation in listing /delisting/ reclassification process
- Defined statutory time-frames

90-day Evaluation

- Limit evaluation to information provided by the petitioner
- Only use information in our files to refute petition claims
- Do not actively search for or solicit outside data at the 90-day stage



CERTIFICATE OF SERVICE

I hereby certify that on October 5, 2017, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. *Plaintiffs,*	§	
v.	§	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. *Defendants.*	§	

INDEX OF PLAINTIFFS' EXCERPTS OF ADMINISTRATIVE RECORD ("AR")

VOLUME 3

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7	Petition Review Form for 90-Day Finding on Petition to Delist the Bone Cave harvestman, March 20, 2017	M003425
8	82 FR 20861 - Bone Cave Harvestman 90-day Finding to Delist, May 4, 2017	M003523
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Dated: October 5, 2017

Respectfully submitted,

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Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To Remove the Bone Cave Harvestman From the List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to remove the Bone Cave harvestman (*Texella reyesi*) from the List of Endangered and Threatened Wildlife under the Endangered Species Act of 1973, as amended (Act). Based on our review, we find that the petition does not present substantial scientific or commercial information indicating that the petitioned action may be warranted. Therefore, we are not initiating a status review in response to this petition. However, we are in the process of conducting a species status assessment and 5-year status review and we invite the public, including the petitioners and other interested parties, to submit new data and information for consideration in this ongoing process. In particular, we ask the public to submit to us any new information that becomes available concerning the status of, or threats to, the Bone Cave harvestman or its habitat at any time.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Act (16 U.S.C. 1531 et seq.) requires that we make a finding on whether a petition to add a species to ("list"), remove a species from ("delist"), or reclassify a species on the Lists of Endangered and Threatened Wildlife and Plants presents substantial scientific or commercial information indicating that the petitioned

action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise available in our files. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of the finding promptly in the **Federal Register**.

The Services revised the regulations at 50 CFR 424.14 to clarify the procedures under which the Services evaluate petitions effective October 27, 2016 (81 FR 66462; September 27, 2016). We originally received the petition that is the subject of this document on June 2, 2014, with supplemental information received on October 5, 2016. We therefore evaluated this petition under the 50 CFR 424.14 requirements that were in effect prior to October 27, 2016, as those requirements applied when the petition and supplemental information were received.

Our standard for substantial scientific or commercial information with regard to a 90-day petition finding was "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)(1)). If we find that substantial scientific or commercial information was presented, we are required to promptly conduct a species status review, which we subsequently summarize in a 12-month finding.

Petition History

On June 2, 2014, we received a petition from John Yearwood, Kathryn Heidemann, Charles and Cheryl Shell, the Walter Sidney Shell Management Trust, the American Stewards of Liberty, and Steven W. Carothers requesting that we remove the endangered Bone Cave harvestman from the Federal List of Endangered and Threatened

Wildlife. The petition clearly identified itself as a petition and included the requisite identification information for the petitioners, as required at 50 CFR 424.14(a) (now 50 CFR 424.14(c)(1)). On June 1, 2015, the Service published a 90-day finding in the **Federal Register** (80 FR 30990) that the petition did not present substantial scientific or commercial information indicating that the petitioned action was warranted. On December 15, 2015, the American Stewards of Liberty, Charles and Cheryl Shell, Walter Sidney Shell Management Trust, Kathryn Heidemann, and Robert V. Harrison, Sr. challenged the 2015 90-day finding in Federal district court. The Service sought the court's permission to reconsider the 90-day finding. On December 22, 2016, the court ordered the Service to complete a new 90-day finding and deliver that finding to the **Federal Register** on or before March 31, 2017. This 90-day finding supersedes the Service's previous 2015 90-day finding, and is made pursuant to the court's December 22, 2016 order, the 2014 petition, and the additional reference materials accompanying the petition.

Previous Federal Actions

On September 16, 1988, the Service determined that the Bone Cave harvestman was endangered under the ESA (53 FR 36029). The 1988 final listing determination included five separate species, one of which was the Bee Creek Cave harvestman. Subsequent scientific studies concluded that the Bee Creek Cave harvestman actually consisted of two separate species: the Bee Creek Cave harvestman and the Bone Cave harvestman. As a result, the Service made a technical correction to include both species on the list of endangered species (58 FR 43818; August 18, 1993).On March 14, 1994, we published a 90-day finding (59 FR 11755) on a petition to delist the Bone Cave

harvestman in which we found that the petition did not present substantial scientific or commercial information indicating that the petitioned action may have been warranted. We developed a draft recovery plan on June 7, 1993, and made it final on August 25, 1994 (Service 1994b). On December 4, 2009, we completed a 5-year review of the Bone Cave harvestman, which recommended that the species remain listed as endangered (Service 2009). On June 1, 2015, we published a 90-day finding (80 FR 30990) on a petition to delist the Bone Cave harvestman which was subsequently withdrawn. This 90-day finding supersedes the Service's 2015 90-day finding. We announced our initiation of a 5-year review of the Bone Cave harvestman, and requested information for that review, on April 15, 2015 (80 FR 20241).

Species Information

For information on the biology and life history of the Bone Cave harvestman, see the final rule listing this species (53 FR 36029; September 16, 1988), the Endangered Karst Invertebrates Recovery Plan for Travis and Williamson Counties (Service 1994b), and the 5-year Status Review for the Bone Cave Harvestman (Service 2009), all posted at *http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=J009*. For information on preserve design and management for karst invertebrate species conservation, see the Karst Preserve Design Recommendations (Service 2012) and the Karst Preserve Management and Monitoring Recommendations (Service 2014) posted at *http://www.fws.gov/southwest/es/AustinTexas/ESA_Sp_KarstInverts.html*.

Evaluation of Information for This Finding

Under section 3(16) of the Act, we may consider for listing any species, including subspecies, of fish, or wildlife, or plants, and any distinct population segment of any

species of vertebrate fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). Such entities are listed under the Act if we determine that they meet the definition of an endangered or threatened species.

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations at 50 CFR 424 set forth the procedures for adding a species to, or removing a species from, the lists of endangered and threatened species. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

We must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) The species is recovered; or (3) The original data for classification were in error. According to 50 CFR 424.11(d)(3), a species may be delisted when subsequent investigations "show that the best scientific and commercial data available when the species was listed, or the interpretation of such data, were in error."

In making this 90-day finding, we evaluated whether the petition presented substantial information indicating that the petitioned action (delisting) may be warranted. The petition did not assert that the Bone Cave harvestman is extinct, nor do we have

information in our files indicating that the species is extinct. The petition asserted that new information indicates that the original data, or our interpretation of the data, used in the listing of this species were in error. The petition also states that significant conservation has been put in place since the species was listed, such that the species is recovered.

In 2009, we conducted a 5-year status review of the Bone Cave harvestman (Service 2009). The purpose of a 5-year status review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on a 5-year review, we recommend whether a species should be removed from the List of Endangered and Threatened Wildlife, be changed in status from endangered to threatened, be changed in status from threatened to endangered, or remain at its current status. As part of the 2009 Bone Cave harvestman review, we evaluated whether the species had met the recovery criteria laid out in the species' recovery plan (Service 1994b, pp. 86–89).

Our Recovery Planning Guidance (NMFS and Service 2010) points out that recovery criteria should address the biodiversity principles of resiliency, redundancy, and representation (Schaffer and Stein 2000). Resiliency is the ability of a population or species to persist through severe hardships or stochastic events.

Redundancy refers to ensuring a sufficient number of populations to provide a margin of safety to reduce the risk of losing a species or certain representation (variation) within a species due to catastrophic events or other threats.

Representation involves conserving "some of everything" with regard to genetic and ecological diversity to allow for future adaptation and maintenance of evolutionary

potential. Representation and the adaptive capabilities (NMFS and Service 2010, p. 76994) of the Bone Cave harvestman are also important for long-term viability. Because a species' genetic makeup is shaped through natural selection by the environments it has experienced (Shaffer and Stein 2000, p. 308), populations should be protected in the array of different environments in which the invertebrate species occur as a strategy to ensure genetic representation, adaptive capability, and conservation of the species. Generally, the more representation, or diversity, the species has, the more it is capable of adapting to changes (natural or human-caused) in its environment.

The recovery plan for the Bone Cave harvestman (Service 1994b, pp. 86–88) identifies criteria for reclassification (from endangered to threatened), but does not include delisting criteria because we were unable to determine criteria for delisting the species at that time. Although meeting recovery criteria is not the standard for delisting, these reclassification recovery criteria are discussed here as a way of measuring our progress toward recovery and assessing the current status of the species. The recovery plan identifies two criteria for reclassifying the species from endangered to threatened: (1) Three karst fauna areas (if at least three exist) within each karst fauna region in its range are protected in perpetuity. If fewer than three karst fauna areas exist within a given karst fauna region, then all karst fauna areas within that region should be protected. (2) Criterion (1) has been maintained for at least 5 consecutive years with assurances that these areas will remain protected in perpetuity.

Karst fauna regions are geographic regions delineated based on geologic continuity, hydrology, and species distribution (Service 1994b, p. 76). There are six karst fauna regions in Travis and Williamson Counties, Texas, that are known to contain the

Bone Cave harvestman (Service 1994b, p. 33): North Williamson, Georgetown, McNeil/Round Rock, Cedar Park, Jollyville Plateau, and Central Austin. These regions are used as a way to facilitate conservation of representation and redundancy (as defined above) throughout the species' range.

Karst geologic areas were initially established for Travis and Williamson Counties, Texas, in 1992 (Veni & Associates 1992) and subsequently incorporated as karst fauna regions into the Recovery Plan for Endangered Karst Invertebrates in Travis and Williamson Counties, Texas (Service 1994b, pp. 28-34). Karst species zones, geographic areas used to denote the potential for listed karst invertebrate occurrence, were revised in 2007 for Travis and Williamson Counties, Texas (Veni and Martinez 2007). That revision incorporated additional species occurrence data and more robust geological mapping, and provided a more refined assessment of species distribution. While some studies suggest specific karst fauna regions could be redefined (Paquin and Hedin 2004, p. 3250; White 2006, pp. 93-99), they remain an overall suitable conservation strategy to aid in species recovery (Veni and Martinez 2007, p. 25; Ledford *et al.* 2012, p. 12).

For the purposes of the recovery plan, a karst fauna area "is an area known to support one or more locations of a listed species and is distinct in that it acts as a system that is separated from other karst fauna areas by geologic and hydrologic features and/or processes that create barriers to the movement of water, contaminants, and troglobitic fauna" that live their entire lives underground (Service 1994b, p. 76). Karst fauna areas should be far enough apart so that if a catastrophic event (for example, contamination of the water supply, flooding, disease) were to destroy one of the areas, that event would not

likely destroy any other area occupied by that species (Service 1994b, p. 76).

To be considered "protected," a karst fauna area must be sufficiently large to maintain the integrity of the karst ecosystem on which the species depends (Service 1994b, p. 87). In addition, these areas must also provide protection from threats such as red imported fire ants, habitat destruction, and contaminants.

The overall recovery strategy for the Bone Cave harvestman includes the perpetual protection and management of an adequate quantity and quality of habitat (three karst fauna areas in each karst fauna regions) that spans the species' geographic range and provides a high probability of the species' recovery and survival over the long term. Adequate quality (as discussed below) and quantity of habitat refers to both size and number of preserved karst fauna areas that are sufficient for supporting the karst invertebrates and the ecosystems upon which they depend (Service 2011, p. 16). The recovery plan criteria call for three karst fauna areas (preserves) in each karst fauna region. The size of karst fauna area preserves should be large enough to ensure resiliency, as discussed above, and to protect the environmental integrity of the karst ecosystems upon which the species depends. The number of karst fauna area preserves called for in the recovery criteria provides redundancy for the species. A minimal level of redundancy within areas representing differing ecological and genetic makeup is essential to provide a margin of safety for the species to reduce the risk of losing the species or representation (variation) within the species from catastrophic events or other threats (Shaffer and Stein 2000 pp. 307, 309–310; Groves *et al.* 2002, p. 506). The Bone Cave harvestman has significant geographic variability across its range, and loss of a significant number of locations in part of its range could result in loss of genetic and

ecological diversity. The conservation of multiple karst fauna area preserves across the Bone Cave harvestman's range should provide representation of the breadth of its genetic and ecological diversity to conserve its adaptive capabilities (Schaffer and Stein 2000, p. 308).

Adequate quality of habitat refers to (1) the condition and configuration of preserved lands with respect to the known localities for the species, and (2) the ability of the species' needs to be met to sustain viable populations. Due to the uncertainty in determining population viability of the Bone Cave harvestman, the design of preserves for its protection should be based on estimates and assumptions that favor a high probability for recovery of this species and the ecosystems upon which it depends as discussed below.

The Endangered Karst Invertebrates Recovery Plan for Travis and Williamson Counties (Service 1994b) calls for protecting karst fauna areas sufficiently large to maintain the integrity of the karst ecosystem on which the species depends. This focus on the ecosystem is consistent with the purposes of the Act, which include "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" (16 U.S.C. 1531(b)). Therefore, we recommend designing karst fauna area preserves to protect occupied karst feature(s) and associated mesocaverns (humanly impassable voids). For further guidance on how to provide for adequate quantity and quality of habitat at specific invertebrate locations, we have developed and refer to our Karst Preserve Design Recommendations (Service 2012).

According to our preserve design guidelines (Service 2012, p. 3-5), karst fauna area preserves should include the following: (1) Surface and subsurface drainage basins

of at least one occupied cave or karst feature; (2) a minimum of 16 to 40 hectares (ha) (40 to 100 acres (ac)) of contiguous, unfragmented, undisturbed land to maintain native plant and animal communities around the feature and protect the subsurface karst community; (3) 105-meter (m) (345-feet (ft)) radius of undisturbed area from each cave footprint for cave cricket foraging (cave crickets are an important source of nutrient input to the karst ecosystem) and to minimize deleterious edge effects; and (4) preserves free of pipelines, storage tanks, or other facilities (for example, water retention ponds) that could cause contamination.

Because of the difficulties determining the population viability and habitat requirements for Bone Cave harvestman, this method follows a precautionary approach, which provides guidance to avert irreversible risk when facing uncertainty (Service 2012, p. A-1). Life-history characteristics of this species indicate that it requires stable temperature and humidity (Barr 1968, p. 47; Mitchell 1971, p. 250), and suggest that this species cannot be reintroduced because it cannot withstand surface climatic conditions.

According to anecdotal reports provided to our Austin Ecological Services Field Office, limited efforts to maintain karst invertebrates in a lab setting have been unsuccessful. Additionally, captive propagation techniques have not been developed for karst invertebrates and may be challenging to develop because of their specific adaptations to subterranean environment. Further, the sample size that would likely be needed to reintroduce a population into a new location cannot be obtained from existing populations due to the cryptic nature of this species and the fact that often only a few individuals are observed per cave survey. Therefore, an attempt to re-establish a population after it has been extirpated is not feasible at this time. In addition, if a

preserve is later found to be insufficient to support the species due to surrounding developments being either too close or too dense, the potential for adequately conserving the site is lost.

Because the Bone Cave harvestman has a relatively long life span and low requirements for food, a decline in population size or even the complete extirpation of the population due to the influence of development or other threats may take years or even decades. Observations of this species over several years on a preserve that is too small for perpetual species preservation may not allow detection of declines that are actually occurring. If these observations are used as evidence that a preserve size was adequate, then the potential for long-term preservation of the species may be lost due to irreversible development surrounding the preserve. Therefore, preserve sizes should be established with caution and be large enough to account for the uncertainty in area requirements for a population.

According to the petition, there are now more known occupied locations identified; there were 6 confirmed caves at listing; 60 confirmed caves at the time the recovery plan was drafted; and 168 confirmed caves in 2009, when the 5-year status review was completed (53 FR 36029, September 16, 1988; Service 1994b, 2009). The petition also states that more locations are likely to be found. We acknowledge that there are more known locations since the time those documents were completed and that the increase is likely an increase in our knowledge, not a true increase in the number of populations or range; however, species are listed under the Act based on an overall assessment of their viability and threats to their continued existence and not a simple assessment of the number of sites or size of the species' range. Some of the ongoing

threats to the species include habitat loss to development, alteration of drainage patterns, alteration of surface plant and animal communities, and contamination.

The petition states that 94 karst preserve areas are currently providing significant conservation. While these karst preserve areas are an important tool for preserving the current population of Bone Cave harvestman, many of the existing protected areas referenced in the petition are too small to meet the Service's preserve design recommendations. As part of the 2009 5-year status review of the Bone Cave harvestman, we reviewed the status of all of the known locations of the harvestman (including 83 of the 94 mentioned in the petition) to assess whether the criteria from the recovery plan to reclassify the species from endangered to threatened had been met for the Bone Cave harvestman. We considered the habitat size and condition to evaluate whether the locations could meet the preserve design recommendations (a reflection of the potential to support a resilient population) and then also looked at whether legally binding mechanisms were in place to provide protection of these sites over the long term (in perpetuity).

Of the locations known at the time of the 5-year review, 21 areas appeared to have the potential to meet the preserve design criteria. Our status review refers to 21 areas, while the petition incorrectly indicates that the status review considered 28 sites. This discrepancy is because the petition considers each individual cave location, while our status review considered closely located caves to be part of the same karst fauna area. Of these 21 areas, 1 is no longer confirmed to have the species (Barker Ranch Cave No. 1), and 5 are now protected karst fauna areas (Priscilla's Well, Twin Springs, Cobbs Cavern, Karankawa, and Tooth Cave).

In addition, at most of the remaining locations (of the 21 areas), we lack information to confirm that they meet the preserve design criteria (such as whether the surface and subsurface drainage basins are protected; tract acreage; exact locations of the cave within the area; and management activities to protect against threats, such as red imported fire ants). Also, many of these areas do not have a legally binding mechanism that ensures perpetual protection and management. Hence, we are unsure whether those areas have adequate undeveloped acreage, management, or protection mechanisms to ensure the long-term protection and survival of the Bone Cave harvestman.

Of the five protected karst fauna areas that meet preserve design criteria, four occur in the North Williamson County Karst Fauna Region and one occurs in the Jollyville Plateau Karst Fauna Region. However, this species occurs in six karst fauna regions, and four of these have no protected karst fauna areas that are confirmed to meet preserve design recommendations. Therefore, the best available information indicates that the criteria for reclassification from endangered to threatened for this species have not been met, nor has adequate redundancy and representation (three karst fauna areas in each karst fauna region) been protected throughout the species' range, leaving the species vulnerable to existing threats including habitat destruction.

The petition asserts that four additional locations are known since the time of the 5-year review. However, the petition does not provide adequate information that would support whether these four additional locations are in a condition to meet preserve design recommendations. Based on information in our files, we are aware of one additional cave since the 5-year review that may meet preserve design recommendations in the North Williamson Karst Fauna Region; however, it is privately owned, and we are unsure about

the property acreage and if the site receives any type of protection or management. Regardless, the amount of protected karst fauna area still falls short of the criteria for reclassification from endangered to threatened.

Further, we reviewed 83 of the 94 caves identified in the petition as receiving some level of protection in the 5-year review. Two of the caves that we did not review (Cobbs Cavern and Whitney West Cave) are now in confirmed karst fauna areas mentioned above (Cobbs Cavern and Twin Springs); one (Pond Party Pit) is in the Beard Ranch Cave area discussed in the 5-year review; and we have no locality information or taxonomic verifications for the remaining caves, and this information was not provided in the petition.

The petition also asserts that threats to the species are not as severe as originally thought. We evaluate that information, below, with respect to the five listing factors.

Factor A: The present or threatened destruction, modification, or curtailment of the species' habitat or range. In the 1988 listing rule (53 FR 36029), we stated that the primary threat to the Bone Cave harvestman was the potential loss of habitat due to development activities, which could result in filling in or collapsing of caves; alteration of drainage patterns; increase in flow of sediment, pesticides, fertilizers, and urban run-off into caves; and increase in human visitation and vandalism.

We also considered additional information on threats to the species when we developed the recovery plan for the species (Service 1994b, pp. 59–65) and when we conducted the 5-year status review of the species (Service 2009, p. 2), in which we concluded that no change in the species' status (that is, reclassification to threatened or delisting) was warranted. We also reviewed available threat information in our files and

in a 1993 petition when we made our negative 90-day finding on that petition to delist (59 FR 11755; March 14, 1994).

The current petition asserts that "[d]evelopment activities on the surface may not result in the significant loss or degradation of habitat for *T. reyesi* as originally thought" and suggests that evidence of this is persistence of the species in caves surrounded by developed areas. Examples given in the petition are Inner Space Caverns, Sun City caves, Weldon Cave, Three-Mile Cave, and Four-Mile Cave. However, the observation of the species in these locations does not mean their populations at these locations are thriving or can withstand the long-term impacts from development activities that are expected to occur to karst invertebrate populations in developed areas, as discussed in the listing rule, recovery plan, and 5-year status review for the Bone Cave harvestman. In addition, increased development provides greater opportunities for contamination events such as pipeline leaks or hazardous material spills.

Bone Cave harvestman populations may be declining or threatened even though they are still observed at a specific site. The petition does not provide adequate information to detect population trends for this species and it is not available from other sources. This species has life-history strategies that include characteristics such as low metabolic and reproductive rates, long life spans, and inherently low sample sizes, which make it difficult to detect population response to possible impacts (Poulson and White 1969, p. 977; Howarth 1983, p. 374). We indicated in the 1994 90-day petition finding (59 FR 11755) that more time was needed to detect if the species was declining; however, while more time has passed, we are still lacking adequate data to conduct a trend analysis. It may be infeasible to assess karst invertebrate population trends in any

statistically significant manner given their association with humanly inaccessible cave habitat such as mesocaverns (Krejca and Weckerly 2007, p. 287). Human surveyors likely only have the opportunity to survey individuals from a subset of the available habitat (Knapp and Fong 1999, p. 6).

The petition states that several Sun City caves are examples of areas where the species can persist in developed areas. However, the petition failed to provide data adequate to assess trends in the karst invertebrate populations since the development occurred. In addition, we worked with the Sun City developers when they designed the project to develop strategies that we believed at the time would avoid or minimize the possibility of "take" of listed karst species. While we now believe that most of the Sun City cave preserves are too small to meet our preserve design recommendations for recovery and long-term survival (Service 2012), we expect that the strategies and conservation measures put in place likely have reduced the rate of impacts to the species.

The commercial cave known as Inner Space Caverns is another example the petition provided where the Bone Cave harvestman continues to persist in a developed area. Although the Bone Cave harvestman may be present at Inner Space Caverns, this does not ensure its populations are robust and secure; they may still be declining, and are at risk due to competition with surface-dwelling invertebrates and other threats associated with development, such as the potential for contamination. This cave has an overgrowth of blue-green algae growing near cave lights where the petition states that this species has been observed. This type of algae is known as "lampenflora" and favors surface-dwelling invertebrate species that can out-compete karst invertebrate species (Mulec and Kosi 2009, p. 109; Culver 1986, p. 438), such as the Bone Cave harvestman. The petition

failed to provide any data adequate to assess trends in the karst invertebrate population in relation to the time (duration and frequency) that they have been exposed to the artificial lighting. Additionally, part of the cave footprint occurs under a major interstate highway and train tracks, both of which present a threat of a contaminant spill that could impact the species in the future.

Weldon Cave was another example in the petition of a cave occupied by the Bone Cave harvestman within a developed area. Based on the best available information in our files, this cave is surrounded by undeveloped open space. Other than a small portion of the subsurface drainage basin potentially being impacted by a school campus, this cave appears to meet our preserve design recommendations but is not within a developed area, as asserted in the petition. Three-Mile Cave and Four-Mile Cave were also provided in the petition as examples of developed caves wherein the Bone Cave harvestman is known to occur. According to the petition, surveys conducted by SWCA in 2008 and 2009 documented the Bone Cave harvestman at these locations. However, detailed survey data were not provided by the petitioners and were not in the SWCA 2009 "Annual Report of Activities Involving Endangered Karst Invertebrates under Threatened and Endangered Species Permit TE800611–2."

The petition also states that, since the Bone Cave harvestman uses mesocaverns, it is protected from surface development activities because mesocaverns are "geologically protected." We are unclear why the petition contends that mesocaverns are protected because mesocaverns are subject to rapid permeation of surface water (Cowan *et al.* 2007, p. 160), and karst landscapes (including mesocaverns) are particularly susceptible to groundwater contamination because water penetrates rapidly through bedrock conduits

providing little or no filtration (White 1988, p. 149).

One of the major threats to the Bone Cave harvestman is habitat loss due to increasing urbanization. The Bone Cave harvestman is a troglobite, meaning it lives its entire life underground. Karst ecosystems are heavily reliant on surface plant and animal communities for nutrient input.

Caves in central Texas that are occupied by federally listed karst invertebrates, such as the Bone Cave harvestman, receive energy (or nutrients) primarily from (1) detritus (decomposing organic matter) that falls or is washed into the caves, and (2) energy brought into the caves by cave crickets (*Ceuthophilus* spp.) (Barr 1968, p. 48; Reddell 1993, p. 2; Lavoie *et al.* 2007, p. 114; Taylor *et al.* 2003, p. 3; 2004, p. 2; 2005, p. 97), which are found in most Texas caves (Reddell 1966, p. 33). Cave crickets forage widely in the surface habitat surrounding the cave. Karst invertebrates feed on the cave cricket eggs (Mitchell 1971, p. 251), feces (Barr 1968, pp. 51–53, Poulson *et al.* 1995, p. 226), and directly on the crickets themselves (Elliott 1994, p. 15).

Development within urbanized areas can destroy or alter the surface plant and animal communities on which karst invertebrates depend. As development increases within the cave crickets' foraging area, there may be dramatic shifts in the available food supply within the cave (Taylor *et al.* 2007, p. 7). The leaf litter and other decomposing material that make up most of the detritus from the surface plant and animal community may also be reduced or altered, resulting in a reduction of nutrient and energy flow into the cave. A study by Taylor *et al.* (2007) compared caves in urbanized areas that were impacted by development to those in natural areas and found that, even though a small area within a largely urbanized ecosystem may support a cave community where karst

invertebrates are occasionally seen, these populations are significantly lower than those found in caves in more natural, less developed ecosystems, most likely as a result of reduced nutrient input. Another study at Lakeline Cave in Travis County, Texas, was conducted in association with the issuance of a habitat conservation plan and accompanying section 10(a)(1)(B) permit issued for Lakeline Mall. That study is based on data collected from 1992 through 2011, which documented a significant decline during that 20-year timeframe in another endangered karst invertebrate, the Tooth Cave ground beetle (*Rhadine persephone*), and cave crickets as development increased (ZARA 2012, pp. 8, 10, 12). Further, at Lakeline Mall Cave, no more than three Bone Cave harvestmen have been observed during any single survey (ZARA 2012, p. 11). Also, no Bone Cave harvestmen were seen during 6 years (1993, 1999, 2001, 2006, 2009, and 2010) and 12 surveys in Lakeline Mall Cave (ZARA 2012, p. 11).

Available information in our files supports our projection in the 1988 listing rule (53 FR 36029) that development and human population would continue to increase within the range of the species. The population of the City of Austin grew from 251,808 people in 1970, to 735,088 people in 2007 (City of Austin 2007). This represents a 192-percent increase over the 37-year period. Population projections from the Texas State Data Center (2012, pp. 496–497), estimate that Travis County will increase 94 percent in population from 1,024,266 in 2010, to 1,990,820 in 2050. The Texas State Data Center also estimates an increase in human population in Williamson County from 422,679 in 2010, to 2,015,294 in 2050 representing a 377-percent increase over a 40-year timeframe. All human population projections from the Texas State Data Center presented here are under a high-growth scenario, which assumes that migration rates from 2000 to 2010 will

continue through 2050 (Texas State Data Center and the Office of the State Demographer 2012, p. 9). Urbanization and human population growth and development were identified as a threat in the original 1988 listing rule and continue to represent a threat to the species.

Factor B: Overutilization for commercial, recreational, scientific, or educational purposes. In the 1988 listing rule for the Bone Cave harvestman (53 FR 36029), we did not identify any threats under this factor. Likewise, the petition and our review of the information in our files did not identify any threats under this factor.

Factor C: Disease or predation. In the 1988 listing rule (53 FR 36029), we stated that increased human population increases the threat of predation by and competition with exotic (nonnative) and native surface-dwelling species, such as sow bugs, cockroaches, and red imported fire ants. The petition states that "[r]ecent studies suggest that fire ants may not present as significant or as lasting of a threat to the species as originally believed." The information cited regarding red imported fire ants is identified in the petition as an article by Porter and Savignano (1990), which we previously considered in our finding on the 1993 petition (59 FR 11755; March 14, 1994), and another study by Morrison (2002). The petition states that "a subsequent study by Morrison in 2002 revisited the Porter and Savignano (1990) study area 12 years later and replicated their study."

Morrison (2002, pp. 2341, 2343–2344) found that arthropod communities had rebounded to pre-RIFA [red imported fire ant]-invasion levels and that all measures of native ant and other arthropod species' diversity had returned to pre-invasion levels. Red imported fire ants were still the most abundant ant species, but not nearly as abundant as

during the initial red imported fire ants infestation. He concluded that the impacts to arthropod communities by red imported fire ants might be greatest during and shortly after the initial invasion, but long-term impacts are likely not as significant as once believed. However, we note that Morrison (2002, p. 2342) also states that "it is quite likely that red imported fire ants did contribute directly or indirectly to the disappearance or reduction in numbers of species" and that their study "should not be interpreted as an indication that detrimental effects of invasive ants will simply disappear with time." In addition, this is not "new information" as we have already reviewed these articles and considered the information they provided in the Bexar County Karst Invertebrates Recovery Plan (Service 2011, p. 12) and in our Karst Preserve Management and Monitoring Recommendations (Service 2014, p. 3), which is applicable here as all central Texas endangered karst invertebrates have similar life-history characteristics, and one of the Bexar County invertebrates (the Cokendolpher Cave harvestman) is in the same genus (*Texella*) as the Bone Cave harvestman. In addition, red imported fire ants have been found within and near many caves in central Texas and have been observed feeding on dead troglobites, cave crickets, and other species within caves (Elliott 1992, p. 13; 1994, p. 15; 2000, pp. 668, 768; Reddell 1993, p. 10; Taylor *et al.* 2003, p. 3).

Factor D: The inadequacy of existing regulatory mechanisms. The 1988 listing rule (53 FR 36029) states that "there are currently no laws that protect any of these species or that indirectly address protection of their habitat." While the petition did discuss some new ordinances that appear to have been put in place since the time of listing, we do not have enough information to indicate whether or not these State and local ordinances provide enough protection from all threats to the Bone Cave harvestman

in perpetuity.

The petition states that "the regulatory landscape includes a number of measures contributing to the conservation of the species outside of the protections afforded by the Endangered Species Act of 1973, as amended." For example, they say that protections offered though the City of Austin are adequate to protect the species in Austin, Texas. In the course of our work, we have reviewed these regulations and understand that most caves that are defined by the City of Austin's Environmental Criteria Manual as a cave are provided a 46- to 91-m (150- to 300-ft) set-back area (City of Austin 2014, p. 13-3). However, a 46-m (150-ft) or 91-m (300-ft) set-back is not adequate to meet our preserve design criteria, does not protect the cave cricket foraging area, and potentially does not include the surface and subsurface drainage basins. Further, the City of Austin's regulations are not applicable across the full range of the Bone Cave harvestman because the species occurs in Travis and Williamson Counties, including areas outside the Austin city limits.

The petition states that the City of Georgetown Water Quality Management Plan for the Georgetown salamander will offer protection to the Bone Cave harvestman. They state that this plan encourages the use of best management practices to protect water quality at Georgetown salamander locations. However, there are few Bone Cave harvestman locations that occur near Georgetown salamander locations, so any protection offered to the harvestman would be limited. Further, it is not clear from the petition whether this mechanism is voluntary, regulatory, or is currently in effect. In addition, the petition did not provide enough detail for us to evaluate all benefits this plan would provide to the Bone Cave harvestman, and it appears that participation in this plan is at

least in part voluntary.

The petition states that the Texas Commission on Environmental Quality (TCEQ) Edwards Rules provide protection to recharge features on the Edwards Plateau and that this provides protection from pollution to the Bone Cave harvestman. In a discussion of Factor D in the Bexar County Karst Invertebrates Recovery Plan (Service 2011, p. 13), we state that "the TCEQ water quality regulations do not provide much protection to the species' habitat (see 65 FR 81419–81433 for more information). For example, while some TCEQ practices provide protection from water quality impacts, others, such as sealing cave entrances for water quality reasons, can harm karst invertebrates." Sealing cave entrances can be harmful by blocking off water (leading to drying) and nutrient input to the karst invertebrate habitat. In addition, not all of the caves and mesocaverns that the Bone Cave harvestman occurs in are considered recharge features and, therefore, would not receive some of the water quality protection measures. Also, not all locations of the Bone Cave harvestman are under the jurisdiction of the Edwards Rules.

Factor E: Other natural or manmade factors affecting the continued existence of the species. In the 1988 listing rule (53 FR 36029), we stated that this species is extremely vulnerable to losses because of its severely limited range and because of its naturally limited ability to colonize new habitats. We also stated that the very small size of the species habitat units and the fragile nature of cave ecosystems make this species vulnerable to even isolated acts of vandalism. The petition states, "Inner Space Cavern demonstrates that the species can persist in caves with frequent human visitation and may be more tolerant of related habitat modification than originally believed." They also provide Three-Mile Cave and Four-Mile Cave as examples of caves that have

experienced human use yet the species persists in them. The petition contends that, since the Bone Cave harvestman exists in Inner Space Caverns, human visitation is not a threat. The petition also states that Three-mile and Four-mile Cave had graffiti from the 1890s, 1920s, and 1950s. However, no detailed information was provided to demonstrate if these caves experienced continued human use. The petition also indicates that Four-Mile Cave was inaccessible to humans prior to 2009, due to boulders blocking the entrance. In addition, the petition provided no trend analysis for these caves. As stated earlier, the observation of the species in these locations does not mean the populations at these locations have not been impacted (in a way that is short of extirpation) or can withstand the long-term impacts that are expected to occur to karst invertebrate populations in developed areas or from human visitation.

In the species 5-year status review (Service 2009, p. 18), we said, "[a]lthough climate change was not identified as a threat to *T. reyesi* in the original listing document or in the recovery plan, the species' dependence on stable temperatures and humidity levels opens the possibility of climatic change impacting this species. Therefore, while it appears reasonable to assume that *T. reyesi* may be affected, we lack sufficient certainty to know how climate change will affect this species."

The petition states that "the use of small voids or 'mesocaverns' within the geologic formations known to support occupied caves mitigates the potential threat of climate change." We acknowledge that mesocaverns may provide some protection from fluctuations in temperature and humidity that may be induced by climate change. However, the presence of mesocaverns alone will likely not be sufficient to ameliorate all of the effects that climate change may pose to this species, especially in the long run.

Karst invertebrates depend on stable temperatures and high humidity (Barr 1968, p. 47; Mitchell 1971, p. 250). The temperatures in caves are typically the average annual temperature of the surface habitat and vary much less than the surface environment (Howarth 1983, p. 372; Dunlap 1995, p. 76). If average surface temperatures increase, this could result in increased in-cave temperatures, which could affect the Bone Cave harvestman.

Increased and/or more severe storms, as well as prolonged periods of high temperatures and drought between rainfall events, associated with anticipated climate change effects may also impact the cave environment. Changes in rainfall regimes may affect the harvestman in several ways, including directly either through flooding or indirectly by modifying their habitat or nutrient availability. Changes in rainfall regimes could (1) alter the moisture levels within the caves leaving them drier between floods, which could lead to desiccation of the Bone Cave harvestman; and (2) affect the amount and timing of nutrients washed into a cave, potentially resulting in longer periods between nutrient input. These changes to drier and less suitable conditions in the caves will likely cause the Bone Cave harvestman to retreat farther into mesocaverns and away from nutrients that are thought to be located in larger cave passages (Howarth 1987, pp. 5–7), causing individuals to spend more energy trying to acquire nutrients in an already stressed environment. In addition, caves in arid regions have been shown to have smaller invertebrate populations and diversity due to less moisture and nutrient availability (George Veni, National Cave and Karst Research Institute, pers. comm. 2010). Since the Bone Cave harvestman is also sensitive to these habitat parameters, it is reasonable to predict that the effects of climate change on these habitat parameters could affect its

populations in a similar manner despite the presence of mesocaverns.

Further, stochastic (random) events from either environmental factors (for example, severe weather) or demographic factors (which come from the chance events of birth and death of individuals) exacerbate threats to the species because of its small population size (Melbourne and Hastings 2008, p. 100). The risk of extinction for any species is known to be highly inversely correlated with population size (Pimm *et al.* 1988, pp. 774–775; O'Grady *et al.* 2004, pp. 516, 518). In other words, the smaller the population the greater the overall risk of extinction. Therefore, threats to the Bone Cave harvestman are exacerbated by its small population size, which makes it more vulnerable to existing threats.

Finding

The U.S. Fish and Wildlife Service and the National Marine Fisheries Service (Services) use the rulemaking process in our administration of the Act, in particular section 4 of the Act. Section 4(b)(3) of the Act establishes deadlines and standards for making findings on petitions to conduct rulemakings under section 4. As stated above, the Services revised the regulations at 50 CFR 424.14 to clarify the procedures under which the Services evaluate petitions effective October 27, 2016 (81 FR 66462; September 27, 2016). We originally received the petition that is the subject of this document on June 2, 2014, with supplemental information received on October 6, 2016. We therefore evaluated this petition under the 50 CFR 424.14 requirements that were in effect prior to October 27, 2016, as those requirements applied when the petition and supplemental information were received.

We have reviewed the petition, including all accompanying materials, and

evaluated readily available, related information in our files. The results of the 2009 5-year review and the assessment of threats in the five factor analysis presented in this 90-day finding do not indicate that the original classification was made in error. The petitioners have primarily based their contention that the species can thrive in developed areas on information that we have previously considered and rejected while working on previous documents (Service 2009, 2012). Petitioners present limited new information, such as the fact that four occupied caves have been discovered since the 5-year status review. In addition, petitioners assert that seven other caves are occupied. However, we lack, and the petition did not provide, locality information or taxonomic verifications related to these potential additional locations of the species. The other arguments presented in the petition lack a large enough sample size to produce population trend information for the Bone Cave harvestman. The petition provided no trend analysis to indicate that this species can withstand the threats associated with development or climate change over the long term. In addition, these threats, particularly those related to development, appear to be increasing in severity. Based on our review and evaluation, we find that the petition does not present substantial scientific or commercial information indicating that the delisting of the Bone Cave harvestman may be warranted due to recovery, extinction, or error in the original scientific data at the time the species was classified or in our interpretation of the data.

Although this finding ends our formal consideration of the petition, we are in the process of conducting a species status assessment and 5-year status review. Specifically, section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years. On April 15, 2015, we published a notice in the Federal Register initiating

this review (80 FR 20241). The purpose of a 5-year review is to determine whether listed species should be removed from the list or changed in status under the Act. In this case, we are developing a species status assessment as a tool to inform the 5-year status review. The 5-year review will consider whether the species status has changed since the time of its listing or its last status review and whether it should be reclassified as threatened or delisted. We invite the public, including the petitioners and other interested parties, to submit new data and information for consideration in this ongoing process.

Much progress has been made toward recovery in the North Williamson and Jollyville Plateau Karst Fauna Regions. We encourage interested parties to continue to gather data and implement conservation actions across the range of the Bone Cave harvestman that will further assist with the conservation of this species. If you wish to provide information regarding the Bone Cave harvestman, you may submit your information or materials to the Field Supervisor, Austin Ecological Services Field Office (see **ADDRESSES**) at any time.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Austin Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this document are staff members of the Austin Ecological Services Field Office.

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: _____

_____

Director, U.S. Fish and Wildlife Service

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: MAR 20 2017

James W. Kurth

James W. Kurth

Acting *Director, U.S. Fish and Wildlife Service*

Petition Review Form for Delisting a Listed Entity

90-DAY FINDING ON A PETITION TO DELIST THE BONE CAVE HARVESTMAN (*Texella reyesi*)

Petitioned action being requested:

☐Reclassify from Endangered to Threatened species

☒Remove from the List of Endangered and Threatened Wildlife (or Plants) (i.e., "Delist")

☒Due to recovery

☐Due to extinction

☒Due to original data for classification in error

☐Revise listed entity (split listing, apply different statuses to each entity; revise boundaries of DPS; conform listing to new taxonomic info, etc.)

Petitioned entity:

☒ Species

☐ Subspecies

☐ DPS of vertebrates

☐ Subset of listed entity (species, subspecies, DPS, etc.)

Background

Section 4(b)(3)(A) of the Act (16 U.S.C. 1531 et seq.) requires that we make a finding on whether a petition to add a species to ("list"), remove a species from ("delist"), or reclassify a species on the Lists of Endangered and Threatened Wildlife and Plants presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise available in our files. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of the finding promptly in the **Federal Register**.

The Services revised the regulations at 50 CFR 424.14 to clarify the procedures under which the Services evaluate petitions effective October 27, 2016 (81 FR 66462; September 27, 2016). We originally received the petition that is the subject of this document on June 2, 2014, with supplemental information received on October 5, 2016. We therefore evaluated this petition under the 50 CFR 424.14 requirements that were in effect prior to October 27, 2016, as those requirements applied when the petition and supplemental information were received.

Our standard for substantial scientific or commercial information with regard to a 90-day petition finding was "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)(1)). If we find that substantial scientific or commercial information was presented, we are required to promptly conduct a species status review, which we subsequently summarize in a 12-month finding.

Petition History

On June 2, 2014, we received a petition dated June 2, 2014, from John Yearwood, Kathryn Heidemann, Charles and Cheryl Shell, the Walter Sidney Shell Management Trust, the American Stewards of Liberty, and Steven W. Carothers, requesting that Bone Cave harvestman be removed from the Federal List of Endangered and Threatened Wildlife ("delisted") due to recovery or error in information. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(a) (now 50 CFR 424.14(c)(1)). This finding addresses the petition, and supersedes the previous 90-day finding published on June 1, 2015.

Evaluation of a Petition to Delist the Bone Cave harvestman Under the Act

When citation lists are provided, the use of the "+" sign to string a series of citations together indicates that the information in these citations, when combined, provide substantial information.

Species and Range

Does the petition identify an entity for delisting that is currently listed under the Act (i.e., the petitioned entity is identical to the entity currently listed)?

☒Yes

☐No

If yes, list common name (scientific name); and describe the current and historical range of the species then proceed to ***Information in the Petition*** *section. If no, answer next question.*

Bone Cave harvestman (*Texella reyesi*)

Historical range: Travis and Williamson counties, Texas

Current range: Travis and Williamson counties, Texas

Does the petition identify a ***portion*** of a listed entity that may be eligible for delisting (i.e., is the petitioned entity a species, subspecies or potential DPS)?

☐Yes

☒No

If yes, list common name (scientific name); and describe the current and historical range of the species. If no, please explain.

The petition identifies the species as the entity that may be eligible for delisting, not a portion of the listed entity.

Information in the Petition

Recovery Criteria

1. If applicable, does the petitioner claim the entity warrants delisting because recovery criteria for delisting have been met?

   ☐Yes

   ☒No

   The recovery plan for the Bone Cave harvestman (Service 1994b, pp. 86–88) identifies criteria for reclassification (from endangered to threatened), but does not include delisting criteria because we were unable to determine criteria for delisting the species at that time. Although meeting recovery criteria is not the standard for delisting, these reclassification recovery criteria are a way of measuring our progress toward recovery and assessing the current status of the species. The recovery plan identifies the following two criteria for reclassifying the species from endangered to threatened:

   (1) Three karst fauna areas (if at least three exist) within each karst fauna region in its range are protected in perpetuity. If fewer than three karst fauna areas exist

within a given karst fauna region, then all karst fauna areas within that region should be protected.

(2) Criterion (1) has been maintained for at least 5 consecutive years with assurances that these areas will remain protected in perpetuity.

The petition discusses these existing recovery criteria, but suggests that these criteria are inappropriate and "may be superfluous with respect to reasonably assuring the continued existence of *T. reyesi*."

Present or threatened destruction, modification or curtailment of the species habitat or range

2. Does the petitioner claim the entity warrants delisting because threats related to the present or threatened destruction, modification or curtailment of the species habitat or range (Factor A) are reduced or are not (or no longer) acting on the species?

☒Yes

☐No

a. If the answer to 2 is yes:

Identify why the petitioner indicates threats related to the present or threatened destruction, modification or curtailment of the species habitat or range are reduced or are not (or are no longer) a threat.

- Habitat improvement
- Habitat protection

b. If the answer to 2 is yes:
Do the sources cited in the petition provide substantial information to support the claim?

☐Yes

☒No

If yes, indicate which activity(ies) (e.g., logging, agriculture, overgrazing, etc.) the petitioner claims are reduced or are not (or no longer) a threat and list the

citations with page numbers for each purpose. If no, please indicate for which activity(ies) and explain.

In the 1988 listing rule (53 FR 36029), we stated that the primary threat to the Bone Cave harvestman was the potential loss of habitat due to development activities, which could result in filling in or collapsing of caves; alteration of drainage patterns; increase in flow of sediment, pesticides, fertilizers, and urban run-off into caves; and increase in human visitation and vandalism.

We also considered additional information on threats to the species when we developed the recovery plan for the species (Service 1994b, pp. 59–65) and when we conducted the 5-year status review of the species (Service 2009, p. 2), in which we concluded that no change in the species' status (that is, reclassification to threatened or delisting) was warranted. We also reviewed available threat information in our files and in a 1993 petition when we made our negative 90-day finding on that petition to delist (59 FR 11755; March 14, 1994).

The current petition asserts that "[d]evelopment activities on the surface may not result in the significant loss or degradation of habitat for *T. reyesi* as originally thought" and suggests that evidence of this is persistence of the species in caves surrounded by developed areas. Examples given in the petition are Inner Space Caverns, Sun City caves, Weldon Cave, Three-Mile Cave, and Four-Mile Cave. However, the observation of the species in these locations does not mean Bone Cave harvestman populations at these locations are thriving or can withstand the long-term impacts from development activities that are expected to occur to karst invertebrate populations in developed areas, as discussed in the listing rule, recovery plan, and 5-year status review for the Bone Cave harvestman.

Bone Cave harvestman populations may be declining or threatened even though they are still observed at a specific site. Information adequate to detect population trends for this species is not readily available and was not provided in the petition. This species has life-history strategies that include characteristics such as low metabolic and reproductive rates, long life spans, and inherently low sample sizes, which make it difficult to detect population response to possible impacts (Poulson and White 1969, p. 977; Howarth 1983, p. 374). We indicated in the 1994 90-day petition finding (59 FR 11755) that more time was needed to detect if the species was declining; however, while more time has passed, we are still lacking adequate data to conduct a trend analysis at most locations, given

that it can take decades to detect population trends due to small sample sizes, the difficulty surveying for the species, and their long life spans.

In addition, some of the threats from development are due to the increased probability of chance events occurring in the future, such as a contaminant event like a pipeline leak, which exists because more contamination sources are in the vicinity of species' locations due to development.

The petition states that several Sun City caves are examples of areas where the species can persist in developed areas. However, the petition failed to provide data adequate to assess trends in the karst invertebrate populations since the development occurred. In addition, we worked with the Sun City developers when they designed the project to develop strategies that we believed at the time would avoid or minimize the possibility of "take" of listed karst species. While we now believe that most of the Sun City cave preserves are too small to meet our preserve design recommendations for recovery and long-term survival (Service 2012), we expect that the strategies and measures put in place likely have reduced the rate of impacts to the species.

The commercial cave known as Inner Space Caverns is another example the petition provided where the Bone Cave harvestman continues to persist in a developed area. Although the Bone Cave harvestman may be present at Inner Space Caverns, this does not ensure its populations are robust and secure; they may still be declining, and are at risk due to competition with surface-dwelling invertebrates and other threats associated with development, such as the potential for contamination. This cave has an overgrowth of blue-green algae growing near cave lights where the petition states that this species has been observed. This type of algae is known as "lampenflora" and favors surface-dwelling invertebrate species that can out-compete karst invertebrate species (Mulec and Kosi 2009, p. 109; Culver 1986, p. 438), such as the Bone Cave harvestman. The petition failed to provide any data adequate to assess trends in the karst invertebrate population in relation to the time (duration and frequency) that they have been exposed to the artificial lighting. Additionally, part of the cave footprint occurs under a major interstate highway and train tracks, which both present a threat of a contaminant spill that could impact the species in the future.

Weldon Cave was another example in the petition of a cave occupied by the Bone Cave harvestman within a developed area. Based on the best available information in our files, this cave is surrounded by undeveloped open space.

Other than a small portion of the subsurface drainage basin potentially being impacted by a school campus, this cave appears to meet our preserve design recommendations but is not within a developed area, as asserted in the petition. Three-Mile Cave and Four-Mile Cave were also provided in the petition as examples of developed caves wherein the Bone Cave harvestman is known to occur. According to the petition, surveys conducted by SWCA in 2008 and 2009 documented the Bone Cave harvestman at these locations. However, detailed survey data were not provided by the petitioners and were not in the SWCA 2009 "Annual Report of Activities Involving Endangered Karst Invertebrates under Threatened and Endangered Species Permit TE800611–2."

The petition also states that, since the Bone Cave harvestman uses mesocaverns, it is protected from surface development activities because mesocaverns are "geologically protected." We are unclear why the petition contends that mesocaverns are protected because mesocaverns are subject to rapid permeation of surface water (Cowan *et al.* 2007, p. 160), and karst landscapes (including mesocaverns) are particularly susceptible to groundwater contamination because water penetrates rapidly through bedrock conduits providing little or no filtration (White 1988, p. 149).

One of the major threats to the Bone Cave harvestman is habitat loss due to increasing urbanization. The Bone Cave harvestman is a troglobite, meaning it lives its entire life underground. Karst ecosystems are heavily reliant on surface plant and animal communities for nutrient input.

Caves in central Texas that are occupied by federally listed karst invertebrates, such as the Bone Cave harvestman, receive energy (or nutrients) primarily from (1) detritus (decomposing organic matter) that falls or is washed into the caves, and (2) energy brought into the caves by cave crickets (*Ceuthophilus* spp.) (Barr 1968, p. 48; Reddell 1993, p. 2; Lavoie *et al.* 2007, p. 114; Taylor *et al.* 2003, p. 3; 2004, p. 2; 2005, p. 97), which are found in most Texas caves (Reddell 1966, p. 33). Cave crickets forage widely in the surface habitat surrounding the cave. Karst invertebrates feed on the cave cricket eggs (Mitchell 1971, p. 251), feces (Barr 1968, pp. 51–53, Poulson *et al.* 1995, p. 226), and directly on the crickets themselves (Elliott 1994, p. 15).

Development within urbanized areas can destroy or alter the surface plant and animal communities on which karst invertebrates depend. As development increases within the cave crickets' foraging area, there may be dramatic shifts in the available food supply within the cave (Taylor *et al.* 2007, p. 7). The leaf litter

and other decomposing material that make up most of the detritus from the surface plant and animal community may also be reduced or altered, resulting in a reduction of nutrient and energy flow into the cave. A study by Taylor *et al.* (2007) compared caves in urbanized areas that were impacted by development to those in natural areas and found that, even though a small area within a largely urbanized ecosystem may support a cave community where karst invertebrates are occasionally seen, these populations are significantly lower than those found in caves in more natural, less developed ecosystems, most likely as a result of reduced nutrient input. Another study at Lakeline Cave in Travis County, Texas, was conducted in association with the issuance of a habitat conservation plan and accompanying section 10(a)(1)(B) permit issued for Lakeline Mall. That study is based on data collected from 1992 through 2011, and it documented a significant decline during that 20-year timeframe in another endangered karst invertebrate, the Tooth Cave ground beetle (*Rhadine persephone*), and cave crickets as development increased (ZARA 2012, pp. 8, 10, 12). Further, at Lakeline Mall Cave, no more than three Bone Cave harvestmen have been observed during any single survey (ZARA 2012, p. 11). Also, no Bone Cave harvestmen were seen during 6 years (1993, 1999, 2001, 2006, 2009, and 2010) and 12 surveys in Lakeline Mall Cave (ZARA 2012, p. 11).

Available information in our files supports our projection in the 1988 listing rule (53 FR 36029) that development and human population would continue to increase within the range of the species. The population of the City of Austin grew from 251,808 people in 1970, to 735,088 people in 2007 (City of Austin 2007). This represents a 192-percent increase over the 37-year period. Population projections from the Texas State Data Center (2012, pp. 496–497), estimate that Travis County will increase 94 percent in population from 1,024,266 in 2010, to 1,990,820 in 2050. The Texas State Data Center also estimates an increase in human population in Williamson County from 422,679 in 2010, to 2,015,294 in 2050 representing a 377-percent increase over a 40-year timeframe. All human population projections from the Texas State Data Center presented here are under a high-growth scenario, which assumes that migration rates from 2000 to 2010 will continue through 2050 (Texas State Data Center and the Office of the State Demographer 2012, p. 9). Urbanization and human population growth and development were identified as a threat in the original 1988 listing rule and continue to represent a threat to the species.

Overutilization for commercial, recreational, scientific, or educational purposes

3. Does the petitioner claim the entity warrants delisting because threats related to overutilization for commercial, recreational, scientific, or educational purposes (Factor B) are reduced or are not (or no longer) acting on the species?

☐Yes

☒No

Disease or predation

4. Does the petitioner claim the entity warrants delisting because threats related to disease or predation (Factor C) are reduced or are not (or no longer) acting on the species?

☒Yes

☐No

a. If the answer to 4 is yes:

Which does the petitioner claim is reduced or is not (or no longer) a threat such that delisting may be warranted (check all that apply)

☐Disease

☒Predation

b. If the answer to 4 is yes:

Do the sources cited in the petition provide substantial information to support the claim?

☐Yes

☒No

If yes, indicate which (disease, predation, or both) the petitioner claims is reduced or is not (or no longer) a threat and list the citations with page numbers for each. If no, please indicate disease and/or predation and provide an explanation.

Predation

In the 1988 listing rule (53 FR 36029), we stated that increased human population increases the threat of predation by and competition with exotic (nonnative) and native surface-dwelling species, such as sow bugs, cockroaches, and red imported fire ants. The petition states that "[r]ecent studies suggest that fire ants may not present as significant or as lasting of a threat to the species as originally believed." The information cited regarding red imported fire ants is identified in the petition as an article by Porter and Savignano (1990), which we previously considered in our finding on the 1993 petition (59 FR 11755; March 14, 1994), and another study by Morrison (2002). The petition states that "a subsequent study by Morrison in 2002 revisited the Porter and Savignano (1990) study area 12 years later and replicated their study."

Morrison (2002, pp. 2341, 2343–2344) found that arthropod communities had rebounded to pre-RIFA [red imported fire ant]-invasion levels and that all measures of native ant and other arthropod species' diversity had returned to pre-invasion levels. Red imported fire ants were still the most abundant ant species, but not nearly as abundant as during the initial red imported fire ants infestation. He concluded that the impacts to arthropod communities by red imported fire ants might be greatest during and shortly after the initial invasion, but long-term impacts are likely not as significant as once believed. However, we note that Morrison (2002, p. 2342) also states that "it is quite likely that red imported fire ants did contribute directly or indirectly to the disappearance or reduction in numbers of species" and that their study "should not be interpreted as an indication that detrimental effects of invasive ants will simply disappear with time." In addition, this is not "new information" as we have already reviewed these articles and considered the information they provided in the Bexar County Karst Invertebrates Recovery Plan (Service 2011, p. 12) and in our Karst Preserve Management and Monitoring Recommendations (Service 2014, p. 3), which is applicable here as all central Texas endangered karst invertebrates have similar life-history characteristics, and one of the Bexar County invertebrates (the Cokendolpher Cave harvestman) is in the same genus (Texella) as the Bone Cave harvestman. In addition, red imported fire ants have been found within and near many caves in central Texas and have been observed feeding on dead troglobites, cave crickets, and other species within caves (Elliott 1992, p. 13; 1994, p. 15; 2000, pp. 668, 768; Reddell 1993, p. 10; Taylor et al. 2003, p. 3).

Other natural or manmade factors

5. Does the petitioner claim the entity warrants delisting because other natural or manmade factors are reduced or are not (or are no longer) affecting its continued existence (Factor E)?

☒Yes

☐No

a. If the answer to 5 is yes:

Identify the other natural or manmade factors claimed by the petitioner are reduced or are not or (are no longer) a threat such that delisting may be warranted.

Effects of Climate Change

b. If the answer to 5 is yes:
Do the sources cited in the petition provide substantial information to support the claim?

☐Yes

☒No

If yes, indicate for which other natural or manmade factors (e.g., road mortality, or small population dynamics) the petitioner claims are reduced or are not (or are no longer) a threat and list the citations with page numbers for each factor. If no, please indicate for which factor(s) and explain.

Effects of Climate Change

In the 1988 listing rule (53 FR 36029), we stated that this species is extremely vulnerable to losses because of its severely limited range and because of its naturally limited ability to colonize new habitats. We also stated that the very small size of the species habitat units and the fragile nature of cave ecosystems make this species vulnerable to even isolated acts of vandalism. The petition states, "Inner Space Cavern demonstrates that the species can persist in caves with frequent human visitation and may be more tolerant of related habitat modification than originally believed." They also provide Three-Mile Cave and

Four-Mile Cave as examples of caves that have experienced human use yet the species persists in them. The petition contends that, since the Bone Cave harvestman exists in Inner Space Caverns, human visitation is not a threat. The petition also states that Three-mile and Four-mile Cave had graffiti from the 1890s, 1920s, and 1950s. However, no detailed information was provided to demonstrate if these caves experienced continued human use. The petition also indicates that Four-Mile Cave was inaccessible to humans prior to 2009, due to boulders blocking the entrance. In addition, the petition provided no trend analysis for these caves. As stated earlier, the observation of the species in these locations does not mean the populations at these locations have not been impacted (in a way that is short of extirpation) or can withstand the long-term impacts that are expected to occur to karst invertebrate populations in developed areas or from human visitation.

In the species 5-year status review (Service 2009, p. 18), we said, "[a]lthough climate change was not identified as a threat to *T. reyesi* in the original listing document or in the recovery plan, the species' dependence on stable temperatures and humidity levels opens the possibility of climatic change impacting this species. Therefore, while it appears reasonable to assume that *T. reyesi* may be affected, we lack sufficient certainty to know how climate change will affect this species."

The petitioners state that "the use of small voids or 'mesocaverns' within the geologic formations known to support occupied caves mitigates the potential threat of climate change." We acknowledge that mesocaverns may provide some protection from fluctuations in temperature and humidity that may be induced by climate change. However, the presence of mesocaverns alone will likely not be sufficient to ameliorate all of the effects that climate change may pose to this species. Karst invertebrates depend on stable temperatures and high humidity (Barr 1968, p. 47; Mitchell 1971, p. 250). The temperatures in caves are typically the average annual temperature of the surface habitat and vary much less than the surface environment (Howarth 1983, p. 372; Dunlap 1995, p. 76). If average surface temperatures increase, this could result in increased in-cave temperatures, which could affect the Bone Cave harvestman.

Increased and/or more severe storms, as well as prolonged periods of high temperatures and drought between rainfall events, associated with predicted climate change effects may also impact the cave environment. Changes in rainfall regimes may affect the harvestman in several ways, including directly

either through flooding or indirectly by modifying their habitat or nutrient availability. Changes in rainfall regimes could (1) alter the moisture levels within the caves leaving them drier between floods, which could lead to desiccation of the Bone Cave harvestman; and (2) affect the amount and timing of nutrients washed into a cave, potentially resulting in longer periods between nutrient input. These changes to drier and less suitable conditions in the caves will likely cause the Bone Cave harvestman to retreat farther into mesocaverns and away from nutrients that are thought to be located in larger cave passages (Howarth 1987, pp. 5–7), causing individuals to spend more energy trying to acquire nutrients in an already stressed environment. In addition, caves in arid regions have been shown to have smaller invertebrate populations and diversity due to less moisture and nutrient availability (George Veni, National Cave and Karst Research Institute, pers. comm. 2010). Since the Bone Cave harvestman is also sensitive to these habitat parameters, it is reasonable to predict that the effects of climate change on these habitat parameters could affect its populations in a similar manner despite the presence of mesocaverns.

Further, stochastic (random) events from either environmental factors (for example, severe weather) or demographic factors (which come from the chance events of birth and death of individuals) exacerbate threats to the species because of its small population size (Melbourne and Hastings 2008, p. 100). The risk of extinction for any species is known to be highly inversely correlated with population size (Pimm *et al.* 1988, pp. 774–775; O'Grady *et al.* 2004, pp. 516, 518). In other words, the smaller the population the greater the overall risk of extinction. Therefore, threats to the Bone Cave harvestman are exacerbated by its small population size, which makes it more vulnerable to existing threats.

Inadequate existing regulatory mechanisms

6. Does the petitioner claim existing regulatory mechanisms or conservation efforts have ameliorated impacts of any of the above threat factors to the species (Factor D)?

☒Yes

☐No

a. If the answer to 6 is yes:

Identify the factors claimed by the petitioner to be ameliorated by existing regulatory mechanisms or conservation efforts.

The petition asserts that the present or threatened destruction, modification or curtailment of the species habitat or range is ameliorated by existing regulatory mechanisms such as existing preserves and protected habitats; Austin's city regulations; Georgetown's Water Quality Management Plan; and the Texas Commission on Environmental Quality's regulations.

b. If the answer to 6 is yes:

Do the sources cited in the petition provide substantial information to support the claim?

☐Yes

☒No

If yes, indicate which factors are ameliorated by existing regulatory mechanisms or conservation efforts and list the citations with page numbers for each. If no, please indicate for which factor(s) and explain.

The 1988 listing rule (53 FR 36029) states that "there are currently no laws that protect any of these species or that indirectly address protection of their habitat."

While the petition did discuss some new ordinances that appear to have been put in place since the time of listing, we do not have enough information to indicate whether or not these State and local ordinances provide enough protection from all threats to the Bone Cave harvestman.

The petition states that "the regulatory landscape includes a number of measures contributing to the conservation of the species outside of the protections afforded by the Endangered Species Act of 1973, as amended." For example, they say that protections offered though the City of Austin are adequate to protect the species in Austin, Texas. In the course of our work, we have reviewed these regulations and understand that most caves that are defined by the City of Austin's Environmental Criteria Manual as a cave are provided a 46- to 91-m (150- to 300-ft) set-back area (City of Austin 2014, p. 13-3). However, a 46-m (150-ft) or 91-m (300-ft) set-back is not adequate to meet

our preserve design criteria, does not protect the cave cricket foraging area, and potentially does not include the surface and subsurface drainage basins. Further, it is not applicable across the range of the Bone Cave harvestman because the species occurs in Travis and Williamson Counties and the City of Austin does not cover all of those counties.

The petition states that the City of Georgetown Water Quality Management Plan for the Georgetown salamander will offer protection to the Bone Cave harvestman. They state that this plan encourages the use of best management practices to protect water quality at Georgetown salamander locations. However, there are few Bone Cave harvestman locations that occur near Georgetown salamander locations, so any protection offered to the harvestman would be limited. Further, it is not clear from the petition whether this mechanism is voluntary, is regulatory, or is currently in effect. In addition, the petition did not provide enough detail for us to evaluate all benefits this plan would provide to the Bone Cave harvestman, and it appears that participation in this plan is at least in part voluntary.

The petition states that the Texas Commission on Environmental Quality (TCEQ) Edwards Rules provide protection to recharge features on the Edwards Plateau and that this provides protection from pollution to the Bone Cave harvestman. In a discussion of Factor D in the Bexar County Karst Invertebrates Recovery Plan (Service 2011, p. 13), we state that "the TCEQ water quality regulations do not provide much protection to the species' habitat (see 65 FR 81419–81433 for more information). For example, while some TCEQ practices provide protection from water quality impacts, others, such as sealing cave entrances for water quality reasons, can harm karst invertebrates." Sealing cave entrances can be harmful by blocking off water (leading to drying) and nutrient input to the karst invertebrate habitat. In addition, not all of the caves and mesocaverns that the Bone Cave harvestman occurs in are considered recharge features and, therefore, would not receive some of the water quality protection measures. Also, not all locations of the Bone Cave harvestman are under the jurisdiction of the Edwards Rules.

Cumulative Effects

7. Does the petitioner claim that the entity may warrant delisting because identified synergistic or cumulative effects are reduced or are not (or no longer) a threat?

☐ Yes

☒ No

Although cumulative or synergistic effects are not explicitly addressed in the petition, the petitioner does suggest that many of the threats identified at the time of listing are no longer significant or relevant. Many of these identified threats can be considered synergistic. In particular, the petition suggests that the threats related to development activities are no longer relevant given the existing protected areas and the expanded range and distribution of the species since the time of listing. However, many of the existing protected areas referenced in the petition are too small to meet the Service's preserve design recommendations and development activities have continued to impact known locations. The petition also suggests that the impact from development activities and red imported fire ants is not as significant or lasting as originally believed. However, the threats associated with development appear to be increasing in severity, and red imported fire ants have been found within and near many caves in central Texas and have been observed feeding on dead troglobites, cave crickets, and other species within caves.

Petition Finding

Based on our review of the petition, sources cited in the petition, and other readily available information, we find that the petition does not provide substantial scientific or commercial information indicating that the petitioned action may be warranted.

Specific Requests for Information

Although this finding ends our formal consideration of the petition, we are in the process of conducting a species status assessment and 5-year status review. Specifically, section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years. On April 15, 2015, we published a notice in the Federal Register initiating this review (80 FR 20241). The purpose of a 5-year review is to determine whether listed species should be removed from the list or changed in status under the Act. In this case, we are developing a species status assessment as a tool to inform the 5-year status review. The 5-year review will consider whether the species status has changed since the time of its listing or its last status review and whether it should be reclassified as threatened or delisted. We invite the public, including the petitioners and other interested parties, to submit new data and information for consideration in this ongoing process. If you wish to provide information regarding the Bone Cave

harvestman, you may submit your information or materials to the Field Supervisor, Austin Ecological Services Field Office at any time.

Author

The primary authors of this notice are the staff members of the Southwest Regional Office, U.S. Fish and Wildlife Service.

FOR FURTHER INFORMATION CONTACT: Adam Zerrenner, Austin Ecological Services Field Office, telephone 512-490-0057

Regional Outreach Contact: Lesli Gray, telephone 972-439-4542

Dated: MAR 20 2017

James W. Kurth

James W. Kurth

Acting Director, U.S. Fish and Wildlife Service

We accept anonymous comments. All comments received will be posted without change to *http://www.regulations.gov* and will include any personal information you have provided. For more about privacy and the docket, you may review a Privacy Act notice regarding the Federal Docket Management System in the March 24, 2005, issue of the **Federal Register** (70 FR 15086).

Documents mentioned in this NPRM as being available in the docket, and all public comments, will be in our online docket at *http://www.regulations.gov* and can be viewed by following that Web site's instructions. Additionally, if you go to the online docket and sign up for email alerts, you will be notified when comments are posted or a final rule is published.

List of Subjects in 33 CFR Part 110

Anchorage grounds.

For the reasons discussed in the preamble, the Coast Guard proposes to amend 33 CFR part 110 as follows:

PART 110—ANCHORAGE REGULATIONS

■ 1. The authority citation for part 110 continues to read as follows:

Authority: 33 U.S.C. 471, 1221 through 1236, 2071; 33 CFR 1.05–1; Department of Homeland Security Delegation No. 0170.1.

■ 2. Add § 110.184 to read as follows:

§ 110.184 Atlantic Ocean, Offshore Jacksonville, FL.

(a) *The anchorage ground.* All waters of the Atlantic Ocean encompassed within the following points: Starting at Point 1 in position 30°29.08′ N., 81°18.21′ W.; thence south to Point 2 in position 30°26.06′ N., 81°18.21′ W.; thence east to Point 3 in position 30°26.06′ N., 81°16.05′ W.; thence north to Point 4 in position 30°29.08′ N., 81°16.05′ W.; thence west back to origin. All coordinates are North American Datum 1983.

(b) *The regulations.* (1) Commercial vessels in the Atlantic Ocean in the vicinity of the Port of Jacksonville must anchor only within the anchorage area hereby defined and established, except in cases of emergency.

(2) Before entering the anchorage area, all vessels must notify the Coast Guard Captain of the Port (COTP) Jacksonville on VHF–FM Channel 22A.

(3) All vessels within the designated anchorage area must maintain a 24-hour bridge watch by a licensed or credentialed deck officer proficient in English, monitoring VHF–FM channel 16. This individual must confirm that the ship's crew performs frequent checks of the vessel's position to ensure the vessel is not dragging anchor.

(4) Vessels may anchor anywhere within the designated anchorage area provided that: Such anchoring does not interfere with the operations of any other vessels currently at anchorage; and all anchor and chain or cable is positioned in such a manner to preclude dragging.

(5) No vessel may anchor in a ''dead ship'' status (that is, propulsion or control unavailable for normal operations) without the prior approval of the COTP Jacksonville. Vessels experiencing casualties such as a main propulsion, main steering or anchoring equipment malfunction or which are planning to perform main propulsion engine repairs or maintenance, must immediately notify the COTP Jacksonville on VHF–FM Channel 22A.

(6) No vessel may anchor within the designated anchorage for more than 72 hours without the prior approval of the COTP Jacksonville. To obtain this approval, contact the COTP Jacksonville on VHF–FM Channel 22A.

(7) The COTP Jacksonville may close the anchorage area and direct vessels to depart the anchorage during periods of adverse weather or at other times as deemed necessary in the interest of port safety or security.

(8) Commercial vessels anchoring under emergency circumstances outside the anchorage area must shift to new positions within the anchorage area immediately after the emergency ceases.

Dated: April 27, 2017.

S.A. Buschman,

Rear Admiral, U.S. Coast Guard, Commander, Seventh Coast Guard District.

[FR Doc. 2017–09036 Filed 5–3–17; 8:45 am]

BILLING CODE 9110–04–P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[MB Docket No. 13–249; Report No. 3073]

Petition for Reconsideration of Action in Rulemaking Proceeding

AGENCY: Federal Communications Commission.

ACTION: Petition for reconsideration.

SUMMARY: A Petition for Reconsideration (Petition) has been filed in the Commission's rulemaking proceeding by Andrew Jay Schwartzman, on behalf of Prometheus Radio Project.

DATES: Oppositions to the Petition must be filed on or before May 19, 2017. Replies to an opposition must be filed on or before May 30, 2017.

ADDRESSES: Federal Communications Commission, 445 12th Street SW., Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Thomas Nessinger, Senior Counsel, Audio Division, Media Bureau, at: (202) 418–2700 or email: *Thomas.Nessinger@fcc.gov.*

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's document, Report No. 3073, released April 17, 2017. The full text of the Petition is available for viewing and copying at the FCC Reference Information Center, 445 12th Street SW., Room CY–A257, Washington, DC 20554. It also may be accessed online via the Commission's Electronic Comment Filing System at: *https://ecfsapi.fcc.gov/file/104101216505007/17-04-10%20Prometheus%20Petition%20for%20Reconsideration%20of%20AMR%20Order%20AS%20FILED.pdf.* The Commission will not send a copy of this document pursuant to the Congressional Review Act, 5 U.S.C. 801(a)(1)(A), because this document does not have an impact on any rules of particular applicability.

Subject: In the Matter of Revitalization of the AM Radio Service, FCC 17–14, released by the Commission on February 24, 2017, in MB Docket 13–249, published at 82 FR 13069, March 9, 2017. The document is being published pursuant to 47 CFR 1.429(e). *See also* 47 CFR 1.4(b)(1) and 1.429(f), (g).

Number of Petitions Filed: 1.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 2017–08953 Filed 5–3–17; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2017–0018; FXES11130900000 178 FF09E42000]

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To Remove the Bone Cave Harvestman From the List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 90-day petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to remove

the Bone Cave harvestman (*Texella reyesi*) from the List of Endangered and Threatened Wildlife (*i.e.,* ''delist'' the species) under the Endangered Species Act of 1973, as amended (Act). Based on our review, we find that the petition does not present substantial scientific or commercial information indicating that the petitioned action may be warranted. However, we ask the public to submit to us any new information that becomes available concerning the status of, or threats to, the Bone Cave harvestman or its habitat at any time.

DATES: The finding announced in this document was made on May 4, 2017.

ADDRESSES: A copy of the petition is available on *http://www.regulations.gov* under Docket No. FWS–R2–ES–2017–0018, or by request from the person listed under **FOR FURTHER INFORMATION CONTACT**.

FOR FURTHER INFORMATION CONTACT: Adam Zerrenner, Field Supervisor, Austin Ecological Services Field Office, 10711 Burnet Road, Suite 200, Austin, TX 78758; telephone 512–490–0057; or facsimile 512–490–0974. If you use a telecommunications device for the deaf (TDD), please call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Act requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of the finding promptly in the **Federal Register**.

At the time we received the petition discussed below (June 2, 2014), the standard for substantial scientific or commercial information with regard to this 90-day petition finding was ''that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted'' (50 CFR 424.14(b)). If we find that a petition presents substantial scientific or commercial information, we are required to promptly commence a review of the status of the species, and we will subsequently summarize the status review in our 12-month finding.

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations at 50 CFR part 424 set forth the procedures for adding a species to, or removing a species from, the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be delisted for one of three reasons: Extinction, recovery, or the original data for classification were in error. A species may be determined to be an endangered or threatened species for the purpose of listing, or recovered for the purpose of delisting, as result of an assessment of the five factors described in section 4(a)(1) of the Act.

Evaluation of a Petition To Delist the Bone Cave Harvestman, Which Is Listed as an Endangered Species Under the Act

Species and Range

The Bone Cave harvestman (*Texella reyesi*) occurs in Travis and Williamson Counties, Texas, and was listed as an endangered species on September 16, 1988 (53 FR 36029). See 58 FR 43818, August 18, 1993, for more information.

Petition History

On June 2, 2014, we received a petition from John Yearwood, Kathryn Heidemann, Charles and Cheryl Shell, the Walter Sidney Shell Management Trust, the American Stewards of Liberty, and Steven W. Carothers requesting that we remove the endangered Bone Cave harvestman from the Federal List of Endangered and Threatened Wildlife. The petition clearly identified itself as a petition and included the requisite identification information for the petitioners, as required at that time in 50 CFR 424.14(a). The Service and National Marine Fisheries Service (''Services'') revised the regulations at 50 CFR 424.14 to clarify the procedures under which the Services evaluate petitions effective October 27, 2016 (81 FR 66462; September 27, 2016). We originally received the petition that is the subject of this document on June 2, 2014, with supplemental information received on October 6, 2016. We, therefore, evaluated this petition under the 50 CFR 424.14 requirements that were in effect prior to October 27, 2016, as those requirements applied when the petition and supplemental information were received. At that time, our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding was ''that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted'' (50 CFR 424.14(b)(1)). On June 1, 2015, the Service published a 90-day finding in the **Federal Register** (80 FR 30990) that the petition did not present substantial scientific or commercial information indicating that the petitioned action was warranted. On December 15, 2015, the American Stewards of Liberty, Charles and Cheryl Shell, Walter Sidney Shell Management Trust, Kathryn Heidemann, and Robert V. Harrison, Sr., challenged the June 1, 2015, 90-day finding in Federal district court. The Service sought the court's permission to reconsider the 90-day finding. On December 22, 2016, the court ordered the Service to complete a 90-day finding and deliver that finding to the **Federal Register** on or before March 31, 2017, and subsequently extended to May 1, 2017. This finding addresses the court's order and the 2014 petition.

Recently, we began publishing multiple 90-day petition findings in a single, batched **Federal Register** notice and using a template format for supplementary information for each finding, to ensure consistency and transparency among findings. We are providing the supporting information for this finding in both the former single-petition **Federal Register** notice format that was used for the prior finding, and the new batched-notice template format. Both of these rely on identical information and can be found along with this **Federal Register** notice at Docket No. FWS–R2–ES–2017–0018. The prior traditional **Federal Register** notice also includes some additional information not included in the petition review form with respect to information such as representation, redundancy, and resilience.

Finding

Based on our review of the petition, sources cited in the petition, and the additional information provided, we find that the petition does not present substantial scientific or commercial information indicating that delisting the Bone Cave harvestman may be warranted. Although this finding ends our formal consideration of the petition, we are in the process of conducting a species status assessment and 5-year status review of the Bone Cave harvestman. Specifically, section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years. On April 15, 2015, we published a notice in the **Federal Register** initiating this review (80 FR 20241). The purpose of a 5-year review is to ensure that listed species have the appropriate level of protection under the Act. In this case, we are developing a species status assessment as a tool to inform the 5-year status review. The 5-year review will consider whether the species' status has changed since the time of its listing or its last status review and whether it should be reclassified as threatened or delisted. We invite the public, including the petitioners and

other interested parties, to submit new data and information for consideration in this ongoing process.

The basis for our finding on this petition, and other information regarding our review of this petition can be found as an appendix at *http://www.regulations.gov* under Docket No. FWS–R2–ES–2017–0018 in the Supporting Documents section. This 90-day finding supersedes the Service's previous June 1, 2015, 90-day finding, and is made pursuant to the court's December 22, 2016, order; the 2014 petition; and the additional reference materials accompanying the petition.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Austin Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**, above).

Authors

The primary authors of this notice are staff members of the Austin Ecological Services Field Office.

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: March 20, 2017.

James W. Kurth,

Acting Director, U.S. Fish and Wildlife Service.

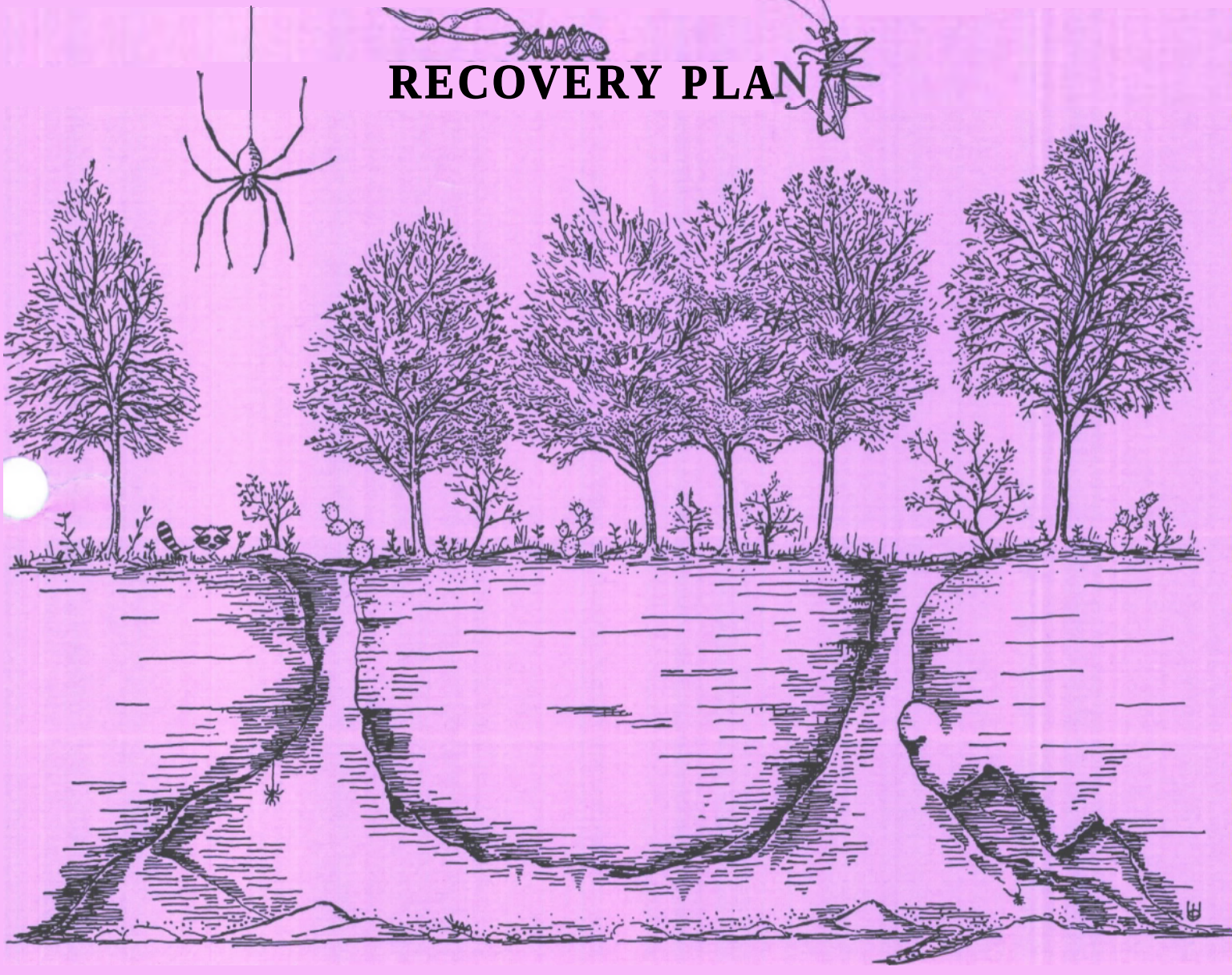
[FR Doc. 2017–09010 Filed 5–3–17; 8:45 am]

BILLING CODE 4333–15–P

ENDANGERED KARST INVERTEBRATES

(TRAVIS AND WILLIAMSON COUNTIES, TEXAS)

RECOVERY PLAN



U.S. Fish and Wildlife Service
Region 2, Albuquerque, New Mexico
1994

RECOVERY PLAN
FOR
ENDANGERED KARST INVERTEBRATES
IN TRAVIS AND WILLIAMSON COUNTIES, TEXAS

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For:

U.S. Fish and Wildlife Service
Region 2

Approved: _____
Regional Director, U.S. Fish and Wildlife Service

Date: 25 August 1994

EXECUTIVE SUMMARY OF THE RECOVERY PLAN FOR ENDANGERED KARST INVERTEBRATES IN TRAVIS AND WILLIAMSON COUNTIES, TEXAS

Current Species' Status: All seven species (*Texella reddelli*, *Texella reyesi*, *Tartarocreagris texana*, *Neoleptoneta myopica*, *Rhadine persephone*, *Texamaurops reddelli*, and *Batrisodes texanus)* are endangered. They spend their entire lives underground and are endemic to karst formations (caves, sinkholes, and other subterranean voids) in Travis and Williamson counties, Texas. Five of these listed invertebrate species occur in only four to seven caves, while *Rhadine persephone* and *Texella reyesi* occupy wider ranges. The total number of individuals is unknown, as are many aspects of their biology. Most localities are imminently threatened by land development, pollution, vandalism, and/or red imported fire ants (*Solenopsis invicta*).

Habitat Requirements and Limiting Factors: All tend to occur in the dark zone of caves, but occasionally in deep twilight. All prefer relative humidities near 100%, but some may be less sensitive to drying than others. Presumably all are predators upon small or immature arthropods, or, as in the case of the ground beetle, possibly cave cricket eggs.

Recovery Objective: Downlisting.

Recovery Criteria: To be considered for downlisting to threatened, the following criteria should be met for each species:

1. Three karst fauna areas within each karst fauna region (as defined in the Recovery Strategy) in each species' range should be protected in perpetuity. If fewer than three karst fauna areas exist within a given karst fauna region of a given species' range, then all karst fauna areas within that region should be protected. If a species' *entire range* contains less than three karst fauna areas, then all karst fauna areas where that species occurs should be protected. At least two karst fauna areas should exist and be protected for that species to be considered for downlisting.

2. Criteria 1 should be maintained for at least 5 consecutive years with assurances that these areas will remain protected in perpetuity before downlisting.

SPECIES 1 – Scientific name: *Neoleptoneta myopica* (Gertsch), formerly *Leptoneta myopica* Gertsch

Common Name: Tooth Cave spider

Taxonomic Classification: Class Arachnida (arachnids), Order Araneae (spiders), Infraorder Araneomorphae (true spiders), Family Leptonetidae. Spiders and other arachnids are not insects. Unlike insects, arachnids possess four pairs of legs, **pedipalps**, and **chelicerae**, and lack antennae. Insects have three pairs of legs, mandibles, and antennae. Leptonetids are minute spiders with six eyes, commonly found in caves and similar habitats. Some leptonetid spiders in Europe and the United States are completely eyeless, but members of this family typically have small eyes.

Original Description: Gertsch (1974)

Type Specimen: Male **holotype**, Tooth Cave, Travis County, Texas, March 30, 1965. Collected by James R. Reddell. Female specimen described but not designated as **paratype**. Type specimens are deposited in the American Museum of Natural History.

Other Taxonomic Literature: Brignoli (1972) erected the genus *Neoleptoneta* for all New World leptonetid spiders and reserved the genus *Leptoneta* for other regions. In 1977, Brignoli formally removed *Leptoneta myopica* to *Neoleptoneta*. The validity of *Neoleptoneta* was further supported by Platnick (1986). This recovery plan follows these two authorities in using the name *Neoleptoneta*.

Selected characteristics: A small, whitish, long-legged troglobitic spider with six **obsolescent eyes**. Eyes medium sized, without dark pigment; front eye row moderately recurved; eyes **subcontiguous** and subequal in size; posterior eyes subcontiguous, set back from anterior lateral eyes. First leg in both sexes 6.1 times as long as **carapace**. Body length 1.6 mm, carapace 0.7 mm long and 0.5 mm wide, abdomen 0.9 mm long and 0.5 mm wide. **Tibia** of male palpus with thin **retrolateral** process set with curved spine.

Intraspecific Variation: Not known.

Distinctiveness: *Neoleptoneta myopica* is related to several other troglobites in the Balcones Fault Zone of Texas: *N. anopica* (eyeless) from Cobb Caverns, Williamson County; *N. coeca* from two caves in Comal County; *N. concinna* from a cave and a mine in Travis County; *N. devia* from one cave in Travis County; and *N. microps* from one cave in Bexar County. Geographically, the *Neoleptoneta* species closest to *N. myopica* is *N. devia* from McDonald Cave (Schulze Cave), only 2.5 km from Stovepipe Cave and 4 km from Tooth Cave, the type locality. *Neoleptoneta devia* is dull yellow with a whitish abdomen and the eyes enclose a dusky field, whereas *N. myopica* is whitish and has very reduced eyes that are not set in a dusky field. *Neoleptoneta devia* and *N. concinna*, the other two species in Travis County, have much shorter legs. Gertsch (1974) did not discuss evolutionary relationships among the six Texas species of Leptoneta that he described.

Listed: Endangered; September 16, 1988; 53 FR 36029.

Recovery Priority: 2C. According to the U. S. Fish and Wildlife Service's (USFWS) criteria (48 FR 51985) this indicates a species with a high degree of threats, high potential for recovery, and in conflict with construction or development projects or other forms of economic activity.

SPECIES 2 – Scientific name: *Tartarocreagris texana* (Muchmore), formerly *Microcreagris texana* Muchmore.

Common Name: Tooth Cave pseudoscorpion

Taxonomic Classification: Class Arachnida (arachnids), Order Pseudoscorpiones (pseudoscorpions), Family Neobisiidae. Pseudoscorpions are quite distinct from scorpions in lacking a postabdomen (tail), stinger, and **book lungs**. Most pseudoscorpions are no more than a few mm long.

Original Description: Muchmore (1969).

Type Specimen: Female holotype, Tooth Cave, Travis County, Texas, May 16, 1965. Collected by James R. Reddell. Deposited in American Museum of Natural History. Male known from Amber Cave (Muchmore 1992).

Other Taxonomic Literature: Muchmore (1992) reassigned *Microcreagris texana* to *Tartarocreagris*, a genus described by Curcic (1984), based on the female holotype of *M. infernalis* from Inner Space Cavern, Williamson County. After Muchmore examined recently collected males of both species, it became clear that *M. texana* also belonged in *Tartarocreagris*. Curcic (1989) had previously reassigned *M. texana* to *Australinocreagris* Curcic (1984), which is based on *M. grahami* from California, but Muchmore (1992) found that classification to be incorrect based on internal male genitalia. Muchmore (1992) described a new species of *Tartarocreagris*, *T. comanche*, from New Comanche Trail Cave 1.8 km southwest of Tooth Cave, and reassigned *M. reddelli*, from McDonald Cave, Travis County, to *Tartarocreagris*. In Muchmore (1992), all

four Texas *Microcreagris* species were reassigned to *Tartarocreagris*. The genus *Microcreagris* is no longer believed to occur in the New World. The four species of *Tartarocreagris* are extremely limited in distribution. Three of the species occur within 4.9 km of each other in the vicinity of the RM 2222 and RM 620 intersection on the central Jollyville Plateau in travis County, Texas. *T. infernalis* occurs in Inner Space Cavern and a few caves, all locations no more than 1.4 km apart in Williamson County, Texas.

Selected Characteristics: A large (female body length 4.1 mm), eyeless pseudoscorpion with **attenuated** appendages. Carapace, chelicerae, and palps golden brown, body and legs light tan. Carapace about 1/3 longer than broad. No eyes or eyespots present. Chelicera about 2/3 as long as carapace, 1.95 times as long as broad. Palps relatively long and **slender**; **femur** 1.5 and chela 2.55 times as long as carapace.

Intraspecific Variation: Male very similar to female in most respects – male body length 3.96 mm.

Distinctiveness: *Tartarocreagris texana* can be distinguished from its closest relatives only by microscopic inspection. *Tartarocreagris comanche* from New Comanche Trail Cave has four poorly developed eyes and relatively **robust** appendages, whereas the others are eyeless and more slender. Among the species of *Tartarocreagris* there are many minor differences in **tergal chaetotaxy** and in the proportions of the palps. Confirmation of the species may require dissection and study of the female **spermathecae** or the male internal genitalia.

Listed: Endangered; September 16, 1988; 53 FR 36029.

Recovery Priority: 2C

SPECIES 3 – Scientific name: *Texella reddelli* Goodnight and Goodnight

Common Name: Bee Creek Cave harvestman

Taxonomic Classification: Class Arachnida (arachnids), Order Opiliones (opilionids, or harvestmen), Suborder Laniatores, Family **Phalangodidae**. Harvestmen are anatomically and evolutionarily quite distinct from spiders (Order Araneae) and are not properly referred to as "spiders". Phalangodid harvestmen are predaceous. Other North American genera are *Banksula* in California (to which *Texella* is most closely related), *Sitalcina*, *Calicina*, and *Phalangodes*. Many harvestmen are **cavernicoles** (soil dwellers). *Texella* is the most widespread genus with 21 species from Texas, New Mexico, California, and Oregon. Several **species groups**, **subgroups**, and **infragroups** are recognized.

Original Description: Goodnight and Goodnight (1967)

Type Specimen: Male holotype, Bee Creek Cave (= "Pine Creek Cave"), Travis County, Texas, October 2, 1963. Collected by James Reddell and David McKenzie. Deposited in the American Museum of Natural History. Redescription by Ubick and Briggs (1992) is based on holotype, female **paratopotype**, and 14 other specimens deposited in the American Museum of Natural History, Texas Memorial Museum, California Academy of Sciences, Darrell Ubick collection, and Marie Goodnight collection.

Other Taxonomic Literature: Goodnight and Goodnight (1942), Ubick and Briggs (1992). The genus *Texella*

was erected by Goodnight and Goodnight (1942) on the basis of one troglomorphic individual, described as *Texella mulaiki*, from Hays County, Texas. This specimen probably was from Ezell's Cave. Ubick and Briggs (1992) revised the genus and recognized 15 species in the *mulaiki* species group of Central Texas.

Selected Characteristics: Body length 1.90-2.18 mm, **scute** length 1.21-1.66 mm, leg II length 4.92-7.59 mm, leg II/scute length 3.81-5.20 mm (N = 16). Color orange. Body of medium **rugosity**. **Eye mound** broadly conical, eyes well developed. Male (holotype) – **Postopercular process** length 0.44; penis: ventral plate prong with two dorsal, 10 lateral, and three ventral **setae**; **apical** spine curved, apically pointed; glans: basal knob slender; middle lobe present; **parastylar** lobes claw-like; **stylus spatulate**, basal fold present. Female (paratopotype) – **Ovipositor cuticle** intricately folded; one pair of apical teeth present.

Intraspecific Variation: Juveniles are white to yellowish-white (as in most *Texella*); adults are orange. The tarsal count (number of **tarsomeres**) and the leg-to-body-length ratio (leg II/scute length) may vary from the south to north part of the species' range, with the least troglomorphic (cave-adapted) population being in Cave Y (south of the Colorado River) and the most troglomorphic in Jester Estates Cave (north of the Colorado River). The origin of this species is not easily explainable in that it is distributed on both sides of the Colorado River, which is a major barrier to other terrestrial troglobites. **Troglomorphy** in this genus is marked by increased leg/body ratio, greater number of tarsomeres,

depigmentation, reduction of **protuberances**, and loss of retinas followed by loss of corneas.

Distinctiveness: Goodnight and Goodnight (1942) described *Texella mulaiki* from Hays County (probably Ezell's Cave), but in 1967 reported it from Cotterell Cave in Travis County as well as Man-With-A-Spear Cave and Beck's Tin Can Cave (Beck Sewer Cave) in Williamson County. In 1967 they also described *T. reddelli*, but the genitalia were not studied and the only differences from *T. mulaiki* noted were the shorter legs, the differently-shaped spine on the **genital operculum**, and a few minor characteristics. The authors also reported *T. reddelli* from Bee Creek Cave, Tooth Cave, and Weldon Cave, Travis County; and Bone Cave, Williamson County. Lacking detailed data and material, they did not note that the distribution patterns of the two species were incongruously mixed. Apparently the identifications were based more on leg length than other characters. Ubick and Briggs (1992) examined more specimens from more caves and **epigean** sites and in their revision distinguished *T. reddelli* from *T. reyesi* (below). They described 18 new species and transferred one species from *Sitalcina* to *Texella*. Sixteen of the 21 *Texella* species are cavernicoles and five are troglobites. Fifteen of the species occur along the Balcones Escarpment in Central Texas.

T. reddelli can be distinguished in the field from its closest relative, *T. reyesi* by its shorter legs, its well developed eyes (versus extremely small or no eyes in *T. reyesi*), and its color, which is more orange. The species is not "without eyes" as noted by Goodnight and Goodnight but has "eye mound broadly conical, eyes well developed" (Ubick and Briggs 1992).

Such details can be seen with the naked eye or a hand lens in the field. However, confirmation of the species must be made microscopically by a qualified systematist on a preserved, adult specimen.

In their redescription of the *Texella* species, Ubick and Briggs (1992) state that *Texella reddelli* and *Texella reyesi* "are clearly very closely related and, using the standards of genitalia distinctness applied to other *Texella* species, may even be considered conspecific." However, given that the two groups can be distinguished, and are considered separate in the taxonomic description, the USFWS follows Ubick and Briggs and considers the two species separately.

Listed: Endangered; September 16, 1988; 53 FR 36029.

Recovery Priority: 2C

SPECIES 4 – Scientific name: *Texella reyesi* Ubick and Briggs

Common Name: Bone Cave harvestman

Taxonomic Classification: Class Arachnida (arachnids), Order Opiliones (opilionids, or harvestmen), Suborder Laniatores, Family Phalangodidae.

Original Description: Ubick and Briggs (1992). This paper describes 18 new species of *Texella*, with a total of 21 species in three species groups in Texas, New Mexico, California, and Oregon. The highest species diversity (15 species) is along the Balcones Escarpment in Central Texas.

Type Specimen: Male holotype, Bone Cave, Williamson County, Texas, 4 June 1989. Collected by William Elliott, James Reddell, and Marcelino Reyes. Male paratype, Tooth Cave, and female paratopotype, Bone Cave. All specimens are deposited at the California Academy of Sciences.

Other Taxonomic Literature: Goodnight and Goodnight (1942, 1967). The genus *Texella* was erected by Goodnight and Goodnight (1942). In 1967 they described *Texella reddelli*, which at that time included some populations of *Texella reyesi*.

Selected Characteristics: A long-legged, blind, pale orange harvestman. Body length 1.41-2.67 mm, scute length 1.26-1.69 mm, leg II length 6.10-11.79 mm, leg II/scute length 4.30-8.68 mm (N = 85). Body finely rugose. Few small **tubercles** on eye mound; eye mound broadly conical, retina absent, cornea variable (well

developed, reduced, or absent). Penis with ventral plate prong round apically; two dorsal, 17 lateral, and four ventral setae; apical spine bent, apically pointed, length 0.05 mm. Glans with basal knob narrowly conical; middle lobe long; parastylar lobes claw-shaped. Stylus long, curved, ventrally **carinate**, apically spatulate; basal fold well developed.

Intraspecific Variation: Juveniles are white to yellowish-white. Adults are pale orange. Elliott (unpublished data) has observed an adult with a pale green abdomen in Man-With-A-Spear Cave, Williamson County, and an adult with a yellowish abdomen in Temples of Thor Cave, Williamson County. These colorations may have been due to eggs in the ovaries. This species is extremely **polymorphic**, most notably in troglomorphic characters, which increase toward the northern populations. Northern populations tend to be more troglomorphic; that is, longer-legged and smoother, with reduced or absent corneas.

Distinctiveness: *Texella reyesi* can be distinguished from its closest relative *T. reddelli* by its longer legs, its lack of retinas (versus well developed eyes in *Texella reddelli*), and its color, which is pale orange. Such differences can be seen with the naked eye or a hand lens in the field. However, confirmation of the species must be made microscopically by a qualified systematist on a preserved adult.

Listed: Because *Texella reyesi* was considered to be *Texella reddelli* before Ubick and Briggs' redescription (1992) and five localities (Tooth, McDonald, Weldon, Bone, and Root caves) of *T. reyesi*

were included with *T. reddelli* at the time *T. reddelli* was listed as endangered on September 16, 1988 (53 FR 36029), *T. reyesi* is considered to be listed as endangered under the Endangered Species Act. The USFWS has reviewed the taxonomic change (Ubick and Briggs 1992) and other available information on this species and determined it should remain listed as endangered (58 FR 43818).

Recovery Priority: 2C

SPECIES 7 – Scientific name: *Batrisodes texanus* Chandler

Common Name: Coffin Cave mold beetle

Taxonomic Classification: Class Insecta (insects), Order Coleoptera (beetles), Suborder Polyphaga, Family Pselaphidae (mold beetles), Tribe Batrisini. Mold beetles are generally minute (about 2 or 3 mm long) rounded beetles with short elytra (wing covers), which expose the posterior half of the abdomen.

Original Description: Chandler (1992)

Type Specimen: Male holotype from Inner Space Cavern, Williamson County, Texas, May 23, 1965. Collected by William H. Russell. Deposited in Field Museum of Natural History, Chicago. Female paratypes from Inner Space Cavern and Off Campus Cave, Williamson County (deposited in Donald S. Chandler collection) and Coffin Cave, Williamson County (deposited in Texas Memorial Museum). The Coffin Cave paratype was the first collected on November 3, 1963, by James Reddell.

Other Taxonomic Literature: Barr (1974b) classified a male pselaphid from Inner Space Cavern as *Texamaurops reddelli*, but the specimen is now recognized by Chandler (1992) as *Batrisodes texanus*.

Selected Characteristics: A small, long-legged beetle with short elytra leaving five abdominal tergites exposed; metathoracic wings absent. Body length 2.60-2.88 mm. Male with vague groove across the head anterior to antennal bases. Sides of head smoothly

curved and flat with a few granules present where eyes should be.

Intraspecific Variation: In females, the **transverse impression** anterior to the antennal bases is absent, and the tenth antennal segment is barely wider and longer than the ninth. In males the tenth is twice as wide as the ninth. No geographical variation has been noted.

Distinctiveness: *Batrisodes texanus* can only be distinguished from other pselaphid beetles by a qualified systematist upon microscopic study. The species can be definitively separated from *Texamaurops reddelli* by its lack of ocular knobs and the presence of a pencil of setae on the metatibia. In life the beetle is a tiny, long-legged form that can be confused with other species such as *Tachys ferrugineus*, which is an eyed, short-legged, shiny, fast-moving carabid beetle with full-length elytra; and *Batrisodes uncicornis*, an eyed species occurring in many caves in Central Texas. Other pselaphids, both blind and eyed, occur in caves outside the range of this species (Chandler 1992).

Listed: Because *Batrisodes texanus* was considered to be *Texamaurops reddelli* before Chandler's redescription (1992) and one locality (Coffin Cave) of *B. texanus* was included with *Texamaurops reddelli* at the time *Texamaurops reddelli* was listed as endangered on September 16, 1988, (53 FR 36029), *B. texanus* is considered to be listed as endangered under the Endangered Species Act. The USFWS has reviewed the species description (Chandler 1992) and other

available information on this species and determined it should remain listed as endangered (58 FR 43818).

Recovery Priority: 2C

McDonald, Weldon, and Root caves, Travis County (53 FR 36029), but these populations have been redescribed as *Texella reyesi* (Ubick and Briggs 1992) (58 FR 43818). Kretschmarr Double Pit, Jest John Cave, and Jester Estates Cave are north of the Colorado River on the Jollyville Plateau. The other four caves are located in the Rollingwood karst fauna region, south of the Colorado River. The Cave Y and Bandit Cave collections do not include the male specimens necessary to confirm the occurrence of this species. However, the females are similar to the females collected from Bee Creek Cave and Jester Estates Cave. Isolation of this species in caves on opposite sides of the Colorado River and in different blocks of limestone may be an indication that the populations are genetically distinct.

SPECIES 4 - *Texella reyesi*: Occurs in 69 caves (60 confirmed, 9 tentative identifications) from northern Travis to northern Williamson County, a distance of 40 km (Tables 1 and 2, Figure 6). This species occurs in six karst fauna regions (Jollyville, Central Austin, Cedar Park, McNeil/Round Rock, Georgetown, and North Williamson County). When Goodnight and Goodnight (1967) described *Texella reddelli* they included four populations, three of which are now recognized as *Texella reyesi* (Tooth Cave and Weldon Cave, Travis County; and Bone Cave, Williamson County). The Goodnight and Goodnight (1992) redescription of *Texella mulaiki* included four populations, three of which are now recognized as *Texella reyesi* (Cotterell Cave,

and management recommendations were also given, including long-term ecological studies, stewardship programs, cooperative agreements, and greenbelts. Through an Endangered Species Act Section 6 cooperative agreement with TPWD, USFWS funded continued karst and biospeleological studies by Reddell and his associates (1991). These studies helped further clarify the range of the listed species and determine areas that warranted additional study.

From 1990 to 1991, the City of Georgetown sponsored an extensive study of 21 caves and 19 other karst features in Georgetown's extraterritorial jurisdiction (Reddell and Elliott 1991). As a result of the study, Temples of Thor and Red Crevice caves were discovered and later sold to Melvin Simon & Associates, Inc. to become part of the LakeLine Mall Habitat Conservation Plan. Known cave locations from the Texas Speleological Society files were mapped onto the City of Georgetown's geographic information system.

Through an Endangered Species Act Section 6 cooperative agreement with TPWD, the USFWS funded a study (Veni & Associates 1992) of geologic controls on cave development and the distribution of karst fauna in the vicinity of Travis and Williamson counties. This study significantly improved the ability to predict where endangered species' localities might occur in Travis and Williamson counties. Veni divided Travis, Williamson, Hays, and Burnet counties into 11 areas (referred to as "karst fauna regions" in this recovery plan) based on geologic continuity, hydrology, and the distribution of 38 rare troglobites. By correlating distribution data for the 38 troglobites to the 11 karst fauna regions, Veni observed that the Jollyville Plateau, Central Austin, and Post Oak

F. Recovery Strategy

This recovery plan is designed to outline steps for long-term protection of the listed invertebrate species, including restoration and enhancement of the habitat where necessary. The recovery criteria state that each species will be considered for downlisting from endangered to threatened when three karst fauna areas (if at least three exist) within each karst fauna region in each species' range are protected in perpetuity (see Section II.A for a more detailed delineation of the criteria).

The "karst fauna regions" depicted in Figure 2 of this plan are adapted from the karst fauna areas delineated in Veni & Associates' 1992 report (see discussion in Section I.B). These regions are delineated based on geologic continuity, hydrology, and the distribution of 38 rare troglobitic species. Each karst fauna region can be further subdivided into karst fauna areas. For the purposes of this plan, a "karst fauna area" is an area known to support one or more locations of a listed species and is distinct in that it acts as a system that is separated from other karst fauna areas by geologic and hydrologic features and/or processes that create barriers to the movement of water, contaminants, and troglobitic fauna. Karst fauna areas should be far enough apart so that if a catastrophic event (for example, contamination of the water supply, flooding, disease) were to destroy one of the areas and/or the species in it, that event would not likely destroy any other area occupied by that species.

As troglobitic populations become increasingly isolated due to hyrdrogeologic processes, subsequent speciation among the isolated populations may occur. The recovery criteria are designed to allow these natural

evolutionary processes to continue for each species. The recovery criteria aim at protecting populations and preserving genetic diversity across each species' range.

Full implementation of the recovery criteria should protect against catastrophic loss of the listed species. Because karst ecosystems can never be recreated once they are destroyed, an adequate number of karst fauna areas per karst fauna region should be protected in perpetuity to ensure the continued survival and conservation of each species. Ideally, at least three karst fauna areas per karst fauna region should be protected to provide a margin of safety against extinction if one or more protected areas are lost due to an unanticipated catastrophic event. This is particularly important for karst species since their habitat can not be recreated. If a given species only occurs in two karst fauna areas, that species would still be considered for downlisting provided both areas were adequately protected. Species whose entire range consists of only one karst fauna area (should one area be destroyed) will not be considered for downlisting. If a species occupies several karst fauna regions (such as *Texella reyesi*), but one or more of those karst fauna regions contains less than three karst fauna areas, then all karst fauna areas within that region must be protected in order to meet the recovery objective.

The first step in recovering these species is to identify the karst fauna areas targeted for recovery. According to the recovery criteria, all localities inhabited by four of the listed species (*Neoleptoneta myopica*, *Tartarocreagris texana*, *Texamaurops reddelli*, and *Batrisodes texanus*) should be provided long-term protection prior to consideration for downlisting. Three of the listed species, *Texella reddelli*, *Texella reyesi*, and

Rhadine persephone, occupy karst fauna regions that contain more than three karst fauna areas. Table 3 identifies the karst fauna regions in which each species occurs, the approximate number of karst fauna areas inhabited by each species, and the number of karst fauna areas that should be protected, based on the recovery criteria for downlisting and current knowledge of the species' distributions (figures 3-9). Continuing surveys for caves and karst invertebrates may result in an increase in the number of karst fauna areas occupied by some species.

In selecting karst fauna areas to be targeted for recovery, priority should be given to those areas that exhibit high species diversity and contain other rare or listed species. This ecosystem-based approach to choosing karst fauna areas for preservation should consider both the listed species and other endemic species and may prevent the need for listing additional species in the future. Numerous rare species inhabit the same karst terrains in Travis and Williamson counties. For example, Travis County contains at least 32 rare karst species, 25 of which are not federally-listed and some of which are undescribed (Elliott 1992a). Many of those rare species were taxonomically described in 1992 and some may become candidates for the endangered species list, especially those found in urbanizing areas. Therefore, judicious selection of karst areas for preservation will aid in the recovery of the listed species, help protect other important elements of the karst ecosystem in Travis and Williamson counties, and possibly prevent the need to list other species in the future.

Table 3. Approximate number of karst fauna areas to be protected for each species to be considered for downlisting. Information is based on currently available information on species' distributions (tables 1 and 2, figures 3-9) and recovery criteria for downlisting.

SPECIES	KARST FAUNA REGION	APPROX. # OF KARST FAUNA AREAS OCCUPIED	# OF AREAS TO PROTECT
Neoleptoneta myopica	Jollyville Plateau	3	ALL
Tartarocreagris texana	Jollyville Plateau	2	ALL
Texella reddelli	Jollyville Plateau	3	ALL
	Rollingwood	>3	AT LEAST 3
Texella reyesi	Jollyville Plateau	>3	AT LEAST 3
	Cedar Park	1	ALL
	Central Austin	1	ALL
	McNeil/Round Rock	>3	AT LEAST 3
	Georgetown	>3	AT LEAST 3
	N. Williamson Co.	>3	AT LEAST 3
Rhadine persephone	Jollyville Plateau	>3	AT LEAST 3
	Cedar Park	>3	AT LEAST 3
Texamaurops reddelli	Jollyville Plateau	2	ALL
Batrisodes texanus	N. Williamson Co.	2	ALL
	Georgetown	2	ALL

Within each karst fauna region, karst fauna areas that are targeted for recovery should be located as far apart as possible, to protect against catastrophic loss and to preserve genetic diversity within each species. Other factors to consider when selecting karst fauna areas include ability to ensure long-term protection, current level of habitat disturbance, past and present land use, presence of other rare or candidate species, ease of protection (landowner cooperation), and, where applicable, importance to the regional groundwater system.

Where the listed species' ranges overlap, particularly on the Jollyville Plateau, more than one of the species may occur in a given karst fauna area. For example, six of the seven species occur in the Jollyville Plateau karst fauna region, and three of the species' entire ranges are in the vicinity of the RM 2222/RM 620 intersection.

Two areas within the Jollyville Plateau karst fauna region that are already known to be very important to the survival and recovery of several of the listed species represent two distinct karst fauna areas and should be targeted for protection. One of these areas, the Tooth Cave karst fauna area, harbors six of the seven listed species and one of the most diverse cave biotas in the southwestern United States. The other area, the Stovepipe Cave karst fauna area, contains five of the listed species. Preservation of these two karst fauna areas would protect 100% of the range of two of the listed invertebrates (*Texamaurops reddelli* and *Tartarocreagris texana*) and 67% of the range of *Neoleptoneta myopica*. A suggested karst fauna area for the Stovepipe Cave cluster is presented in Figure 11.

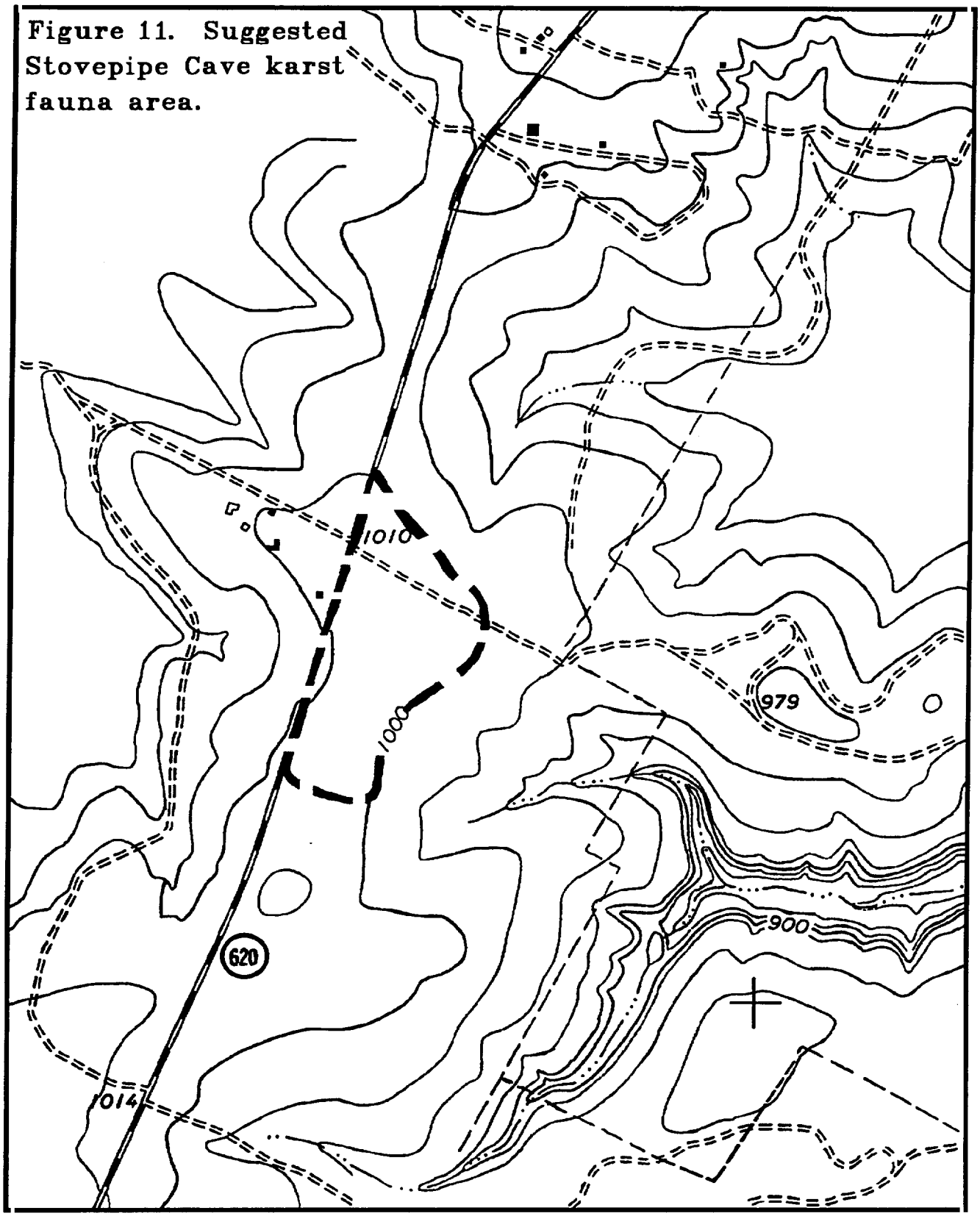

Figure 11. Suggested Stovepipe Cave karst fauna area.

The second major step in recovery is to determine the appropriate size and configuration of each of the karst fauna areas targeted for recovery. To be considered "protected", a karst fauna area should contain a large enough expanse of contiguous karst and surface area to maintain the integrity of the karst ecosystem on which each species depends. The size and configuration of each karst fauna area should be adequate to maintain moist, humid conditions, air flow, and stable temperatures in the air-filled voids; maintain an adequate nutrient supply; prevent contamination of surface and groundwater entering the ecosystem; prevent or control the invasion of exotic species, such as fire ants; and allow for movement of the karst fauna and nutrients through the interstitium between karst features.

Several factors should be considered in determining the size and configuration of karst fauna areas, including the pattern and direction of groundwater movement, direction and area of surface and subsurface drainage, preservation of the surface community above and surrounding the cave, and the presence of other caves or karst features. In general, land bounded by the contour interval at the cave floor is the area within which contaminants moving over the surface or through the karst could move toward the cave. Outside this contour, contaminants would move away from the cave. A hydrogeologic investigation may be useful in determining the surface and subsurface drainage basin of the karst ecosystem, local recharge areas, and direction of groundwater movement. This information would be used to determine the area necessary to protect the karst fauna area's water supply. The amount of surface area necessary to maintain the ecological processes of the karst ecosystem should also be considered and may be larger than the surface drainage area of the

cave. Other nearby karst features, which may affect the moisture, air flow, temperature, and nutrient regimes and allow movement of karst fauna through the interstitium, should be included in each karst fauna area. Major sources of nutrient input and areas necessary to sustain these sources should be considered. Recent research as part of the LakeLine Mall HCP may provide some information on the importance of the surface area surrounding karst features in providing nutrients to the cave ecosystem. Wherever possible, karst fauna areas should connect to larger undeveloped lands that are not slated for future development, in order to ensure adequate nutrient flow into the karst ecosystem and to help combat the fire ant threat.

Setting aside large preserves may help to control fire ants. Porter et al. (1991) state that control of fire ants in large areas (>5 hectares) (12 acres) may be more effective than in smaller areas since multiple queen fire ant colonies reproduce primarily by "budding" (whereby queens and workers branch off from the main colony and form new sister colonies). Budding is a relatively slow process, and fire ants may not as quickly reinvade areas where they have been eliminated with this method. Native ant communities may also require large, undisturbed areas to help them combat the fire ant threat.

Research in some areas, including the fire ant's native range, indicates that fire ants are associated with open habitats disturbed as a result of human activity (such as old fields, lawns, roadsides, ponds, and other open, sunny habitats) but are absent or rare in late succession or climax communities such as mature forest (Tschinkel 1986). Although this association is not apparent in all areas, especially in central Texas (Porter et al. 1988,

1991), maintaining native vegetation communities may help sustain native ant populations and further deter fire ant infestations. Chemical control methods have some effectiveness in controlling fire ants, but the effect of these agents on non-target species (including the listed invertebrates) is unclear and, if used indiscriminately, may also eliminate native ant populations. Ideally, intensive fire ant control should be implemented along disturbed areas on the periphery of large preserves. This type of fire ant control, combined with safer but more labor intensive methods (such as hot water applied mound-by-mound) in the vicinity of cave entrances, should help sustain the native ant fauna and reduce the need to implement intensive control within the preserve.

Due to the multiplicity of factors to consider when determining the size and configuration of the karst fauna areas, the design of each karst fauna area will be site-specific. Although many factors (such as the species' ecological requirements, distribution in the interstitium, and the amount of surface area necessary to sustain nutrient flow) are unknown, the amount of time and financial expense to acquire this knowledge would preclude achieving the recovery objective if karst fauna area protection were delayed pending additional research in these areas. To compensate for this lack of knowledge, delineation of the karst fauna areas should be based on protecting the integrity of the karst terrain supporting the listed species and a conservative interpretation of the available biological and hydrogeological information.

Another step needed to accomplish recovery is to provide long-term protection for the targeted karst fauna areas. Methods could include land acquisition, conservation easements, and cooperative agreements with

private landowners and public entities.

Implementation of appropriate conservation and management measures for each targeted karst fauna area is also needed for recovery. This may include control of fire ants and other threats; management of surface plant and animal communities; maintaining surface and groundwater quality and quantity; preventing vandalism, dumping, and unauthorized human visitation; and other actions deemed necessary. Additional studies will be necessary to monitor the effects of each management program, refine management techniques as appropriate, and determine any other steps necessary to fully recover the species.

Regardless of whether a listed species occurs in a karst ecosystem that is in or outside of a karst fauna area targeted for protection, the listed species are still protected under the Endangered Species Act (Act) unless authorization for incidental "take" has been obtained under Section 7 or Section 10 of the Act.

Karst Preserve

Design Recommendations

U.S. Fish and Wildlife Service
Austin Ecological Services Field Office
10711 Burnet Rd. Suite #200
Austin, TX 78758

July 28, 2011

Revised March 1, 2012

1.0 INTRODUCTION

The purpose of this document is to provide a reference guide for designing preserves to protect endangered karst invertebrates. The recommendations provided in this document may be updated as new scientific information becomes available. This preserve design document assumes the reader is familiar with karst invertebrate biology, ecology, and habitat requirements. For more on these topics see the Karst Invertebrate Habitat Requirements document (Service 2011a). For more information on the science behind these preserve design recommendations, see the Appendix.

2.0 KARST PRESERVE DESIGN

Goal – The overall goal of establishing karst preserves is to meet the species resource needs and protect them from threats to their survival (see Figure 1 for more on resource needs and potential influences on these needs).

Objectives – Karst preserves should be designed to meet the following objectives:

Provide adequate quality and quantity of moisture to karst ecosystems
Maintain stable in-cave temperature
Reduce or remove red-imported fire ant (RIFA) predation/competition
Provide adequate nutrient input to karst ecosystems
Protect mesocaverns[1] to support karst invertebrate population needs, including adequate gene flow and population dynamics
Ensure resiliency of karst invertebrate populations by establishing preserves large enough to withstand random or catastrophic events
Provide a high probability of viable karst invertebrate population persistence in each preserve (following the "precautionary principle")
Minimize the amount of active management needed for each preserve

Karst Fauna Area (KFA) – a karst fauna area (Service 1994) is a geographic area known to support one or more locations of an endangered karst invertebrate species. A KFA is distinct in that it acts as a system that is separated from other KFAs by geologic and hydrologic features and/or processes or distances that create barriers to movement of water, contaminants, and troglobitic fauna. Karst Fauna Areas should be far enough apart that a catastrophic event (such as contaminants from a spill, pipeline leak, or flooding, etc.) that may kill karst invertebrates or destroy habitat in one KFA would be unlikely to impact karst invertebrates or habitat in other KFAs. A KFA refers to the geographic area that includes one or more karst invertebrate locations and that includes enough of the ecosystem to support karst invertebrate populations. For a KFA to count toward meeting the recovery criteria for the endangered karst invertebrates the KFA must be of a certain quality and perpetual protection and management of the KFA must be assured through a legally binding mechanism.

[1] Mesocaverns – humanly impassable voids that may or may not be connected to larger cave passages.

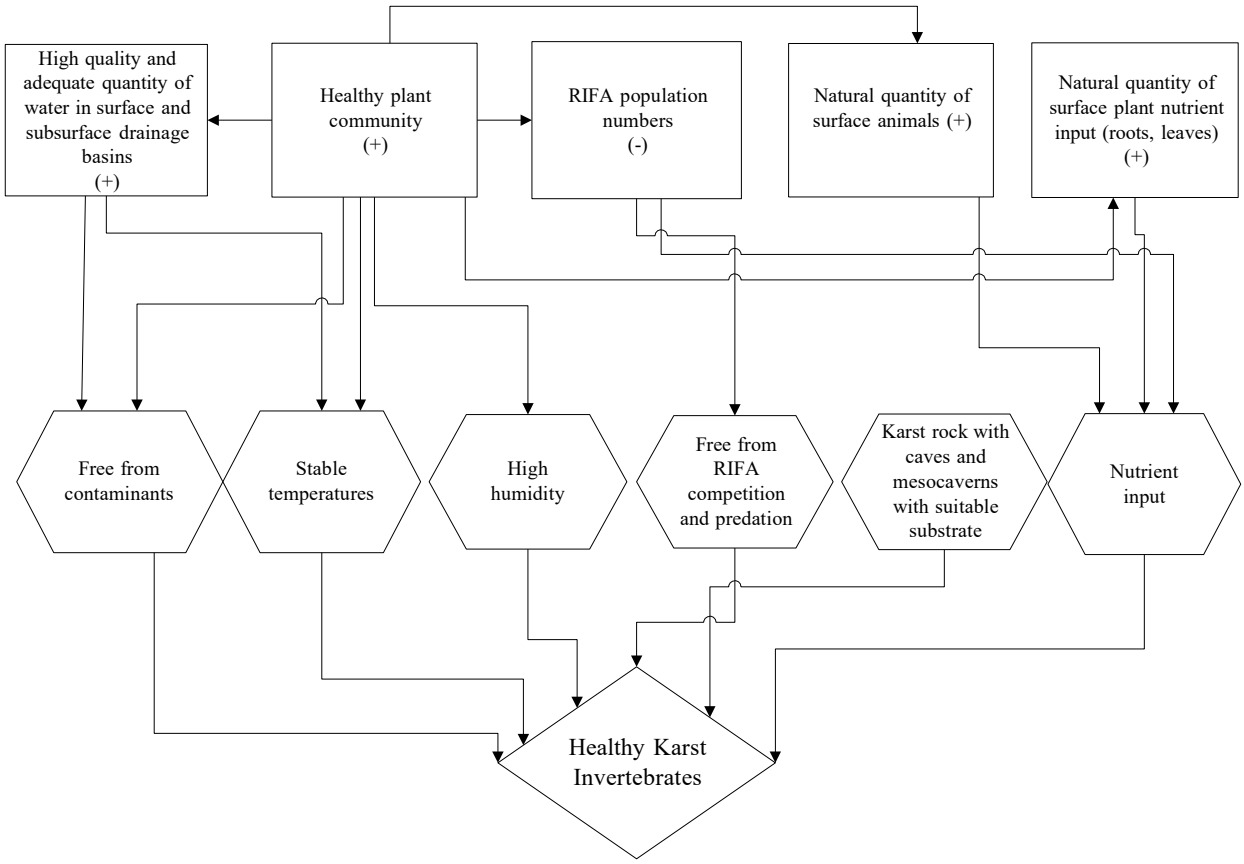

Figure 1. Resource needs (in hexagons) and potential ecosystem influences (in squares) on resources. (Note: whether the influencing factor has a positive or negative influence on resources is indicated in the box.)

CONSERVATION BIOLOGY

The Science of Scarcity and Diversity

Chapter 21: Cave Faunas
by David Culver
1986

Edited by Michael E. Soulé
SCHOOL OF NATURAL RESOURCES
UNIVERSITY OF MICHIGAN

SINAUER ASSOCIATES, INC. • PUBLISHERS
Sunderland, Massachusetts

Title: Conservation Biology, Culver, D.C. (1986)

resulted in an increase in the crustacean fauna and the bat fauna, and apparently no irreversible damage had been done.

Other cave faunas are probably less adversely affected by human visitation, but two other problems are worth noting. Illumination of cave passages, a prerequisite for any commercialization, almost completely eliminates the cave fauna in that area, due to competition from surface species that can grow in the cave, behavioral avoidance of light, and perhaps the directly harmful effects of light on the nearly transparent cave animals. Recreational cavers (and cave scientists for that matter) often use acetylene produced by the reaction between water and calcium carbide as a light source. The by-product, calcium hydroxide, is very toxic. The backpacker's adage—pack it in, pack it out—also holds in caves.

The various IUCN Red Data Books provide a useful worldwide perspective on the dangers posed to cave and karst faunas, and this information is summarized in Table 3 (see also Figure 3). Many noncave subsurface species not listed in Table 3 are threatened or endangered as well, including various species of desert pupfish in the genus *Cyprinidon*. While the species listed in Table 3 are certainly only a tiny fraction of the threatened cave species, it does provide a useful overview of the problems. Two kinds of threats are especially common. Groundwater pollution and overuse are the major short-term and long-term threats to endangered, rare, and vulnerable cave species. Second, an appalling number of species are threatened by overcollecting. The well-worn phrase "no collecting except for scientific purposes" is no longer sufficient. Every museum need not have a specimen of every species of cave fish; every cave ecologist need not examine the gut contents of cave salamanders. If these practices continue, the scientific community may be directly responsible for some extinctions.

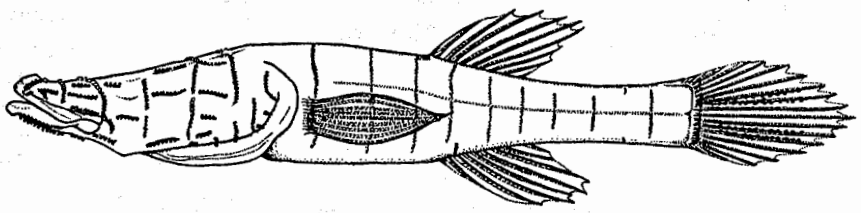

FIGURE 3. *Speoplatyrhinus poulsoni,* a cavefish found in Alabama. The species is threatened by groundwater pollution from agricultural runoff. (Drawing by J.E. Cooper.)

THE CONSERVATION BIOLOGY OF BATS

The problems associated with the conservation, preservation, and protection of bats and their habitats are distinct enough from other components of the cave fauna that they warrant a separate discussion. Education must play a major role in the conservation of bats and bat caves. As the pamphlets of Bat Conservation International point out, bats have received bad press. It is probably fair to say that even among conservationists, at least until very recently, bats and the caves they inhabit were not high on the priority list of species and habitats to be protected. In a paper that deserves wide distribution, Tuttle and Kern (1981) debunk the myths surrounding the negative effects of bats on human public health, especially the erroneous claims that bats are asymptomatic carriers of rabies.

The gray bat, *Myotis grisescens,* is probably the most endangered of all the American bats, and certainly the one most dependent on caves. The recovery plan for this species (Tuttle, 1979; Brady et al., 1982) can serve as a general model for other threatened species. The immediate objective is to reduce human disturbance in bat caves. Tuttle suggests the following three types of caves be given the highest priority to receive immediate protection:

1. Primary hibernating caves (those occupied now or in the past by more than 50,000 bats).
2. Primary maternity caves (those occupied now or in the past by more than 50,000 bats).
3. Primary bachelor caves (those used now or in the past by more than 50,000 male and nonreproductive female bats).

The total number of caves involved is relatively small. For example, there are only nine primary hibernating caves. The standard method of reducing human disturbance has been to install gates. Unfortunately, some gates have done more harm than good, either by altering the cave microclimate so that it is unsuitable for bats, or by subjecting the bats to high predation levels because of the difficulty bats have in getting through some gates (Tuttle, 1977). However, suitable designs for a cave gate that does not adversely affect bats are now available (Tuttle, 1977, Brady et al., 1982). In other caves where the threat of human disturbance is less severe, the entrance is posted with a sign asking people to keep out during the critical period, for example during winter for a hibernating site.

In some instances, gating or closing caves for hibernating or maternity colonies of bats has proved to be quite controversial within the

CERTIFICATE OF SERVICE

I hereby certify that on October 5, 2017, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. *Plaintiffs,*	§	
v.	§	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. *Defendants.*	§	

INDEX OF PLAINTIFFS' EXCERPTS OF ADMINISTRATIVE RECORD ("AR")

VOLUME 4

No.	Document Description	AR Pages
12	USFWS Bexar County Karst Invertebrates Recovery Plan, 2011	R000799
13	Email from J. Krejca to C. Watson, September 21, 2010	R001039
14	Mulec and Kosi article - Lampenflora algae and methods of growth control, 2009 (Excerpt)	R001146
15	Balcones Canyonlands Preserve Karst Monitoring and Management FY 2004 Annual Report (Excerpt)	R002969
16	Goble article – Recovery, 2010 (Excerpt)	R003267
17	USFWS Final Environmental Impact Statement/Habitat Conservation Plan for proposed Issuance of a Permit to allow Incidental take of the Golden Cheeked Warbler, Black Capped Vireo, and Six Karst Invertebrates in Travis County, Texas, 1996 (Excerpt)	R003443
18	Williamson County Regional Habitat Conservation Plan, 2008 (Excerpt)	R004128
19	USFWS Final Rule To Delist the Florida Population of the Pine Barrens Tree frog To Rescind Previously Determined Critical Habitat, 1983	R004776
20	USFWS Final Rule To Determine Five Texas Cave Invertebrates To Be Endangered Species, 1988	R004780
21	USFWS Final Rule To Determine Coffin Cave Mold Beetle and the Bone Cave Harvestman To Be Endangered Species, 1993	R004882

Dated: October 5, 2017

Respectfully submitted,

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Bexar County Karst Invertebrates

Recovery Plan

August 2011

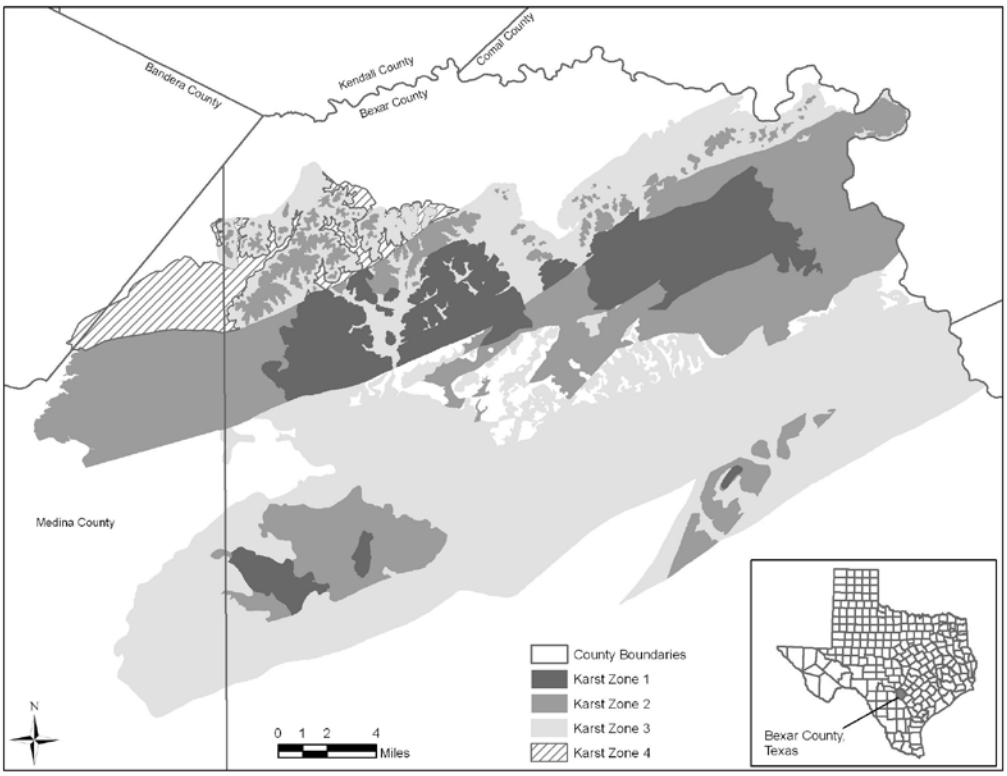

Figure 1. Karst Zones in the San Antonio area

Population estimates - Population estimates are unavailable for any of these species due to lack of adequate techniques, their cryptic behavior, inaccessibility of **mesocaverns**, and difficulty accessing cave and karst habitat. In known locations, one or two individuals are typically observed per survey event, and it is not uncommon to observe none at all (Krejca and Weckerley 2007). Results of point counts are available for some species at some localities in unpublished literature (for example, scientific permittee annual reports). Techniques that may be useful for population estimates of invertebrates include mark-recapture, such as have been used for cave crickets and troglobitic crustaceans (Knapp and Fong 1999, Taylor et al. 2005) but not for any of the listed species or their relatives.

Some of the nine listed species are known from only one location, despite the fact that a considerable amount of effort has been expended collecting cave species in Bexar County.

cave is not uncommon, and sometimes the crickets will spend their day on the surface away from a known cave, probably in a tiny crack or other protected **microhabitat** (Taylor et al. 2004). The nutrient input from foraging by tens to thousands of crickets is quite large, as it consists of deep cricket guano blanketing large parts of the floor of some cave passages. Research conducted by Taylor et al. (2007a) found that the total number of cave **taxa** was strongly correlated with the total number of cave crickets. This is an indicator of the importance of cave crickets to the karst ecosystem.

The most abundant recognized species of cave cricket in central Texas is *C. secretus*. There is at least one other widely recognized, but not formally described, species of cave cricket known as "*Ceuthophilus* species B." These species are known to exit caves at night and forage on the surface (Taylor et al. 2007b). A third species, *C. cunicularis*, is more troglomorphic and rarely exits caves (Taylor et al. 2007b).

Mesocaverns - It is conjectured that the majority of nutrients are located in humanly accessible caves with open entrances; therefore, they are foci of troglobitic populations that may occur in low densities throughout the karst. Since metabolic rates of troglobites are typically low, they may be able to sustain periods ranging from months to years existing on lower levels of food or no food (Howarth 1983). During temperature extremes, small mesocavernous spaces connected to caves may have a physical environment with more favorable humidity and temperature levels than the cave (Howarth 1983), but where the abundance of food may be less than in the larger cave passages. Troglobites may spend the majority of their time in such retreats, only leaving them during temporary forays into the larger cave passages to forage (Howarth 1987). For more information on mesocaverns see the document on karst invertebrate habitat requirements at: http://ecos.fws.gov/tess_public/.

Mesocaverns are important to karst invertebrate populations, and covering them with urbanization is detrimental; therefore, more effort should be put toward preserving contiguous karst areas. These areas are important for two reasons (1) they may be occupied, though they are extremely difficult to sample, and (2) they may serve as migration routes.

Humidity and Temperature - Terrestrial troglobites require stable temperatures and constant, high humidity (Barr 1968, Mitchell 1971b). The temperatures in caves are typically the average annual temperature of the surface habitat and vary much less than the surface environment (Howarth 1983, Dunlap 1995). Relative humidity in a cave is typically near 100 percent for caves supporting troglobitic invertebrates (Elliott and Reddell 1989, TPWD 2009, SWCA 2010). Many of these species have lost the adaptations needed to prevent desiccation in drier habitat (Howarth 1983) or the ability to detect and/or cope with more extreme temperatures (Mitchell 1971b). To maintain these conditions, it is important to maintain an adequate drainage area to supply moisture to the cave and connected karst areas and to maintain the surface plant communities that insulate the karst system from excessive drying and from more extreme temperature fluctuations.

2.0 RECOVERY

The following sections present a strategy to recover the species, including objective and measurable recovery criteria to achieve downlisting and delisting, and site-specific management actions to monitor and reduce or remove threats to the Bexar County karst invertebrates, as required under section 4 of the ESA. The Recovery Plan also addresses the five statutory listing/recovery factors (section 4(a)(1) of the ESA) to demonstrate how the recovery criteria and actions will lead to removal of the Bexar County karst invertebrates from the lists of Threatened and Endangered Species.

2.1 Recovery Strategy

Habitat preservation, management, and research to refine our understanding of these species are key components of recovery. The recovery strategy for these species includes the perpetual protection and management of an adequate quantity and quality of habitat that spans the geographic range of each of the species.

An "adequate" quantity and quality of habitat means that needed to provided a high probability of species survival over the long term (for example, at least 90 percent probability over 100 years). Normally our preference would be a probability closer to 99 percent over 100 years. However, calculating a probability for these species may not be possible with much certainty due to the difficulty sampling for the population parameters that are necessary to calculate this probability. Therefore, since we will likely be estimating this probability based on best available scientific and expert judgment, we are suggesting that a probability of greater than 90 percent is a more reasonable target range to estimate.

Adequate quantity of habitat refers to both size and number of preserved and areas that are sufficient for supporting the karst ecosystems. The number of preserves called for in the criterion below provides redundancy to the species by providing a sufficient number of populations to provide a margin of safety for these species to withstand a catastrophic event (Schaffer and Stein 2000). The size of preserves should be adequate to ensure resiliency of the population so that they are large enough to withstand stochastic events (Schaffer and Stein 2000). Multiple **karst fauna areas** (KFAs) across the species' ranges should provide representation of the breadth of their genetic diversity to conserve their adaptive capabilities (Schaffer and Stein 2000).

Adequate quality of habitat refers to (1) the condition and orientation of preserved lands with respect to the known localities for the species and (2) the ability of the species' needs to be met to sustain **viable populations**.

Considering the rapid rate of development and habitat loss within these species' ranges, establishing these KFAs as soon as possible (ten years or less) is the highest priority action for this recovery strategy. Once KFAs are established, our second priority is increasing our knowledge about these species and adaptively managing. Please check

our website for recommendations on designing preserves for these species (http://ecos.fws.gov/tess_public/). These recommendations may be updated as new information becomes available.

This section provides an overview of the number and distribution of preserves needed for recovery. For more information on how to design preserves see the karst preserve design document referred to above. The actions to accomplish recovery of these species are outlined in section 2.3 and are described in more detail in section 2.4.

Selecting Areas for Preservation

Conservative Estimates for Preserve Design - The basic strategy for designing a karst ecosystem preserve is to protect an adequate area to (1) meet the species needs to feed, breed, and have shelter and (2) to provide a high probability that karst invertebrate populations will survive and thrive over the long term. Basic preserve design features include protecting the surface and subsurface drainage basins of at least one occupied karst feature and adequate surface habitat to maintain native plant and animal communities, which provide nutrient input and a buffer to temperature and humidity extremes. Details of the minimum area needed to protect the population detected in a feature are difficult to define due to limited information on these species' life history and population dynamics. Furthermore, population trends of all the listed invertebrates are difficult to obtain due to small sample sizes. This means that the only way to determine with certainty that a preserve is insufficient to support karst invertebrates is to document the extinction of a population by observing no specimens over the course of many years.

Current knowledge indicates that these species cannot be reintroduced into existing habitat. Therefore, an attempt to re-establish a population after it has been extirpated is not a feasible method. In addition, if a preserve is later found to be insufficient to support the species due to surrounding developments being either too close or too dense, the potential for preserving additional land is lost (the potential for **adaptive management** will be gone). Because these species have relatively long life spans and low requirements for food, a decline in population size or even the complete extinction of the population may take years or even decades. Observations of a listed species over several years on a preserve that is too small for perpetual species preservation may not detect declines that are actually occurring. If these observations are used as evidence that a preserve size was adequate, then the potential for long-term preservation of that species may be lost due to irreversible development surrounding the preserve. Therefore, preserve sizes should be established precautiously and be large enough to account for the uncertainty in area requirements for a population.

To provide long-term conservation of these species, consideration needs to also be given to the population dynamics and population genetics of these species. To preserve the genetic diversity of the species, preserves should be established based on consideration of population genetics analyses (if available), subsurface barriers or restrictions to travel, and the species' ranges. Some species-level genetic work has been done on *Cicurina* (including *C. madla*, *C. vespera*, and several non-listed *Cicurina*) (Paquin and Hedin

"Jean Krejca, Ph.D." <jean@zaraenvironmental.com>
09/21/2010 09:59 AM

To cyndee_watson@fws.gov
cc
bcc
Subject Re: question

History: This message has been replied to.

Cyndee,

I would agree but just say: "Logically, karst fauna life stages that are most vulnerable to RIFA predation are theimmature stages, eggs, and slower-moving adults."

The main problem I have with going overboard on RIFA direct effects on karst inverts is that all of our work in 2003 basically showed this was a small component of the overall effects which are mainly indirect.

Work by Taylor et al. (2003) indicates that RIFA use of caves is primarily in the entrance area and does not overlap with the in-cave range of troglobites as
much as entrance fauna such as cave crickets. While direct effects from RIFA to
karst invertebrates may be limited, indirect effects such as competition with and predation on cave crickets are well documented (Taylor et al. 2003).

You could say this:

Krejca (2010, pers. comm.) reports that sticky traps placed in caves as part of
endangered species presence/absence surveys commonly catch cave crickets, which
are then quickly swarmed and devoured by RIFA even when they are still alive.

Taylor, S. J., J. K. Krejca, J. E. Smith, V. R. Block, and F. Hutto. 2003. Investigation of the potential for Red Imported Fire Ant (Solenopsis invicta) impacts on rare karst invertebrates at Fort Hood, Texas: a field study. Illinos
Natural History Survey, Center for Biodiversity Technical Report 2003(28):1-153.

Good luck!

Jean

----- Original Message ----
From: "cyndee_watson@fws.gov" <cyndee_watson@fws.gov>
To: jean@zaraenvironmental.com
Sent: Tue, September 21, 2010 7:20:57 AM
Subject: Fw: question

Hey Jean,

I understand that you do not have an email or other documentation for the

pers comm from James below. Do you agree with the statement below and if so are you comfortable with us citing you for this pers comm?

Also, in the table below (from the recovery plan), do you remember why it indicates that two additional medium quality KFAs are needed for spp that occur in two KFRs and that one additional medium quality KFA is needed for spp that occur on three KFRs?

# of KFRs per species	Configuration of KFAs within KFRs					Total No. of KFAs
1	KFR #1: 3 High (H) + 3 Medium (M)					6
2	KFR #1: HMM	KFR #2: HHM			Plus in either KFR: MM	8
3	KFR #1: HMM	KFR #2: HMM	KFR #3: HMM		Plus in either KFR: M	10

	KFR #1: HMM	KFR #2: HMM		KFR #3: HMM		KFR #4: HMM	12
4							
	KFR #1: HMM	KFR #2: HMM	KFR #3: HMM		KFR #4: HMM	KFR #5: HMM	15
5							

Thanks for you help,
Cyndee

_____
Cyndee Watson
Wildlife Biologist
United States Fish and Wildlife Service
512-490-0057 ext. 223
----- Forwarded by Cyndee Watson/R2/FWS/DOI on 09/21/2010 07:13 AM -----

Cyndee Watson/R2/FWS/DOI		To
09/17/2010 08:19 AM	"Jean Krejca, Ph.D." <jean@zaraenvironmental.com>	cc
		Subject
	question(Document link: Cyndee Watson)	

Hey Jean,

Do you have an email or phone record documenting the pers comm (in the recoveyr plan) from James Reddell below?

Karst fauna life stages that are most vulnerable to RIFA predation are the immature stages, eggs, and slower-moving adults (James Reddell, Texas Memorial Museum, pers. comm., 2006).

Thanks,
Cyndee

J. Mulec and G. Kosi – Lampenflora algae and methods of growth control. *Journal of Cave and Karst Studies,* v. 71, no. 2, p. 109–115.

LAMPENFLORA ALGAE AND METHODS OF GROWTH CONTROL

JANEZ MULEC[1] AND GORAZD KOSI[2]

Abstract: Karst caves are unique natural features and habitats where specialized organisms live. Some caves are also important as cultural heritage sites. In recent decades, many caves have experienced intensified tourist visits. To attract visitors, artificial illumination was installed that changed conditions in the caves. As a result, communities of organisms called lampenflora develop in close and remote proximity to lights. These phototrophic organisms are inappropriate from an aesthetic point of view and cause the degradation of colonized substrata, which is a particular problem in caves with prehistoric art. Key factors that allow lampenflora to grow are light and moisture. Illuminated spots in caves can be quickly colonized by algae, some of which have broad tolerances for different substrata. Several phototrophs can survive in caves even at photon flux densities lower than the photosynthetic compensation point. In this paper, the pros and cons of physical, chemical, and biological methods to control phototrophic growth are reviewed and discussed. Experiences in show caves can be helpful in controlling undesirable algal growth in other environments.

INTRODUCTION

Caves have a special place in human history. Early in prehistory, humans discovered that caves can provide suitable temporary or permanent shelters. Later, man developed a different relation with caves, not only as shelter but also for their natural beauty and inspiration. In many caves around the globe, remnants of prehistoric man are found. Especially interesting are those caves with paintings. Many caves of natural and cultural importance are listed on the United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage List. Cave tourism is considered to be one of the oldest forms of tourism.

In recent decades, many caves have experienced intensified tourist visits. To attract visitors, artificial illumination was installed. Illuminated areas such as rocky surfaces, sediments, and artificial materials around lamps quickly become colonized by phototrophic organisms. This complex community of autotrophic photosynthetic organisms is called lampenflora and develops in natural and artificial caves around artificial light sources (Dobat, 1998). In this lampenflora community, various aerophytic algae, as well as some mosses and ferns dominate, and are usually strongly adhered to the substratum. Mosses and ferns, also part of lampenflora, are not discussed further because in the early phase of colonization and succession, algae, both prokaryotic cyanobacteria and eukaryotic algae, usually play the most important role, while mosses and ferns appear later in the succession. Vascular plants are sometimes found, but almost always as germinating shoots (Martinčič et al., 1981). Lampenflora is, relative to the aerophytic phototrophs from the cave entrances, completely independent of sunlight and other external climatic factors. In comparison with sunlight, artificial light sources show no oscillations in light intensity. Dobat (1972) named spots with growing lampenflora ecosystems in formation.

One of the characteristics of the natural cave environment is low nutrient input (Simon et al., 2007) that is changed with the introduction of light energy. Such drastic changes to the cave ecosystem directly and indirectly influence cave fauna. Higher nutrient input in cave environments enables newcomers to be more competitive than the originally present troglomorphic organisms. Consequently obligate cave-dwelling organisms are threatened and may become extinct without restoration of previous natural conditions (Pipan, 2005).

In the last few years, many different views about unwanted phototrophs in caves have appeared, but the main question was not what these green cave dwellers are, but how to prevent their growth (Planina 1974; Ash et al., 1975; Caumartin, 1977; Caumartin, 1986; Iliopoulou-Georgoudaki et al., 1993; Gurnee, 1994; Byoung-woo, 2002; Hazslinszky, 2002; Lochner, 2002; Olson, 2002; Merdenisianos, 2005). An important problem occurs when lampenflora becomes covered with $CaCO_3$, irrespective of whether this carbonate is a result of abiotic or biotic precipitation. Such an amorphous mix of dead phototrophs and $CaCO_3$ irreversibly destroys the natural heritage of speleothems or other objects of cultural value (Mulec, 2005). Loss of historic paintings and objects in caves due to biological activities is becoming an important problem. The purpose of this paper is to review various methods to control lampenflora growth and to select the most appropriate one.

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[2] National Institute of Biology, Večna pot 111, SI-1000 Ljubljana, Slovenia, gorazd.kosi@nib.si

Balcones Canyonlands Preserve Karst Management 2004 Annual Report

Travis County Natural Resources
and the City of Austin BCP – AWU

Travis County Parks and Natural Resources
Project Numbers 0905-0312, 0905-0323, 0905-0324

January 2005

1.0 REGIONAL PERMIT

There are six species of endangered karst invertebrates and 25 karst species of concern (SOC) covered by the Balcones Canyonlands Conservation Plan (BCCP), a regional 10(a)1(b) permit issued by the U.S. Fish and Wildlife Service (USFWS) to the City of Austin (COA) and Travis County (TC) in May 1996. If these 25 species of concern become listed as endangered in the future, no additional mitigation would become necessary to protect them if all of the karst protection outlined in the BCCP is fully implemented. Many of the species of concern may actually be as endangered, or more so than the currently listed species. The SOC have no protection under the Endangered Species Act of 1973, as amended, so the SOC caves lack the federal protections given to the endangered species caves.

The Regional Permit requires protection of 35 endangered species (ES) caves and 27 caves additional caves that support SOC that are not currently listed by the USFWS for a total of 62 karst features (60 caves, 1 mine and 1 karst spring).

The six species of endangered karst invertebrates in Travis County are:

Tooth Cave pseudoscorpion	*Tartarocreagris texana*	Kretschmarr Cave mold beetle	*Texamaurops reddelli*
Tooth Cave spider	*Neoleptoneta myopica*	Bee Creek Cave harvestman	*Texella reddelli*
Tooth Cave ground beetle	*Rhadine persephone*	Bone Cave harvestman	*Texella reyesi*

The 25 additional karst species of concern to be protected by the regional permit are:

FLATWORMS	*Sphalloplana mohri*	**PSEUDOSCORPIONS**	*Aphrastochthonius* N. S.
OSTRACODS	*Candona* sp. nr. *stagnalis*		*Tartarocreagris comanche*
SPIDERS	*Cicurina bandida* (#1)*		*Tartarocreagris reddelli*
	Cicurina cueva (#4)		*Tartarocreagris intermedia (#2)*
	Cicurina ellioti (#5)		*Tartarocreagris* N. S. 3
	Cicurina reddelli (#3)	**HARVESTMEN**	*Texella spinoperca* (#2)
	Cicurina reyesi (#6)	**GROUND BEETLES**	*Rhadine s. subterranea*
	Cicurina travisae (#7)		*Rhadine s. mitchelli*
	Cicurina wartoni (#9)		*Rhadine austinica*
	Neoleptoneta concinna	**ISOPODS**	*Caecidotea reddelli*
	Neoleptoneta devia		*Trichoniscinae* N. S.
	Eidmannella reclus		*Miktoniscus* N. S.
MILLIPEDES	*Speodesmus* N. S.		

*Numbers #1-9 correspond to species listing in the Final HCP-EIS, Section 2-66.

2.0 CAVE MANAGEMENT SUMMARY

This annual report covers the fiscal year 10/01/03-9/30/04 and is referred to in this document as "2004". In 2004, the Balcones Canyonlands Conservation Plan (BCCP) partners continued efforts to determine and track cave status of the 62 karst features covered by the BCCP 10(a) permit. The permit holders continued efforts to acquire, protect, and monitor the karst species in the caves included in the Permit.

Table 1 – Endangered Karst Invertebrate Locations in Travis County, Texas. This table is revised for 2004 from the HCP (USFWS 1996) to show new species location information from James Reddell (2004).

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion	Tooth Cave Spider	Tooth Cave Ground Beetle	Kretschmarr Cave Mold Beetle	Bee Creek Cave Harvestman	Bone Cave Harvestman
Amber Cave	BCP Jollyville/ TC	Jollyville Plateau	X			X		
Bandit Cave	Private	Rollingwood					P	
Beard Ranch Cave	BCP Ivanhoe/COA	Jollyville Plateau						X
Bee Creek Cave	Private	Rollingwood					X	
Beer Bottle Cave	***Not Protected under BCCP***	McNeil/Round Rock						X
Broken Arrow Cave	BCP Lime Cr. Prs./COA	Cedar Park			X			
Cave Y	Barton Creek Grblt/COA	Rollingwood					**"P" 1996 delete "P" 2004**	
Cold Cave	Private	McNeil/Round Rock						X
Cotterell Cave	BCP Spicewood Spgs. Pk./COA	Central Austin						X
Disbelievers Cave	BCP Private 10(a)	Jollyville			X			
Eluvial Cave	BCP Private 10(a)	Jollyville						X
Fossil Cave	Schroeter Pk./COA	McNeil/Round Rock						X
Fossil Garden Cave	Private	McNeil/Round Rock						X
Gallifer Cave	Private TSNL/TC owns surrounding land	Jollyville Plateau		P	P			X
Hole-in-the-Road	Private	McNeil/Round Rock						X
Japygid Cave	BCP Private 10(a)	Jollyville			X	P		
Jest John Cave	BCP Forest Ridge/COA	Jollyville Plateau					X	
Jester Estates Cave	BCP Forest Ridge/COA	Jollyville Plateau					X	
Jollyville Plateau Cv.	BCP Private 10(a)	Jollyville			X			X
Kretschmarr Cave	Private TSNL	Jollyville Plateau			X	X		
Kretschmarr Dble. Pit	Private TSNL	Jollyville Plateau	P		P		P	
Lamm Cave	Private Section 7	Jollyville Plateau			X			
Little Bee Cr. Cave	BCP Ullrich WTP/COA	Rollingwood					X	
McDonald Cave	BCP Jollyville/TC	Jollyville Plateau						X
McNeil Bat Cave	Private	McNeil/Round Rock						X
Millipede Cave	Not Protected under BCCP	McNeil/Round Rock						X
M.W.A. Cave	BCP Private 10(a)	Jollyville	P		X	P		X
New Comanche Tr. Cave	Private	Jollyville Plateau		X				X
No Rent Cave	Private	McNeil/Round Rock						X
North Root Cave	Private TSNL	Jollyville Plateau			X			
Puzzle Pits Cave	Not Protected under BCCP	Jollyville			X			
Rolling Rock Cave	BCP Lime Cr. Prs./COA, Sec.10(a)	Cedar Park			X			
Root Cave	Private TSNL	Jollyville Plateau			X			X
Spider Cave	BCP Park West/COA	Jollyville Plateau			**"P" 1996 "X" 2004**		**"X" 2004**	**"P" 1996** delete "P" 2004
Stovepipe Cave	Private Sec. 7	Jollyville Plateau	P	P	X	X		P
Tardus Hole	Private TSNL	Jollyville Plateau			X			
Tooth Cave	Private TSNL	Jollyville Plateau	X	X	X	X		X
Weldon Cave	Private	McNeil/Round Rock						X
West Rim Cave	Not Protected under BCCP	Central Austin						X
Known Locations (In Permit area)			2	2	14	4	4	20
Possible Locations (In Permit area)			3	2	3	2	3	2

Source: Elliott 1992 and USFWS (1994)

X = confirmed occurrence based on collected specimen

P = probably occurrence based on observation but not confirmed with collected specimen

Thirty-nine out of the 62 karst features (62 = 60 caves, one spring, and one mine) covered by this Karst Management Plan are privately owned. BCP Partners will work closely with non-profit groups and other interested parties to protect the listed karst features.

Nineteen caves are protected as part of the BCP on COA owned or managed land (managed by the Austin Water Utility Dept.-BCP office), one on The Nature Conservancy (TNC) land, two on Travis County (TC) land, 7 caves (entrances only) are protected on TSNL land, 2 caves are protected on Texas Cave Management Association (TCMA) land, 8 caves are protected as part of private Section 10(a) or Section 7 agreements with USFWS, one is protected by a private landowner (Bandit Cave), and one private cave is informally protected by TC (Talus Springs Cave). A total of 43 of the BCCP caves are "protected" in some way, with 19 "unprotected" (including Fossil Cave since its location and status in the park is unknown). This is the only publicly owned "unprotected" cave. Some "protected" caves only have protected entrances, but are threatened by surrounding development or planned development. With the exception of the Four Points: Northeast Cluster, which is protected by a private 10(a) agreement and some of the caves in the Four Points Northwest Cluster, all the caves in clusters to be protected by the permit are threatened by potential development near the caves (Tables 1&2)

In addition to managing the karst features required in the BCCP permit, BCP Partners are also voluntarily managing other karst features located on preserve land, such as Testudo Tube (COA) and several non-BCP karst features.

3.0 KARST FEATURE STATUS

The following table lists the names and status in 2004 of the 62 caves/karst features listed in the BCCP permit.

Table 2 Status in 2004 of the 62 caves/karst features listed in the BCCP permit with 35 with ES and 27 additional caves with SOC.

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster	2004 Status
Adobe Springs Cave	SOC	BCP Lehmann/TNC		Good
Airman's Cave	SOC	BCP Barton Creek/COA		Good
Amber Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)	Good, too close to roadway
Armadillo Ranch Sink	SOC	Private		Unknown
Arrow Cave	SOC	BCP Slaughter Cr. Pk./COA		Good
Bandit Cave	ES	Private		Good, the owner is ecologically concerned
Beard Ranch Cave (Featherman's	ES	BCP Ivanhoe/COA		Good

Cave)				
Bee Creek Cave	ES	Private		Unknown
Blowing Sink Cave	SOC	BCP COA		Good
Broken Arrow Cave	ES	BCP Lime Crk Pres/COA		Good
Buda Boulder Spg.	SOC	BCP Shoal Creek Grblt./COA		Good
Cave X	SOC	Private/COA Protection Agreement		Unknown, New agreement not working smoothly yet
Cave Y	ES	BCP Barton Creek Grblt/COA		Good
Ceiling Slot Cave	SOC	Private		Unknown
Cold Cave	ES	Private	Northwood Cl.	Unknown
Cotterell Cave	ES	BCP Spicewood Spgs. Pk./COA		Good
Disbelievers Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)	Good
District Park Cave	SOC	BCP D.Nickols Pk./COA		Good
Eluvial Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)	Good
Flint Ridge Cave	SOC	Prop 2/COA		Good
Fossil Cave	ES	BCP Schroeter Pk./COA		Can't find entrance, area in park protected however, FWS thinks taken
Fossil Garden Cave	ES	Private	McNeil Cl.	Unknown
Gallifer Cave	ES	Private TSNL/ surrounding land to TC 12/03	4 Points Cl (Parke)	Good
Get Down Cave	SOC	Private/COA Protection Agreement with TCMA		Good, implementing agreement, COA/TCMA management agreement pending
Goat Cave	SOC	BCP Goat Cave Karst Preserve/COA		Good
Hole-in-the-Road	ES	Private	Northwood Cl.	Unknown
Ireland's Cave	SOC	Private Circle C		Poor, watershed probs., golf course new development, with a proposed grossly inadequatt setback
Jack's Joint	SOC	Private		Unknown
Japygid Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)	Good
Jest John Cave	ES	BCP Forest Ridge/COA		Good
Jester Estates Cave	ES	BCP Forest Ridge/COA		Good COA recently took over management
Jollyville Plateau Cv.	ES	BCP Private 10(a)	4 Points Cl. (Perot)	Good
Kretschmarr Cave	ES	Private TSNL	4 Points Cl. (Parke)	Good
Kretschmarr Dble. Pit	ES	Private TSNL	4 Points Cl. (Parke)	Good
Lamm Cave	ES	BCP Private Section 7		Entrance OK, FWS considers taken
Little Bee Cr. Cave	ES	BCP Ullrich WTP/COA		Good
Lost Gold Cave	SOC	Private		Unknown, new owner
Lost Oasis Cave	SOC	Private TCMA		Good
M.W.A. Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)	Good
Maple Run Cave	SOC	BCP Goat Cave Karst Preserve/COA		Good
McDonald Cave	ES	BCP Jollyville/TC		Good
McNeil Bat Cave	ES	Private	McNeil Cl.	Unknown
Midnight Cave	SOC	BCP Slaughter Cr. Pk./COA		Good
Moss Pit	SOC	Private		Unknown
New Comanche Tr.	ES	Private		Unknown

Cave				
No Rent Cave	ES	Private	McNeil Cl.	Unknown
North Root Cave	ES	Private TSNL	4 Points Cl (Parke)	Good
Pennie's Cave	SOC	Private		Destroyed (cave filled in)
Pickle Pit	SOC	BCP Private Sec. 7		Unknown
Pipeline Cave	SOC	Private		Unknown
Rolling Rock Cave	ES	BCP Lime Cr. Prs./COA		Good
Root Cave	ES	Private TSNL	4 Points Cl (Parke)	Good
Slaughter Creek Cave	SOC	BCP Slaughter Cr.Pk./COA		Good
Spanish Wells	SOC	Private		Unknown
Spider Cave	ES	BCP Park West/COA		Good
Stark's North Mine	SOC	Private		Unknown, Recently sold
Stovepipe Cave	ES	BCP Private Sec. 7		Unknown, (fence cut, illegal acces), Appears permit holder not protecting adequately
Talus Springs Cave	SOC	Private/ 10(a) permit, TC checks entrance		Good/Unknown, only 50' setback from dev.
Tardus Hole	ES	Private TSNL	4 Points Cl (Parke)	Good
Tooth Cave	ES	Private TSNL	4 Points Cl (Parke)	Good
Weldon Cave	ES	Private	McNeil Cl.	unknown
Whirlpool Cave	SOC	Private TCMA		Good

Many of the caves designated here as "protected" with the status of "good" in this table do not have large enough buffer areas around the caves to be adequately protected to meet the new requirements listed in *the U.S. Fish and Wildlife Service Draft Recommendations for Karst Preserve Design, March, 2001 Version,* including many caves that were considered "protected" under USFWS individual 10a permits in years past. The new USFWS preserve design directs that the protected area surrounding the cave must be 59-89 acres in size to capture the majority the plant and animal community elements in viable numbers needed to support the cave species. The terms "protected" and "good" listed in this document refer to caves with some amount of setback around the entrance and some amount of protection over the footprint of the cave and do not necessarily provide this large protected area acreage.

Caves on Balcones Canyonlands Preserve (BCP) land generally have adequate buffer areas and are receiving adequate protection, however some are too close to adjacent development or the protected areas are not large enough to adequately protect the caves under the new criteria. Also some of the caves listed as "protected" under individual USFWS Section 10(a) or Section 7 permits may not be managed to adequately protect them.

The COA currently has two Private Landowner Agreements to protect BCP caves but obtaining and managing these agreements has been challenging.

Though the TSNL caves have "protected" entrances, the privately owned areas around the small cave tracts are not large enough to adequately protect the footprint and drainage areas around the caves. TSNL is negotiating with Travis County about accepting ownership of these caves with the transfer pending for Dec. 2004.

4.0 ACCESS STATUS AND KARST EDUCATION

In the fiscal year 10/01/03-9/30/04, the total number of visitors in the City of Austin's BCCP caves for educational/recreational/rescue training that were issued access permits were: District Park Cave (0), Maple Run Cave (14), Midnight Cave (15), Whirlpool Cave (876), Goat Cave (150) and Get Down Cave (6). The City of Austin issued a Scientific/Research permit to Rob Jackson, and Will Pockman for Cotterell Cave.

The following table lists caves that are currently gated, fenced and/or open to the public, and also protection and monitoring status.

Table 3: 62 BCP karst feature status.

Cave Name	Gated/Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status (Yes= surveys done regularly in last 12 months)	Public Access
Adobe Springs Cave	Tract perimeter	Protected on preserve		none
Airman's Cave		Protected on parkland	COA species and surface monitoring	open
Amber Cave	Gated	Protected on preserve – too close to road and sewer line	TC surface monitoring	none
Armadillo Ranch Sink		Unknown		none
Arrow Cave	Gated	Protected in parkland	COA annual species and surface monitoring	none
Bandit Cave	Gated	Protected by private ecologically concerned landowner		none
Beard Ranch Cave		Protected on preserve	COA annual species and quarterly surface monitoring	none
Bee Creek Cave		Unknown		none
Blowing Sink Cave	Gated [1]	Protected on preserve	COA annual species and quarterly surface monitoring	none
Broken Arrow Cave		Protected on preserve	COA annual species and quarterly surface monitoring	none
Buda Boulder Spg.		Protected in parkland	COA annual species monitoring	none
Cave X	Gated and fence	Protected by landowner with 4.5 acre setback to protect cave footprint. Protected to some extent (not actively managed an set back is inadequate)		none
Cave Y	Gated	Protected in parkland	COA annual species and quarterly surface monitoring	none
Ceiling Slot Cave		Unknown		none
Cold Cave		Unknown		none
Cotterell Cave	Fenced	Protected in parkland	COA species and surface monitoring	none
Disbelievers Cave		Protected by 10a permit, hired ACI Consulting		none

District Park Cave	Gated after the 1	Protected in parkland	COA species and surface monitoring	1st room open, past the 1st room access by permit*
Eluvial Cave		Protected by 10a permit, hired ACI Consulting		none
Flint Ridge Cave	Gated	Protected in watershed protection Land (drainage basin will be negatively impacted the construction of a new highway).	COA annual species and quarterly surface monitoring	none
Fossil Cave		Protected in parkland	Exact location of cave is unknown	none
Flint Ridge Cave	Gated	Protected in watershed protection land		none
Fossil Cave		Protected in parkland		none
Fossil Garden Cave		Unknown		none
Gallifer Cave	Gated	Protected by TSNL and TC owns surrounding land.		none
Get Down Cave	Gated	Protected with Protection Agreement Inadequate setback from development.	TCMA species and surface monitoring	none
Goat Cave	Fenced	Protected on preserve	COA species and surface monitoring	access by permit*
Hole-in-the-Road		Unknown		none
Ireland's Cave	Fenced	Protected by landowner with 4.8 ac. Setback, watershed problems with golf course, set inadequate		none
Jack's Joint		Unknown		none
Japygid Cave		Protected by 10a permit, hired ACI Consulting		none
Jest John Cave		Protected on preserve	COA cricket exit count, bi-annual surface monitoring	none
Jester Estates Cave	Gated	Protected on preserve	COA annual species and quarterly surface monitoring	none
Jollyville Plateau Cv.	Gated [1]	Protected by 10a permit, hired ACI Consulting		none
Kretschmarr Cave	Gated [1] and Fenc	Protected by TSNL in fenced area. Too close to roadway and in powerline ROW. Potential development land too close east and west.		none
Kretschmarr Dble. Pit		Protected by TSNL in 5 ac tract and TC owns surrounding land.		none
Lamm Cave		Protected under Section 7 permit but setback is too		none
Little Bee Cr. Cave		Protected by COA WWW Dept		none
Lost Gold Cave	Gated	Unknown, new owner, may be development near cave entrance		none
Lost Oasis Cave	Gated and Fence	Protected by TCMA	TCMA species and surface monitoring	controlled access**
M.W.A. Cave		Protected by 10a permit, hired ACI Consulting		
Maple Run Cave	Gated	Protected on preserve	COA species and surface monitoring	access by permit*
McDonald Cave	Tract perimeter	Protected on preserve	TC surface monitoring	none
McNeil Bat Cave		Unknown		none
Midnight Cave	Fenced	Protected in parkland - Good	COA annual species and Quarterly surface monitoring	access by permit*
Moss Pit		Unknown		none
New Comanche Tr. Cave		Unknown		none
No Rent Cave		Unknown		none
North Root Cave		Some protection because TSNL owns the cave ent Potentially threatened with surrounding developm		none
Pennie's Cave		Destroyed (cave filled in)		none
Pickle Pit	Gated	Unknown		none
Pipeline Cave	Metal frame [1]	Unknown		none
Rolling Rock Cave		Protected on preserve	COA annual species and quarterly surface monitoring	none

Root Cave		Some protection because TSNL owns the cave ent Potentially threatened with surrounding developm		none
Slaughter Creek Cave	Gated	Protected in parkland	COA annual species and quarterly surface monitoring	none
Spanish Wells		Unknown		none
Spider Cave		Protected on preserve	COA annual species and quarterly surface monitoring	none
Stark's North Mine		Unknown, recently sold		none
Stovepipe Cave		Unknown - fence cut, illegal access. Appears pe holder not protecting adequately.		none
Talus Springs Cave	Gated	Protected by Homeowners Association and TC, is gated but only has 50' setback from houses and is probably effected by uphill develop	TC surface monitoring	none
Tardus Hole		Protected by TSNL in 5 ac tract, TC protects adjoining land on 3 sides.		none
Tooth Cave	Gated	Some protection because TSNL owns the cave ent Potentially threatened with surrounding developm		none
Weldon Cave		Unknown		none
Whirlpool Cave	Gated	Protected by TCMA	TCMA species and surface monitoring	controlled access**

* Access by Permit - Permit may be issued by COA – Austin Water Utility or PARD staff.

** Controlled Access - Private cave owners control the access

[1] Needs gate repairs/improved gate

5.0 MANAGEMENT COORDINATION AND OVERSIGHT

The City of Austin, Travis County and TCMA have continued to work together to standardize monitoring and reporting procedures.

In 2004, a Karst Sub-Committee of the Scientific Advisory Committee (that advises the BCP Coordinating Committee) was established to monitor BCP karst issues and make recommendations on BCP karst protection issues.

6.0 BIOLOGICAL MONITORING

The City of Austin's BCCP staff performed species surveys for Airman's, Broken Arrow, Cotterell Cave, District Park, Flintridge, Goat, Lost Gold, Maple Run and Midnight Caves.

Nico Hauwert with the COA-WPDRD continued his study on the surface catchment area of Flintridge cave. This study will help determine the potential negative impacts associated with the construction of state Highway 45 South.

Rob Jackson, professor at Duke and Will Pockman, professor at the University of New Mexico continued their study on water uptake of certain species of trees located within Cotterell cave.

Travis County's BCCP staff did surface monitoring of McDonald Cave and Amber Cave. For training purposes, county staff assisted local karst researchers holding USFWS permits with karst monitoring to receive training in karst biological survey methodology and species identification. County staff continued training activities with the goal of obtaining USFWS

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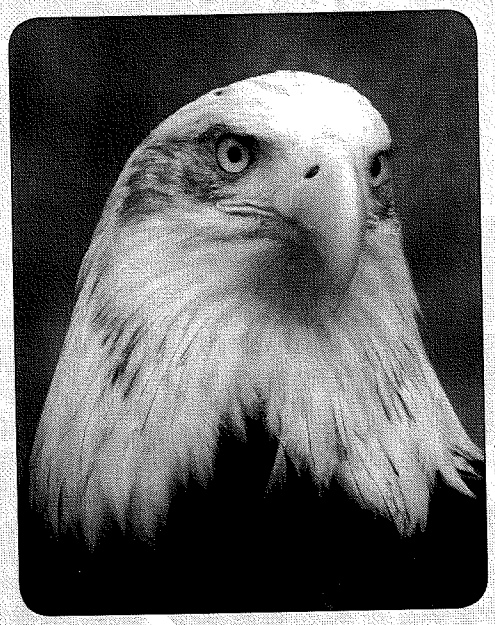


Recovery

Dale D. Goble

methods and procedures which are necessary to bring any [listed] species to the point at which the measures provided pursuant to this Act are no longer necessary."[10] The Act thus implicitly defines "recovery" as "no longer sufficiently at risk of extinction to be listed as endangered or threatened."

The agencies responsible for implementing the Act, U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries), have affirmed this understanding of the term in a series of regulations beginning in 1980.[11] For example, the FWS issued guidelines on recovery planning in 1990 that defined "recovery" as

> the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self-sustaining wild populations of species.[12]

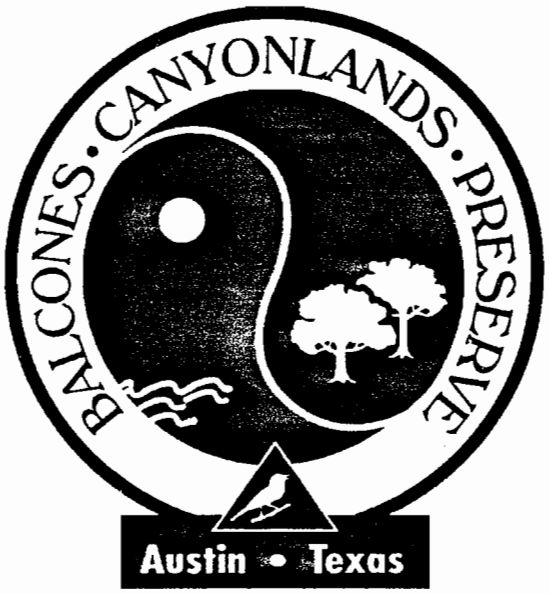
In short, the ESA and its implementing regulations define "recovered" to mean "no longer in need of the Act's protection." A species no longer requires the Act's protection when it is no longer endangered or threatened. Thus, it is the Act's definitions of "endangered" (i.e., "in danger of extinction throughout all or a significant portion of its range"[13]) and "threatened" (i.e., "*likely* to become an endangered species *within the foreseeable future* throughout all or a significant portion of its range"[14]) that provide the applicable standards for determining whether a species has "recovered."

"Recovery" as Risk Assessment

"Endangered" and "threatened" are risk-based standards. As first-year torts students quickly discover, "risk" is the possibility that something bad may happen.[15] Under the ESA, the "something bad" is the extinction of a species. This bad has two components. The first is *uncertainty*: What is the probability that the species will become extinct? The second issue is *time*, since extinction is a process rather than a tort-like calamitous event: What is the temporal scale over which the risk of extinction is to be assessed? Thus, in assessing the status of species (i.e., deciding to list, reclassify, or delist a species), the FWS and NOAA must determine the probability that the species will become extinct over some period of time.

The Act's definitions of "endangered" and "threatened" provide some limited guidance on these questions. To be "endangered," the Act specifies the required probability of extinction as "in danger"; to be "threatened," the probability is that the species is "likely to become" in danger. These are obviously vague and only marginally helpful statements.[16] How much "in danger" must a species be to be "endangered"? Beyond a vague "more," how does that degree of risk differ from the degree of risk that is "likely to become" in danger? Or is the difference between "endangered" and "threatened" to be determined solely on a temporal scale? That is, is an endangered species "in danger" *now* while a threatened species is "in danger" *within the foreseeable future*? How long is "foreseeable" on a planet that is 4.567 billion years old? And, since species have always gone extinct, are there any species that are truly not "foreseeably" at risk of extinction?

HABITAT CONSERVATION PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT



City of Austin & Travis County, Texas

March 1996

required.

b. Alternative 2: Regional Permit

Impacts

All known localities of the endangered karst invertebrates in the BCCP preserve area and the current protection status for them are listed in Table 22. Some of these caves will be protected in individual cave preserves and others will be in cave clusters (Figure 20). Cave clusters include the general area surrounding caves and other karst features at three locations in the plan area (Figure 21). These clusters are the McNeil, Northwood, and Four Points clusters. Hydrogeological investigations will be performed for each cave cluster prior to the delineation of final boundaries of the areas to be protected. Detailed hydrogeological studies have been completed for the Four Points cave cluster (Veni and Associates 1988); thus, acquisition can proceed for this cave cluster.

The delineation of appropriate boundaries for the individual preserves will require additional studies by the BCCP Coordinating Committee to delineate the surface and subsurface hydro-geologic boundaries for the cave and the surface area necessary to maintain the biological resources important to the cave.

Some caves in the area are currently protected to varying degrees by the landowner (e.g., Bandit Cave, Bee Creek Cave); in such cases, the Coordinating Committee or their designated representative will work with the owners to obtain written conservation agreements to protect the caves.

There are 39 known endangered karst invertebrate localities shown in Table 22. Of these, all but four are proposed for protection by the BCCP. Beer Bottle Cave, Millipede Cave, Puzzle Pits Cave, and West Rim Cave do not support a diverse fauna and contain the most widely distributed federally-listed cave invertebrates. The take of these caves would still allow protection of the species.

There are an additional 27 karst features that contain one or more of the 25 karst species of concern. This plan will protect the environmental integrity of these features through acquisition and management or implementation of a management/conservation agreement with entities that influence the hydrogeological area needed to protect the feature.

The recommended plan protects most of the known localities. However, although the BCCP permit area has been extensively searched for caves and karst features, the possibility remains that features may be found that provide habitat for listed species or

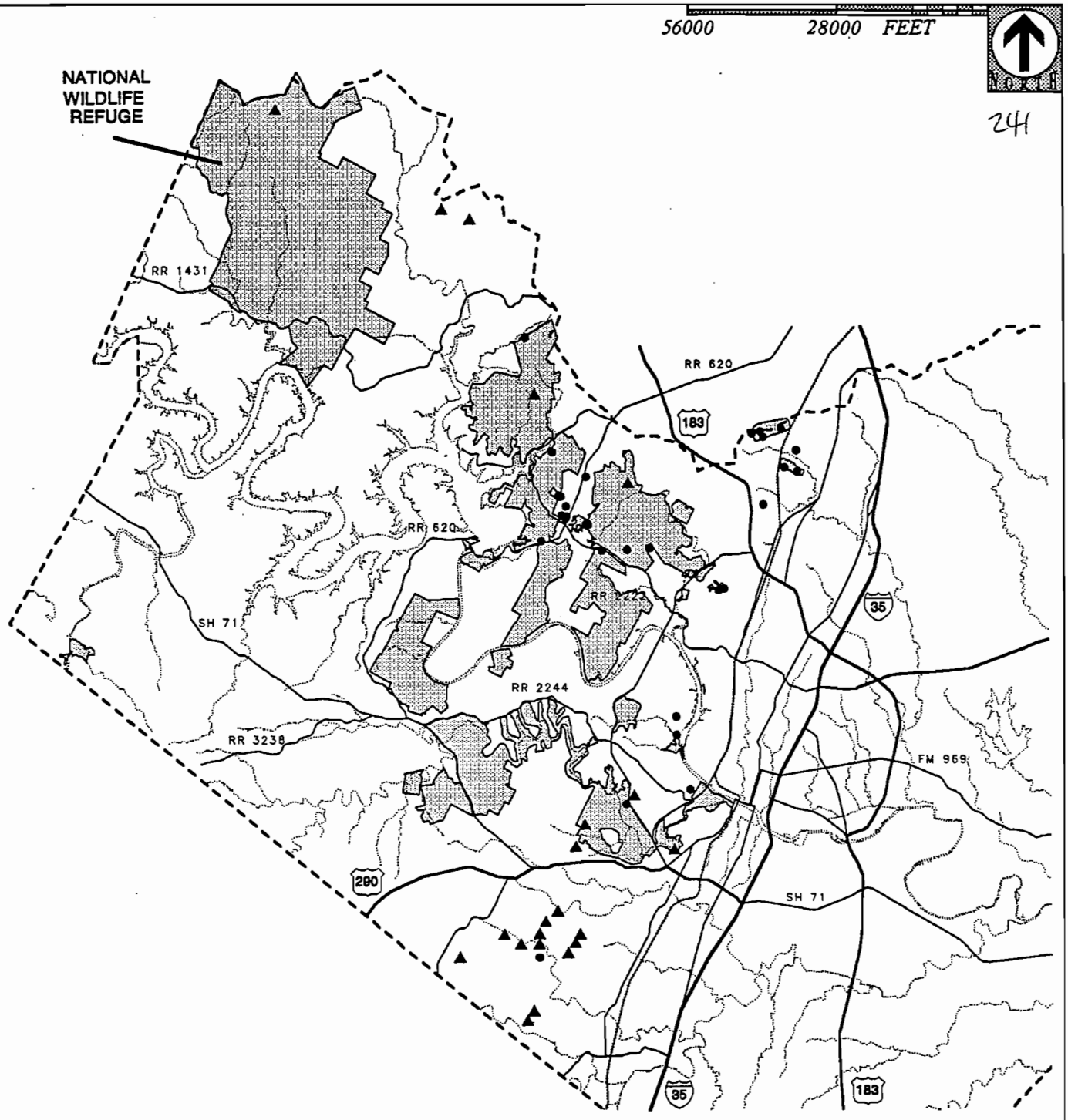
TABLE 22
ENDANGERED KARST INVERTEBRATE LOCATION IN TRAVIS COUNTY, TEXAS

Cave Name	Current Preserve Status	Karst Fauna Region	Occurrence of Projected Species					
			Tooth Cave Pseudoscorpion	Tooth Cave Spider	Tooth Cave Ground Beetle	Kretschmarr Cave Mold Beetle	Bee Creek Cave Harvestman	Bone Cave Harvestman
Amber Cave		Jollyville Plateau	X			X		
Bandit Cave	Owner Cooperation	Rollingwood					P	
Beard Ranch Cave		Jollyville Plateau						X
Bee Creek Cave	Owner Cooperation	Rollingwood					X	
Beer Bottle Cave	Not Protected	NcNeil/Round Rock						X
Broken Arrow Cave	COA	Cedar Park			X			
Cave Y	COA	Rollingwood					P	
Cold Cave	Protected by Owner	McNeil/Round Rock						X
Cotterell Cave	COA	Central Austin						X
Disbelievers Cave		Jollyville			X			
Eluvial Cave		Jollyville						X
Fossil Cave	COA	McNeil/Round Rock						X
Fossil Garden Cave		McNeil/Round Rock						X
Gallifer Cave		Jollyville Plateau		P	P			X
Hole-in-the-Road		McNeil/Round Rock						X
Japygid Cave		Jollyville			X	P		
Jest John Cave	COA	Jollyville Plateau					X	
Jester Estates Cave	Protected by Owner	Jollyville Plateau					X	
Jollyvide Plateau Cave		Jollyville			X			X
Kretschmarr Cave		Jollyville Plateau			X	X		
Kretschmarr Double Pit		Jollyville Plateau	P		P		P	
Lamm Cave	Semi-protected	Jollyville Plateau			X			
Little Bee Creek Cave	COA	Rollingwood					X	
McDonald Cave		Jollyville Plateau						X
McNeil Bat Cave		McNeil/Round Rock						X
Millipede Caven	Not Protected	McNeil/Round Rock						X
M.W.A. Cave		Jollyville	P		X	P		X
New Comanche Trail Cave		Jollyville Plateau		X				X
No Rent Cave		McNeil/Round Rock						X
North Root Cave		Jollyville Plateau			X			
Puzzle Pits Cave	Not Protected	Jollyville			X			
Rolling Rock Cave	TPWD	Cedar Park			X			
Root Cave		Jollyville Plateau			X			X
Spider Cave	COA	Jollyville Plateau			P			P
Stovepipe Cave	Individual Preserve	Jollyville Plateau	P	P	X	X		P
Tardus Hole		Jollyville Plateau			X			
Tooth Cave		Jollyville Plateau	X	X	X	X		X
Weldon Cave		McNeil/Round Rock						X
West Rim Cave	Not Protected	Central Austin						X
KNOWN LOCATION			2	2	14	4	4	20
POSSIBLE LOCATION			3	2	3	2	3	2

SOURCE: Elliott 1992 and USFWS (1994).

X = confirmed occurrence based on collected specimen

P = probable occurrence based on observation but not confirmed with collected specimen



LEGEND

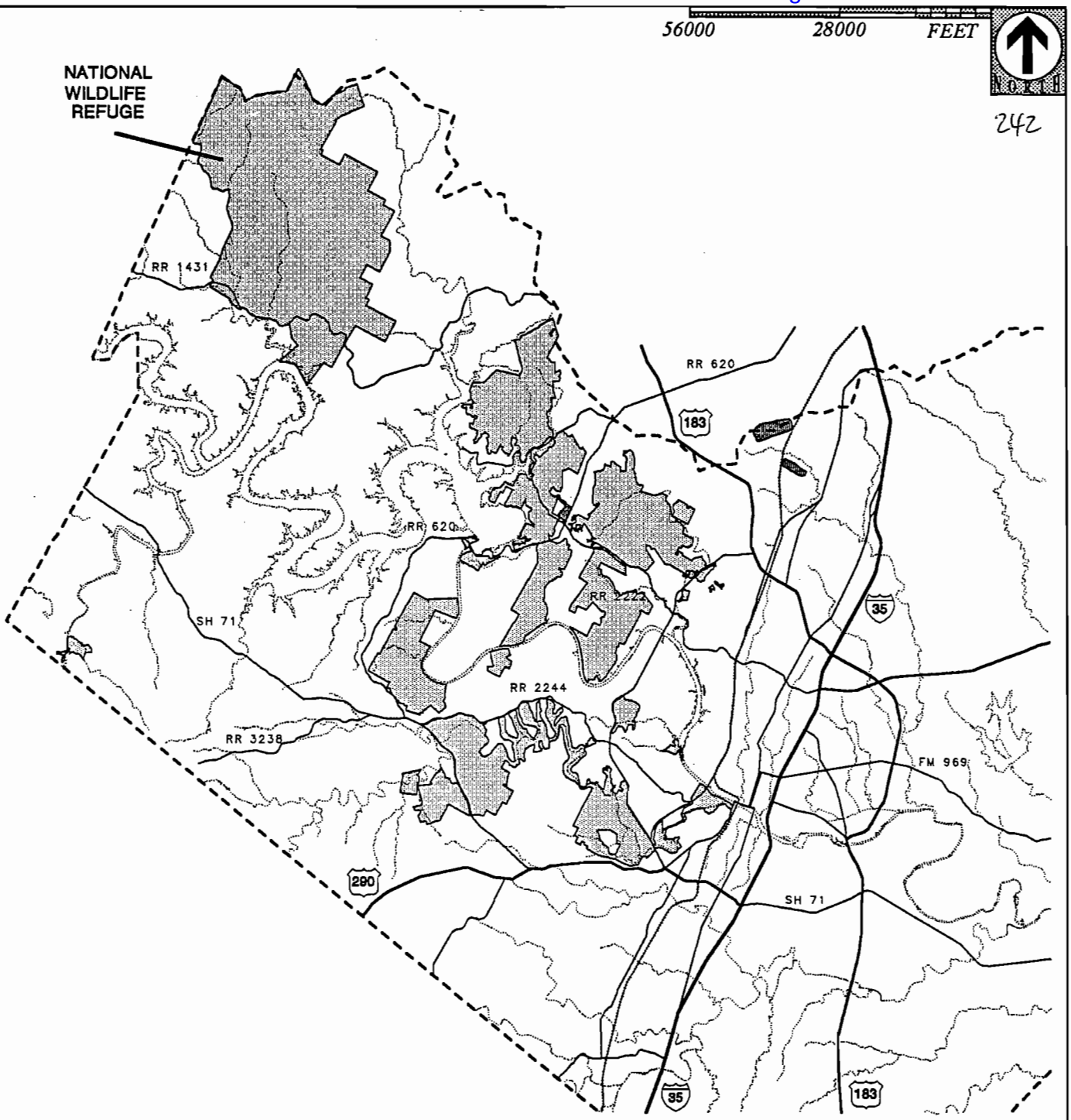
- ▲ Rare Karst Species
- • Known Endangered Species
- Preserve

Source: KSB&A and EH&A 1992
TNRIS in lit.

FIGURE 20

Karst Species Locations
Relative to Proposed Bird Preserve

RECON



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LEGEND

Karst Clusters

Preserve

Source: KSB&A and EH&A 1992
TNRIS in lit.

FIGURE 21

Karst Clusters and
Bird Preserves within the Plan Area

RECON

other equally rare karst invertebrates. In such cases, the BCCP Coordinating Committee will attempt to protect such karst features, using the protection strategies discussed above.

The uniformity of distribution of the karst invertebrates throughout the potential karst habitat is not well understood, and creates some uncertainty about the extent of take which may occur under the proposed plan. The results of studies on the proposed Lakeline Mall site indicate that these species may be distributed through at least portions of the karst that are not accessible to humans. Studies from other locations indicate that the distribution of subterranean invertebrates is limited by the availability of nutrients from the surface. Even where substantial subsurface voids occur there may not be invertebrates without a nutrient connection to the surface. While the proposed plan attempts to protect known localities and significant areas of potential karst habitat, some areas of occupied karst habitat that are not known to be occupied may be taken under the plan.

Table 9 summarizes the acreage of potential karst invertebrate habitat in the BCCP area, as shown in Figure 14. Approximately 45,368 acres of potential karst invertebrate habitat occurs in the plan area (52,972 acres, according to Community Land Resources, Inc.). Of this total, approximately 6,702 acres (15 percent) occurs in preserve acquisition areas, including cave clusters, and 2,596 acres (6 percent) is in public/institutional land, for a total of 9,298 acres (20 percent) in preserve areas. However, it is projected that 66 percent of the lands in preserve acquisition areas will be acquired, thus, 7,019 acres (15 percent) is the best available estimate of the potential karst invertebrate habitat the plan will protect. This number may vary depending on the specific tracts which are included in the final preserve system, and may increase if sufficient funding is available. The unprotected habitat is at least 36,070 acres (80 percent), and may be as much as 38,349 acres (85 percent). This is the area of unprotected potential karst invertebrate habitat that would be subject to take under the proposed plan.

Significance of Impacts

According to the USFWS review of the BCCP, ". . . the draft BCCP has done an excellent job of identifying species and karst systems that should be protected." Further, the USFWS states that, ". . . based upon the information available at this time, the BCCP would provide adequate protection for the current federally-listed cave invertebrates and the majority of the cave invertebrates likely to be listed over the life of the permit" (KSB&A and EH&A 1992: Exhibit E).

Final

Williamson County Regional Habitat Conservation Plan

Prepared for:

Williamson County Conservation Foundation

The Honorable Lisa Birkman,
President and Commissioner, Precinct 1

Prepared by:

SWCA Environmental Consultants

Smith, Robertson, Elliott, Glen, Klein & Bell, L.L.P.

Prime Strategies, Inc.

Texas Perspectives, Inc.

August 15, 2008

SWCA Project Number 10622-139-AUS

Two categories of species are addressed in this RHCP: covered species and additional species. "Covered species" are the federally listed species to be included on and covered by the Permit. The covered species in the Williamson County RHCP include two federally listed karst invertebrates: the Bone Cave harvestman (*Texella reyesi*) and Coffin Cave mold beetle (*Batrisodes texanus*). Two federally listed bird species are covered as well: the golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapilla*). Twenty-four "additional species" addressed in the RHCP, including the Tooth Cave ground beetle (*Rhadine persephone*), which is currently listed as endangered, are not covered by the Permit.[2] As the RHCP is being implemented, the Foundation will evaluate on an ongoing basis the degree to which the plan is providing conservation benefits to these additional species and what supplementary measures, if any, the Foundation could implement through the RHCP to contribute to their conservation. If the County determines that coverage of any additional species would benefit both the landowners of Williamson County and the species in question, the County may apply for any appropriate amendments to the RHCP and the Permit.

In addition to providing the affected landowners of Williamson County with an improved process for complying with the Endangered Species Act, the primary purposes of this RHCP are to 1) contribute to and facilitate the recovery of the federally listed endangered Bone Cave harvestman, Coffin Cave mold beetle, golden-cheeked warbler, and black-capped vireo (the covered species); and 2) assist the Service in precluding the need to list the 19 rare, currently *non-listed* karst species and four rare salamander species (all additional species). The conservation actions, as detailed in the RHCP, will facilitate compliance with the Endangered Species Act by implementing a comprehensive, coordinated strategy for future species conservation throughout the County.

The incidental take of covered species associated with the following otherwise lawful activities would be authorized under and in accordance with this RHCP: road construction, maintenance, and improvement projects; utility installation and maintenance, including but not limited to power and cable lines; water, sewer, and natural gas pipelines; construction of plants and other facilities; school development or improvement projects; public or private construction and development; and land clearing. The activities authorized under this RHCP are expected to impact the covered species in the County. Direct impacts to covered species may occur if development and construction results in the disturbance, alteration, or removal of occupied and potentially occupied habitat. Species may also be indirectly impacted by negative changes in habitat quality, which may occur due to removal of existing vegetation, alteration of drainage patterns, increased habitat fragmentation, increased populations of predatory or competitive species, and other indirect effects of proximity to development activities.

ANTICIPATED IMPACTS (TAKE) AND MITIGATION

An objective of the RHCP is to promote the conservation of endangered and rare species in Williamson County by helping plan participants avoid and minimize impacts to suitable habitat for these species. The plan also is designed to help participants minimize disturbance during the

[2] This RHCP does not anticipate the need for permitting take of the Tooth Cave ground beetle because in Williamson County it is restricted to the Cedar Park area, which has little open space left for new development that would potentially affect the species.

Table ES-1. Summary of the Williamson County RHCP anticipated take and mitigation for the covered species and conservation measures for the Georgetown salamander and other additional species.

Species	How Level of take Determined	Estimated Covered Take Over Life of RHCP[1]	Participation Fee Structure	Mitigation or Conservation Measures
Bone Cave Harvestman and Coffin Cave Mold Beetle	Impacts to species-occupied caves based on effects to cave moisture regime (surface recharge area) and nutrient input (primarily cave cricket foraging area) measured in distance from cave. Number of species-occupied caves in two zones: Impact Zone A (50–345 ft from cave footprint). Impact Zone B (within 50 ft of cave footprint).	210 species-occupied caves, including: Impact Zone A: 150 caves. Impact Zone B: 60 caves (including one previously undetected species-occupied void per year discovered and destroyed during construction).	Karst Zone (includes impacts to previously undetected species-occupied voids and other direct and indirect incidental take outside of Impact Zones A and B, below): $100/acre Species-occupied caves: Disturbance in Impact Zone A: $10,000/acre Disturbance in Impact Zone B (does not include impacts to previously undetected species-occupied voids): $400,000 flat fee.	By Year 10 acquire and manage 9 to 15, 40- to 90-acre KFAs totaling approximately 700 acres (a minimum of three KFAs in each of the three KFRs occupied by the covered karst species). To qualify as Service-approved, long-term, viable KFAs, the KFAs may be newly established or may be existing karst conservation areas enlarged and/or put under permanent management. To enhance RHCP efforts towards recovery of listed invertebrates preserve up to six additional KFAs acquired with Endangered Species Act section 6 funds or other sources. Assume management/ monitoring of 10 of the 22 existing karst conservation areas.
Golden-cheeked Warbler	Acres of impact to known and potential habitat patches verified with habitat assessments or breeding bird surveys.	Direct and Indirect Impacts: 6,000 acres.	$7,000/acre for impacted habitat beginning in Year 2, increasing by $500/year for 10 years.	Purchase 500 Hickory Pass Ranch mitigation credits each in Years 1 and 4 (1,000 total) and establish a preserve(s)/ conservation bank(s) in the County.[2] Possibly purchase additional mitigation credits outside the County.
Black-capped Vireo	Same as for golden-cheeked warbler	Direct Impacts: 4,267 acres.	$5,000/acre for impacted potential or occupied habitat, with fees increases evaluated on an annual basis.	As accumulated participation fees allow, restore and/or enhance protected vireo habitat on a rolling basis.
Georgetown Salamander	N.A.	N.A.	N.A.	Conduct research and monitoring in Years 2–6, develop a conservation strategy for the species in Year 2, and explore feasibility of a Candidate Conservation Agreement with Assurances.
Additional Species	N.A.	N.A.	N.A.	Mitigation measures for covered species likely to benefit some or all additional species. Fund and manage research and public awareness programs. Periodically evaluate effect of beneficial actions and potential need to convert additional species to covered species.

[1] The estimate of covered take is based on a projected 20% level of participation in the plan, a level that may be exceeded over the life of the RHCP. This reasonable estimate is not intended to establish a maximum amount of authorized take; rather, because the mitigation and conservation measures of the RHCP for the covered karst species amount to satisfaction of recovery criteria, all covered take within the karst will be fully mitigated.

[2] Williamson County has already purchased the first 500 acres of Hickory Pass Ranch Conservation Bank mitigation credits, as well as 115.52 acres of in-county warbler mitigation credits at the Whitney Tract near Lake Georgetown.

Approximately 15.5 percent (112,000 acres; 45,325 hectares) of the County is underlain by geology that is likely to contain caves with endangered karst invertebrates. At the present time, approximately 28.6 percent, or 32,000 acres (12,950 hectares), of the Karst Zone have already been developed or somewhat disturbed. This leaves approximately 80,000 acres (32,375 hectares) of currently undeveloped karst habitat in the County. At least 590 caves have been identified in Williamson County, with over 160 caves known to contain covered or additional species. The RHCP estimates that participation levels under this incidental take permit will range from 10 to 20 percent (i.e., it is anticipated that 10–20 percent of future development on the remaining 80,000 acres of undeveloped karst habitat in the County will be authorized under this RHCP).

To avoid overestimating income from participation, the RHCP assumes 10 percent participation for income estimates. Caves both with and without surface expressions and with and without listed species will be encountered and impacted. To compensate for impacts to these previously undetected voids, the participation fee for any development in the Karst Zone as depicted in Figure ES-1 will be $100/acre.[7]

Over the 30-year life of the RHCP it is estimated that 150 species-occupied caves will be directly and/or indirectly impacted within an area between 50 feet (15 meters) and 345 feet (105 meters) from the cave footprint (Impact Zone A). The participation fee for such impacts to a known species-occupied cave will be $10,000/acre. Based on historical development patterns and related cave discoveries, it is also anticipated that a total of 60 species-occupied caves will be directly and/or indirectly impacted by plan participants within an area 50 feet of the cave footprint (Impact Zone B). This estimate includes previously undetected voids damaged during construction activities. The participation fee for such impacts to a *known* species-occupied cave will be $400,000/cave. Impacts to previously undetected voids occupied by covered karst species are covered by the Karst Zone fee, as are any impacts to a known cave's ecosystem resulting from surface disturbance more than 345 feet from the cave's footprint.

Full mitigation for anticipated impacts to karst species is expected to be realized in the fulfillment of the biological goals of the RHCP, which are focused on ensuring Recovery Plan goals for the karst covered species in Williamson County are reached as quickly as possible by the following actions: 1) contributing to and/or facilitating the establishment and perpetual adaptive management/monitoring of 9 to 15 Service-approved KFAs on 700 acres (202 hectares) of newly acquired (by deed or conservation easement) land; 2) implementing perpetual adaptive management/monitoring plans[8] for 10 karst conservation areas that are already established, but not provided with guaranteed long-term funding; 3) implementing and providing funding for a 30-year research and public awareness program on Williamson County endangered and rare species; and 4) while not required as mitigation, establishing an additional six KFAs as a non-mandatory RHCP recovery enhancement activity with Endangered Species Act section 6 and other sources of external funding.

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[7] All participation fees identified in the RHCP are subject to reassessment and adjustments over the life of plan. For planning purposes, all fees related to impacts to karst habitat are estimated to increase by 10 percent every five years.

[8] The Foundation would prepare and implement the adaptive management/monitoring plans following Service guidance procedures.

CHAPTER 1 — BACKGROUND, PURPOSE, AND NEED

1.1 BACKGROUND

1.1.1 Introduction

Williamson County, Texas, contains habitat occupied by three karst invertebrate and two bird species that the U.S. Fish and Wildlife Service (Service) has listed as endangered under the Endangered Species Act of 1973, as amended.[14] The County also contains habitat for other rare species, including at least four species of salamanders and several karst invertebrate species that may require conservation efforts to preclude the need for listing in the future.

Section 9 of the Endangered Species Act prohibits "take" of any federally listed endangered wildlife species (16 USC § 1538(a)). Take, as defined by the Endangered Species Act, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC § 1532(19)). "Harm" is defined in the Service's regulations as "an act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering" (50 CFR § 17.3 (2005)). If it is not possible to design an otherwise lawful land use activity so as to avoid take of a listed species, either directly or through habitat modification, section 10(a)(1)(B) of the Endangered Species Act (16 USC §1539(a)(1)(B)), authorizes the Service to issue a permit allowing take of species providing that the taking is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10a(2)(A) lays out certain conditions that an applicant must satisfy in order to be issued a permit. These conditions include the preparation of a conservation plan that identifies the impacts that will likely result from the permitted taking, "what steps the applicant will take to minimize and mitigate such impacts" and "the funding that will be available to implement such steps."

Since the late 1980s, a substantial number of private and public projects have been carried out in Williamson County that have had an impact on endangered species. To compensate for these impacts, the agencies and entities responsible for the projects have implemented a variety of individual conservation initiatives. Individual project consultations or habitat conservation plans (HCPs) in Williamson County that have been completed, or are under preparation, include Lake Georgetown, Ronald W. Reagan Boulevard and State Highway 195, O'Connor Road, Silver Oak Property, Brushy Creek Municipal Utility District, Parmer Lane Extension, Shadow Canyon, Lakeline Mall, Buttercup Creek, U.S. 183-A, State Highway 45, Leander Independent School District, Russell Park Estates, Sultan and Kahn, and Sun City Georgetown.[15]

To avoid a continuation of the piecemeal approach to endangered species conservation strategies, Williamson County is committed to applying the lessons learned from permitting and mitigating

[14] A glossary of terms used in this document (e.g., "karst" and "Endangered Species Act") is provided in Chapter 12.

[15] Examples of HCPs and Biological Opinions from Williamson County can be found on-line at http://www.fws.gov/southwest/es/Library.

individual projects to a regional-scale conservation plan that will contribute to the recovery of the listed endangered species and likely benefit the additional species. This regional habitat conservation plan (RHCP) is being prepared in support of an application for a section 10(a)(1)(B) incidental take permit (the Permit). Covering a 30-year period from 2008 to 2038, the RHCP will achieve a significant level of conservation for the County's rare and protected species while streamlining approvals for public and private projects.

The permit area for this RHCP is Williamson County in central Texas (Figure 1-1). While the entire county will be covered by the requested Permit, [16] potential habitat for the listed and other rare/endemic species in the County occurs primarily west of Interstate Highway 35 on the Edwards Plateau, in the Limestone Cut Plain and Balcones Canyonlands Level IV ecoregions[17] and within the Edwards and Georgetown Limestone formations that make up the Karst Zone.[18] Because potential habitat and known locations of the species of interest occur in those areas, the anticipated incidental take and specified mitigation for the karst invertebrate species will also occur in that portion of the County.

Two categories of species are addressed in this RHCP: covered species and additional species. "Covered species" are those covered by the requested Permit. The covered species in the Williamson County RHCP include two karst invertebrates, Bone Cave harvestman (*Texella reyesi*) and Coffin Cave mold beetle (*Batrisodes texanus*), and two listed bird species, the golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapilla*).

The "additional species" are not covered by the requested Permit. Only one of the 24 additional species addressed in this RHCP is listed under the Endangered Species Act, but the remaining 23 species are rare and/or endemic, and without adequate conservation measures they may be listed in the future. Should any of these 23 species become federally listed, they would only be covered by the requested Permit if the County applies for and the Service grants an amendment to the Permit. The single listed species, Tooth Cave ground beetle (*Rhadine persephone*), is an endangered species that, in Williamson County, is restricted to the Cedar Park area, which has little open space left for development. This RHCP does not anticipate the need for allowing take of this ground beetle. Since this Permit would not authorize take of the Tooth Cave ground beetle, any actions that would impact this species would need to be authorized separately by the Service.

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[16] The permit area includes portions of the County that currently are not known to contain federally listed species or their habitat. This was done to facilitate any needed amendments to the RHCP and the requested Permit should such species or their habitat occur in those areas in the future.

[17] Level IV ecoregions are subdivisions of larger Level III ecoregions. Williamson County falls within the Balcones Canyonlands subdivision of the Edwards Plateau Level III ecoregion, and within the Limestone Cut Plain subdivision of the Cross Timbers Level III ecoregion.

[18] Veni and Associates (1992) defined four karst zones in Williamson County based on lithology, geologic controls on cave development, and distributions of known caves and cave fauna. In 1992, Zones 3 and 4 were judged to have little or no potential to provide habitat for troglobitic invertebrates, and that remains the case today. Zone 1 was known to contain listed invertebrates, and Zone 2 was thought to have a high potential to do so. Since 1992, listed karst invertebrates have been collected from both Zones 1 and 2; therefore, theses two zones have been combined in this RHCP and are collectively referred to as the "Karst Zone."

is later. Acquisition of all habitat preserves in the RHCP must be completed no later than the sixth anniversary of the date the Federal permit was issued (Texas Parks and Wildlife Code § 83.018(c)).

Finally, Chapter 83 imposes a requirement that before adopting an RHCP, plan amendment, ordinance, budget, fee schedule, rule, regulation, or order with respect to an RHCP, the plan participant must hold a public hearing and publish notice of such hearing in the newspaper of largest general circulation in the county in which the participant proposes the action, such notice to include a brief description of the proposed action and the time and place of a public hearing on the proposed action. The plan participant must publish notice in accordance with the foregoing requirements, and must do so not later than the thirtieth day prior to the public hearing (Texas Parks and Wildlife Code § 83.019).

1.3 PURPOSE AND NEED FOR ACTION

The proposed action is issuance by the Service of a section 10(a)(1)(B) permit approving the Williamson County RHCP, under which a variety of land use activities that could adversely affect listed species, and which therefore must comply with the Endangered Species Act, will have a voluntary alternative means of achieving such compliance that is more efficient, effective, and coordinated than would be the case under individual project approvals and which will also contribute to and facilitate the recovery of the covered species. The RHCP and requested Permit are designed to achieve the following general goals:

- *Conservation of natural resources*: The RHCP will promote the recovery of the covered species and long-term conservation of the covered and additional species.
- *Efficient and effective administration of the Endangered Species Act*: The RHCP will reduce the administrative and logistical burden on the Service of processing individual Endangered Species Act permits and monitoring post-issuance performance of multiple individual permit projects within the County.
- *Reduced burden on individual permit applicants*: The RHCP will reduce time and costs for individual permit applicants.
- *Responsible economic activities*: The RHCP will facilitate the coordinated and beneficial use of land within Williamson County to promote the local and regional economy.
- *Maintenance of open space and quality of life in Williamson County*: The RHCP will help to ensure that some of the natural character of the County is maintained despite extensive anticipated development.

The primary ecological purposes of this Williamson County RHCP are to 1) contribute to and facilitate the recovery of the federally listed endangered Bone Cave harvestman, Coffin Cave mold beetle,[22] golden-cheeked warbler, and black-capped vireo (covered species) in Williamson

[22] Chandler and Reddell (2001) have proposed taxonomically splitting the endangered *Batrisodes texanus* (Coffin Cave mold beetle) into two species—*B. texanus* and *B. cryptotexanus*—and renaming *B. texanus* "Inner Space Caverns mold beetle" because they now identify the mold beetles occurring in Coffin Cave as *B. cryptotexanus*. However, the taxonomy and distribution of these mold beetles in Williamson County are not fully understood, are the subject of ongoing research, and may yet again be revised. Because of these uncertainties, the Service has not

County; and 2) assist the Service in precluding the need to list the currently unlisted additional species. The conservation actions, as detailed in the RHCP, will facilitate compliance with the Endangered Species Act by implementing a comprehensive, coordinated strategy for future species conservation throughout the County. The RHCP will contribute to the species' long-term survival while allowing otherwise lawful development to comply with the Endangered Species Act through a voluntary alternative to seeking individual project approvals.

The presence of endangered species habitat has significantly affected both public and private development activities within Williamson County. As the County continues to grow, conflicts with the requirements of the Endangered Species Act will likely increase, and important open space and habitat may be lost. The RHCP is needed to ensure that development goes forward in an orderly, efficient manner consistent with the protection of rare species. The urgency for addressing habitat and species protection in an organized and predictable manner is underscored by the high rate of growth projected for Williamson County. In the next 30 years, population in the County is expected to grow from under 400,000 to over 1.5 million, an increase of over 300 percent (Texas State Data Center Population Forecast, Scenario 1.0). An estimated 69 percent of this growth will occur in the Karst Zone, where most of the endangered and rare species and their habitat are found (see Chapter 4, Section 4.2.2 for more information about projected population growth in the County). As many as 80,000 acres in the Karst Zone may be developed in the next 30 years (see Chapter 4, Section 4.2.2 for an explanation).

As the number of projects requiring Endangered Species Act compliance in Williamson County continues to grow, the RHCP approach will be beneficial to the covered and additional species and much less cumbersome and expensive for public and private entities that intend to carry out development projects. Through this RHCP, the County will approach conservation at the landscape scale. A regional approach will make management, monitoring, and research more efficient. The regional approach will be beneficial to the species and will provide significant cost and time savings to the entities seeking to carry out development projects in the County, but it will also be beneficial to the region as a whole. The RHCP will enhance the County's reputation as an entity that facilitates stable and orderly development, which is an attractive attribute for many who are planning to invest, relocate, or start businesses in Williamson County.

1.4 TERMINATION STATEMENT

The County retains the express right to terminate the RHCP at any time, provided the County will remain obligated to perform any action required by conditions of the RHCP and the Permit to be performed up to the date of termination and will remain obligated for the perpetual operation and maintenance of all preserves acquired under the plan through the date of termination.

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recognized the split and considers all beetles identified as *B. cryptotexanus* to be the endangered *B. texanus* and retains the name "Coffin Cave mold beetle" for this species. The RHCP conforms with U.S. Fish and Wildlife Service practice in this regard.

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Final Rule To Remove the Florida Population of the Pine Barrens Treefrog From the List of Endangered and Threatened Wildlife and To Rescind Previously Determined Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service makes a final determination to remove the Florida population of the Pine Barrens treefrog (*Hyla andersonii*) from the List of Endangered and Threatened Wildlife and to rescind the Critical Habitat that has been designated for this population. This action is being taken because recent evidence indicates that the species is much more widely distributed than originally known. Removal of this species from the List of Endangered and Threatened Wildlife eliminates all protection provided it by the Endangered Species Act of 1973, as amended.

DATE: This rule becomes effective on December 22, 1983.

ADDRESS: The complete file for this rule is available for public inspection by appointment during normal business hours at the Service's Regional Office, 75 Spring Street, SW., Room 1282, Atlanta, Georgia 30303.

FOR FURTHER INFORMATION CONTACT: Mr. Marshall P. Jones, Endangered Species Staff Specialist, at the above address (404/221–3583 or FTS 8/242–3583).

SUPPLEMENTARY INFORMATION:

Background

On April 5, 1977, the Service published a proposed rule in the **Federal Register** (42 FR 18109–18111) advising that sufficient evidence was on file to support a determination that the Florida population of the Pine Barrens treefrog (*Hyla andersonii*) was an Endangered species, as provided for by the Endangered Species Act of 1973, as amended. After a thorough review and consideration of all the information available, the Service published a final rule on November 11, 1977 (42 FR 58754–58756), determining that the Florida population of the species was in danger of extinction throughout all or a significant portion of its range due to one or more of the factors described in Section 4(a)(1) of the Act. The

Endangered determination was based primarily on factor number one, "the present or threatened destruction, modification, or curtailment of its habitat or range." At that time the only known existing breeding sites were limited to seven small areas in Okaloosa County.

The total number of individuals at these sites was estimated at less than 500. Four other breeding groups, including the only ones known from Walton County, were reported to have been extirpated in the period following the frog's discovery in 1970. It appeared that without the protection afforded by the Endangered Species Act, the remaining Florida population would likely be lost. The final rule classifying the Florida population as Endangered and designating Critical Habitat became effective on December 8, 1977. At that time, other populations of the Pine Barrens treefrog were known from the Carolinas and New Jersey. The Service is reviewing the status of these populations on the basis of notices published in the **Federal Register** of August 2, 1977 (42 FR 39119–39120), and September 27, 1982 (47 FR 42387–42388).

In the spring of 1978, the Florida Game and Fresh Water Fish Commission began a project to assess habitat needs and distribution limits of the species. This work was conducted pursuant to an Endangered Species Cooperative Agreement between the Service and the State as authorized under Section 6 of the Endangered Species Act. Survey results for 1978 and 1979 revealed a number of new populations in Okaloosa, Walton, and Santa Rosa Counties. In consequence of the more extensive distribution of the species, the Service contracted with the Florida Game and Fresh Water Fish Commission in December 1979 (Contract No. 14–16–004–79–145) to develop recommendations regarding possible reclassification of the species. The report, subsequently transmitted to the Service in January 1980, entitled "The Florida Population of the Pine Barrens Treefrog (*Hyla andersonii*), A Status Review," recommended that the species be removed from the Federal List of Endangered and Threatened Wildlife. The forenamed report was supplemented later in 1980 by the State's grant-in-aid final study report covering the period of May 1, 1978, to June 30, 1980 (Project No. E–1, Study No. I–R). Data were presented which expanded the species' known Florida distribution from seven Okaloosa County sites to a total of over 150 sites in Okaloosa, Walton, Santa Rosa, and Holmes Counties. Incidental investigations conducted in nearby Alabama areas revealed six other sites in Escambia and Covington Counties.

To provide a more complete picture of the Florida-Alabama population as a whole, the Service contracted during 1980 for a thorough status survey in southern Alabama. This survey turned up an additional 16 sites in the Geneva-Escambia-Covington County area. The frogs at these Alabama sites were not covered by the 1977 rule which listed the Florida population as Endangered. However, knowledge of their existence does provide further evidence of the species' overall well-being in what is a much larger area than that originally known.

Although the species appears to be limited to only four counties in Florida, it is of widespread occurrence within this area (Moler, 1981). A considerable amount of potential habitat within the Florida range has not been investigated, and results from the 1978–1980 survey indicate that much of this habitat is very likely to harbor the species. The large number of known and potential habitat sites suggests that the Florida population is relatively secure for the immediate future. On September 15, 1982, the Service published a proposed rule in the **Federal Register** (47 FR 40673–40676) advising that this new status information was considered sufficient to permit removal of the Florida population from the List of Endangered and Threatened Wildlife and to rescind the designated Critical Habitat.

Summary of Comments and Recommendations

In the September 15, 1982, **Federal Register** proposed rule, all interested parties were invited to submit comments or suggestions which might contribute to the formulation of a final rule. Letters were sent to the States of Alabama and Florida, to county governments, and to Federal agencies and interested parties, soliciting their comments. Notifications were also published in local newspapers. Official comments were received from the Florida Game and Fresh Water Fish Commission and from Eglin Air Force Base. Comments were also received from four additional individuals or organizations.

Of the six written responses received by the Service on this proposal, five favored and one opposed the proposal action. Those respondents having direct knowledge of the species through recent survey work, including the Florida Game and Fresh Water Fish Commission, Eglin Air Force Base, and Dr. Robert H. Mount, Auburn University, concurred with the proposal. Dr. Roy W. McDiarmid, Research Zoologist/Curator with the National Museum of Natural History, also concurred on the basis of the available data. The Florida Audubon Society, represented by Dr. Peter C. H. Pritchard, Vice President of Science and Research, guardedly concurred with the proposal on the condition that land use policies on Federal holdings continue to protect the species.

One private individual opposed the proposal on the basis that the species should be monitored for at least 10 years to ensure that its restoration is permanent. In the case of the Pine Barrens treefrog, however, it has not been a matter of restoring the species, but a matter of discovering unknown populations which, for the most part, have undoubtedly existed in the past.

Summary of Factors Affecting the Species

After a thorough review and consideration of all the available information, the Service has determined that the Florida population of the Pine Barrens treefrog (*Hyla andersonii*) should be removed from the List of Endangered and Threatened Wildlife, and that designated Critical Habitat for the species should be rescinded. This determination is based upon an evaluation of the five factors in section 4(a)(1) of the Act for determining whether a species is Endangered or Threatened. These factors and their application to the Florida population of the Pine Barrens treefrog are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Recent data do not substantiate any significant trend in habitat loss. Of the 112 new habitat sites surveyed by the Florida Game and Fresh Water Fish Commission between May 1978 and June 1980, 4 had been degraded to some degree by siltation or runoff, but still supported the frogs, and 15 of the localities were within or adjacent to clear-cut areas, but there was no immediate evidence of adverse effects to the frog population. Drainage of bogs for agricultural or silvicultural purposes does represent a potential threat, but to date such drainage has not been extensively practiced within the species' Florida range.

Some of the Pine Barrens treefrog's habitat has likely been lost through the creation of artificial lakes and ponds within bog areas utilized by the species. Manmade impoundments are common throughout the frog's Florida range, and new impoundments will likely continue to pose at least a minor threat.

The herb bog and shrub habitats required by the Pine Barrens treefrog are

subclimax communities maintained by periodic fire. In total absence of fires, these habitats are converted through plant succession to "mixed swamp" or "bayhead communities" (Means and Moler, 1979). Many of these subclimax communities have apparently disappeared during the last several centuries as the result of wildfires being supressed or limited through human activity. However, Means and Moler (1979) suggest that in some cases other disturbance factors may be a suitable substitute for fire. They cite clear-cutting of surrounding uplands, such as may occur with the construction and maintenance of electric and gas transmission lines, as increasing groundwater seepage by reducing evapotranspiration, thus contributing to formation of herb bogs. Numerous population sites were found along such transmission lines during the Florida Game and Fresh Water Fish Commission's 1978–1980 survey of the species (Moler, 1981).

A review of the data indicates that the Florida population is apparently even larger and more secure than the New Jersey population which historically has been the best known enclave and long considered the stronghold of the species (Moler, 1980a, 1980b). The Florida population has a further advantage in that many of the presently known breeding sites are located on large tracts of public land (Blackwater River State Forest and Eglin Air Force Base) that will presumable forestall extensive residential and industrial development.

In summary, it should be noted that while some losses of habitat will occur, such losses are not expected to be significant within the foreseeable future.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* This factor has apparently had no significant effect. Only the males can be easily located, and the number calling at any one site fluctuates erratically from night to night.

C. *Disease or predation.* Not applicable.

D. *The inadequacy of existing regulatory mechanisms.* The Florida Game and Fresh Water Fish Commission has regulatory authority to regulate collecting of the species. Removal of the prohibitions afforded by the Act would not likely have any effect since collecting is not considered to represent a significant threat. The State of Florida protects the species as a "species of special concern;" permits are required to collect the treefrog within that State.

E. *Other natural or manmade factors affecting its continued existence.* None.

Critical Habitat

The Act defines "Critical Habitat" as (i) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection, and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination that such areas are essential for the conservation of the species.

The data presented above in regard to section 4(a)(1) of the Act indicate that the Florida population of the Pine Barrens treefrog is biologically neither Endangered nor Threatened at this time. Accordingly, the need for Critical Habitat is negated, and the areas previously designated in Okaloosa County are rescinded concurrent with the determination to remove this species from the List of Endangered and Threatened Wildlife.

Effects of the Final Rule

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all Endangered wildlife. These prohibitions no longer apply to the Florida population of the Pine Barrens treefrog. This rule eliminates the Federal prohibitions on such actions as taking, possessing, or selling in interstate or foreign commerce. Any Federal Endangered species permit requirements, as codified at 50 CFR 17.22 and 17.23, are also eliminated.

The protection afforded the Pine Barrens treefrog under section 7(a) of the Act is terminated. Section 7(a) requires Federal agencies to insure that actions they authorize, fund, or carry out, are not likely to jeopardize listed species or result in the destruction or adverse modification of designated Critical Habitat.

Survey work leading to the recommendation for delisting was made possible by partial funding under section 6 of the Act. An attendant effect of delisting will be to lower the Federal funding priority under the grant program. However, in view of the currently known status of the Florida population, neither the failure to conduct such studies nor the loss of protective measures under sections 7 and 9 of the Act could be expected to have any appreciable effect upon the species. Furthermore, retention of the species in the category of "special concern" on the State of Florida list will help to insure that attention is still given to the species.

National Environmental Policy Act

In accordance with a recommendation from the Council on Environmental Quality (CEQ), the Service has not prepared any NEPA documentation for this rule. The recommendation from CEQ was based, in part, upon a decision in the Sixth Circuit Court of Appeals which held that the preparation of NEPA documentation was not required as a matter of law for listing under the Endangered Species Act. *PLF v Andrus* 657 F.2d 829 (6th Cir. 1981).

Author

The primary author of this rule is Thomas W. Turnipseed, U.S. Fish and Wildlife Service, 75 Spring Street, SW., Room 1282, Atlanta, Georgia 30303.

References

Means, D.B., and P.E. Moler. 1979. The Pine Barrens treefrog: fire seepage bogs, and management implications. *In* Odum, R.R., and L. Landers (eds.), Proceedings of the Rare and Endangered Wildlife Symposium, Georgia Dept. Nat. Res., Game & Fish Div., Tech. Bull. WL 4. pp. 77–83.

Moler, P.E. 1980. The Florida population of the Pine Barrens treefrog (*Hyla andersonii*), a status review. Rept. to the U.S. Fish Wildl. Serv., Atlanta, Georgia. 44 pp.

Moler, P.E. 1980b. Pine Barrens treefrog population. Study completion rept., Florida Endangered Species Project No. E–1, Study No. I–R (Available from the Florida Game & Fresh Water Fish Commission, Tallahassee, Florida).

Moler, P.E. 1981. Notes on *Hyla andersonii* in Florida and Alabama. J. Herpetol. 15(4):441–444.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Fish, Marine mammals, Plants (agriculture).

Regulations Promulgation

PART 17—[AMENDED]

Accordingly, Part 17, Subpart B of Chapter I, Title 50 of the U.S. Code of Federal Regulations, is amended as set forth below:

1. The authority citation for Part 17 reads as follows:

Authority: Pub. L. 93–205, 87 Stat. 884; Pub. L. 95–632, 92 Stat. 3751; Pub. L. 96–159, 93 Stat. 1225; and Pub. L. 97–304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

§ 17.11 [Amended]

2. Amend § 17.11(h) by removing the Florida population of the Pine Barrens treefrog under Amphibians from the List of Endangered and Threatened Wildlife.

§ 17.95 [Amended]

3. Amend § 17.95(d), Amphibians, by removing the Critical Habitat for the Pine Barrens treefrog.

Dated: October 18, 1983.

J. Craig Potter.

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 83-31344 Filed 11-21-83; 9:45 am]

BILLING CODE 4310-55-M

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Final Rule To Determine Five Texas Cave Invertebrates To Be Endangered Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Service determines endangered status under the authority of the Endangered Species Act of 1973, as amended, for five species of cave-dwelling, invertebrate animals in Texas. The five species are the Tooth Cave pseudoscorpion (*Microcreagris texana*), the Tooth Cave spider (*Leptoneta myopica*), the Bee Creek Cave harvestman (*Texella reddelli*), the Tooth Cave ground beetle (*Rhadine persephone*), and the Kretschmarr Cave mold beetle (*Texamaurops reddelli*). Each of these species is known from only six or fewer small, shallow, dry caves near Austin in Travis and Williamson Counties, Texas. Urban, industrial, and highway expansion are planned or ongoing in the area containing the cave habitat of these species. This development could result in filling or collapse of these shallow caves, disturbances of water drainage patterns that affect cave habitat, introduction of exotic competitive and predatory insects and other organisms,

and pollution of the cave systems with pesticides, fertilizers, oils, and other harmful substances. Final determination that these five species are endangered implements for them the protections provided by the Endangered Species Act.

EFFECTIVE DATE: September 16, 1988.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Service's Regional Office of Endangered Species, 500 Gold Avenue SW., Albuquerque, New Mexico 87103.

FOR FURTHER INFORMATION CONTACT: Dr. Steven M. Chambers, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service Regional Office, Albuquerque, New Mexico (See ADDRESSES above) (505/766–3972 or FTS 474–3972).

SUPPLEMENTARY INFORMATION:

Effective Date

The usual 30-day delay between date of publication of a final rule and its effective date may be waived for cause, as provided by 50 CFR 424.18(b)(1) and by the Administrative Procedure Act (5 U.S.C. 553(d)(3)). The Service finds that this period be waived for this rule because immediate protection is needed to meet the ongoing threat of construction activities that are taking place on land that includes all or a major portion of each of the subject species' habitat.

Background

The Tooth Cave pseudoscorpion, *Microcreagris texana* (family Neobisiidae), was first described by Muchmore (1969) from a specimen collected in Tooth Cave, Travis County, by James Reddell in 1965. It reaches a length of about 4 millimeters (mm) (about 5/16 inch) and resembles a tiny, tailless scorpion. Pseudoscorpions lack a stinger and are harmless to humans. They use their pincers to prey on small insects and other arthropods. The Tooth Cave pseudoscorpion is eyeless and troglobitic (lives only in caves). It is known only from Tooth and Amber Caves, both in Travis County, Texas.

The Tooth Cave spider, *Leptoneta myopica* (family Leptonetidae), was first collected by James Reddell in 1963, and later described by Gertsch (1974). It has been found only in Tooth Cave, Travis County, Texas. This spider is very small, up to 1.6 mm (about 1/16 inch) in total length, pale colored, and has relatively long legs. It is a troglobite, although reduced eyes are present. The Tooth Cave spider is sedentary and spins webs from the ceiling and walls of Tooth Cave.

The Bee Creek Cave harvestman, *Texella reddelli* (family Phalangodidae), was first described by Goodnight and Goodnight (1967) from a specimen collected by James Reddell and David McKenzie from Bee Creek Cave (erroneously reported as "Pine Creek Cave"), Travis County. This light yellowish-brown harvestman has relatively long legs that extend from a small body (2 mm, or less than 1/8 inch, in length). It is an eyeless troglobite and is probably predatory. The Bee Creek Cave harvestman lives in Tooth, Bee Creek, McDonald, Weldon, and Bone Caves in Travis and Williamson Counties, Texas. The *Texella* reported by Reddell (1984) from Root Cave, Travis County, may also be this species.

The Tooth Cave ground beetle, *Rhadine persephone* (family Carabidae), was first described by Barr (1974) from specimens collected in the Tooth Cave by W.M. Andrews, R.W. Mitchell, and T.C. Barr in 1965. This species is a small (7–8 mm or about 5/16 inch in length), reddish-brown beetle. It is troglobitic and has only rudimentary eyes. It probably feeds on cave cricket eggs, which have been determined to be a major food of another troglobite species of *Rhadine* (Mitchell 1968). The Tooth Cave ground beetle is known only from Tooth and Kretschmarr Caves, Travis County, Texas.

The Kretschmarr Cave mold beetle, *Texamaurops reddelli,* was first described by Barr and Steeves (1963) from a specimen collected in Kretschmarr Cave by James R. Reddell and David McKenzie in 1963. This species is a very small (less than 3 mm, or about 1/8 inch, in length) dark-colored, short-winged, beetle with elongated legs. This member of the family Pselaphidae is an eyeless troglobite and is known only from Kretschmarr, Amber, Tooth, and Coffin Caves in Travis and Williamson Counties, Texas.

The caves inhabited by these five species are relatively small. The largest, McDonald Cave, consists of less than 60 meters (m) (about 200 feet) of passage, and most of the others are considerably smaller. These caves occur in isolated "islands" of the Edwards Limestone formation that were separated from one another when stream channels cut through the overlying limestone to lower rock layers. This fragmentation of habitat has resulted in the isolation of groups of caves that have developed their own, highly localized faunas.

In addition to the five species that are the subject of this final rule, these caves and others in the area support a number of other uncommon and scientifically significant species. Available habitat of this type is very limited, and many of these caves have been lost or are threatened with imminent loss.

The Service was first notified of the possible status of these five species by an August 20, 1984, letter from the Travis Audubon Society, Austin, Texas. The Conservation Committee of the Travis Audubon Society then petitioned the Service on February 8, 1985, to list these five and one other species (the Tooth Cave rove beetle, *Cylindropsis* sp.) as endangered. The Service evaluated this petition and on May 1, 1985, found that the petition did present substantial information indicating that the requested action may be warranted. A notice of that finding was published in the **Federal Register** on July 18, 1985 (50 FR 29238). On February 19, 1986, the Service found that the petitioned action was warranted but that such action was precluded by work on other pending proposals, in accordance with section 4(b)(3)(iii) of the Act. A notice of that finding was published on August 20, 1986 (51 FR 29672). On July 1, 1987 (52 FR 24487), the Service published a notice that the petitioned action was again warranted but precluded for the five species addressed in the present final rule. That same notice also announced the finding that listing was not warranted for the sixth species named in the petition, the Tooth Cave blind rove beetle (*Cylindropsis* sp.). This conclusion was based on the determination that the single known specimen was in such poor condition that it could not provide adequate material for taxonomic evaluation and description; furthermore, the best available scientific information indicates that the taxon it represents is extinct. Endangered status for these five species was proposed on April 19, 1988 (53 FR 12787).

Summary of Comments and Recommendations

In the April 19, 1988, proposed rule (53 FR 12787) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. A newspaper notice was published in the *American Statesman* (Austin, Texas) on May 25, 1988, which invited general public comment. Nine comments were received and are discussed below. The proposal is supported by the City of Austin, three organizations, and four individuals. A letter from the U.S. Department of Housing and Urban

Development contained no substantive comments on the proposed listings. No public hearing was requested or held.

Four commenters urged that the Service prepare an emergency listing for the five Texas cave invertebrates. The Service's expedited preparation and review of this final rule is in lieu of an emergency listing.

The City of Austin, three organizations, and three individuals requested that critical habitat be designated for these five species. The Services's reasons for not designating critical habitat are explained in the Critical Habitat section of this rule. Designation of critical habitat would not be prudent at this time because any benefits from that designation would be outweighed by the increase in unauthorized visitation and vandalism of the caves that would result from publication of precise critical habitat descriptions and maps. Although the Service agrees with one commenter that listing itself draws attention, to some extent, to the localities of these species, publication of maps and descriptions in local newspapers, which is required when designating critical habitat, would disseminate exact locality information to a much larger segment of the public. The Service notes that, even without critical habitat designation, the habitats of these species receive protection under section 7 of the Act.

Eight commenters provided information on development activities in the area, such as deep trenching, road and utility construction, and cave destruction. They expressed concern about these serious threats to the five species. The Service recognizes the potential negative impacts of these activities and the present listings are in response to them. Both direct effects, such as those mentioned above, and indirect effects, such as alteration of drainage patterns, have been considered.

Three commenters discussed the threat of fire ants and their effect on native cave fauna. The Service recognized the threat of exotic insects in the original proposal (Factor C).

One commenter urged emergency buying of an easement or actual purchase of the cave areas. These options will be considered by the Service in development of a recovery plan for these species.

Two commenters expressed support for placing grates over cave entrances, but expressed concern that grates be properly designed. The Service agrees that grates are needed and that their design must take into account the biological needs of the species.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal Lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Tooth Cave pseudoscorpion (*Microcreagris texana*), Tooth Cave spider (*Leptoneta myopica*), Bee Creek Cave harvestman (*Texella reddelli*), Tooth Cave ground beetle (*Rhadine persephone*), and Kretschmarr Cave mold beetle (*Texamaurops reddelli*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* The primary threat to the five species comes from potential loss of habitat owing to ongoing development activities. Proximity of the caves inhabited by these species to the City of Austin makes them vulnerable to the continuing expansion of the Austin metropolitan area. Road, industrial, residential, and commercial developments that would adversely affect these species have already begun. Tooth, Amber, Kretschmarr, Kretschmarr Salamander, McDonald, and Root Caves are in an area for which a major residential, commercial, and industrial development has been proposed, and preliminary clearing and digging has begun. This area includes the entire known ranges of the Tooth Cave pseudoscorpion, the Tooth Cave spider, and the Tooth Cave ground beetle, all but one known locality of the Kretschmarr Cave mold beetle, and a large portion of the habitat of the Bee Creek Cave harvestman. Unless proper safeguards can be devised, this development could result in the filling in or collapsing of caves during road and building site preparation, and in alteration of drainage patterns that could affect the cave habitat. These species inhabit dry cave habitats that depend on some infiltration of groundwater. Disruption of this input would be harmful, as would excess input of water that would flood the caves. Flooding of habitat could also result from proposed no-discharge sewage effluent irrigation. Development of this area could also increase the flow of sediment, pesticides, fertilizers, and general urban runoff into the caves. Land alterations in this area were noted earlier (Reddell 1984), and have recently intensified. Landmarks have been altered so that it is difficult to relocate some caves, and large boulders have been placed in the entrance of Kretschmarr Cave on two occasions (Reddell 1984). This cave is an important habitat for the beetles included in this proposal. Development in this area is also likely to increase human visitation and vandalism in the caves, which are so small that even occasional episodes could adversely alter the cave habitat.

Tooth Cave is near one alternative route for a proposed water pipeline from Lake Travis. Even if it is bypassed by the direct path of the pipeline, operation of heavy construction equipment or blasting could adversely affect Tooth Cave and other caves in the area inhabited by these species.

Weldon Cave, which supports a population of the Bee Creek Cave harvestman, is in or very near the path of a recent road extension, and may no longer exist. Residential development is also occurring in this area, and is likely to be stimulated by the improved access provided by this road.

It is likely that most, if not all, of the five cave species occupied other caves that have already been lost to earlier development. This may have been the fate of Coffin Cave, which is historic habitat of the Tooth Cave mold beetle. Recent attempts to relocate this cave have not been successful.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* No threat from overutilization of these species is known to exist at this time. Collection for scientific or educational purposes could become a threat if localities become generally known.

C. *Disease or predation.* As the human population of the area around these caves increases, the problems of predation by and competition with exotic (non-native) species also increases. Human habitation introduces a complement of exotic invertebrate species into many areas, particularly in semiarid areas such as the plateaus northwest of Austin. These predatory species are transported into the area in various accompaniments of human occupation, including landscaping plants. Buildings, lawns, and shrubbery provide habitat from which these highly adaptable species can disperse. The relative accessibility of the shallow caves leaves them especially vulnerable to invasion by introduced invertebrate predators or competitors such as sowbugs, cockroaches, and fire ants.

D. *The inadequacy of existing regulatory mechanisms.* There are currently no laws that protect any of these species or that directly address

protection of their habitat. Cave protection laws of the City of Austin do not apply because these areas are all outside the city limits.

E. Other natural or manmade factors affecting its continued existence. These species are extremely vulnerable to losses because of their severely limited range and habitat and because of the naturally limited ability to colonize new habitats. These troglobitic species have little or no ability to move appreciable distances on the surface. The division of the limestone habitat into "islands" limits the mobility of the species through channels within the limestone. Moisture regimes, food supply, and other factors may also limit subsurface migrations and may account for the different distribution patterns seen among these five species.

The specific climatic factors within the caves, such as humidity, are affected by input through the cave entrance, the overlying soils, and the rocks in which the caves are formed. As discussed under factor A above, surface alterations can affect these conditions, as well as facilitate the flow of pollutants into the habitat.

The very small size of these habitats, in addition to the fragile nature of cave ecosystems in general, make these species vulnerable to even isolated acts of vandalism. As the human population of the area increases, the likelihood of such acts also increases.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these species in determining to make this rule final. Based on this evaluation, the preferred action is to list the Tooth Cave pseudoscorpion, the Tooth Cave spider, the Bee Creek Cave harvestman, the Tooth Cave ground beetle, and the Kretschmarr Cave mold beetle as endangered species. These species require the maximum possible protection provided by the Act because their extremely small, vulnerable, and limited habitats are within an area that can be expected to experience continued pressures from economic and population growth. Critical habitat has not been determined for reasons given in the next section.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate any habitat of a species which is considered to be critical habitat at the time the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for these species at this time. Their cave habitats are at the edge of an expanding urban area with a growing population. Increased human population density increases the likelihood of acts of vandalism that could irreversibly damage the caves. All involved parties and land owners will be notified of the location and importance of protecting these species' habitats. Protection of these habitats will be addressed through the recovery process and through the section 7 jeopardy standard. Therefore, it would not be prudent to determine critical habitat for these species at this time.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. No Federal involvement has been identified at this time. As development progresses, the Federal Department of Housing and Urban Development, the Federal Highway Administration, and the Environmental Protection Agency may become involved in funding or permitting projects. Any involvement by these agencies in development in the area of these caves would be a subject of consultation with the Service.

Section 9 of the Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered fish and wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions would apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

Barr, T.C., Jr. 1974. Revision of *Rhadine* LeConte (Coleoptera, Carabidae). I. The *subterranean* group. American Museum Noivitates No. 2539. 30 pp.

Barr, T.C., Jr. and H.R. Steeves, Jr. 1963. *Texamaurops*, a new genus of pselaphids from caves, in central Texas (Coleoptera: Pselaphidae). The Coleopterists' Bulletin 17:117–120.

Gertsch, W.J. 1974. The spider family Leptonetidae in North America. The Journal of Arachnology 1:145–203.

Goodnight, C.J. and M.L. Goodnight. 1967. Opilionids from Texas caves (Opiliones, Phalangodidae). American Museum Novitates No. 2301. 8 pp.

Mitchell, R.W. 1968. Food and feeding habits of the troglobitic carabid beetle *Rhadine subterranean*. International Journal of Speleology 3:249–270.

Muchmore, W.B. 1969. New species and records of cavernicolous pseudoscorpions of the genus *Microcreagris* (Arachnida, Chelonethida, Neobisiidae, Ideobisiinae). American Museum Novitates No. 2932. 21 pp.

Reddell, J.R. 1984. Report on the Caves and Cave Fauna of the Parke, Travis County, Texas. Unpublished report to the Texas System of Natural Laboratories. 25 pp.

Author

The primary authors of this final rule are Dr. Steven M. Chambers, Fish and Wildlife Biologist, and Ms. Sonja Jahrsdoerfer, Wildlife Biologist, Office of Endangered Species, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103 (505/766-3972 or FTS 474-3972).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Final Regulations Promulgation

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*); Pub. L. 99-625, 100 Stat. 3500 (1986), unless otherwise noted.

2. Amend § 17.11(h) by establishing a new taxonomic group, "Arachnids", with its entries, to follow the taxonomic group, "Insects", on the List of Endangered and Threatened Wildlife.

3. Section 17.11(h) is further amended by adding the following entries for Beetles, in alphabetical order under the taxonomic group heading, "Insects", to the List of Endangered and Threatened Wildlife.

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Insects							
*	*	*	*	*		*	
Beetle, Kretschmarr Cave mold	*Texamaurops reddelli*	U.S.A. (TX)	NA	E	327	NA	NA
*	*	*	*	*		*	
Beetle, Tooth Cave ground	*Rhadine persephone*	U.S.A. (TX)	NA	E	327	NA	NA
*	*	*	*	*		*	
Arachnids							
Harvestman, Bee Creek Cave	*Texella reddelli*	U.S.A. (TX)	NA	E	327	NA	NA
Pseudoscorpion, Tooth Cave	*Microcreagris texana*	U.S.A. (TX)	NA	E	327	NA	NA
Spider, Tooth Cave	*Leptoneta myopica*	U.S.A. (TX)	NA	E	327	NA	NA
*	*	*	*	*		*	

Dated: September 8, 1988.

Susan Recce,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 88-21301 Filed 9-14-88; 3:21 pm]

BILLING CODE 4310-55-M

the market.[2] Motor carriers remain powerful competitors for this traffic. An exemption would enable the railroads to become more effective competitors for this traffic and thus give shippers additional options. There is also intense rail-to-rail and geographic competition because shippers have numerous options in selecting origin and destination points for used motor vehicle traffic and thus need not limit rail transportation to only one carrier.

Based upon these findings, we are exempting the rail transportation of used motor vehicles (STCC 41–118) from the provisions of 49 U.S.C. subtitle IV by adding this STCC code to the list of exempted commodities found at 49 CFR 1039.11. The exemption is subject to the exceptions contained in 49 CFR 1039.11(a), which generally relate to car hire and car service, and in 49 CFR 1039.11(b), which requires carriers to continue to comply with applicable accounting and reporting requirements.

Environmental and Energy Consideration

We conclude that this action will not significantly affect either the quality of the human environment or the conservation of energy resources.

Regulatory Flexibility Analysis

We conclude that this action will not

§ 1039.11 Miscellaneous commodities exemptions.

(a) * * *

STCC No.	STCC tariff	Commodity
*	* * * *	*
41 118	6001–U, eff. 1–1–93.	Used vehicles.

* * * * * *

[FR Doc. 93–20113 Filed 8–17–93; 8:45 am]

BILLING CODE 7035–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AC05

Endangered and Threatened Wildlife and Plants: Coffin Cave Mold Beetle (Batrisodes texanus) and the Bone Cave Harvestman (Texella reyesi) Determined To Be Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule; technical corrections.

SUMMARY: Recently published taxonomic studies have revealed that two listed species, the Kretschmarr Cave mold beetle (*Texamaurops reddelli*) and the Bee Creek Cave harvestman (*Texella reddelli*), each comprise two species. The next republication of the List of Endangered and Threatened Wildlife will include two additional entries, the Coffin Cave mold beetle (*Batrisodes texanus*) and the Bone Cave harvestman (*Texella reyesi*), to ensure that recognition and protection under the Endangered Species Act (Act) is provided for species equivalent to the originally listed taxa. This rule describes the technical basis for these changes to the List.

EFFECTIVE DATE: September 17, 1993.

ADDRESSES: Lisa O'Donnell, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, 611 East 6th Street, room 407, Austin, Texas 78701.

FOR FURTHER INFORMATION CONTACT: Lisa O'Donnell, telephone: 512/482–5436.

SUPPLEMENTARY INFORMATION:

Background

A final rule listing five species of Texas karst invertebrates as endangered was published by the U.S. Fish and Wildlife Service (Service) on September 16, 1988 (53 FR 36029–36033). That final rule included the Kretschmarr Cave mold beetle (*Texamaurops reddelli* Barr and Steeves) and the Bee Creek Cave harvestman (*Texella reddelli* Goodnight and Goodnight). Recently published taxonomic revisions by Chandler (1992) and Ubick and Briggs (1992) present evidence that each of these species, as formerly recognized, actually comprises two species.

The final rule listing the Kretschmarr Cave mold beetle (*Texamaurops reddelli*) indicated that this species was known from Kretschmarr, Amber, Tooth, and Coffin caves in Travis and Williamson counties, Texas. Coffin Cave, Williamson County, was the northern-most locality recognized for that species. The Coffin Cave population was subsequently placed in the newly described species *Batrisodes texanus*, along with specimens from a few Williamson County localities to the south of Coffin Cave (Chandler 1992). The genera *Texamaurops* and *Batrisodes* are very similar, the key difference being a "pencil" of appressed setae present on the metatibiae in *Batrisodes*, but absent in *Texamaurops*. Detection of this character requires magnification of the appropriate appendages. All known localities of *Texamaurops reddelli* and *Batrisodes texanus* are within the recognized range of the Kretschmarr Cave mold beetle as it was originally listed, although additional localities have been discovered within that range. Both species continue to face the same general threats identified in the original listing. Because these two species together are equivalent to the originally listed Kretschmarr Cave mold beetle, both species will be included as endangered species in the next republication of the List of Endangered and Threatened Wildlife (50 CFR 17.11). *Texamaurops reddelli* will retain the common name of Kretschmarr Cave mold beetle, as in previous publications of the List, and the new entry for *Batrisodes texanus* will include the common name of "Coffin Cave mold beetle."

The final rule listing the Bee Creek Cave harvestman (*Texella reddelli*) indicated that this species was known from several caves, which are distributed about 22 miles (34 km) along the edge of the Edwards Plateau in Travis and Williamson counties, Texas. *Texella reyesi* was subsequently described to include some of the specimens formerly attributed to *Texella reddelli*, as well as specimens from several newly-discovered localities (Ubick and Briggs 1992). According to Ubick and Briggs (1992, p.208), "[t]he two species are clearly very closely related and, using the standards of genitalic distinctness applied to other

Texella species, may even be considered conspecific." Both of these species continue to face the same general threats identified in the original listing of the Bee Creek Cave harvestman. Their combined ranges, including newly-discovered localities, extend about 31 miles (50 km) along the edge of the Edwards Plateau in Travis and Williamson counties. Although the weak differentiation of the two species would justify the continued recognition of all of these populations under the single name recognized in the original listing, the Service prefers to follow the published revision in taxonomy and recognize *Texella reddelli* and *Texella reyesi* as equivalent to the originally-listed Bee Creek Cave harvestman. Both species will therefore be included as endangered species in the next republication of the List of Endangered and Threatened Wildlife (50 CFR 17.11). *Texella reddelli* will retain the common name of Bee Creek Cave harvestman, as in previous publications of the List, and the new entry for *Texella reyesi* will include the common name of "Bone Cave harvestman."

The Service has determined that this amendment to 50 CFR of taxonomic changes does not impact or change the status of the species covered under the current List of Threatened and Endangered Wildlife nor does it affect the types of activities that are permitted or prohibited. Since this final rule reflects actions already accomplished by the scientific community, this document is not a rule as contemplated by the Regulatory Flexibility Act (5 U.S.C 601) and Executive Order 12291. Therefore, as provided by 5 U.S.C. 553(b)(3)(B), the Service has determined that solicitation of public comment is unnecessary and serves no public interest.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

Chandler, D.S. 1992. The Pselaphidae (Coleoptera) of Texas caves. Texas Mem. Mus., Speleol. Monogr. 3:241–253.

Ubick, D., and T.S. Briggs. 1992. The harvestman family Phalangodidae. 3. Revision of *Texella* Goodnight and Goodnight (Opiliones: Laniatores). Texas Mem. Mus., Speleol. Monogr. 3:155–240.

Author

The primary author of this final rule is Dr. Steven M. Chambers, Division of Endangered Species, U.S. Fish and Wildlife Service Regional Office, P.O. Box 1306, Albuquerque, N.M. 87103 (telephone: 505/766–3972).

Authority

The authority for this action is the Endangered Species Act (16 U.S.C. 1531 *et seq.*).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulations Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

§ 17.11 [Amended]

2. Amend § 17.11(h) in the entries for "Beetle, Kretschmarr Cave mold" under Insects and for "Harvestman, Bee Creek Cave" under Arachnids by revising the "When listed" column to read "327, 513".

3. Amend § 17.11(h) by adding the following entries, in alphabetical order under Insects and Arachnids, respectively, to the List of Endangered and Threatened Wildlife, to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
•	•	•	•	•	•	•	•
Insects							
•	•	•	•	•	•	•	•
Beetle, Coffin Cave mold.	*Batrisodes texanus* .	U.S.A. (TX)	NA	E	327,513	NA	NA
•	•	•	•	•	•	•	•
Arachnids							
•	•	•	•	•	•	•	•
Harvestman, Bone Cave.	*Texella reyesi*	U.S.A. (TX)	NA	E	327,513	NA	NA
•	•	•	•	•	•	•	•

Dated: July 27, 1993.

Richard N. Smith,

Acting Director.

[FR Doc. 93-19533 Filed 8-17-93; 8:45 am]

BILLING CODE 4310-55-P

CERTIFICATE OF SERVICE

I hereby certify that on October 5, 2017, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

AMERICAN STEWARDS OF LIBERTY, et al. *Plaintiffs,*	§ § §	
v.	§ §	No. 1:15-cv-01174-LY
UNITED STATES FISH & WILDLIFE SERVICE, et al. *Defendants.*	§ § §	

INDEX OF PLAINTIFFS' EXCERPTS OF ADMINISTRATIVE RECORD ("AR")

VOLUME 5

No.	Document Description	AR Pages
22	USFWS 90-day Finding on a Petition To Delist Seven Texas Karst Invertebrates, 1994	R005051
23	USFWS Bone Cave harvestman 5-Year Review: Summary and Evaluation, 2009 (Excerpt)	R005236

Dated: October 5, 2017

Respectfully submitted,

NOSSAMAN LLP

By: */s/ Alan M. Glen*

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Issued on March 4, 1994.

Barry Felrice,

Associate Administrator for Rulemaking.

[FR Doc. 94-5487 Filed 3-11-94; 8:45 am]

BILLING CODE 4910-69-M

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 90-day Finding on a Petition To Delist Seven Texas Karst Invertebrates

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of petition finding.

SUMMARY: The U.S. Fish and Wildlife Service (Service) announces a 90-day finding on a petition to remove seven species of invertebrates that occur in karst topography in Travis and Williamson counties, Texas, from the List of Endangered and Threatened Wildlife and Plants. The Service determines that the petition does not present substantial scientific or commercial information indicating that delisting the Coffin Cave mold beetle (*Batrisodes texanus*), the Tooth Cave spider (*Neoleptoneta myopica*), the Tooth Cave ground beetle (*Rhadine persephone*), the Tooth Cave pseudoscorpion (*Tartarocreagris texana*), the Kretschmarr Cave mold beetle (*Texamaurops reddelli*), the Bee Creek Cave harvestman (*Texella reddelli*), and the Bone Cave harvestman (*Texella reyesi*) may be warranted.

DATES: The finding announced in this notice was made on March 7, 1994. Comments and information related to this petition finding may be submitted until further notice.

ADDRESSES: Information, comments, or questions may be submitted to the State Administrator, U.S. Fish and Wildlife Service, Ecological Services Field Office, 611 East 6th Street, room 407, Austin, Texas 78701. The petition, finding, supporting data, and comments will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Ruth Stanford, Ecologist, at the above address (512/482-5436).

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), requires that the Service make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. To the maximum extent practicable, this finding is to be made within 90 days of receipt of the petition, and the finding is to be published promptly in the **Federal Register**. If the finding is positive, the Service is also required to promptly commence a status review of the species.

Judge John C. Doerfler, representing the Williamson County Commissioners Court, submitted a petition to the Service to delist six species of endangered karst invertebrates in Travis and Williamson counties, Texas. The petition was dated June 7, 1993, and received by the Service on that date. On June 16, 1993, the Service received a letter from attorney J.B. Ruhl on behalf of the petitioners, clarifying the intent of the petition to incorporate recent taxonomic revisions and the taxonomic reevaluation of five listed karst invertebrate species as seven species.

The final rule listing the Tooth Cave pseudoscorpion (*Microgreagris texana*), the Tooth Cave spider (*Leptoneta myopica*), the Bee Creek Cave harvestman (*Texella reddelli*), the Tooth Cave ground beetle (*Rhadine persephone*), and the Kretschmarr Cave mold beetle (*Texamaurops reddelli*) as endangered species was published in the **Federal Register** on September 16, 1988 (53 FR 36029) (final rule). Subsequent taxonomic revisions have formalized genus reassignments for *M. texana* and *L. myopica* and established that *Texella reddelli* and *Texamaurops reddelli* each actually comprise two species. *Microcreagris texana* has been reassigned to *Tartarocreagris texana* (Muchmore 1992). *Leptoneta myopica* has been formally reassigned to *Neoleptoneta myopica* following Brignoli (1977) and Platnick (1986). *Texella reddelli* has been found to comprise two species, *Texella reddelli* (Bee Creek Cave harvestman) and *Texella reyesi* (Bone Cave harvestman) (Ubick and Briggs 1992). *Texamaurops reddelli* has been found to comprise two species, *Texamaurops reddelli* (Kretschmarr Cave mold beetle) and *Batrisodes texanus* (Coffin Cave mold beetle) (Chandler 1992). A **Federal Register** notice announcing the latter two revisions was published on August 18, 1993 (58 FR 43818).

Several caves in Travis County contain more than one of the endangered karst invertebrates. These include Tooth Cave, Amber Cave, Gallifer Cave, Kretschmarr Cave, and Kretschmarr Double Pit. These caves and others are protected under the stewardship of the Texas System of Natural Laboratories (TSNL). In addition, some other caves are in preserves regulated by the Cities of Austin and Georgetown. (For further discussion, see Factor D, "The inadequacy of existing regulatory mechanisms," below.) However, many of the caves containing endangered karst invertebrates currently have no protection other than that provided by the Act.

The petitioners point out that, since publication of the final rule, new locations have been discovered for several of the species, most notably the Tooth Cave ground beetle and the Bone Cave harvestman. The Tooth Cave ground beetle was known from two caves about 2.5 kilometers (km) (1.5 miles (mi)) apart in Travis County, Texas, at the time of listing. It is currently known from about 27 locations (24 confirmed, 3 tentative) along a 14-km (9-mi) distance in Travis and Williamson counties, Texas. Only 10 of these caves are provided any degree of local protection (James Reddell, Texas Memorial Museum, *in litt.*, 1993). Seven of these caves are located in the small TSNL preserves discussed above, one is in a small preserve owned by the City of Austin, and two are in small preserves acquired as mitigation for a development project.

The Bone Cave harvestman was not described at the time of the original listing, but was thought to be the same species as the Bee Creek Cave harvestman. The Bone Cave harvestman is currently known from about 69 locations (60 confirmed, 9 tentative) along a 40-km (25-mi) distance in Travis and Williamson counties, Texas. Of the 69 caves recorded as locations of the Bone Cave harvestman, only 9 are provided any local protection. Three are TSNL caves, two are in City of Austin preserves, two are in City of Georgetown preserves, and two were acquired as mitigation for a development project. In addition, this species exhibits considerable geographical variation and loss of a significant number of locations within a part of its range would result in a loss of genetic diversity within the species (Reddell, *in litt.*, 1993). Few caves are provided any protection other than that now provided by the Act and their distribution is disjunct and at the extremes of the species' range.

The number of caves in which the other five endangered karst invertebrates have been found or tentatively identified has increased slightly for three of the species, remained the same for another species

(although its range has decreased), and decreased for the fifth species.

The Tooth Cave pseudoscorpion, known at the time of listing from Tooth and Amber caves, within a 1.3-km (0.8-mi) radius in Travis County, remains confirmed only from the two original caves. The species has been tentatively identified from Stovepipe Cave and Kretschmarr Double Pit, lying within the original range. Stovepipe Cave is located on private property that the City of Austin has approved for development. The three remaining caves are located in the small TSNL preserves discussed above.

The Tooth Cave spider, known at the time of listing only from Tooth Cave, is now also confirmed at New Comanche Trail Cave and tentatively identified from Gallifer and Stovepipe caves, all lying along a 4.5-km (3-mi) distance in northwest Travis County, Texas. Tooth and Gallifer caves lie within small TSNL preserves, Stovepipe Cave is on private property approved for development, and New Comanche Trail Cave is not protected and may be adversely impacted by a planned realignment of New Comanche Trail Road.

The Coffin Cave mold beetle was not described at the time of listing, but was thought to belong to the same species as the Kretschmarr Cave mold beetle. The Coffin Cave mold beetle is currently confirmed from four caves and tentatively identified from one cave, all occurring along a 17-km (10-mi) distance in Williamson County, Texas. Off Campus and Sierra Vista caves are located in a small preserve surrounded by a subdivision; the adequacy of the preserve for long-term protection of the species at those sites is uncertain. On Campus Cave lies on a high school campus. The status of the type locality (Coffin Cave) is unknown; recent attempts to locate the species in Inner Space Cavern were unsuccessful (Reddell, *in litt.*, 1993).

The Kretschmarr Cave mold beetle was believed to occur in four caves in Travis and Williamson counties at the time of listing and is currently known from four caves in Travis County. A specimen from Coffin Cave was redescribed as the Coffin Cave mold beetle and a new location for the Kretschmarr Cave mold beetle was discovered at Stovepipe Cave. The range of the Kretschmarr Cave mold beetle has consequently decreased since the original listing from a 45-km (28-mi) distance in Travis and Williamson counties to a 2-km (1.2-mi) distance in Travis County. Stovepipe Cave lies within a proposed subdivision and the other three locations for the species, Tooth, Amber, and Kretschmarr caves, lie within small TSNL preserves.

The Bee Creek Cave harvestman was believed to occur in five caves in Travis and Williamson counties at the time of listing. It is currently confirmed at four caves and tentatively identified from two caves. The distribution of the Bee Creek Cave harvestman consists of two disjunct areas, one about 5 km (3 mi) long and the other about 8 km (5 mi) in length, with a distance of about 28 km (17 mi) between the northernmost and southernmost localities, all of which lie in Travis County. Little Bee Creek Cave, Jester Estates Cave, and Kretschmarr Double Pit (a TSNL cave) are located in small preserve areas. Bandit Cave is maintained as a small preserve, although attempts to relocate the Bee Creek Cave harvestman in the cave in 1966, 1988, and 1989 were unsuccessful (Reddell, *in litt.*, 1993). Cave Y is located in a proposed development area; the species' status in Bee Creek Cave is unknown since it has not been possible to obtain permission to inspect the cave since 1975 (Reddell, *in litt.*, 1993).

None of these invertebrates are known to occur in large numbers (William Elliott, Texas Memorial Museum, *in litt.*, 1993; Reddell, *in litt.* and pers. comm., 1993). The fact that several of the species are known to occur at several dozen locations should not be interpreted to mean that those species are abundant. (See Factor A, "The present or threatened destruction, modification, or curtailment of its habitat or range," below).

Summary of Factors Affecting the Species

Section 4(a)(1) of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for adding species to or removing species from the Federal Lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the seven karst invertebrates are re-evaluated in light of new information available to the Service and information presented in the petition and are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The Service determined that the primary threat to these species comes from loss of habitat due to ongoing and proposed development activities (final rule). The proximity of the caves inhabited by these species to the City of Austin makes them vulnerable to continuing expansion of the Austin metropolitan area. Threats to specific caves occupied by these species were addressed in the final rule (53 FR 36029).

The known ranges of the Tooth Cave pseudoscorpion, the Tooth Cave spider, the Kretschmarr Cave mold beetle, the Coffin Cave mold beetle, and the Bee Creek Cave harvestman have not appreciably increased since the original listing. Although the range and number of known locations for the Tooth Cave ground beetle and the Bone Cave harvestman have increased since the original listing, the degree of threat of habitat destruction or modification remains significant, and may have increased, throughout the range of each species.

Searches for karst features and karst fauna surveys have become more frequent since the listing, as developers and landowners have sought to comply with the Act. Many of the new locations of these karst invertebrates have been discovered as a result of biological surveys conducted prior to development or sale of land; consequently, newly discovered locations are frequently threatened by habitat destruction and other threats associated with development. The recent revitalization of the real estate market in the Austin metropolitan area has maintained and intensified the threat of karst invertebrate habitat destruction and other associated threats.

The petitioners present a list of caves with endangered species that have been subject to some degree of disturbance. They cite these cases as demonstrating that activities such as dumping, vandalism, and sealing of cave entrances do not actually threaten the karst invertebrates. Reddell (in litt., 1993) counters that, in most of these cases, the disturbance to the cave environment is recent in origin, minor in scale, and/or generally restricted to the immediate entrance zone. The Service concurs with Reddell and believes that these examples do not present convincing evidence that dumping, vandalism, and sealing entrances are harmless to the karst invertebrates. In most cases, not enough time has elapsed since the disturbance to detect an effect on the karst invertebrates. The Service agrees with the petitioners that there is little quantitative data available on the direct effects of trash dumping, vandalism, sealing, and other disturbances on the karst invertebrates. However, there is substantial qualitative evidence indicating that the threats to the karst invertebrates discussed in the final rule and in this finding are real, significant, and ongoing. Reddell (*in litt.*, 1993) and

Elliott (*in litt.*, 1993) both cite examples in which trash dumping, vandalism, and over-visitation have resulted in decreased occurrence of karst invertebrates in affected areas.

The petitioners cite the work of Crawford (1981) and Veni (1992) as evidence that the caves where the karst invertebrates occur are not isolated "islands" of special habitat and that the invertebrates likely occur and move throughout the karst in the interstitial spaces. In this interpretation, the petitioners misunderstand the Service's use of the "island" analogy in the final rule. The final rule listing the karst invertebrates stated that the caves containing the karst invertebrates "occur in isolated 'islands' " of the Edwards limestone formation that were separated from one another when stream channels cut through overlying limestone to lower rock layers" (53 FR 36029). The Service applied the island analogy to the distinct, geologically isolated karst areas (referred to in the Draft Recovery Plan (U.S. Fish and Wildlife Service 1993) and hereinafter as "regions") within which the caves containing the karst invertebrates have formed, not to the individual cave systems. Veni's work (1992) delineates these karst regions and identifies areas "having a high probability of suitable habitat for endangered or other endemic invertebrate cave fauna." A letter from Veni in response to the petition clarifies that he did not intend that his work be interpreted to mean that there are thousands of acres of habitat suitable for the karst invertebrates (George Veni, Veni and Associates, *in litt.*, 1993).

While the Service believes that the karst invertebrates are likely to use interstitial spaces in the karst, particularly in areas with some surface nutrient input to the karst system, the Service does not believe that this suitable habitat exists uniformly within the larger karst regions (as delineated by Veni (1992) and described by the Service in the final rule as "islands"). Finally, Crawford (1981) focuses on aquatic karst species. In the aquatic karst ecosystems upon which Crawford based his ideas, continuously flowing water through caves and the interstitium may provide more continuous habitat for aquatic subterranean species and thus provide more opportunity for aquatic invertebrates to inhabit interstitial spaces. Given that the Travis and Williamson County karst invertebrates are exclusively terrestrial and that habitat for terrestrial species is more patchy and distributed according to the occurrence of food, cover, and moisture, Crawford's ideas may not apply to these invertebrates.

The petitioners cite the work of Curl (1966), Juberthei and Delay (1981), and Culver (1986) as evidence that most caves have no entrance, that caves are rare even in karst areas, and that caves may be less favorable environments for karst invertebrates than interstitial spaces. They cite these papers as evidence that habitat for terrestrial troglobites (obligate cave-dwelling species) is ubiquitous in karst areas and that the Texas karst invertebrates exist throughout the karst even where there are no caves or openings to the surface. Culver (1986) says that "the number of caves (defined as cavities large enough for human access) more or less corresponds to the number of habitable patches for terrestrial troglobites." Reddell (*in litt.*, 1993) and Peck (1976) believe that cave entrances provide an important avenue of nutrient input for cave fauna. Reddell (*in litt.*, 1993) also cites several examples in which subsurface voids having no natural entrance were encountered during construction activities and found not to contain karst invertebrates. Similarly, clay-filled sinkholes with no openings to the surface rarely contain karst invertebrates, whereas caves and sinkholes that are sealed to human access by soil or rock fill or with openings to the surface that allow access by cave crickets or small mammals (and associated nutrients) more often contain karst fauna (Reddell, *in litt.*, 1993).

B. Overutilization for Commercial, Recreational, Scientific or Educational Purposes

No threat from overutilization of these species is known to exist at this time. Collection for scientific or educational purposes could become a threat if specific localities become widely known.

C. Disease or Predation

At the time of listing, predation by and competition with non-native species introduced in association with human habitation was considered a potential threat to the karst invertebrates. Human activities facilitate movement of non-native competitors and predators such as sowbugs, cockroaches, and fire ants into an area. Buildings, lawns, roadways, and landscaped areas provide habitat from which these species can disperse. The relative accessibility of the shallow caves in Travis and Williamson counties makes them especially vulnerable to invasion by non-native species.

Fire ants are a major threat to the karst invertebrates. The significance of this threat and the difficulty of controlling fire ants should not be underestimated. Fire ants are voracious predators and there is evidence that overall arthropod diversity drops in their presence (Vinson and Sorensen 1986, Porter and Savignano 1990). Reddell (*in litt.*, 1993) lists at least nine cave-inhabiting species that he has observed being preyed upon by fire ants. Elliott (1992) cites other examples and notes that fire ant activity has increased dramatically in Central Texas since 1989.

Although the threat posed by fire ants was not recognized at the time these species were listed, the magnitude of the threat the ants pose has subsequently become quite apparent. Even in the unlikely event that fire ants do not prey upon the listed species, their presence in and around caves could have a drastic detrimental effect on the cave ecosystem through loss of species, inside the cave and out, that provide nutrient input and critical links in the food chain.

Controlling fire ants once they have invaded the cave and vicinity is difficult. Chemical control methods have some effectiveness but the effect of these agents on non-target species is unclear. Consequently, using chemicals to control fire ants in and near caves is not advisable. Currently, the Service recommends only boiling water treatment for control of fire ant colonies near caves inhabited by listed invertebrates. This method is labor-intensive and only moderately effective. Presently, the burden of carrying out such practices is not a designated or mandated duty of any agency, individual, or organization. This type of control will likely be needed indefinitely or until a long-term method of fire ant control is developed.

D. The Inadequacy of Existing Regulatory Mechanisms

Invertebrates are not included on the Texas Parks and Wildlife Department's list of threatened and endangered species and are provided no protection by the State; nor do the Department regulations contain provisions for protecting habitat of any listed species.

As previously discussed, some of the caves containing endangered invertebrates are in TSNL and city preserves. A small preserve surrounds the entrance to each of these caves. However, these preserves encompass only a fraction of the surface drainage area that provides input of nutrients and moisture into the caves. The entire surface and subsurface drainage area is the minimum area believed necessary to provide adequate long-term protection for cave ecosystems. The preserves around these caves are not sufficient to counter nutrient depletion and prevent

pollution, should the surrounding areas be developed.

Some of the TSNL caves are under temporary deed to TSNL and may be sold at the owner's discretion (U.S. Fish and Wildlife Service 1993). In addition, City of Austin cave protection laws do not apply in most cases, since the great majority of these caves lie outside the city limits.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

The Service is unaware of other threats to these species beyond those discussed under factors A–D (above). As noted under Factor A, the Bone Cave harvestman exhibits considerable geographical variation. Loss of a number of locations within any one part of its range would result in a loss of genetic diversity for the species (Reddell, *in litt.*, 1993). The Tooth Cave pseudoscorpion, Tooth Cave spider, Coffin Cave and Kretschmarr Cave mold beetles, and Bee Creek Cave harvestman are each known from fewer than 10 locations (4, 4, 5, 4, and 6 locations respectively, including unconfirmed identifications). Therefore, the loss of even a single location would represent a significant loss of genetic diversity for any of those species. Lack of genetic diversity can accelerate the decline or extinction of rare species.

Conclusion

As discussed in the final rule, these species remain extremely vulnerable to losses. For the Tooth Cave pseudoscorpion, the Tooth Cave spider, the Kretschmarr Cave mold beetle, the Coffin Cave mold beetle, and the Bee Creek Cave harvestman, neither the range nor the number of confirmed localities within the range has expanded significantly since the original listing. The Tooth cave ground beetle and the Bone Cave harvestman occur in more locations and are more widespread than was originally believed, but the expansion of the overall range is not significant and the majority of caves in which these species occur are subject to one or more of the threats discussed above (Reddell, *in litt.*, 1993).

The Service recently released a Draft Recovery Plan for the karst invertebrates (U.S. Fish and Wildlife Service 1993). That document details recovery actions and criteria that, when met, may result in reclassification or delisting of the endangered karst invertebrates. Continued efforts to locate new inhabited caves, to implement habitat conservation measures, and to control the threat of fire ants could bring the karst invertebrates to the point where protection under the Act is no longer necessary.

The Service has carefully assessed the information presented in the petition, as well as the best and most current scientific and commercial information, in determining that the petition does not present substantial scientific and commercial information indicating that delisting of any of the seven karst invertebrates may be warranted. These species continue to require the protection provided by the Act because of their extremely small, vulnerable, and limited habitats located within an area that is experiencing continued pressures from economic and population growth.

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Author

The primary author of this notice is Ruth Stanford (See **ADDRESSES** section).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531–1544).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Dated: March 7, 1994.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

[FR Doc. 94–5854 Filed 3–11–94; 8:45 am]

BILLING CODE 4310–55–P

Bone Cave Harvestman
(*Texella reyesi*)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
Austin Ecological Services Field Office
Austin, Texas

5-YEAR REVIEW
Bone Cave Harvestman (*Texella reyesi*)

1.0 GENERAL INFORMATION

1.1 Reviewers:

Lead Regional Office: Southwest Regional Office, Region 2
Susan Jacobsen, Chief, Threatened and Endangered Species
505-248-6641
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Julie McIntyre, Recovery Biologist, 505-248-6657

Lead Field Office: Austin Ecological Services Field Office (AESFO)
Cyndee Watson, Endangered Species Biologist
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1.2 Methodology used to complete the review:

The U.S. Fish and Wildlife Service (Service) conducts status reviews of species on the List of Endangered and Threatened Wildlife and Plants (50 CFR 17.12) as required by section 4(c)(2)(A) of the Endangered Species Act (16 U.S.C. 1531 et seq.). The Service provides notice of status reviews via the Federal Register and requests information on the status of the species. This review was conducted by Cyndee Watson and Bill Seawell from the AESFO. This status review mostly relied on information summarized and cited in Balcones Canyonlands Preserve (BCP)[1] Annual Report (BCCP 2009a)[2] and the BCP cave assessment (BCCP 2009b). We also used the draft Bexar County Karst Invertebrate Recovery Plan (Bexar RP) (Service 2008), which contains new karst invertebrate research and preserve design concepts; the Recovery Plan for Endangered Karst Invertebrates in Travis and Williamson Counties, Texas (Travis and Williamson RP) (Service 1994), and cave data contained within AESFO's files.

As a basic first step in assessing whether caves that contain *T. reyesi* met the downlisting recovery criteria in the Travis and Williamson RP, we compiled a list of some basic characteristics (further described in Section 2.2.3). While the Travis and Williamson RP discusses broad concepts regarding preserve design, the draft Bexar RP has an appendix that is a compilation of research to help more specifically delineate preserve boundaries that follow those basic concepts (Service 2008). These preserve design principles and characteristics describe what is needed to protect each karst feature and its surrounding

[1] BCP - A system of preserves permanently set aside to conserve habitat for 8 endangered species (including *T. reddelli*) and 27 species of concern as part of a joint regional 10(A)(1)(B) incidental take permit PRT 788841, held by the City of Austin and Travis County.
[2] BCCP - The incidental take permit mentioned above is also referred to as the Balcones Canyonlands Conservation Plan (BCCP).

area. From the list of known locations of these species, we identified those that had the highest likelihood of meeting these characteristics. Our determinations (discussed in section 2.2.3) for each of these characteristics were based on site-specific information found in the AESFO files and on cave location and parcel data. Unless otherwise noted, all acreage estimates were calculated using Geographic Information Systems (GIS) (2008 digital aerial photography, 2006 Travis County parcel data, and 2005 Williamson County parcel data) and are subject to typical margins of error associated with GPS units, GIS, and transferring data from paper sources to digital media. These acreages and respective cave locations need to be ground-truthed (i.e., verified by site visits).

1.3 Background:

The Bone Cave harvestman, *Texella reyesi*, is a troglobite which is a species restricted to the subterranean environment. As typical of troglobites, this harvestman exhibits morphological adaptations to that environment, such as elongated appendages and loss of eyes and pigment. Troglobitic habitat includes caves and mesocavernous voids in karst limestone (a terrain characterized by landforms and subsurface features, such as sinkholes and caves, which are produced by solution of bedrock) in Travis and Williamson Counties. Karst areas commonly have few surface streams; most water moves through cavities underground. Within this habitat this species depends on high humidity, stable temperatures, and nutrients derived from the surface. Examples of nutrient sources include leaf litter fallen or washed in, animal droppings, and animal carcasses. The harvestman is predaceous upon small or immature arthropods. It is imperative to consider that while these species spend their entire lives underground, their ecosystem is very dependent on the overlying surface habitat.

Texella reyesi was listed as endangered in 1988 based on the threats of: 1) habitat loss to development; 2) cave collapse or filling; 3) alteration of drainage patterns; 4) alteration of surface plant and animal communities, including the invasion of exotic plants and predators (i.e. the red-imported fire ant (RIFA), *Solenopsis invicta*), changes in competition for limited resources and resulting nutrient depletion, and the loss of native vegetative cover leading to changes in surface microclimates and erosion; 5) contamination of the habitat, including groundwater, from nearby agricultural disturbance, pesticides, and fertilizers; 6) leakages and spills of hazardous materials from vehicles, tanks, pipelines, and other urban or industrial runoff; and 7) human visitation, vandalism, and dumping; mining; quarrying (limestone); or, blasting above or in caves.

There are 168 caves known to contain *T. reyesi* in Travis and Williamson Counties, Texas (Table 1). Currently, *T. reyesi* faces the same threats that it did at the time it was listed.

1.3.1 FR Notice citation announcing initiation of this review:

75 FR 20134, April 23, 2007

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)? Yes

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information: The recovery plan only provides criteria for downlisting from endangered to threatened (Service 1994).

Recovery Criteria: Each species will be considered for reclassification from endangered to threatened when:

(1) Three karst fauna areas (KFA) (if at least three exist) within each karst fauna region (KFR) in each species' range are protected in perpetuity. If fewer than three KFAs exist within a given KFR, then all KFAs within that region should be protected. If the entire range of a given species contains less than three KFAs, then they should all be protected for that species to be considered for downlisting.

(2) Criterion (1) has been maintained for at least five consecutive years with assurances that these areas will remain protected in perpetuity.

There are seven KFRs (adapted from the karst fauna areas in Figure 19 of Veni & Associates' 1992 report and reproduced in Figure 2 of the Travis and Williamson RP) in Travis and Williamson counties that are known to contain listed karst invertebrate species. These regions are delineated based on geologic continuity, hydrology, and the distribution of rare troglobites.

Within each KFR, established karst preserves may be considered a KFA if they meet recovery criteria. For the purposes of the recovery plan, a KFA is an area known to support one or more locations of a listed species and is distinct in that it acts as a system that is separated from other KFAs by geologic and hydrologic features and/or processes that create barriers to the movement of water, contaminants, and troglobitic fauna. Karst fauna areas should be far enough apart so that if a catastrophic event (for example, contamination of the water supply, flooding, disease) were to destroy one of the areas, that event would not likely destroy any other area occupied by that species. To be considered "protected", a KFA must be sufficiently large to maintain the integrity of the karst ecosystem on which the species depend(s). In addition, these areas must also provide protection from threats such as red-imported fire ants (*Solenopsis invicta*) (RIFA), habitat destruction, and contaminants.

Brief summary of preserve design principles:
Much of the conservation and recovery of this endangered and cryptic species is dependent upon the long-term preservation of its habitat. Because most endangered karst invertebrates are difficult to detect during in-cave faunal surveys, their conservation strategies focus on the delineation, study, and management of occupied KFAs. Regarding size and configuration of KFAs, the Travis and Williamson RP provides some conceptual guidelines on habitat conditions that are important to karst invertebrates,

CERTIFICATE OF SERVICE

I hereby certify that on October 5, 2017, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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