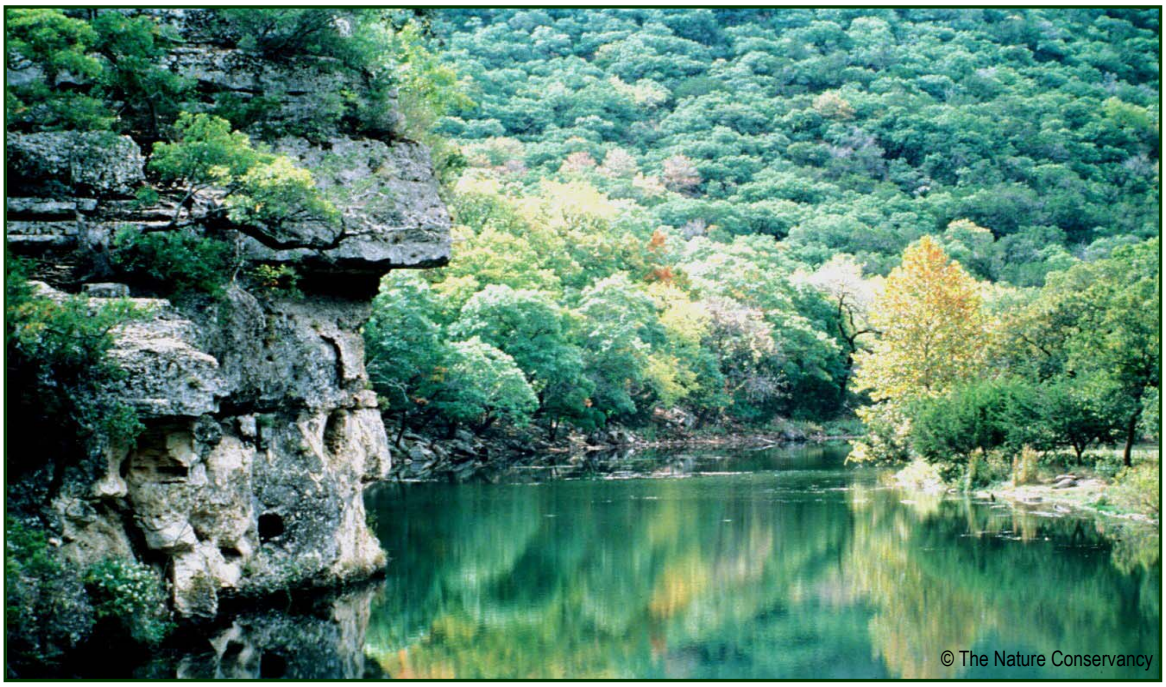
A Biodiversity and Conservation Assessment of the Edwards Plateau Ecoregion

June 2004



The Nature Conservancy

SAVING THE LAST GREAT PLACES ON EARTH

DEPARTMENT OF DEFENSE LEGACY PROGRAM

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Executive Summary

Ecoregional biodiversity assessment is a global objective of The Nature Conservancy. With these assessments we are developing a global "blueprint" for successfully implementing our conservation vision: To conserve portfolios of functional conservation areas within and across ecoregions. Through this portfolio approach, we will work with partners to conserve the full array of ecological systems and viable native communities and species.

The Edwards Plateau of central Texas includes a variety of well-known Texas features. The terrestrial and aquatic environments found here are home to a rich diversity of plants and animals, many of which occur in this ecoregion and nowhere else on the planet. The Edwards Plateau is truly a unique place, even from a global perspective.

The Edwards Plateau is also one of the fastest developing regions in the United States. The Conservancy recognizes the complexity of this region not only in a biological context but also in a socioeconomic setting. Just as there are unique species of plants and animals within the region, so too are there unique population, economic, cultural, and social attributes. To meet our mission we must frame our conservation action within the acceptable limits of each community in which we work. If the Conservancy is to be successful within the Edwards Plateau, we must facilitate the means by which humans can live productively and sustainably while conserving biological diversity.

For this assessment, we used a coarse filter - fine filter approach to identify areas of biodiversity significance within the ecoregion. Our goal was to capture representative examples of a subset of species, communities, and ecosystems, with the underlying assumption that in doing so we will also capture examples of the biodiversity associated with those explicitly represented. Our approach emphasizes the identification of large landscapes that are more likely to be able to maintain the critical ecological processes important to ecosystem function.

The resultant portfolio of areas includes 102 terrestrial areas of biodiversity significance and 62 aquatic areas and stream/river segments. Each area represents one or more examples of a species, community, or ecosystem of conservation concern.

Conservation goals in terms of both abundance and distribution have been met for 29 of 275 (11%) species, communities or ecosystems of conservation concern. Data and research gaps were identified for several taxonomic groups and individual targets. We also identified some key and widespread threats to biodiversity in these areas. The most prominent threats include overgrazing, excessive herbivory, altered fire regime, residential/urban development, and fragmentation. Finally, we assessed the current status of biodiversity conservation in the Edwards Plateau by comparing our portfolio to a set of known areas under varying degrees of conservation management. Our results suggest that approximately 4% of the identified terrestrial portfolio and 2% of the aquatic portfolio are already being managed for the conservation of biodiversity.

Areas of biodiversity significance in the portfolios represent places whose collective conservation would help insure that the biological diversity of the Edwards Plateau ecoregion will persist over the long term. The Nature Conservancy, acting alone and through diverse partnerships, will focus its foreseeable future conservation efforts in these areas. These are not areas of land acquisition priorities. Protection of these areas will necessitate a

broad array of conservation actions implemented by private landowners, public natural resource agencies and private conservation organizations. We hope that this assessment will serve as an important resource to guide those cooperative ventures.

Note: Most of the data used to develop this assessment and accompanying report can be obtained by contacting The Nature Conservancy, P.O. Box 1440, San Antonio, Texas 78295 or by calling (210) 224-8774.

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In its 50-year history, the Conservancy has continually adapted and expanded its conservation strategies and methods to be more efficient and scientifically sound. Within the last 10 years, the Conservancy has adopted a framework for mission success that places emphasis on the conservation of all viable species, communities and ecosystems (not just the rare ones). This framework, known as *Conservation by Design*, also emphasizes conservation at multiple scales of biological organization and recognizes the value of comprehensive biodiversity analyses within ecological, rather than geopolitical, units (The Nature Conservancy 2001).

Integral to *Conservation By Design* is a four-part approach: setting area-based priorities, developing strategies to conserve biodiversity and abate threats at appropriate scales, taking conservation action to abate current and future threats, and measuring the effectiveness of conservation actions. The initial step of setting priorities through ecoregion-based biodiversity assessments is a complex, science-based, and iterative process. This document presents the methodology and results of the first iteration of a biodiversity assessment of the Edwards Plateau ecoregion.

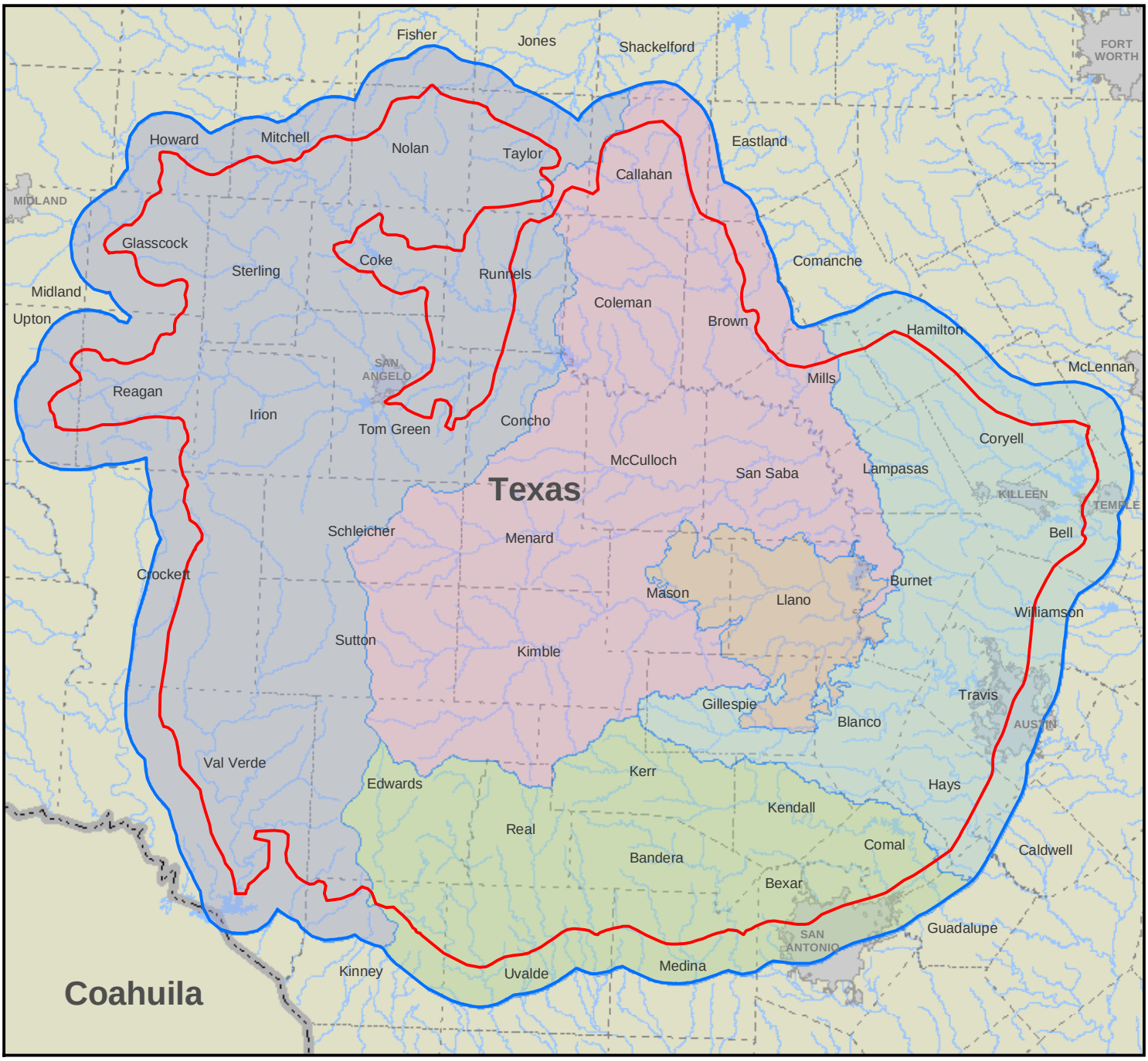
Ecoregions and the Edwards Plateau

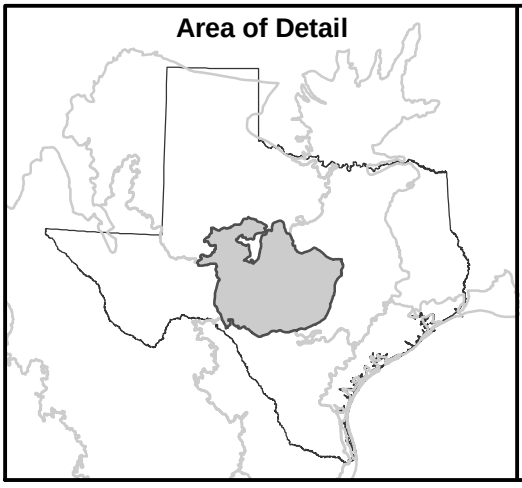
To aid in the analysis of the patterns of biodiversity at biologically meaningful scales, ecoregions have been identified as appropriate ecological units for conservation and management planning. From a conservation planning perspective, ecoregions are defined as "...relatively large areas of land and water that contain geographically distinct assemblages of natural communities. These communities (1) share a large majority of their species, dynamics, and environmental conditions, and (2) function together effectively as a conservation unit at global and continental scales" (Ricketts et al. 1999). The Conservancy has chosen the U.S. Forest Service ECOMAP framework as the base map of ecoregional assessment units in the United States (Bailey 1995; 1998). In each of these 80 ecoregions, the Conservancy is or will be conducting assessments to identify areas critical to the conservation of the remaining viable biodiversity. Ecoregions are more appropriate units for biodiversity assessments because they are not restricted by arbitrary geographic administrative boundaries that cut across the ecological landscape of most species. However, the Conservancy does recognize the importance of state and local governments and working across ecoregional boundaries in the ultimate success of conservation.

Ecological Setting

The Edwards Plateau, as defined for this assessment, encompasses approximately 23,500,000 acres or 36,680 square miles (larger than the state of Indiana) of central Texas (Fig. 1). The ecoregion includes a variety of well known Texas features, such as the much-loved Hill Country with its rugged and forested hillsides. There are also the many irregular limestone (karst) features that are critical to the integrity of the Edwards Aquifer, the water supply for well over a million people and untold numbers of wildlife in the region. The terrestrial and aquatic environments found here are home to a rich diversity of plants and animals, many of which occur in this ecoregion and nowhere else on Earth. The Edwards Plateau is truly a unique place, even from a global perspective.

Figure 1: Edwards Plateau Ecoregion Planning Unit





Edwards Plateau Boundary
Ecoregion Buffer (10mi)

Ecoregion Stratification Units

- Eastern Balcones Escarpment
- Southern Balcones Escarpment
- Eastern Edwards Plateau
- Western Edwards Plateau
- Llano Uplift

Lakes and Rivers
County Lines
Cities
Texas/Mexico Border

0 10 20 40 60 Miles

N
W E
S

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/14/04

The Edwards Plateau is often envisioned as being primarily composed of the steep, limestone hillsides covered in juniper woodlands so commonly seen along the Balcones Escarpment. In fact, this ecoregion is made up of a wide range of botanical and zoological communities on varied topography and geologic features. It is this varied ecological setting that makes the Edwards Plateau one of the most diverse biological regions in the world.

There remains considerable debate as to the true nature of the terrestrial environment in this ecoregion prior to European settlement. However, it does appear that even prior to significant human modification (pre-1860), this ecoregion was a transitional area represented by a woodland/forest to savanna/grassland gradient (Weniger 1988), but that a woodland/forest landscape was dominant. Riskind and Diamond (1988) highlight and describe four regions of the Edwards Plateau: Balcones Canyonlands, Lampasas Cut Plain, Llano Uplift, and the Central and Western Plateau.

Today, grasslands to the east quickly transition into the oak and juniper forests of the Balcones Canyonlands. Here are the steep-sloping and forested hillsides of Hill Country fame. Also found here are the geologic features that allowed for the development of one of the most diverse faunas in the world. The organisms that inhabit the underground features (caves and crevices) of this region are often uniquely adapted to their local environment. Besides displaying the interesting evolutionary characteristics common to many cave-obligate species (e.g., loss of pigmentation, diminished visual acuity), many of these species inhabit one or only a few cave features of the Edwards Plateau.

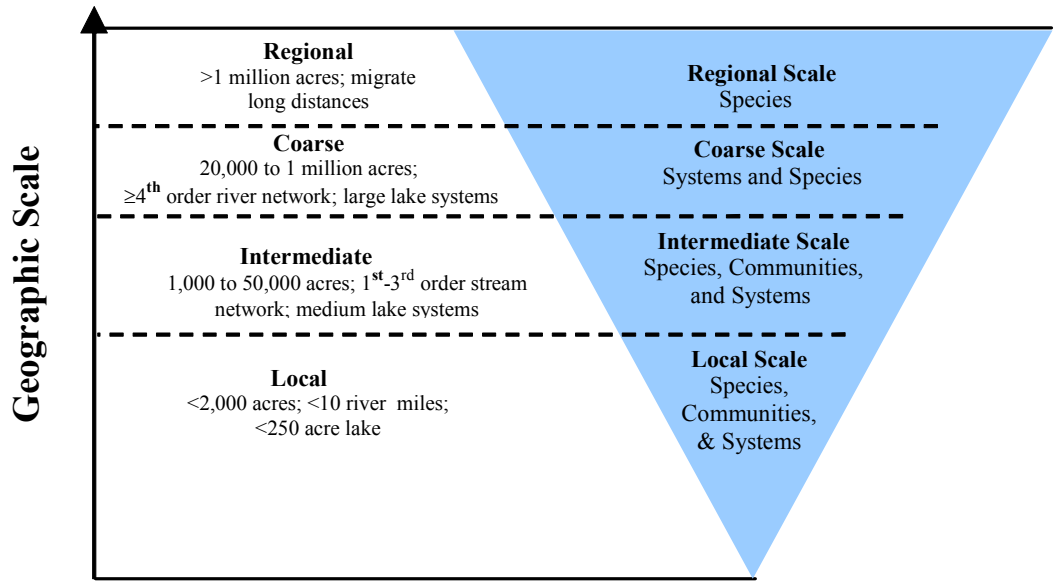
West of the escarpment lies a broad area of varied habitat that includes grasslands, shrublands, oak and mesquite savannas, open woodlands, forests, and riparian corridors. The Lampasas Cut Plain is flatter and less dissected than the Canyonlands, resulting in a more open, wooded environment. The Llano Uplift has more woodland- and savanna-like communities overlaying soils of granitic origin (Riskind and Diamond 1988).

The central and western portions of the plateau have been highly modified and exhibit a mosaic of community types. As one moves west, the landscape shows a strong transition from the Canyonlands-like wooded hillsides to the xeric shrublands more representative of the Chihuahuan Desert. Both here and in the Lampasas Cut Plain, mesquite (*Prosopis glandulosa*) has become an important part of the landscape. The lack of adequate assessments of the historical dominance of mesquite in this ecoregion makes it difficult to portray accurately how the distribution and abundance of this species has changed through the years.

Focusing on Functional Landscapes

The Conservancy's ecoregional assessment process represents a shift away from conservation focused primarily on rarity to conservation based on concepts related to functioning ecosystems. One trend emerging from this philosophical shift is an emphasis on conserving intact and functional landscapes. A functional landscape conserves biodiversity at several spatial scales and levels of biological organization (Poiani et al. 2000, Fig. 2). More importantly, it is of sufficient size and configuration to enable and endure the environmental processes that naturally impact the area, such as drought, flooding, disease, and fire. In other words, functional landscapes are identified with change in mind: by conserving ecosystem-level

Figure 2. Diagram illustrating the interaction between biodiversity and geographic scale. Adapted from Poiani et al. 2000.



environmental processes, these landscapes — and the targets of biodiversity within them — will be more likely to persist through time.

The attention to functional landscapes is intended to improve the efficiency and effectiveness of conservation work. These landscapes are thought to provide more habitat, greater habitat diversity, and larger populations of known and unknown species. Because of their complex and comprehensive environmental gradients, they may offer greater protection against global change. Yet functional landscapes are also exponentially more complex; understanding and measuring them requires substantial resources.

Although all areas of biodiversity significance should be functional, either naturally or through human assistance, not all will be functional landscapes. In contrast to a functional landscape, a functional site aims to conserve a small number of targets at only one or two spatial scales. Although they are not necessarily easy to conserve, targets are relatively few and often share similar sustaining ecological processes (e.g., fire-dependent prairie plants and butterflies; a wetland and its rare species; an assemblage of rare fish).

The Changing Landscape

The biological diversity of the Edwards Plateau, along with the ecological processes important to its maintenance, faces serious threats. Habitat loss and fragmentation represent two of the most significant threats. Population growth is also a factor; seven counties in the ecoregion ranked among the top 100 fastest growing counties in the country between 1990 and 2000 (U.S. Census Bureau). The city of San Antonio, straddling the boundary between the Edwards Plateau and the Crosstimbers–Southern Tallgrass Prairie ecoregions, is the eighth largest city in the U.S. and continues steadily to grow and spread.

Much of the growth in the ecoregion is occurring on top of the recharge zone for the Edwards Aquifer, from which San Antonio receives its water supply. This situation highlights the need for careful land use planning in order to reduce current impacts and avoid future environmental disasters. Immediate protection and restoration of natural areas in the Edwards Plateau is needed if we are to abate the threats to ecological processes that drive the region's economic and ecological productivity, and its aesthetic attractiveness.

The proximate causes of change in the distribution and composition of plant and animal communities and the function of ecosystems in the Edwards Plateau are many. Land conversion, water-use patterns, modification of natural fire regimes, exotic species introductions, and landscape fragmentation have all had major impacts. David Schmidly, in his new book "Texas Natural History: A Century of Change" (2002), describes how these factors and others have brought about change across the Texas landscape. In the Hill Country, explosive population growth has led to increased water demands, further modification in the natural fire regime, and extensive fragmentation of lands and land ownership (Schmidly 2002; Wilkins et al. 2000). These recent changes have significantly contributed to more rapid depletion-recharge cycles of the Edwards Aquifer and a general reduction in water quality; the continuing invasion of woody plants into grasslands; and the break up of large, intact landscapes that many plant and animal species rely on for continued existence.

The Nature Conservancy and other conservation-minded landowners and organizations recognize the implications of these changes to the ecological and cultural landscape of the Edwards Plateau. This assessment represents the Conservancy's initial effort to identify areas of biodiversity significance and summarize the critical threats to that biodiversity.

II. Setting Priorities

The first step in the Conservancy's conservation process is completing an assessment for each ecoregion that identifies the areas that represent, based on available data, the best remaining examples of biodiversity in the ecoregion. We define biodiversity as the variety of living organisms, the ecological complexes within which they occur, and the ways in which they interact with each other and the physical environment (Groves et al. 2002; Redford and Richter 1999). In addition, many of these areas are likely to be able to sustain the ecological processes (e.g., fire, seasonal stream flow) important to the development and maintenance of that diversity. This assessment indicates general areas of high biodiversity value and sufficient likelihood of persistence needing to be conserved, managed, or restored to represent the entire diversity of the ecoregion in populations, communities, and ecosystems. The principal products of this effort are a map of areas of biodiversity significance and, more critically, a geographically explicit database that contains key ecological information about the individual conservation targets (species, communities, ecosystems) captured within these areas.

The key steps in the Conservancy's conservation assessment process (Groves et al. 2002) are:

- **Identify conservation targets** – These are the species, communities, ecological systems, and abiotic features that are selected to represent the biodiversity of the ecoregion.
- **Collect information and identify information gaps** – Using a variety of sources, including rapid ecological assessments, biological inventories, and expert workshops, to assemble information on the distribution and condition of conservation targets.
- **Evaluate target viability** – Using criteria of size, condition, and landscape context. May also involve the use of GIS-based suitability models.
- **Determine conservation goals** – Includes goals for representation and quality; distributed across environmental gradients.
- **Assemble a conservation portfolio** – Using site or area selection methods and/or algorithms as a tool
- **Identify priority conservation areas** (a.k.a. areas of biodiversity significance)
- **Assess existing conservation areas** – Attempts to estimate the degree to which conservation of biodiversity has already been successfully accomplished.

Each of the above steps can be accomplished in a variety of ways. However, the Conservancy's assessment teams generally use the methods and techniques outlined in "Designing a Geography of Hope" (Groves et al. 2000).

Identifying Conservation Targets

Conservation targets are the building blocks of ecoregional assessments. They are the plants, animals, natural communities, ecological systems, physical land attributes, or ecological processes around which the Conservancy designs areas of biodiversity significance. Because it is impractical to

assess all remaining elements of biodiversity in an ecoregion, we selected a subset of targets at different spatial scales and levels of biological organization that represents all biological diversity.

Conservation targets used in this assessment included all plant and animal species and vegetation communities known to occur in the ecoregion with a Natural Heritage global rank of G1 to G3 (Table 1). Natural community types identified for use in this assessment were modified from the National Vegetation Classification System (NVCS) for the southeastern U.S. (Association for Biodiversity Information 2001). Other species and communities of "special concern" were included if data or expert opinion suggested that they met one or more of the following criteria: declining, endemic, disjunct, vulnerable, or focal (Table 2).

Table 1. Definitions for Natural Heritage Global Rank codes.

Rank Code	Rank Name	Rank Description
GX	PRESUMED EXTINCT	Not located despite intensive searches
GH	PRESUMED ELIMINATED (HISTORIC)	Presumed eliminated throughout its range, with no or virtually no likelihood that it will be rediscovered, but with the potential for restoration.
G1	CRITICALLY IMPERILED	Generally 5 or fewer occurrences and/or very few remaining acres or very vulnerable to elimination throughout its range due to other factor(s).
G2	IMPERILED	Generally 6-20 occurrences and/or few remaining acres or very vulnerable to elimination throughout its range due to other factor(s).
G3	VULNERABLE	Generally 21-100 occurrences. Either very rare and local throughout its range or found locally, even abundantly, within a restricted range or vulnerable to elimination throughout its range due to specific factors.
G4	APPARENTLY SECURE	Uncommon, but not rare (although it may be quire rare in parts of its range, especially at the periphery). Apparently not vulnerable in most of its range.
G5	SECURE	Common, widespread, and abundant (though it may be quite rare in parts of its range, especially at the periphery). Not vulnerable in most of its range.

Conservation targets also included a set of terrestrial and aquatic ecological systems that function as a "coarse filter" (e.g., Noss and Cooperrider 1994, Noss 1996). The coarse-filter approach used here assumes that by protecting representative examples of all the different system types in the ecoregion, the majority of other species and communities that exist within these system occurrences will also be protected.

Terrestrial ecological systems classified for use as coarse-filter targets in this assessment are dynamic spatial assemblages of ecological communities that occur together on the landscape and are tied together by similar ecological processes, underlying environmental features, or environmental gradients

(Groves et al. 2000). These systems tend to form a robust, cohesive and distinguishable unit on the ground. Nomenclature for system types was developed by modifying type names from the "ecological group" level of the NVCS.

Similarly, aquatic (freshwater) ecological systems are dynamic spatial assemblages of ecological communities that occur together in an aquatic landscape with similar geomorphological patterns, are tied together by similar ecological processes (e.g., hydrologic and nutrient regimes, access to floodplains) or environmental gradients (e.g., temperature, chemical and habitat volume), and form a robust, cohesive and distinguishable unit on a hydrography map (Higgins 2003).

The results of this selection process are summarized in Table 3. A total of 275 terrestrial and aquatic targets were selected for this assessment (See Appendices A and B for target names and ranks). All subterranean species were included within the terrestrial portfolio and in the terrestrial target lists.

Table 2. Descriptions of criteria for selecting species of special concern as conservation targets.

Reasons for Special Concern	Descriptions
Declining	Exhibit significant, long-term declines in habitat and/or numbers, are subject to a high degree of threat, or may have unique habitat or behavioral requirements that expose them to great risk.
Endemic	Restricted to an ecoregion, depend entirely on a single area for survival, and therefore are often more vulnerable.
Disjunct	Populations are geographically isolated from other populations.
Vulnerable	Usually abundant, may or may not be declining, but some aspect of their life history makes them especially vulnerable.
Focal	Have spatial, compositional, and functional requirements that may encompass those of other species in the region and may help address the functionality of ecological systems.

Table 3. Summary of number of conservation targets by major taxonomic group and level of biological organization.

Taxonomic Group	Number of Targets Selected
Vascular plants	78
Mollusks	19
Crustaceans	23
Insects	20
Other Karst Invertebrates	8
Fishes	13
Amphibians	15
Reptiles	4
Birds	13
Mammals	2
Level of Biological Organization	
Species	195
Vegetation communities	17
Terrestrial ecological systems	18
Aquatic ecological systems	45

Conservation Target Occurrences

Developing a meaningful assessment of the biodiversity in the Edwards Plateau required some understanding of the distribution and viability (ability to persist) of target occurrences across the ecoregion. Occurrences are the individual biodiversity units of each target (e.g., population, community or ecological system) and are used as the primary accounting units in assessing the conservation value of an area. Data used to determine the location and extent of individual occurrences and their viability were assembled from a variety of sources including the Texas Natural Heritage Program's Biological and Conservation Database (BCD), rapid field surveys, and expert knowledge.

In an effort to make our units of biodiversity more meaningful in assessing conservation status, we combined individual records of conservation targets if they, as a group, represented a single occurrence of a population, community, or ecological system. When possible, we represented occurrences of natural communities and ecological systems with areas (polygons) delineated using field survey data, interpretation of satellite imagery or aerial photography, and GIS modeling.

This step in the assessment process resulted in a total of 1,173 terrestrial target occurrences and 585 aquatic target occurrences, including 359 aquatic system occurrences. The abundance of the terrestrial target occurrences was greatest along the Balcones Escarpment and in the southwest portion of the ecoregion, within the Devils River watershed.

Distribution and Scale of Conservation Targets

To better understand the representation needs of conservation targets within the ecoregion, each target was assessed in terms of its range-wide distribution pattern and the typical geographic scale of an occurrence (e.g., population). Species, community, and terrestrial ecological system targets were assigned to one of five categories describing their distribution in the ecoregion relative to their range-wide distribution:

- **Restricted/endemic**: occurs primarily in one ecoregion
- **Limited**: occurs in the ecoregion and a few other adjacent ecoregions
- **Widespread**: widely distributed in several to many ecoregions
- **Disjunct**: occurs in ecoregion as a disjunct from the core of its distribution
- **Peripheral**: more commonly found in other ecoregions

The geographic scale of conservation targets refers to the land area or length of watercourse presumed to be necessary to sustain a population or other occurrence. These spatial scales are thought to be associated with different levels of biological organization or spatial pattern (Poiani et al. 2000; Fig. 2). Terrestrial ecological community and system types vary greatly in size and the environmental conditions in which they occur. Typically, a few of these are dominant, forming extensive cover encompassing hundreds to millions of acres. These matrix communities and systems exist under a broad range of environmental conditions, are driven by regional-scale ecological processes, and are

important habitat for wide-ranging species. One example of this type of system in the Edwards Plateau is the live oak-and-juniper dominated forest that covers much of the eastern portion of the ecoregion.

Many communities and ecological systems are embedded within these matrix-forming types and cover relatively smaller portions of land area. These smaller patch communities and systems are maintained primarily by specific environmental features like soil type or microclimate rather than disturbance processes.

We categorized each terrestrial community and system type into one of three categories associated with these different levels of organization or pattern: local, intermediate, or coarse. Similarly, we categorized aquatic system types into one of four size classes based on physical and biotic changes in stream/river characteristics associated with the size of the watershed and the geographic scope of their key ecological processes: creek/headwater, small river, medium river, and large river.

Species targets also exhibit a wide range of patterns of scale. In this case, scale requirements refer to the land area or length of watercourse needed for a population to persist. For long-distance migrants or species with vastly different seasonal requirements, species are classified relative to those different needs. For example, Neotropical migrant birds that only occur in the Edwards Plateau during the breeding season are classified based on their spatial needs during that period of time. Categories used to describe the range of spatial-scale requirements of terrestrial and aquatic species targets were: local, intermediate, coarse, or regional. Each of these categories is associated with a range of area required for functionality. For example, the Kretschmarr Cave mold beetle (*Texamaurops reddelli*) is known to occur in one or only a very few localized karst (cave) features in the ecoregion making up < 2,000 acres of land area. As such, this species was classified as a local-scale conservation target.

Occurrence Mapping

For mapping and analysis purposes, we represented most local- and intermediate-scale target occurrences as buffered points in a Geographic Information System (GIS). Point records were buffered by an area proportional to their assigned scale or by an area thought to represent the spatial extent of an occurrence based on literature review and expert opinion (e.g., territory size for breeding birds). Occurrences of the same target whose buffers overlapped were combined to create a single functional occurrence. Where data were available, we represented local- and intermediate-scale occurrences as polygons defining the known extent of that occurrence (e.g., population). This was most commonly done for restricted plant populations and plant communities.

Coarse-scale ecological system occurrences were mapped as polygons whose boundaries were roughly coincident with the extent of each occurrence. These boundaries were estimated using a variety of data sources including field surveys, satellite imagery, and other publicly available data describing physical and biotic characteristics of the landscape (e.g., digital elevation models, vegetation maps). Contiguous areas of a single dominant system type were subdivided across watersheds or into upstream-downstream areas within a watershed to create multiple occurrences if they exceeded the estimated minimum dynamic area (MDA) of a system by more than 100%. The MDA

of an ecological system is the area thought to be required to allow for the existence of the dominant ecological processes (e.g., fire and regeneration) critical to maintenance of that system. We estimated this value for each coarse-scale system type through a review of relevant literature and discussions with experts. Most resultant system occurrences met or exceeded MDA for the given system type.

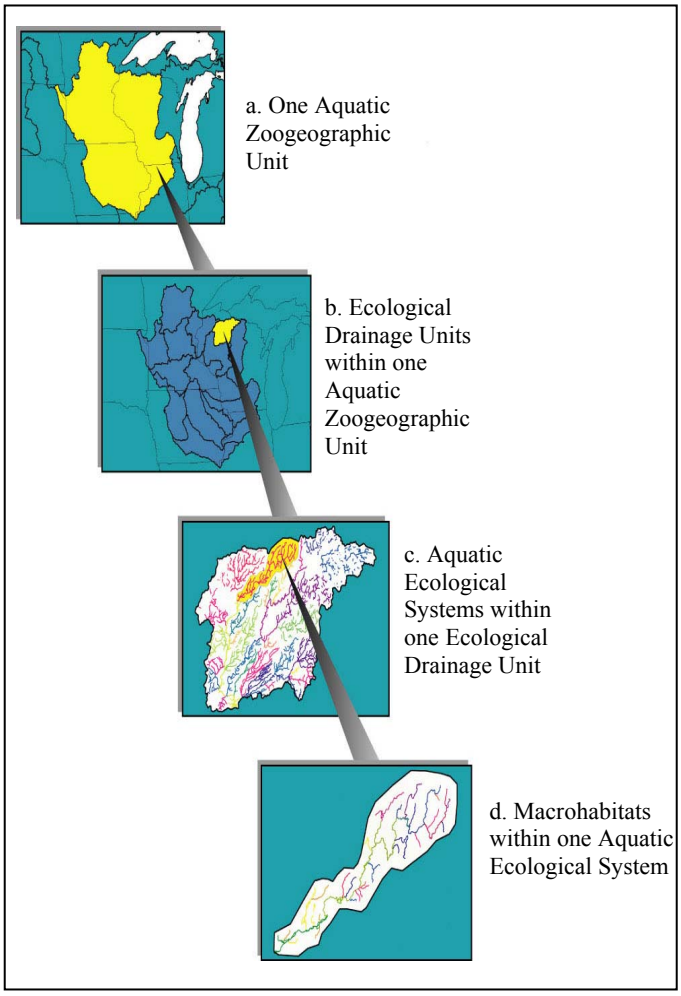
Occurrences of targets classified as regional in scale, particularly migratory birds, were mapped to represent functional occurrences during the time they are present in the ecoregion. For example, golden-cheeked warblers (*Dendroica chrysoparia*) occur in the Edwards Plateau primarily during the breeding season only and were mapped at a scale relative to their estimated spatial requirements for breeding habitat.

Mapping Aquatic Systems

Aquatic ecological systems were defined and mapped in the context of a hierarchical framework developed by the Conservancy (Fig. 3). The highest level of the framework (but not incorporated into this assessment) is the aquatic zoogeographic unit (e.g., freshwater ecoregions developed by Abell et al. 2000). The next level of the framework is represented by Ecological Drainage Units (EDUs). Ecological Drainage Units are groups of watersheds (8-digit U.S. Geological Survey hydrologic catalog units) that share a common zoogeographic history, physiographic and climatic characteristics, and most likely have similar freshwater assemblages and habitats within them.

Aquatic ecological systems (the third and finer scale of classification) are nested within EDUs as the third level of the classification; each aquatic system type is unique to a given EDU. As described earlier, aquatic systems are dynamic spatial assemblages of

Figure 3. A four-tiered hierarchical classification framework of aquatic (freshwater) ecosystems (Higgins 2003).



ecological communities that occur together in an aquatic landscape with similar geomorphological patterns, are tied together by similar ecological processes (e.g., hydrologic and nutrient regimes, access to floodplains) or environmental gradients (e.g., temperature, chemical and habitat volume), and form a robust, cohesive and distinguishable unit on a hydrography map (Higgins 2003).

Aquatic ecological systems are comprised of finer scale components, referred to as macrohabitats in this classification framework. Macrohabitats are defined as river valley segments and small to medium-sized lakes that are relatively homogeneous with respect to the local hydrologic regime,

temperature, chemistry, and geomorphology. Groups of macrohabitats that repeat are used to define aquatic ecological systems. A description follows of how macrohabitats in this ecoregion were mapped and repeating groups of macrohabitat types were identified to classify aquatic ecological systems. This GIS-based process was based on a methodology developed by The Nature Conservancy (Higgins 2003; Higgins et al. in press).

As the first step, we consulted available literature and regional experts to determine the most important physical variables that define environmental gradients and influence species distributions within the ecoregion. We identified stream size, gradient, flow permanence, and geology (as it relates to substrate type, hydrologic regime, and water chemistry) as critical variables.

We then obtained digital data for each of these variables and used these data to classify stream segments into macrohabitat types. To do this we divided each variable into classes that corresponded to major differences in ecosystem structure and/or function (Table 4). Each stream segment was assigned one of these classes for each variable. Each macrohabitat type is the result of a combination of the four variables.

Aquatic systems were then classified by analyzing patterns of macrohabitat types within a set of nested watersheds. The methodology for analyzing patterns of macrohabitat types differed based on the stream size class. For the three smallest stream size classes (headwater, creek--combined to form a single class--and small river), a multivariate clustering analysis was used to group watersheds with similar macrohabitat components into distinct aquatic ecological system types (Gauch 1982; McCune et al. 2002). The two largest stream size classes (medium and large rivers) were classified manually; the classification process was based primarily on the location of the river channel (i.e., the physiography and geologic substrata) and the types of nested creek/headwater and small river systems. The result of these analyses was a map of all occurrences of each distinct creek/headwater and river system types. These mapped occurrences were our units of selection for identifying aquatic areas of biodiversity significance.

Conservation Target Screening

In the context of this biodiversity assessment, viability is the likelihood that an occurrence (e.g., population) of a conservation target will survive over some predetermined period of time. For this assessment we ranked the viability of occurrences relative to a 100-year time horizon. Occurrences were screened relative to their estimated viability in an attempt to focus scarce conservation resources toward species, communities and ecosystems with a reasonable chance for survival.

Terrestrial and aquatic target occurrences were assigned to one of five qualitative descriptors of overall viability: Very Good, Good, Fair, Poor, or Unknown. Occurrences with Unknown viability will become priorities for inventory and assessment. Functional occurrences made up of multiple, overlapping occurrences were assigned the average viability rank of each individual occurrence they contained.

Where possible, we used three criteria to assess the viability of each occurrence: size, condition, and landscape context. Each of these criteria were assigned a qualitative rank of Very Good, Good, Fair, Poor, or Unknown. At the population level, size is an indication of abundance and/or density. For

Table 4. Stream/river size, gradient, flow permanence, and bedrock and surficial geology classes used in the classification of macrohabitats.

Stream Size (Link[1])	Stream Gradient (meters/meters)	Flow Permanence	Geology
Headwater (1-10)	Low (<0.03)	Intermittent	Recent alluvium, colluvium
Creek (11-50)	Moderate (0.03-0.13)	Perennial	Folian sand
Small River (51-120)	High (>0.13)		Aquifer sand
Medium River (120-700)			Mudstone/shale and clay
Large River (>700)			Sandstone, sand
			Conglomerate, gravel
			Moderately calcareous rocks
			Calcareous clay, marl
			Limestone, dolomite
			Evaporite, anhydrite
			Schist
			Granitic/silicic
			Basaltic/mafic

[1] Link (i.e., Shreve order, Shreve 1996) is defined as the number of un-branched source streams upstream of a given segment in the drainage network.

communities and ecosystems, size is an indication of areal extent relative to MDA. Condition is an integrated estimate of the quality of biotic and abiotic factors, as well as processes that characterize targets. Factors used to assess condition can include success and regularity of reproduction, presence/absence of competitors/predators, and degree of anthropogenic impacts. Landscape context for populations is an integrated estimate of connectivity to other populations and intactness of surrounding ecological processes and environmental regimes. Communities and ecosystems that are connected to or in close proximity to other natural habitats are usually preferable to isolated examples.

To calculate an overall viability score using these three factors (size, condition, landscape context) we weighted each factor to account for differences in the assumed effect of each on viability. In this assessment, size was thought to have the greatest influence on viability due to its importance in sustaining key ecological processes in these typically large landscapes.

Viability ranks for terrestrial matrix system occurrences were based on the results of rapid field surveys, visual interpretation of aerial photography and/or color satellite imagery, and/or expert opinion. For species occurrences (terrestrial and aquatic), we used Natural Heritage Element Occurrence Ranks (EO Ranks) to assign viability ranks. These EO Ranks are thought to reflect, to varying degrees, the size, condition, and landscape context criteria described above. However, Heritage ranks were often unavailable. In those cases, terrestrial and aquatic target occurrences were assigned viability estimates based on expert opinion whenever possible. If no other information was available, occurrences (terrestrial only) were assigned a viability rank identical to that of the matrix-type ecological system

occurrence within which they were embedded. One exception to using this "embedded" viability assessment was with occurrences of subterranean targets. Occurrences of these targets were given a viability rank of "Unknown" unless they had an assigned Heritage rank. This is because we do not clearly understand the relationship between the functionality of the above-ground ecological system and that of its associated subterranean component.

The viability of aquatic system occurrences was assessed in a GIS environment using a suite of indicator variables that represent some of the major sources of impairment of aquatic system integrity in the ecoregion. The five variables used in the analysis were: percent watershed area in cultivation for agriculture, percent watershed area in urban development, storage volume in major reservoirs per unit watershed area, number of point sources of pollution per unit watershed area, and density of roads (unit road length per unit watershed area). Spatially explicit datasets representing these variables were analyzed in a GIS environment to estimate overall viability.

Conservation Goals

Conservation target goals estimate the number and distribution of viable occurrences necessary to sustain a conservation target in the ecoregion and across its range over some period of time. Although it is impossible to say with certainty the exact number or distribution of any species, community, or ecological system that will ensure its persistence in the face of climatic or other environmental changes, conservation goals provide guidance as to "how much is enough?"

Conservation efforts within ecoregions should complement those of other ecoregions. As such, targets were selected and their associated goals developed to be in alignment with ecoregions that share conservation targets. This is a particular challenge for widespread species (e.g., migratory birds) whose populations may be abundant in one ecoregion but exhibit significant declines in other parts of its range.

Occurrences of conservation targets considered to have a very low chance for survival or with unknown viability were mapped and tracked in our biodiversity database, but were not counted toward meeting conservation goals.

Stratification Units

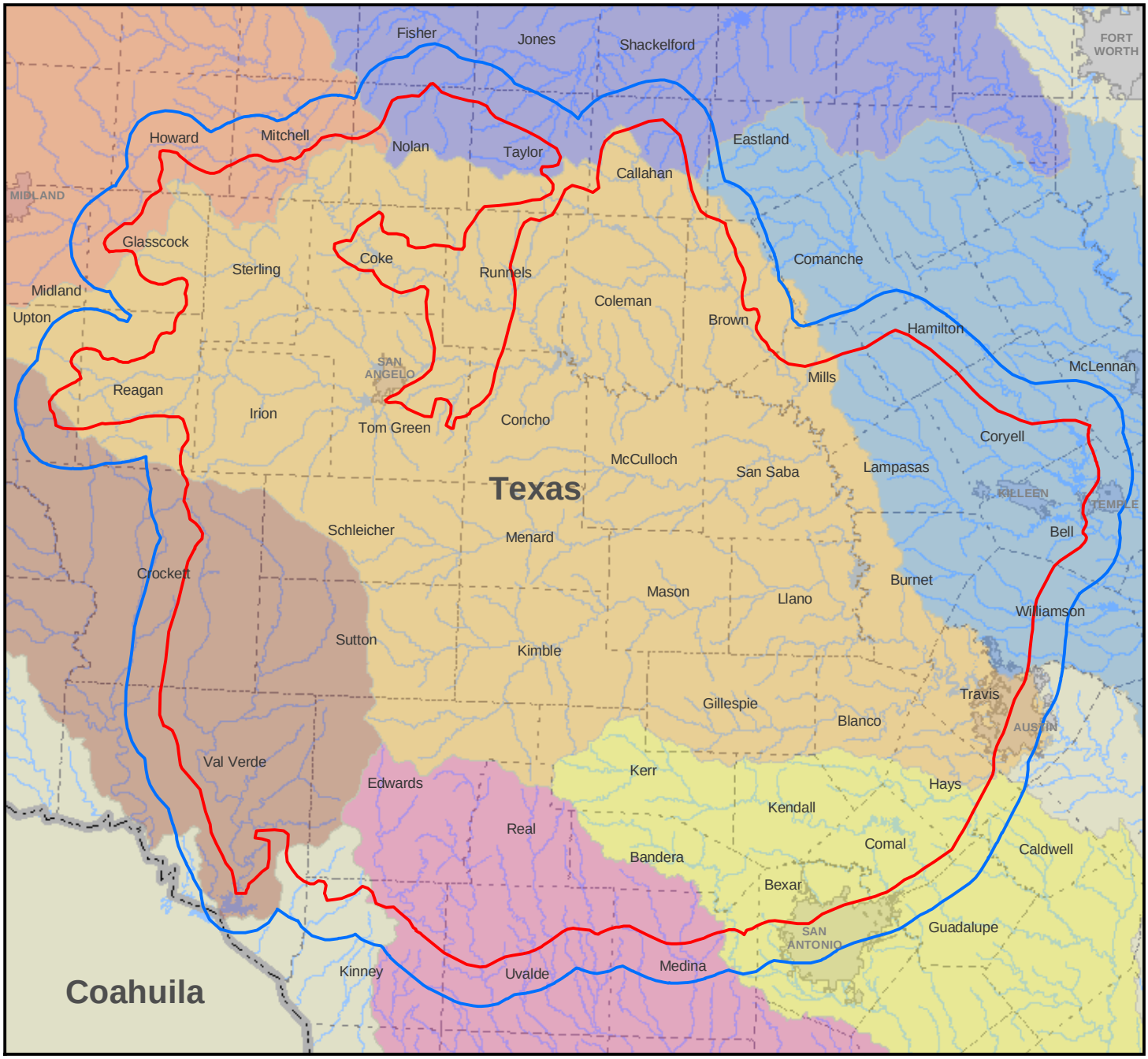
In order to help capture occurrences of targets across their natural range of genetic and environmental variation and to provide sufficient replication to ensure persistence in the face of predicted or unpredicted environmental change, we subdivided the ecoregion into stratification units and set representation goals for conservation targets within those units. For instance, if the range of a species spans the entire ecoregion, it is preferable to select viable occurrences throughout the ecoregion, rather than clustered in one local area.

The ecoregion was stratified into five terrestrial (Fig. 1) and seven aquatic (Ecological Drainage Units) regions (Fig. 4). Representation goals for terrestrial targets (including subterranean species) were set using the terrestrial regions. Aquatic goals were stratified across EDUs.

Goal Values

Conservation goal values for most species (terrestrial and aquatic) and small-scale terrestrial community and system targets were set using default values developed by the Conservancy that account for both

Figure 4: Edwards Plateau Ecological Drainage Units



Ecological Drainage Units

- Brazos River - Prairie
- Colorado River - Edwards Plateau
- Colorado River - Prairie
- Corpus Christi/Frio/Nueces
- Guadalupe/San Antonio
- Lower Brazos River
- Lower Pecos River/Devils River

- Edwards Plateau Boundary
- Ecoregion Buffer (10mi)
- Lakes and Rivers
- County Lines
- Cities
- Texas/Mexico Border

N
W E
S

0 10 20 40 60 Miles

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

the geographic scale and distribution of targets (Tables 5,6). We occasionally adjusted the default value when it did not adequately represent the historical range and/or life history of the target.

Goals were adjusted in cases meeting one of several criteria. First, when the number of historical populations of a target was known with much certainty and its taxonomic status precluded discovery of other populations, the goal was set at the number of historical populations. Second, when both the number of historical populations and the taxonomic status were uncertain, but it was thought to be highly unlikely that the number of existing populations would ever be as high as the default goal, the goal was set at some intermediate value. Finally, if ancillary information from experts or species recovery plans suggested a value different from the default, we adjusted the value appropriately.

Terrestrial system targets were assigned area-based goals in stratification units where they represented a matrix-type system. Goals were set equal to 30% of the estimated historical (*circa* ~1860) extent of the system in the ecoregion. We used area rather than individual occurrences of these targets due to their distribution over large areas and our ability to map them as large polygons across the landscape. Our estimate of the historical extent of these large-scale system types was developed by examining relevant literature and current landcover data, combined with expert opinion. Overall goals for all terrestrial targets in the ecoregion can be found in Appendix A; goals by stratification unit are shown in Appendix C.

The goals for aquatic system targets were also set equal to 30% of the occurrences of each system target up to a maximum of three occurrences. Because system targets were nested within EDUs, there was no stratification of their goals across EDUs. Overall goals for all aquatic targets in the ecoregion can be found in Appendix B; goals by stratification unit are shown in Appendix D.

Portfolio Assembly

Terrestrial Portfolio

Portfolios of terrestrial and aquatic areas of biodiversity significance were assembled through two independent processes. The terrestrial portfolio was assembled by selecting areas from among a larger set of potential portfolio areas. Most of these potential areas represented an area characterized by the occurrence of at least one matrix-type ecological system often containing multiple occurrences of other conservation targets. The boundaries of these areas were generally coincident with the extent of the dominant vegetation type associated with that system. Some potential areas did not represent a matrix-system type, but rather captured one or more local or intermediate-scale occurrences of a species or community. We developed potential portfolio areas across the entire extent of the Edwards Plateau except where the landscape had been dramatically altered such that it no longer appeared to support a native matrix system type (e.g., areas with significant row crop coverage).

Once identified, each potential terrestrial area was scored and ranked by calculating the weighted average of two primary metrics: Preliminary Functionality and Number/Variety. The Preliminary Functionality score was the average of the viability scores for each target occurrence in an area. The Number/Variety score was itself a weighted average of two sub-scores: Number and Variety. The Number score reflected the number of unique targets found

Table 5. Default conservation goals (number of occurrences) for terrestrial conservation targets.

Geographic Scale	*Regional*	*Coarse*	*Intermediate*	*Local*
Distribution				
Endemic	N/A	10	10	25
Limited	5	5	5	13
Disjunct	5	5	5	13
Widespread	3	3	3	7
Peripheral	1	1	1	3

Table 6. Default conservation goals (number of occurrences) for aquatic conservation targets (species only).

Geographic Scale	*Coarse*	*Intermediate*	*Local*
Distribution			
Endemic	10	18	25
Limited	5	9	13
Disjunct	5	9	13
Widespread	3	5	7
Peripheral	1	2	3

within each area, while the Variety score reflected the number and nature of different geographic scales represented by the targets found there. For example, an area with conservation targets representing multiple scales (e.g., matrix, intermediate, and local) received a higher score than an area with targets representing only one scale.

Each of the three metrics received a score from 0-100, and in all cases we used a 50:50 ratio for calculating weighted averages, treating each value with equal importance.

Once the entire pool of potential areas was scored we reviewed each in rank order from highest to lowest, examining what proportion of goals would be met by selecting a particular area for the final portfolio. An area was selected for the portfolio if it contributed one or more target occurrences for which conservation goals had not yet been met, and it represented one of the best remaining examples of the target for which it was being considered. High-ranked areas were examined first; these were most likely to make nonredundant contributions to goals and to contain high-quality occurrences of targets. Therefore, these high-ranked areas were most likely to be selected. As we moved down the ranked list and selected areas into the portfolio, the percentage of goals met for some targets began to exceed 100%. In these cases we assessed the importance of the area for contributing to goals for other targets. We rejected areas if they did not contain occurrences of targets for which we still needed representation. We also rejected them if we felt that there were significantly better examples of a conservation target in an area with a lower rank. After one complete pass reviewing all the areas, we calculated goals met by the selected portfolio and chose additional areas, sometimes for a single conservation target, if they contributed to any unmet goals.

Aquatic Portfolio

The aquatic portfolio was assembled in two steps: First, we asked experts to identify areas supporting viable populations of aquatic species targets. We also asked them to identify high quality streams, rivers, springs, and other aquatic habitats. Where possible, the condition of these expert-nominated areas was validated using the GIS-based aquatic system

condition indicators mentioned earlier. These expert-nominated areas were overlaid on top of the aquatic system occurrences, and areas of overlap were selected as the first components of the portfolio.

As the second step in portfolio assembly, we evaluated progress toward goals for conservation targets. Occurrences of system targets whose goals were not yet met were subsequently selected into the portfolio based on their GIS-modeled condition. We selected examples of each system with the lowest (best) values for GIS condition indicators until goals were met. Finally, as for the terrestrial portfolio, we selected additional, lower quality areas if they contributed to unmet goals.

Portfolio areas delineated solely on the basis of GIS indicators carry a lower certainty of conservation value primarily due to the lack of any ground-truthing of these areas. As a result, we placed each aquatic portfolio area into one of two confidence categories: Tier 1 – Portfolio area, strong confidence that viable target populations and/or high quality system occurrences are present; Tier 2 – Provisional portfolio area selected as a potential high quality example of an aquatic system, as indicated by GIS modeling, but more validation of target status and ecological integrity is needed.

Spatial representation of areas of aquatic biodiversity significance in portfolio maps follows three conventions: 1) areas delineated to capture headwaters and creeks are shown as the entire watershed area; 2) areas capturing small, medium and large rivers are shown as stream lines buffered to 1 km; 3) spring complexes are represented as polygons delineated around the springs. In some cases, we kept adjacent or connecting reaches as separate areas if the targets captured in them were distinct in life history and/or size of stream occupied from adjacent ones. We also maintained separation among conservation areas occurring in separate EDUs.

III. Results and Next Steps

Portfolio Results

The portfolio assembly process resulted in 102 terrestrial conservation areas, ranging in size from 10.6 acres (4 hectares) to 293,259 acres (118,678 hectares) and including areas from each of the five stratification units (Figs. 5, 7). The total area of the terrestrial portfolio covers approximately 30% or 8,977,766 acres (3,633,188 hectares) of the ecoregion. This value is consistent with the average area for the Conservancy's other conservation portfolios in the continental U.S (Sotomayor 2004).

There are 62 aquatic areas in the aquatic portfolio that represent a diversity of system types in each of the EDU's (Figs. 6-7). There are nine aquatic areas in the Brazos River drainage, thirty-four in the Colorado River drainage, eleven in the Guadalupe/San Antonio River drainages, five in the Frio/Nueces River drainages, and three in the Devils River drainage. Thirty-six aquatic areas represent streams and small river watersheds, twelve are stretches of larger rivers, eight are a combination of both, and six are springs or spring complexes. Overall, the total stream length included in the aquatic portfolio area boundaries is 9,088 miles (14,626 kilometers) or 27% of the total stream length in the ecoregion.

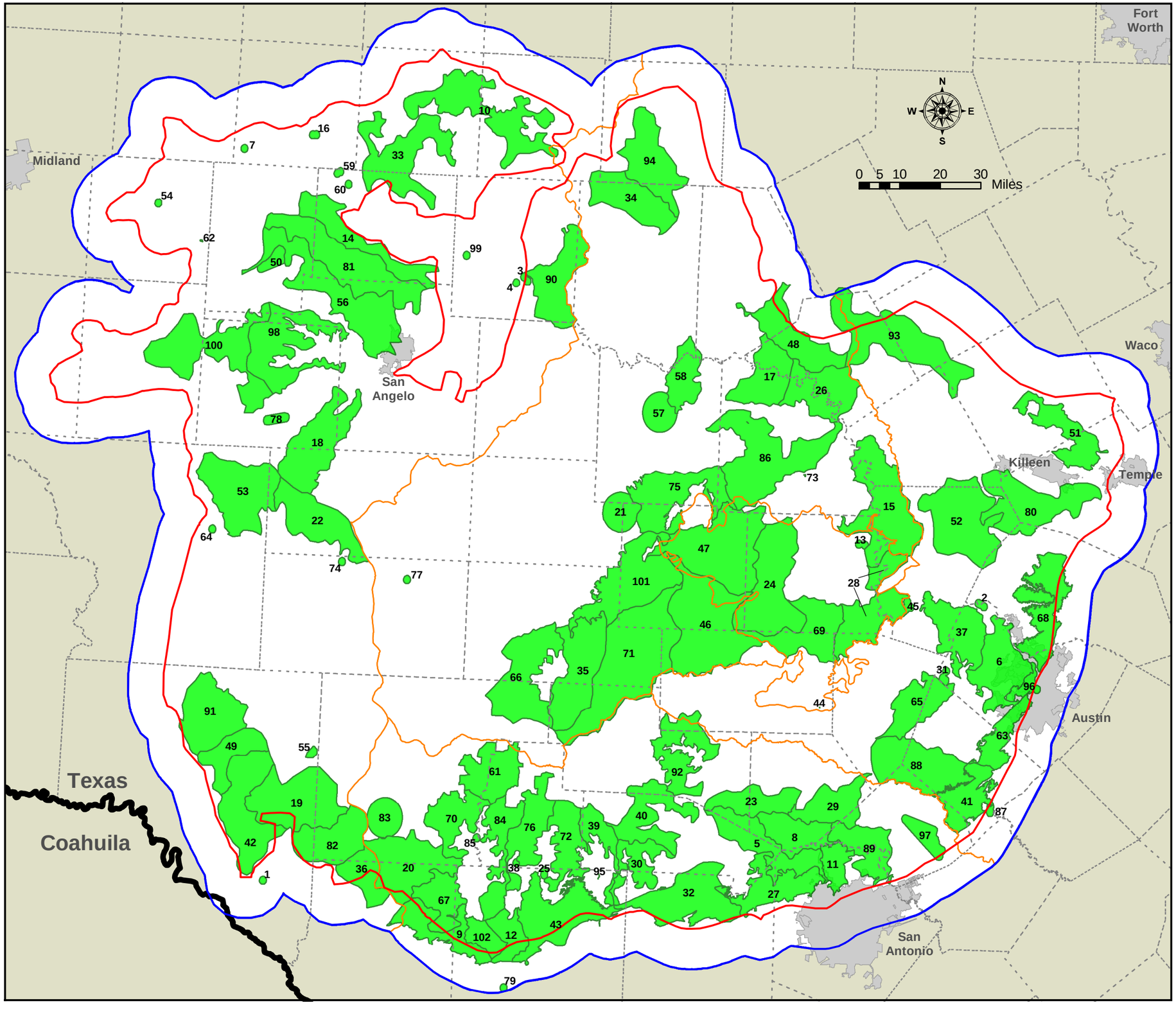
Three analyses were conducted to critically evaluate the conservation implications of the portfolio. First, we assessed the success of portfolios in meeting our conservation goals to better understand the state of biodiversity in the ecoregion and to identify potential gaps in our target database. Second, we created a matrix of known threats to biodiversity at each of the conservation areas. This preliminary threats assessment should allow for more efficient and effective development of conservation strategies by the Conservancy and its partners. Finally, we identified and assessed the areas of overlap between currently managed sites (public and private) and our portfolios to better understand the current status of biodiversity protection in the ecoregion.

Success at Meeting Conservation Goals

Ninety-two out of 188 terrestrial targets (49%) had at least one viable occurrence captured in the portfolio. Abundance and distribution goals (i.e., goals for each stratification unit) were completely met for 10 of those targets. Of the 10, six were bird species, two were vascular plants, and two were ecological systems. The remaining 96 targets (primarily subterranean species) did not have any occurrences with a viability rank of Fair or better captured in the portfolio. Progress towards goals for each of the terrestrial targets can be found in Appendices A and C.

The Tier 1 portfolio met goals for 3 of 41 species targets. Of those three species, two were amphibians, and one was a fish. The Tier 1 aquatic portfolio areas also captured viable occurrences to meet abundance and distribution goals for 16 of 45 (36%) system targets. With the addition of the Tier 2 areas, the number of system targets meeting goals increased to 43 of 45 (96%). However, there is a need to validate through ground-truthing that all system examples captured in Tier 2 are viable as described in our screening methodology. Please refer to Table 7 for a summary of goals progress for aquatic system targets in Tier 1 and Tier 2 portfolio areas. Progress towards goals for each of the aquatic targets can be found in Appendices B and D.

Figure 5: Edwards Plateau Ecoregion Terrestrial Portfolio



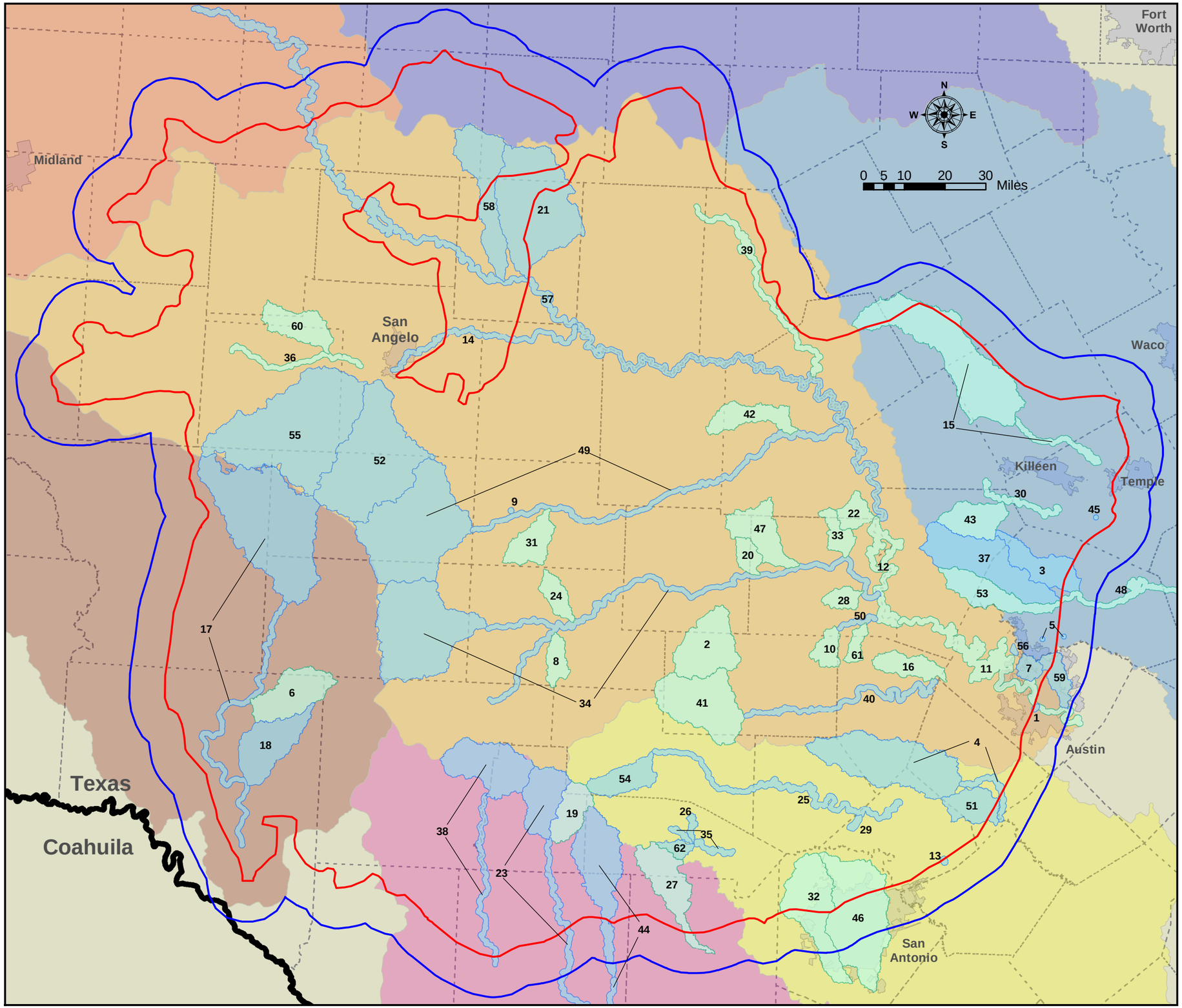
This map depicts a set of areas whose collective conservation would help insure that the biological diversity of the Edwards Plateau ecoregion will persist over the long term. The Nature Conservancy, acting alone and through diverse partnerships, will focus its foreseeable future conservation efforts in these areas. This is not a map of land acquisition priorities. Protection of these areas will necessitate a broad array of conservation actions implemented by private landowners, public natural resource agencies and private conservation organizations. Places outside this set of areas should not be considered as expendable or unnecessary for conservation success. Finally, this portfolio is based on current knowledge and will be refined over time.

- Edwards Plateau Boundary
- Ecoregion Buffer (10mi)
- Stratification Units
- Terrestrial Portfolio
- County Lines
- Cities
- Texas/Mexico Border

1. Amistad NRA
2. Austin NW
3. Ballinger East
4. Ballinger South
5. Bandera Pass
6. Barton Creek
7. Beals Creek
8. Boerne
9. Brackettville
10. Buffalo Gap
11. Camp Bullis
12. Central Uvalde Co.
13. City of Llano
14. Coke Co.
15. Colorado Bend SP
16. Colorado City
17. Colorado River - NW San Saba Co.
18. Dove Creek
19. Dry Devils River
20. Dutch Mountain
21. Eastern Menard
22. Eldorado
23. Elm Pass
24. Enchanted Rock SP
25. Garner SP North
26. Goldthwaite SW
27. Government Canyon SNA
28. Granite Shoals - Inks Lake SP
29. Guadalupe River SP
30. Gunsight Mountain
31. Hamilton Pool - West Cave
32. Hill Country SNA
33. Horse Mountain
34. Jim Ned Creek
35. Johnson Fork Cr.
36. Kickapoo Cavern SNA
37. Lake Travis
38. Leakey
39. Lost Maples SP - Upper Sabinal River
40. Love Creek Preserve
41. Lower Blanco River
42. Lower Devils River
43. Lower Frio River
44. Lyndon B. Johnson SHP
45. Marble Falls
46. Mason
47. Mason & NE Mason Co.
48. Mid and Lower Pecan Bayou
49. Middle Devils River
50. Mulberry Creek
51. N Ft. Hood
52. NE Burnett Co.
53. NE Crockett Co.
54. NE Glasscock Co.
55. NE Val Verde Co.
56. North Concho River
57. North McCulloch Co. - 1
58. North McCulloch Co. - 2
59. NW Coke Co. - 1
60. NW Coke Co. - 2
61. NW Real Co - Upper Nueces River
62. NW Sterling Co.
63. Onion Creek
64. Ozona NE
65. Pedernales Falls
66. S. Llano R. SP - Walter Buck WMA
67. Salmon Peak
68. San Gabriel River
69. Sandy Creek
70. SE Edwards Co.
71. SE Kimble Co.
72. SE Real Co.
73. SE San Saba Co.
74. Sonora
75. South McCulloch Co.
76. Southcentral Real Co.
77. Southcentral Schleicher Co.
78. Spring Creek
79. Springrun Whitehead
80. Stillhouse Hollow Lake
81. SW Coke Co.
82. SW Edwards Co. - 1
83. SW Edwards Co. - 2
84. SW Real Co.
85. SW Real Co. - Upper Nueces River
86. SW San Saba Co.
87. Texas Wild Rice
88. Upper Blanco River
89. Upper Cibolo Cr.
90. Upper Colorado River
91. Upper Devils River
92. Upper Guadalupe
93. Upper Lampasas R. & Cowhouse Cr.
94. Upper Pecan Bayou
95. Upper Sabinal River
96. West Austin
97. West New Braunfels
98. West Rocky Creek - Irion Co.
99. West Runnels Co.
100. Western Irion Co.
101. Western Mason Co. - Llano R.
102. Western Uvalde Co. - Upper Nueces River

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

Figure 6: Edwards Plateau Ecoregion Aquatic Portfolio



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- Aquatic Portfolio - Tier 1
- Aquatic Portfolio - Tier 2
- Edwards Plateau Boundary
- Ecoregion Buffer (10mi)
- County Lines
- Cities
- Texas/Mexico Border

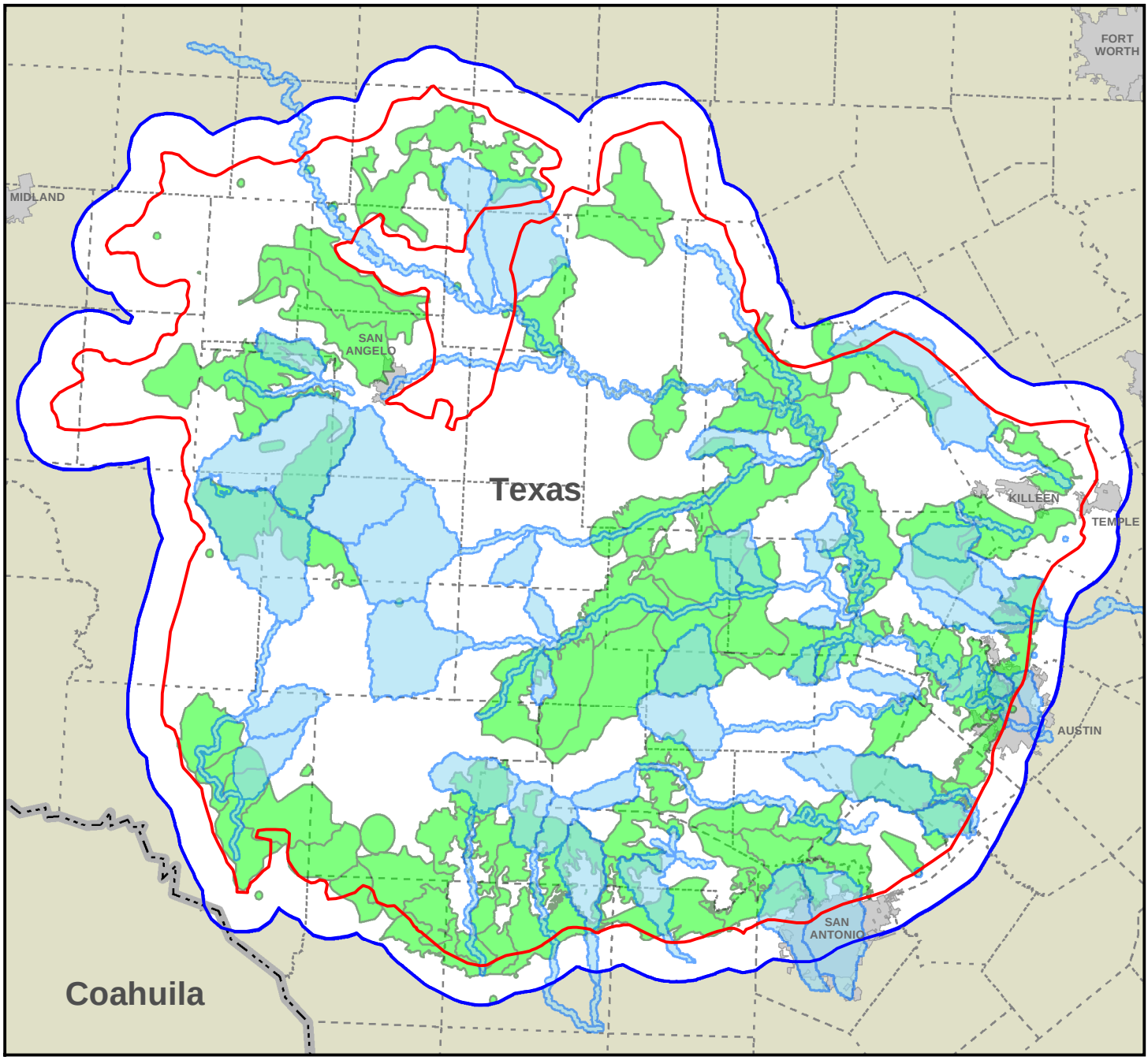
Ecological Drainage Units

- Brazos River - Prairie
- Colorado River - Edwards Plateau
- Colorado River - Prairie
- Corpus Christi/Frio/Nueces
- Guadalupe/San Antonio
- Lower Brazos River
- Lower Pecos River/ Devils River

1. Barton Springs
2. Beaver Creek
3. Berry Creek
4. Blanco River
5. Brushy Creek Springs
6. Buckley Draw
7. Bull Creek
8. Cedar Creek
9. Clear Spring
10. Coal Creek
11. Colorado River
12. Colorado River (Lake Buchanan to Lake LBJ)
13. Comal Springs
14. Concho River
15. Cowhouse Creek
16. Cypress Creek (Pedernales)
17. Devils River
18. Dolan Creek
19. East Frio River
20. Elm Creek (Llano)
21. Elm, Bluff Creeks
22. Fall Creek
23. Frio River
24. Gentry Creek
25. Guadalupe River
26. Hicks Creek
27. Hondo Creek
28. Honey Creek (Llano)
29. Honey Creek (Guadalupe)
30. Lampasas River
31. Las Moras Creek
32. Leon Creek
33. Little Llano River
34. Llano River
35. Medina River
36. Middle Concho River
37. North Fork San Gabriel River
38. Nueces River, Devil's Sinkhole
39. Pecan Bayou
40. Pedernales River
41. Pedernales River headwaters
42. Richland Springs Creek
43. Rocky Creek
44. Sabinal River
45. Salado Springs
46. San Antonio River headwaters/ Salado Creek
47. San Fernando Creek
48. San Gabriel River
49. San Saba River
50. Sandy Creek
51. Sink Creek/San Marcos Springs
52. South Concho River/ Head of the River Ranch
53. South Fork San Gabriel River
54. South Fork Guadalupe River
55. Spring, Dove Creeks/ Head of the River Ranch
56. Travis County Springs
57. Upper Colorado River
58. Valley Creek
59. Walnut Creek
60. West Rocky Creek
61. White Creek
62. Winans Creek

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

Figure 7: Edwards Plateau Ecoregion Aquatic and Terrestrial Portfolios



Terrestrial Portfolio
Aquatic Portfolio
Edwards Plateau Boundary
Ecoregion Buffer (10mi)
County Lines
Cities
Texas/Mexico Border

N
W E
S

0 10 20 40 60 Miles

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

Table 7. Progress toward aquatic system goals in Tier 1 and Tier 2 aquatic portfolio areas.

Size category	Tier 1 only # of Targets Meeting Goals/ Total # of Targets	Tier 1 and 2 # of Targets Meeting Goals/ Total # of Targets
Creeks/Headwaters	2/26	24/26
Small Rivers	8/11	11/11
Medium Rivers	5/7	7/7
Large Rivers	1/1	1/1

Threats Assessment

A preliminary assessment of the known threats to biodiversity at terrestrial and aquatic portfolio areas was undertaken to assist in identifying the critical, pervasive threats to biodiversity across the portfolio, and in developing strategies to abate those threats. Threat information was gathered from interviews with both Conservancy personnel and external experts with extensive knowledge of the ecoregion.

Threats were identified for each terrestrial and aquatic portfolio area (Appendix E, F). Each threat type represented a particular source of potential harm to the biodiversity in that area. Once identified, each threat at an area was scored on three criteria: criticality, urgency, and reversibility. Each criterion received a score of High (100), Medium (67), Low (33), or Very Low (0) based on the experience and understanding of Conservancy protection staff, land stewards, and external experts. An overall threat score for each area was calculated by averaging these scores across all threats present. Criticality indicated the intensity of the threat or the likelihood that this threat would adversely affect biodiversity in the portfolio area. Urgency indicated the time period within which a threat would have a significant affect on biodiversity. For example, a score of High for Urgency indicated that the threat was likely to affect biodiversity at the site within two years. Reversibility reflected the chances for the natural recovery of the biodiversity affected if the threat were to be abated. Scores for reversibility were inverted relative to the other criterion such that a score of 100 corresponded to the Very Low category and a score of 0 with the High reversibility category.

The analysis for the terrestrial portfolio identified four threats that were thought to occur at more than half of the selected areas: overgrazing, excessive herbivory, altered fire regime, and fragmentation. The overgrazing threat specifically refers to the effects of livestock raised for commercial purposes. Excessive herbivory primarily results from foraging by native and exotic wildlife populations at densities above that which can be naturally sustained by their local environment. Areas threatened by an altered fire regime typically exhibit varying degrees of habitat modification (composition and structure) through the invasion of both native (e.g., mesquite, cedar) and exotic species due to long-term fire suppression. Finally, fragmentation threatens biodiversity in several ways, such as influencing the movement patterns of organisms across the landscape and, because of associated landuse changes, causing a loss of compatible habitat.

In Texas today, fragmentation results primarily from the breakup of large landholdings into smaller holdings for residential development (Wilkins et al. 2000) and recreational use.

The greatest current threats to the aquatic portfolio are development of various types (e.g., urban, recreational), issues associated with fire management and brush clearing for streamflow, grazing practices, groundwater withdrawal, recreational use, and management of introduced game species. Three threats were judged to be present at over 50% of the aquatic areas: altered fire regime, inappropriate grazing practices, and development of various types. An altered fire regime refers to fire suppression that results in increased invasions by woody plants. This increase in woody ground cover has been linked to modifications (reductions) in streamflow, especially during times of drought. Inappropriate grazing practices include overgrazing and grazing in riparian areas. These activities can lead to increased rates of erosion and sedimentation in streams, along with altered hydrologic processes.

The threats most likely to extirpate targets (i.e., those threats with an overall Medium or High rating) at one or more aquatic areas are: development (sixteen sites); tree clearing in riparian areas to improve streamflow (eight sites), recreational use (six sites); and management for introduced game species (two sites). Groundwater withdrawal also has strong potential to affect targets in many aquatic portfolio areas; its overall severity rating is close to Medium in twenty-eight areas.

Threats to many terrestrial and aquatic targets in this ecoregion are amplified by the fact that many target populations have already been drastically reduced in size or are naturally small in number and distribution. Small population size often results in greater sensitivity to both natural events and human-induced conditions. Threats identified in this assessment can create more urgent conditions for targets with small populations due in part to their reduced ability to replace lost individuals and to adapt to environmental change. It is also possible that because of the increased chance of extinction associated with very low-density populations, alleviation of threats may not be sufficient in all cases to ensure the persistence of those populations.

Managed Area Analysis

In an effort to better assess the current status of conservation in the Edwards Plateau relative to the portfolios, we mapped all public and private lands in the ecoregion thought to be under some form of legal protection. We subsequently compared that map to our terrestrial and aquatic portfolios to determine what proportion of the portfolio area and the functional occurrences is already under legal conservation protection. Prior to analysis of the aquatic portfolio, stream and river reaches captured in the portfolio were buffered to 100m on both sides to represent the stream/river channel and some part of the associated riparian zone. This map was then used to calculate the area of these riparian features falling within managed areas.

A total of 89 areas were mapped in our managed areas dataset as being within the Edwards Plateau ecoregion (Figs. 8-9). Twenty-seven of those areas (approx. 170,000 acres) are Conservancy-owned lands or lands under a conservation easement held by the Conservancy. The remaining 62 areas (approx. 478,000 acres) are lands owned and managed by state or federal agencies.

Approximately 4% (370,000 acres) of the terrestrial portfolio falls within the boundaries of our mapped managed areas. Only about 2% (16,124 acres) of the aquatic portfolio riparian areas fall within managed areas. A total of 304 functional occurrences of terrestrial targets (out of 1,173 in the terrestrial portfolio) are partially or wholly contained within a Conservancy or other managed area. Many of the 304 occurrences are only partially captured within a managed area and most of those are occurrences of matrix-type ecological system targets. This suggests that most of our managed areas are too small to adequately represent a functional ecosystem.

The results of this analysis may underestimate the total area of land and water currently under conservation management. Many private landowners are managing their lands in such a way as to contribute to the protection of biodiversity on their lands, intentionally or otherwise. Most of those lands are not included in our managed-areas dataset. On the other hand, areas owned by private, state, and federal landowners typically are not managed primarily for biodiversity protection. Biodiversity is often of relatively low priority in these areas compared to other management needs. Also, this analysis represents a reasonable assessment of conservation-oriented protection of riparian areas in the portfolio, but it is certainly a significant underestimation of the area still in need of watershed management protection. This analysis also does not provide much perspective on aquatic conservation status related to other factors such as water supply management and invasive species.

The areas of overlap between the portfolios and the managed-areas dataset may represent the best chance for identifying core, protected areas around which additional conservation protection could be built. However, the results of this analysis are preliminary at best, with more information needed about the true status of managed lands. Finally, the fact that <3% of the total land area of the ecoregion is known to be under some level of conservation management highlights the need for continued efforts in working with public and private landowners to secure adequate protection for the remaining biodiversity.

Data Gaps

In addition to the identification of areas of biological significance, a valuable outcome of this assessment was the elucidation of gaps in our knowledge of the status of biodiversity in the ecoregion. We believe the dominant reason for these gaps is the lack of sufficient inventory and research. For example, 89 terrestrial conservation targets lacked spatial data specific enough for us to use in our assessment process. The majority of those targets were obligate subterranean species. An additional weakness of this assessment was our very limited knowledge of the ecological requirements for the persistence of most targets. This resulted in the use of very generalized approaches to assigning conservation goals and viability scores for most species. Continued and expanded research to identify critical ecological attributes for population and species survival is needed.

Our ability to accurately map the distribution of large-scale ecological system types was hindered by the lack of a complete digital map of surficial geology. Our use of rapid field surveys significantly improved our understanding of the distribution and viability of coarse-scale ecological systems and communities, but much more investigation of these targets is needed.

A large number of target occurrences and their associated viability assessments are in need of verification. Our use of embedded viability was a solution to a methodological problem and was not intended to replace on-the-ground assessments. This is particularly true for subterranean targets.

Relative to aquatic biodiversity, the primary data need is on-the-ground validation of the status of Tier 2 portfolio areas. At a minimum, rapid bioassessments of these areas should be performed before applying any conservation effort. Also, because assessment of aquatic systems focused on watershed-scale processes, there is a need for a more thorough review of whether the best locations of the representative, non-target fauna of fine-scale ecosystems (e.g., springs and wetlands) were captured in the portfolio. Addressing these data gaps, as well as all the others mentioned, will be essential in improving the efficiency and effectiveness of future iterations of this assessment.

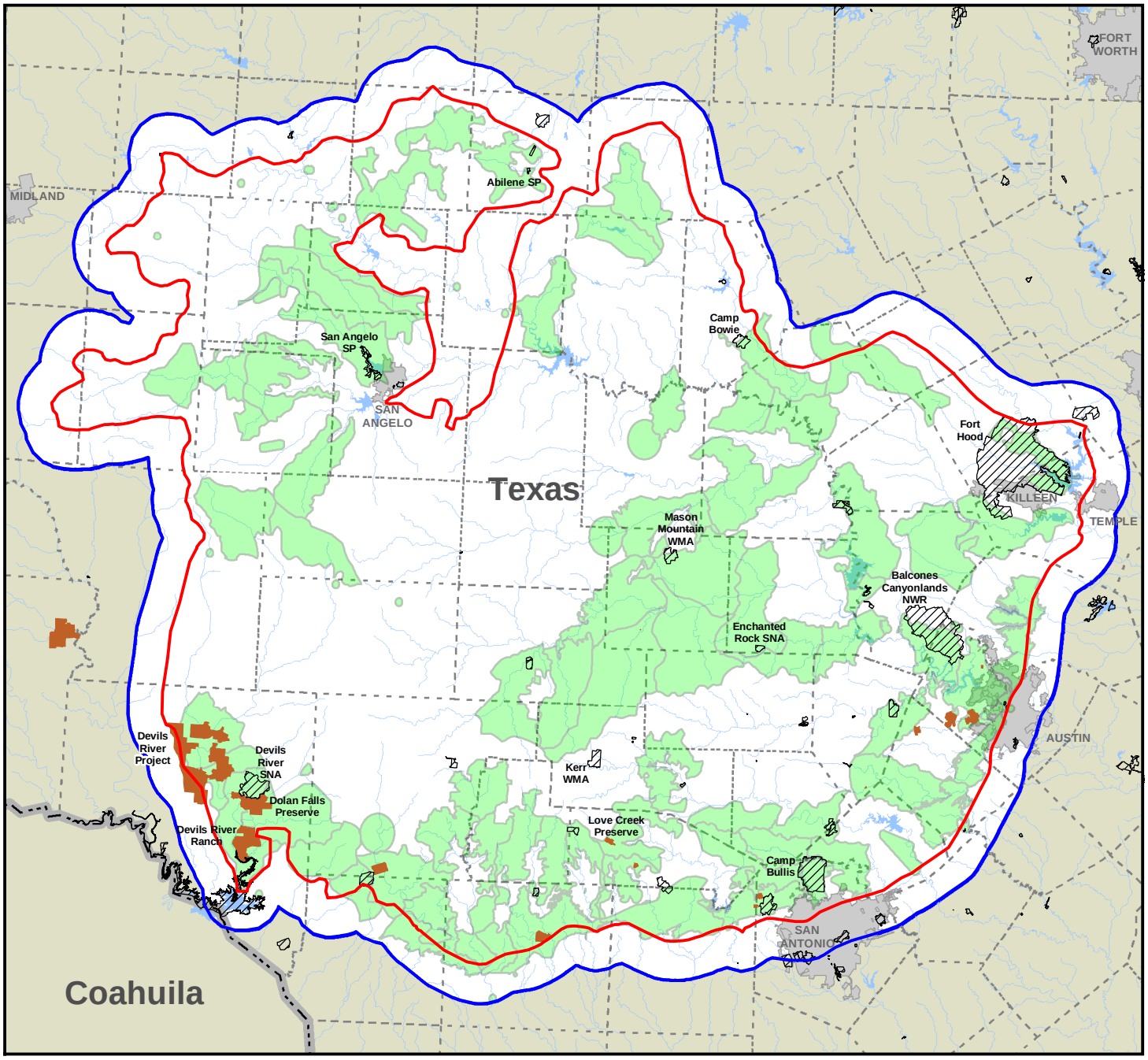
Taking Conservation Action

Although ecoregional, landscape-scale conservation is the approach the Conservancy has chosen to emphasize, it does not encompass all that could be done to protect biodiversity. Conservation approaches by other agencies/organizations, as well as private landowners, will undoubtedly enhance biodiversity conservation beyond that which is described in this report.

Moreover, areas of biodiversity significance in the portfolio do not necessarily represent areas where The Nature Conservancy alone is going to actively engage in conservation. The scope and scale of this assessment makes it clear that the conservation of biological diversity in the ecoregion will be dependent on the cooperation and participation of many stakeholders. These will include private landowners, industry, government, and nonprofit conservation organizations. The tools of conservation will range from the continued good stewardship of the lands and waters where targets occur, to more permanent protection tools such as conservation easements and land acquisition.

It is imperative for the Conservancy and all stakeholders in the ecoregion to work cooperatively to protect the biodiversity of the Edwards Plateau. Fulfillment of this lofty goal, however, will require a great amount of understanding, cooperation, and resources. We hope that this assessment will serve as an important resource to guide those cooperative ventures.

Figure 8: Edwards Plateau Ecoregion Managed Areas with Terrestrial Portfolio



NOT ALL MANAGED AREAS LABELED

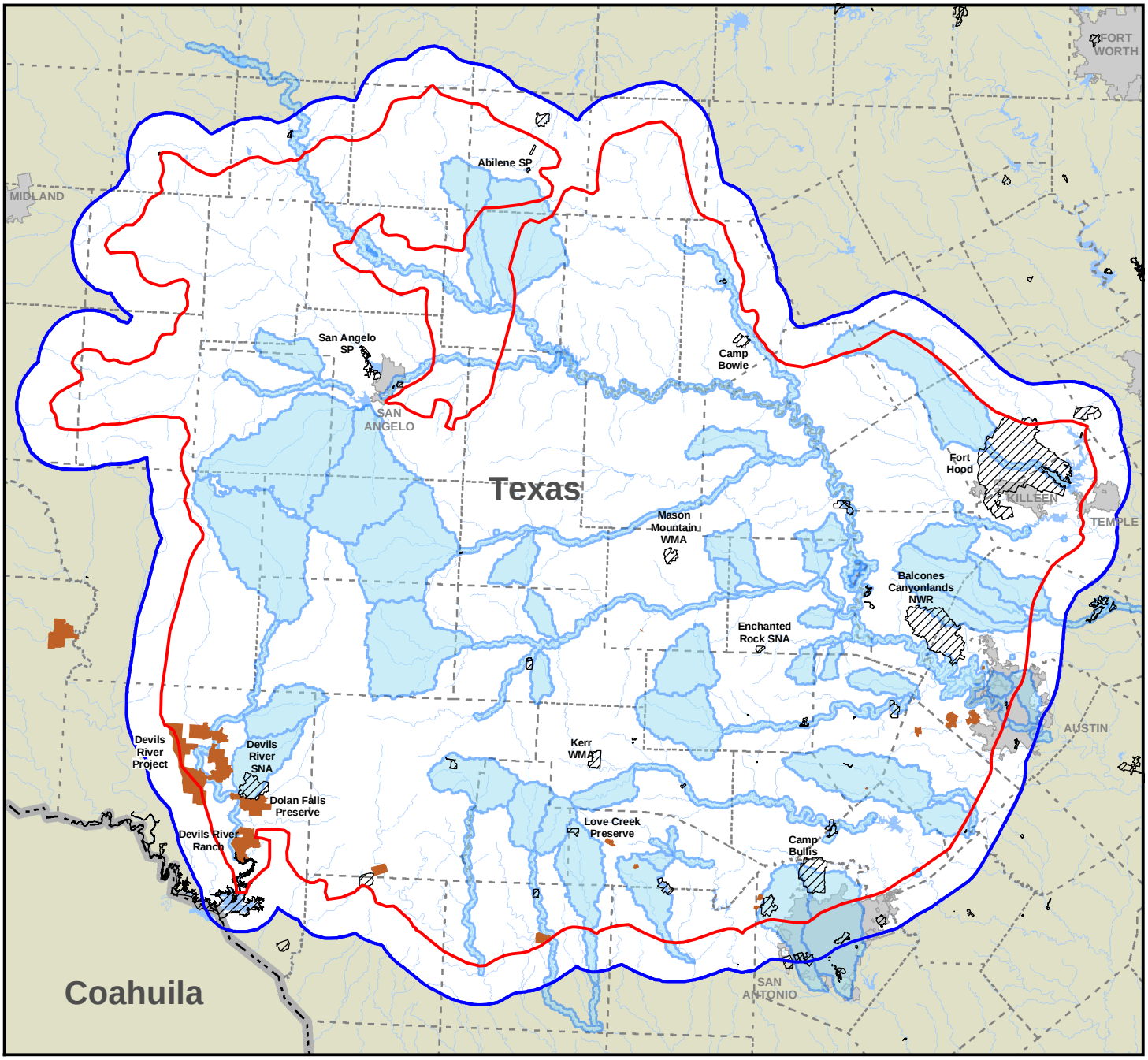
- Terrestrial Portfolio
- The Nature Conservancy Conservation Lands
- Texas Managed Area
- Edwards Plateau Boundary
- Ecoregion Buffer (10mi)
- Lakes and Rivers
- County Lines
- Cities
- Texas/Mexico Border

N W E S

0 10 20 40 60 Miles

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

Figure 9: Edwards Plateau Ecoregion Managed Areas with Aquatic Portfolio



NOT ALL MANAGED AREAS LABELED

- Aquatic Portfolio
- The Nature Conservancy Conservation Lands
- Texas Managed Area
- Edwards Plateau Boundary
- Ecoregion Buffer (10mi)
- Lakes and Rivers
- County Lines
- Cities
- Texas/Mexico Border

N
W E
S

0 10 20 40 60 Miles

Map generated by The Nature Conservancy of Texas GIS Department. Map date: 6/22/04

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Appendix A: Terrestrial Conservation Targets–Progress Towards Overall Ecoregional Goals

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Amphibians						
	Eurycea latitans	Cascade Caverns salamander	G3	S3	25	0
	Eurycea rathbuni	Texas blind salamander	G1	S1	25	2
	Eurycea robusta	Blanco blind salamander	G1Q	S1	25	0
	Eurycea tridentifera	Comal blind salamander	G1	S1	25	2
	Eurycea troglodytes	Valdina farms sinkhole salamander	G3	S3	24	0
Birds						
	Aimophila cassinii	Cassin's sparrow	G5	S4B	5	17
	Aimophila ruficeps	Rufous-crowned sparrow	G5	S4B	5	28
	Calamospiza melanocorys (breeding)	Lark bunting (breeding)	G5	S4B	3	3
	Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5	S4B	10	2
	Callipepla squamata	Scaled quail	G5	S4B	4	10
	Cyrtonyx montezumae	Montezuma quail	G4G5	S3B	3	1
	Dendroica chrysoparia	Golden-cheeked warbler	G2	S2B	8	33
	Micrathene whitneyi	Elf owl	G5	S4B	8	1
	Passerina ciris	Painted bunting	G5	S4B	5	31
	Spiza americana	Dickcissel	G5	S4B	5	17
	Vireo atricapilla	Black-capped vireo	G2G3	S2B	10	70
	Vireo bellii	Bell's vireo	G5	S3B	5	24
	Vireo vicinior	Gray vireo	G4	S4B	2	2

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Crustaceans						
	Allotexiweckelia hirsuta	A cave-obligate amphipod	G3	S?	24	0
	Arstesia subterranea	A cave-obligate amphipod	G1G2	S?	25	0
	Holsingerius samacos	A cave-obligate amphipod	G1G2	S?	25	0
	Lirceolus bisetus	A cave-obligate isopod	G3	S?	24	0
	Lirceolus pilus	A cave-obligate isopod	G3	S?	25	0
	Lirceolus smithii	A cave-obligate isopod	G1G2	S?	25	0
	Monodella texana	A cave-obligate crustacean	G1G2	S1	24	0
	Palaemonetes antrorum	Balcones Cave shrimp	G1G2	S1	25	0
	Parabogidiella americana	A cave-obligate amphipod	G3	S?	24	0
	Seborgia relicta	A cave-obligate amphipod	G3	S?	25	0
	Sphaeromicola moria	A cave-obligate shrimp	G1G2	S?	25	0
	Stygobromus balconis	Balcones Cave amphipod	G3	S1	25	0
	Stygobromus bifurcatus	Bifurcated cave amphipod	G1G2	S1	25	0
	Stygobromus dejectus	Cascade Cave amphipod	G1	S1	25	0
	Stygobromus flagellatus	Ezell's Cave amphipod	G1	S1	25	0
	Stygobromus hadenoecus	Devil's sinkhole amphipod	G1	S1	25	0
	Stygobromus longipes	Long-legged cave amphipod	G1G2	S1	25	0
	Stygobromus pecki	Peck's cave amphipod	G1	S1	25	0
	Stygobromus reddelli	Reddell's cave amphipod	G1	S1	25	0
	Stygobromus russelli	A cave-obligate amphipod	G3	S3	25	0
	Texiweckelia insolita	A cave-obligate amphipod	G3	S?	24	0
	Texiweckelia texensis	A cave-obligate amphipod	G3	S?	25	0
Fishes (Subterranean)						
	Satan eurystomus	Widemouth blindcat	G1	S1	25	0
	Trogloglanis pattersoni	Toothless blindcat	G1	S1	25	0

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Insects						
	Batrisodes texanus	Coffin Cave mold beetle	G1	S1	25	0
	Batrisodes venyivi	Helotes mold beetle	G1	S1	25	0
	Cylindropsis sp. *1*	Tooth Cave ground beetle	G1	S1	25	0
	Haideporus texanus	Edwards aquifer diving beetle	G1	S?	25	0
	Neoleptoneta microps	Government Canyon Cave spider	G1	S1	25	0
	Neoleptoneta myopica	Tooth Cave spider	G1	S?	25	1
	Rhadine exilis	A ground beetle	G1	S1	25	0
	Rhadine infernalis	A ground beetle	G1G2	S1	25	0
	Rhadine persephone	Tooth Cave ground beetle	G1	S1	25	1
	Stygoparnus comalensis	Comal Springs dryopid beetle	G1	S1	25	0
	Texamaurops reddelli	Kretschmarr Cave mold beetle	G1G2	S1	25	1
Mammals						
	Cynomys ludovicianus	Black-tailed prairie dog	G4	S3	4	2
	Geomys texensis texensis	Llano pocket gopher	G2QT2	S2	24	0
Mollusks						
	Balconorbis uvaldensis	Balcones ghostsnail	G1	S?	25	0
	Phreatodrobia conica	Hueco cavesnail	G1	S?	25	0
	Phreatodrobia coronae	A cavesnail	G1	S?	25	0
	Phreatodrobia imitata	Mimic cavesnail	G1	S1	25	0
	Phreatodrobia micra	Flattened cavesnail	G2G3	S2S3	24	0
	Phreatodrobia nugax inclinata	A cavesnail	G3T1T2	S?	25	0
	Phreatodrobia nugax nugax	A cavesnail	G3T3	S?	24	0

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Mollusks (cont'd)						
	Phreatodrobia plana	Disc cavesnail	G1	S?	24	0
	Phreatodrobia punctata	High-hat cavesnail	G1	S?	25	0
	Phreatodrobia rotunda	Beaked cavesnail	G1	S?	25	0
	Stygopyrgus bartonensis	Barton cavesnail	G1	S1	25	0
Other Karst Invertebrates						
	Cicurina baronia	Robber Baron Cave meshweaver	G1	S1	25	0
	Cicurina madla	Madla Cave meshweaver	G1	S1	25	0
	Cicurina venii	Bracken Bat Cave meshweaver	G1	S1	25	0
	Cicurina vespera	Government Canyon Bat Cave meshweaver	G1	S1	25	0
	Tartarocreagris texana	Tooth Cave pseudoscorpion	G1	S1	25	1
	Texella cockendolpheri	Robber Baron Cave harvestman	G1G2	S1	25	0
	Texella reddelli	Bee Creek Cave harvestman	G1G2	S1	25	1
	Texella reyesi	Bone Cave harvestman	G1G2Q	S1	25	0
Reptiles						
	Holbrookia lacerata lacerata	Plateau earless lizard	G3T3	S?	24	0
	Thamnophis sirtalis annectens	Texas garter snake	G5T3	S3	12	1
Plants						
	Acleisanthes crassifolia	Texas trumpets	G2	S2	3	0
	Agalinis densiflora	Osage plains foxglove	G3	S3	13	1
	Allium elmendorfii	Elmendorf onion	G2	S2	3	0
	Amorpha roemeriana	Texas amorpha	G3	S3	24	14
	Argythamnia aphoroides	Hill Country wild mercury	G2	S2	24	5

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Plants (cont'd)						
	Astragalus mollissimus var. *coryi*	Cory's woolly loco	G5T3	S3	25	0
	Astragalus reflexus	Texas milk-vetch	G3	S3	12	0
	Bauhinia lunarioides	Texas plume	G3	S1	13	1
	Bonamia repens	Bonamia repens	G3	S2	13	0
	Brickellia dentata	Leafy brickell-bush	G3	S3	24	4
	Brickellia eupatorioides var. *gracillima*	Narrow-leaf brickell-bush	G5T3	S3	19	4
	Caesalpinia brachycarpa	Broadpod rushpea	G2	S2	19	4
	Callirhoe scabriuscula	Texas poppy-mallow	G2	S2	13	8
	Campanula reverchonii	Basin bellflower	G2	S2	25	6
	Cardamine macrocarpa var. *texana*	Texas largeseed bittercress	G3T2	S2	14	2
	Chaetopappa effusa	Spreading leastdaisy	G3	S3	24	19
	Clematis texensis	Scarlet virgin's-bower	G3	S3	24	8
	Croton alabamensis var. *texensis*	Texabama croton	G3T2	S2	25	6
	Cucurbita texana	Texas gourd	G4?	S3	12	0
	Cuscuta exaltata	Tall dodder	G2G3	S3	12	6
	Dalea hallii	Hall's prairie-clover	G3	S3	12	1
	Dalea sabinalis	Sabinal prairie-clover	GH	SH	24	0
	Desmanthus reticulatus	Net-leaf bundle-flower	G3	S3	12	1
	Desmodium lindheimeri	Lindheimer's tickseed	G3G4	S1	13	3
	Epipactis gigantea	Giant helleborne	G3G4	S3	6	8
	Eriocaulon koernickianum	Small-headed pipewort	G2	S1	13	0
	Eriogonum nealleyi	Irion County wild buckwheat	G2	S2	25	7
	Eriogonum tenellum var. *ramosissimum*	Basin wild-buckwheat	G5T3	S3	24	6
	Euphorbia peplidion	Low spurge	G3	S3	12	0
	Euphorbia strictior	Panhandle spurge	G3	S3	13	0
	Festuca versuta	Texas fescue	G5	S3	12	18
	Glossopetalon texense	Texas grease bush	G1	S1	24	1

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Plants (cont'd)						
	Hesperaloe funifera	Hesperaloe funifera	G3	S1	13	0
	Hesperaloe parviflora	Red-flower yucca	G3	S3	14	6
	Hexalectris nitida	Glass mountain coral-root	G3	S3	12	19
	Hexalectris warnockii	Purple-spike coralroot	G2	S2	12	3
	Indigofera miniata var. *texana*	Texas scarlet pea	G5T3Q	S3	25	0
	Isoetes lithophila	Rock quillwort	G2	S2	25	5
	Lesquerella engelmannii	Engelmann bladderpod	G4	S4	12	0
	Lythrum ovalifolium	Oval-leaved loosestrife	G4	S3	12	0
	Mahonia swaseyi	Texas barberry	G3	S3	24	4
	Marsilea vestita ssp. *tenuifolia*	Narrow-leaf water fern	G5T2Q	S2	25	0
	Matelea edwardsensis	Plateau milkvine	G3	S3	24	4
	Matelea sagittifolia	Arrow-leaf milkvine	G3	S3	2	0
	Monarda punctata var. *stanfieldii*	Stanfield's horsemint	G5T3	S3	25	0
	Nesaea longipes	Longstalk heimia	G2G3	S2	3	0
	Onosmodium helleri	Heller's false-gromwell	G3	S3	24	16
	Pediomelum cyphocalyx	Turnip-root scurf pea	G4	S3S4	24	0
	Pediomelum humile	Rydberg's scurf pea	G1	S1	13	1
	Penstemon guadalupensis	Guadalupe beardtongue	G3	S3	12	0
	Penstemon triflorus	Heller's beardtongue	G3	S3	12	0
	Perityle angustifolia	Rayless rockdaisy	G3	S3	13	0
	Perityle cinerea	Gray rock-daisy	G2	S2	3	0
	Perityle lindheimeri var. *halimifolia*	Devil's River rockdaisy	G4TUQ	S3	12	0
	Perityle warnockii	River rockdaisy	G1	S1	13	1
	Philadelphus ernestii	Canyon mock-orange	G2	S2	24	10
	Philadelphus texensis	Texas mock-orange	G2	S2	25	6

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Plants (cont'd)						
	Physostegia correllii	Correll's false dragon-head	G2	S2	7	0
	Prenanthes barbata	Barbed rattlesnake-root	G3	S3	13	2
	Prunus minutiflora	Texas almond	G3	S3	12	1
	Prunus texana	Peach bush	G3	S3	3	0
	Salvia penstemonoides	Big red sage	G1	S1	25	4
	Sclerocactus brevihamatus ssp. *tobuschii*	Tobusch fishhook cactus	G5T3	S3	24	21
	Selenia jonesii	Jones' selenia	G4	S4	13	4
	Seymeria texana	Texas seymeria	G3	S3	24	1
	Streptanthus bracteatus	Bracted twistflower	G2	S2	24	8
	Streptanthus platycarpus	Broad-pod jewelflower	G3	S3	12	0
	Styrax platanifolius ssp. *platanifolius*	Sycamore-leaved snowbell	G3T3	S3	24	6
	Styrax platanifolius ssp. *stellatus*	Sycamore leaf silverbell	G3T3	S3	25	12
	Styrax platanifolius ssp. *texanus*	Texas snowbells	G3T1	S1	24	8
	Tradescantia pedicellata	Granite spiderwort	G2Q	S2	24	5
	Tragia nigricans	Dark noseburn	G3	S3	25	15
	Trichocoronis rivularis	Springrun whitehead	G3	S1	3	1
	Valerianella stenocarpa	Narrow-celled corn-salad	G3	S3	25	0
	Valerianella texana	Edwards Plateau cornsalad	G2	S2	25	5
	Vitis rupestris	Sand grape	G3	S1	3	2
	Yeatesia platystegia	Texas shrimp plant	G2G4	S2	2	3
Communities						
	Acer grandidentatum - Quercus muehlenbergii - Quercus laceyi / Carex edwardsiana - Chaetopappa effusa Southern Edwards Plateau Forest	Bigtooth maple - chinquapin oak - lacey oak / Edwards Plateau sedge - spreading leastdaisy southern Edwards Plateau forest	G2	S2	16	3

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Communities (cont'd)						
	Acer grandidentatum - Quercus muehlenbergii / Carex edwardsiana Lampasas Cutplain Forest	Bigtooth maple - chinquapin oak / Edwards Plateau sedge lampasas cutplain forest	G1	S2	8	0
	Adiantum capillus-veneris - Thelypteris ovata var. *lindheimeri Herbaceous Vegetation*	Southern maidenhair - Lindheimer's maidenfern herbaceous vegetation	G2	S?	24	0
	Buddleja racemosa - Ungnadia speciosa / Aquilegia canadensis - Aristolochia serpentaria Shrubland	Wand butterfly-bush - Mexican-buckeye / Eastern columbine - turpentine-root shrubland	G2?	S?	24	0
	Juglans microcarpa - Brickellia laciniata / Indigofera lindheimeriana Edwards Plateau Shrubland	Little walnut - splitleaf brickelbush / creek indigo Edwards Plateau shrubland	G2?	S4	24	0
	Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3	S?	5	0
	Panicum obtusum - Buchloe dactyloides Herbaceous Vegetation	Vine-mesquite - buffalo grass herbaceous vegetation	G?Q	S?	3	0
	Panicum virgatum - Andropogon glomeratus - Cladium mariscus ssp. jamaicense Herbaceous Vegetation	Switchgrass - bushy broomsedge - sawgrass herbaceous vegetation	G2G3	S5	12	0
	Pinus remota - Juniperus ashei - Quercus spp. Woodland	Papershell pinyon - Ashe's juniper - oak species woodland	G2G3	S4	25	4
	Platanus occidentalis - Juglans major Woodland	Sycamore - Arizona walnut woodland	G2?	S5	24	0
	Platanus occidentalis - (Salix nigra) / Juglans microcarpa - Baccharis salicifolia Woodland	Sycamore - (black willow) / little walnut - seep-willow woodland	G2G3	S5	12	0
	Quercus fusiformis - (Quercus stellata) / Schizachyrium scoparium Granite Woodland	Plateau live oak - (post oak) / little bluestem granite woodland	G2?	SP	5	0

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Communities (cont'd)						
	Quercus fusiformis / Hilaria belangeri Woodland	Plateau live oak / curly-mesquite woodland	G?	S3	24	1
	Quercus laceyi - Juniperus ashei Woodland	Lacey oak - Ashe's juniper woodland	G2	S3	10	4
	Quercus muehlenbergii - Juglans major - Ulmus rubra / Verbesina virginica Forest	Chinquapin oak - Arizona walnut - slippery elm / frostweed forest	G2G3	S2	24	0
	Sedum nuttallianum - Selaginella peruviana Granitic Outcrop Sparse Vegetation	Nuttall's stonecrop - Peruvian spikemoss granitic outcrop sparse vegetation	G2	S?	7	0
	Taxodium distichum - Platanus occidentalis Edwards Plateau Forest	Bald-cypress - sycamore Edwards Plateau forest	G2	S3	24	5
Ecological Systems						
	Chihuahuan Desert Grasslands (Heavy Soils)	Chihuahuan Desert grasslands (heavy soils)	Unranked	Unranked	1	0
	Chihuahuan Desert Xeric Shrublands	Chihuahuan Desert xeric shrublands	Unranked	Unranked	3	3
	Crosstimbers Oak Forests and Woodlands[1]	Crosstimbers oak forests and woodlands	Unranked	Unranked	12	8
	Crosstimbers Oak Forests and Woodlands[1]	Crosstimbers oak forests and woodlands	Unranked	Unranked	1000 (ha)	61496 (ha)
	Edwards Plateau and Chihuahuan Riparian Shrublands and Grasslands	Edwards Plateau and Chihuahuan riparian shrublands and grasslands	Unranked	Unranked	12	5
	Edwards Plateau Shaded Cliffs and Rock Outcrops	Edwards Plateau shaded cliffs and rock outcrops	Unranked	Unranked	24	2

[1] *Some system targets were assigned two types of goals: total area (in hectares) and number of discrete occurrences.*

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	#/Area of Viable Occurrences Captured In Portfolio
Ecological Systems (cont'd)						
	Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	Unranked	10	1
	Great Plains Granite Woodlands	Great Plains granite woodlands	Unranked	Unranked	67290 (ha)	139684 (ha)
	Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	Unranked	1573534 (ha)	1862065 (ha)
	Great Plains Mixedgrass Prairies[1]	Great Plains mixedgrass prairies	Unranked	Unranked	6	8
	Great Plains Mixedgrass Prairies[1]	Great Plains mixedgrass prairies	Unranked	Unranked	422916 (ha)	36265 (ha)
	South Central Bottomland Forests	South Central bottomland forests	Unranked	Unranked	10	14
	Southern Great Plains Canyon Forests	Southern Great Plains canyon forests	Unranked	Unranked	24	1
	Southern Great Plains Granite Glades	Southern Great Plains granite glades	Unranked	Unranked	25	6
	Southern Great Plains Mesquite Woodlands and Shrublands[1]	Southern Great Plains mesquite woodlands and shrublands	Unranked	Unranked	374934 (ha)	777631 (ha)
	Southern Great Plains Mesquite Woodlands and Shrublands[1]	Southern Great Plains mesquite woodlands and shrublands	Unranked	Unranked	4	11
	Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	Unranked	10	27
	Southern Great Plains Saline Shrublands	Southern Great Plains saline shrublands	Unranked	Unranked	4	1

[1] *Some system targets were assigned two types of goals: total area (in hectares) and number of discrete occurrences.*

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	#/Area of Viable Occurrences Captured In Portfolio
Ecological Systems (cont'd)						
	Southern Great Plains Shallow Alkaline Soil Shrublands	Southern Great Plains shallow alkaline soil shrublands	Unranked	Unranked	357366 (ha)	824937 (ha)
	Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	Unranked	10	4

Appendix B: Aquatic Conservation Targets–Progress Towards Overall Ecoregional Goals

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Amphibians						
	Eurycea chisholmensis	Salado Springs salamander	G1	S1	5	0
	Eurycea nana	San Marcos salamander	G1	S1	1	1
	Eurycea naufragia	Georgetown salamander	G1	S1	10	4
	Eurycea neotenes	Texas salamander	G1	S1	5	0
	Eurycea pterophila	Blanco River Springs salamander	G2	S2	10	1
	Eurycea sosorum	Barton Springs salamander	G1	S1	1	1
	Eurycea sp. *6*	Pedernales River spring salamander	G1	S1	5	0
	Eurycea sp. *7*	Edwards Plateau spring salamander	G1G3Q	S1S3	25	1
	Eurycea sp. *8*	Comal Springs salamander	G1Q	S1	1	0
	Eurycea tonkawae	Jollyville Plateau salamander	G1	S1	25	6
Crustaceans						
	Hyalella texana	Clear Creek amphipod	G1	S1	5	1
Fishes						
	Cyprinella lepida	Plateau shiner	G1G2	S1S2	5	3
	Cyprinella proserpina	Proserpine shiner	G3	S2	5	1
	Cyprinella sp. *2*	Nueces River shiner	G1G2Q	S1S2	5	1
	Cycleptus elongatus	Blue sucker	G3G4	S3	1	0
	Dionda diaboli	Devils River minnow	G1	S1	5	1
	Etheostoma grahami	Rio Grande darter	G3	S2	5	1

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Fishes (cont'd)						
	Etheostoma fonticola	Fountain darter	G1	S1	5	2
	Gambusia senilis	Blotched gambusia	G3G4	SX	2	0
	Gambusia heterochir	Clear Creek gambusia	G1	S1	1	1
	Ictalurus lupus	Headwater catfish	G3	S2	4	4
	Micropterus treculi	Guadalupe bass	G3	S3	9	6
Insects						
	Austrotinodes texensis	Texas Austrotinodes caddisfly	G2	S2	Undetermined[1]	0
	Baetodes alleni	A mayfly	G1	S?	Undetermined[1]	0
	Comaldessus stygius	Comal Springs diving beetle	G1	S1	5	1
	Heterelmis comalensis	Comal Springs riffle beetle	G1	S1	5	2
	Neocylloepus boeseli	Boesel's riffle beetle	G?	S?	Undetermined[1]	0
	Plauditus texanus	A mayfly	G3	S?	Undetermined[1]	0
	Procloeon distinctum	A mayfly	G1	S?	Undetermined[1]	0
	Protoptila arca	San Marcos saddle-case caddisfly	G1	S1	Undetermined[1]	0
	Pseudocentroptiloides morihari	A mayfly	G2	S?	Undetermined[1]	0
Mollusks						
	Lampsilis bracteata	Texas fatmucket	G1	S?	9	0
	Quadrula aurea	Golden orb	G1	S?	9	0
	Quadrula houstonensis	Smooth pimpleback	G2	S?	9	0
	Quadrula petrina	Texas pimpleback	G2G3	S?	9	0
	Truncilla macrodon	Texas fawnsfoot	G2	S?	9	0
	Phreatoceras taylori	Nymph trumpet	G1G2	S?	Undetermined[1]	0
	Popenaias popeii	Texas hornshell	G1	S1	9	0

Group	Scientific Name	Common Name	Global Rank	State Rank	Ecoregional Conservation Goal	# of Viable Occurrences Captured In Portfolio
Mollusks (cont'd)						
	Texapyrgus longleyi	Striated hydrobe	G1	S1	Undetermined[1]	0
Reptiles						
	Graptemys caglei	Cagle's map turtle	G3	S3	13	2
	Nerodia paucimaculata	Concho water snake	G2	S2	10	6
Plants						
	Zizania texana	Texas wild-rice	G1	S1	3	1

Systems

Since each system type is unique to an Ecological Drainage Unit, their names and goals have not been included here. Please refer to Appendix D for a listing of aquatic systems and goal information by Ecological Drainage Unit.

[1]*Detailed information about the current and historical distribution of these species was unavailable during this first iteration of the Edwards Plateau Biodiversity and Conservation Assessment. As a result, goals could not be determined for these conservation elements. It is hoped that these information gaps will be addressed prior to or during the next iteration of the assessment process.*

APPENDIX C: Terrestrial Conservation Targets–Progress Toward Stratification Unit Goals

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Amphibians							
	Eastern Balcones Escarpment						
		Eurycea rathbuni	Texas blind salamander	G1/S1	25	2	23
		Eurycea robusta	Blanco blind salamander	G1Q/S1	25	0	25
		Eurycea troglodytes	Valdina Farms sinkhole salamander	G3/S3	12	0	12
	Southern Balcones Escarpment						
		Eurycea latitans	Cascade Caverns salamander	G3/S3	25	0	25
		Eurycea tridentifera	Comal blind salamander	G1/S1	25	2	23
		Eurycea troglodytes	Valdina Farms sinkhole salamander	G3/S3	12	0	12
Birds							
	Eastern Balcones Escarpment						
		Aimophila cassinii	Cassin's sparrow	G5/S4B	1	1	0
		Aimophila ruficeps	Rufous-crowned sparrow	G5/S4B	1	3	0
		Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5/S4B	2	1	1
		Dendroica chrysoparia	Golden-cheeked warbler	G2/S2B	2	14	0
		Passerina ciris	Painted bunting	G5/S4B	1	3	0
		Spiza americana	Dickcissel	G5/S4B	1	2	0
		Vireo atricapilla	Black-capped vireo	G2G3/S2B	2	18	0
		Vireo bellii	Bell's vireo	G5/S3B	1	1	0
	Eastern Edwards Plateau						
		Aimophila cassinii	Cassin's sparrow	G5/S4B	1	2	0
		Aimophila ruficeps	Rufous-crowned sparrow	G5/S4B	1	7	0
		Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5/S4B	2	0	2

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Birds (cont'd)							
	Eastern Edwards Plateau (cont'd)						
		Callipepla squamata	Scaled quail	G5/S4B	2	2	0
		Dendroica chrysoparia	Golden-cheeked warbler	G2/S2B	2	3	0
		Micrathene whitneyi	Elf owl	G5/S4B	4	0	4
		Passerina ciris	Painted bunting	G5/S4B	1	8	0
		Spiza americana	Dickcissel	G5/S4B	1	3	0
		Vireo atricapilla	Black-capped vireo	G2G3/S2B	2	16	0
		Vireo bellii	Bell's vireo	G5/S3B	1	5	0
	Llano Uplift						
		Aimophila cassinii	Cassin's sparrow	G5/S4B	1	2	0
		Aimophila ruficeps	Rufous-crowned sparrow	G5/S4B	1	5	0
		Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5/S4B	2	0	2
		Callipepla squamata	Scaled quail	G5/S4B	2	1	1
		Dendroica chrysoparia	Golden-cheeked warbler	G2/S2B	2	0	2
		Passerina ciris	Painted bunting	G5/S4B	1	2	0
		Spiza americana	Dickcissel	G5/S4B	1	2	0
		Vireo atricapilla	Black-capped vireo	G2G3/S2B	2	1	1
		Vireo bellii	Bell's vireo	G5/S3B	1	4	0
	Southern Balcones Escarpment						
		Aimophila cassinii	Cassin's sparrow	G5/S4B	1	4	0
		Aimophila ruficeps	Rufous-crowned sparrow	G5/S4B	1	8	0
		Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5/S4B	2	1	1
		Dendroica chrysoparia	Golden-cheeked warbler	G2/S2B	2	16	0
		Passerina ciris	Painted bunting	G5/S4B	1	7	0
		Spiza americana	Dickcissel	G5/S4B	1	5	0
		Vireo atricapilla	Black-capped vireo	G2G3/S2B	2	21	0
		Vireo bellii	Bell's vireo	G5/S3B	1	4	0
		Vireo vicinior	Gray vireo	G4/S4B	1	2	0

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Birds (cont'd)							
	Western Edwards Plateau						
		Aimophila cassinii	Cassin's sparrow	G5/S4B	1	8	0
		Aimophila ruficeps	Rufous-crowned sparrow	G5/S4B	1	5	0
		Calamospiza melanocorys (breeding)	Lark bunting (breeding)	G5/S4B	3	3	0
		Calamospiza melanocorys (wintering)	Lark bunting (wintering)	G5/S4B	2	0	2
		Callipepla squamata	Scaled quail	G5/S4B	2	7	0
		Cyrtonyx montezumae	Montezuma quail	G4G5/S3B	3	1	2
		Micrathene whitneyi	Elf owl	G5/S4B	4	1	3
		Passerina ciris	Painted bunting	G5/S4B	1	11	0
		Spiza americana	Dickcissel	G5/S4B	1	5	0
		Vireo atricapilla	Black-capped vireo	G2G3/S2B	2	14	0
		Vireo bellii	Bell's vireo	G5/S3B	1	10	0
		Vireo vicinior	Gray vireo	G4/S4B	1	0	1
Crustaceans							
	Eastern Balcones Escarpment						
		Allotexiweckelia hirsuta	A cave-obligate amphipod	G3/S?	12	0	12
		Artesia subterranea	A cave-obligate amphipod	G1G2/S?	25	0	25
		Holsingerius samacos	A cave-obligate amphipod	G1G2/S?	25	0	25
		Lirceolus bisetus	A cave-obligate isopod	G3/S?	12	0	12
		Lirceolus smithii	A cave-obligate isopod	G1G2/S?	25	0	25
		Monodella texana	A cave-obligate crustacean	G1G2/S1	12	0	12
		Palaemonetes antrorum	Balcones Cave shrimp	G1G2/S1	25	0	25
		Parabogidiella americana	A cave-obligate amphipod	G3/S?	12	0	12
		Seborgia relicta	A cave-obligate amphipod	G3/S?	25	0	25
		Sphaeromicola moria	A cave-obligate shrimp	G1G2/S?	25	0	25
		Stygobromus balconis	Balcones Cave amphipod	G3/S1	25	0	25
		Stygobromus bifurcatus	Bifurcated cave amphipod	G1G2/S1	25	0	25
		Stygobromus flagellatus	Ezell's Cave amphipod	G1/S1	25	0	25

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Crustaceans (cont'd)							
	Eastern Balcones Escarpment (cont'd)						
		Stygobromus reddelli	Reddell's cave amphipod	G1/S1	25	0	25
		Stygobromus russelli	A cave-obligate amphipod	G3/S3	25	0	25
		Texiweckelia insolita	A cave-obligate amphipod	G3/S?	12	0	12
		Texiweckelia texensis	A cave-obligate amphipod	G3/S?	25	0	25
	Eastern Edwards Plateau						
		Lirceolus bisetus	A cave-obligate isopod	G3/S?	12	0	12
	Southern Balcones Escarpment						
		Allotexiweckelia hirsuta	A cave-obligate amphipod	G3/S?	12	0	12
		Lirceolus pilus	A cave-obligate isopod	G3/S?	25	0	25
		Monodella texana	A cave-obligate crustacean	G1G2/S1	12	0	12
		Parabogidiella americana	A cave-obligate amphipod	G3/S?	12	0	12
		Stygobromus dejectus	Cascade Cave amphipod	G1/S1	25	0	25
		Stygobromus hadenoecus	Devil's sinkhole amphipod	G1/S1	25	0	25
		Stygobromus longipes	Long-legged cave amphipod	G1G2/S1	25	0	25
		Stygobromus pecki	Peck's cave amphipod	G1/S1	25	0	25
		Texiweckelia insolita	A cave-obligate amphipod	G3/S?	12	0	12
Fishes (Subterranean)							
	Southern Balcones Escarpment						
		Satan eurystomus	Widemouth blindcat	G1/S1	25	0	25
		Trogloglanis pattersoni	Toothless blindcat	G1/S1	25	0	25
Insects							
	Eastern Balcones Escarpment						
		Batrisodes texanus	Coffin Cave mold beetle	G1S1	25	0	25

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Insects (cont'd)							
	Eastern Balcones Escarpment (cont'd)						
		Cylindropsis sp. *1*	Tooth Cave ground beetle	G1/S1	25	0	25
		Neoleptoneta myopica	Tooth Cave spider	G1/S?	25	1	24
		Rhadine persephone	Tooth Cave ground beetle	G1/S1	25	1	24
		Texamaurops reddelli	Kretschmarr Cave mold beetle	G1G2/S1	25	1	24
	Southern Balcones Escarpment						
		Batrisodes venyivi	Helotes mold beetle	G1/S1	25	0	25
		Haideporus texanus	Edwards aquifer diving beetle	G1/S?	25	0	25
		Neoleptoneta microps	Government Canyon Cave spider	G1/S1	25	0	25
		Rhadine exilis	A ground beetle	G1/S1	25	0	25
		Rhadine infernalis	A ground beetle	G1G2/S1	25	0	25
		Stygoparnus comalensis	Comal Springs dryopid beetle	G1/S1	25	0	25
Mammals							
	Eastern Balcones Escarpment						
		Cynomys ludovicianus	Black-tailed prairie dog	G4/S3	1	1	0
	Eastern Edwards Plateau						
		Cynomys ludovicianus	Black-tailed prairie dog	G4/S3	1	1	0
		Geomys texensis texensis	Llano pocket gopher	G2QT2/S2	12	0	12
	Llano Uplift						
		Cynomys ludovicianus	Black-tailed prairie dog	G4/S3	1	0	1
		Geomys texensis texensis	Llano pocket gopher	G2QT2/S2	12	0	12
	Western Edwards Plateau						
		Cynomys ludovicianus	Black-tailed prairie dog	G4/S3	1	0	1

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Mollusks							
	Eastern Balcones Escarpment						
		Phreatodrobia micra	Flattened cavesnail	G2G3/S2S3	12	0	12
		Phreatodrobia nugax nugax	A cavesnail	G3T3/S?	12	0	12
		Phreatodrobia plana	Disc cavesnail	G1/S?	12	0	12
		Phreatodrobia punctata	High-hat cavesnail	G1/S?	25	0	25
		Phreatodrobia rotunda	Beaked cavesnail	G1/S?	25	0	25
		Stygopyrgus bartonensis	Barton cavesnail	G1/S1	25	0	25
	Southern Balcones Escarpment						
		Balconorbis uvaldensis	Balcones ghostsnail	G1/S?	25	0	25
		Phreatodrobia conica	Hueco cavesnail	G1/S?	25	0	25
		Phreatodrobia imitata	Mimic cavesnail	G1/S1	25	0	25
		Phreatodrobia micra	Flattened cavesnail	G2G3/S2S3	12	0	12
		Phreatodrobia nugax inclinata	A cavesnail	G3T1T2/S?	25	0	25
		Phreatodrobia nugax nugax	A cavesnail	G3T3/S?	12	0	12
		Phreatodrobia plana	Disc cavesnail	G1/S?	12	0	12
	Western Edwards Plateau						
		Phreatodrobia coronae	A cavesnail	G1/S?	25	0	25
Other Karst Invertebrates							
	Eastern Balcones Escarpment						
		Tartarocreagris texana	Tooth Cave pseudoscorpion	G1/S1	25	1	24
		Texella reddelli	Bee Creek Cave harvestman	G1G2/S1	25	1	24
		Texella reyesi	Bone Cave harvestman	G1G2Q/S1	25	0	25

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Other Karst Invertebrates (cont'd)							
	Southern Balcones Escarpment						
		Cicurina baronia	Robber Baron Cave meshweaver	G1/S1	25	0	25
		Cicurina madla	Madla Cave meshweaver	G1/S1	25	0	25
		Cicurina venii	Bracken Bat Cave meshweaver	G1/S1	25	0	25
		Cicurina vespera	Government Canyon Bat Cave meshweaver	G1/S1	25	0	25
		Texella cockendolpheri	Robber Baron Cave harvestman	G1G2/S1	25	0	25
Reptiles							
	Eastern Balcones Escarpment						
		Holbrookia lacerata lacerata	Plateau earless lizard	G3T3/S?	6	0	6
		Thamnophis sirtalis annectens	Texas garter snake	G5T3/S3	4	0	4
	Eastern Edwards Plateau						
		Holbrookia lacerata lacerata	Plateau earless lizard	G3T3/S?	6	0	6
	Llano Uplift						
		Thamnophis sirtalis annectens	Texas garter snake	G5T3/S3	4	0	4
	Southern Balcones Escarpment						
		Holbrookia lacerata lacerata	Plateau earless lizard	G3T3/S?	6	0	6
		Thamnophis sirtalis annectens	Texas garter snake	G5T3/S3	4	1	3
	Western Edwards Plateau						
		Holbrookia lacerata lacerata	Plateau earless lizard	G3T3/S?	6	0	6

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants							
	Eastern Balcones Escarpment						
		Agalinis densiflora	Osage plains foxglove	G3/S3	13	1	12
		Amorpha roemeriana	Texas amorpha	G4/S3	12	5	7
		Argythamnia aphoroides	Hill Country wild mercury	G2/S2	6	0	6
		Astragalus reflexus	Texas milk-vetch	G3/S3	6	0	6
		Brickellia dentata	Leafy brickell-bush	G3/S3	6	3	3
		Brickellia eupatorioides var. *gracillima*	Narrow-leaf brickell-bush	G5T3/S3	8	1	7
		Chaetopappa effusa	Spreading leastdaisy	G3/S3	12	0	12
		Clematis texensis	Scarlet virgin's-bower	G3/S3	12	4	8
		Croton alabamensis var. *texensis*	Texabama croton	G3T2/S2	25	6	19
		Cucurbita texana	Texas gourd	G4?/S3	4	0	4
		Cuscuta exaltata	Tall dodder	G2G3/S3	3	0	3
		Dalea hallii	Hall's prairie-clover	G3/S3	4	1	3
		Desmanthus reticulatus	Net-leaf bundle-flower	G3/S3	6	0	6
		Epipactis gigantea	Giant helleborne	G3G4/S3	2	4	0
		Eriogonum tenellum var. *ramosissimum*	Basin wild-buckwheat	G5T3/S3	12	0	12
		Euphorbia peplidion	Low spurge	G3/S3	6	0	6
		Festuca versuta	Texas fescue	G5/S3	6	11	0
		Hexalectris nitida	Glass mountain coral-root	G3/S3	3	9	0
		Hexalectris warnockii	Purple-spike coralroot	G2/S2	3	1	2
		Lesquerella engelmannii	Engelmann bladderpod	G4/S4	4	0	4
		Lythrum ovalifolium	Oval-leaved loosestrife	G4/S3	4	0	4
		Mahonia swaseyi	Texas barberry	G3/S3	12	3	9
		Matelea edwardsensis	Plateau milkvine	G3/S3	12	0	12
		Onosmodium helleri	Heller's false-gromwell	G3/S3	12	12	0
		Pediomelum cyphocalyx	Turnip-root scurf pea	G4/S3S4	12	0	12

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants (cont'd)							
	Eastern Balcones Escarpment (cont'd)						
		Penstemon guadalupensis	Guadalupe beardtongue	G3/S3	3	0	3
		Perityle lindheimeri var. *halimifolia*	Devil's River rockdaisy	G4TUQ/S3	6	0	6
		Philadelphus ernestii	Canyon mock-orange	G2/S2	12	7	5
		Physostegia correllii	Correll's false dragon-head	G2/S2	7	0	7
		Prunus minutiflora	Texas almond	G3/S3	3	0	3
		Seymeria texana	Texas seymeria	G3/S3	6	0	6
		Streptanthus bracteatus	Bracted twistflower	G2/S2	12	2	10
		Styrax platanifolius ssp. *platanifolius*	Sycamore-leaved snowbell	G3T3/S3	6	6	0
		Tradescantia pedicellata	Granite spiderwort	G2Q/S2	12	1	11
		Vitis rupestris	Sand grape	G3/S1	1	0	1
	Eastern Edwards Plateau						
		Argythamnia aphoroides	Hill Country wild mercury	G2/S2	6	2	4
		Astragalus reflexus	Texas milk-vetch	G3/S3	6	0	6
		Brickellia dentata	Leafy brickell-bush	G3/S3	6	0	6
		Caesalpinia brachycarpa	Broadpod rushpea	G2/S2	8	0	8
		Dalea hallii	Hall's prairie-clover	G3/S3	4	0	4
		Hesperaloe parviflora	Red-flower yucca	G3/S3	1	1	0
		Hexalectris nitida	Glass mountain coral-root	G3/S3	3	0	3
		Hexalectris warnockii	Purple-spike coralroot	G2/S2	3	0	3
		Lesquerella engelmannii	Engelmann bladderpod	G4/S4	4	0	4
		Lythrum ovalifolium	Oval-leaved loosestrife	G4/S3	4	0	4
		Penstemon guadalupensis	Guadalupe beardtongue	G3/S3	3	0	3
		Prunus minutiflora	Texas almond	G3/S3	3	0	3
		Sclerocactus brevihamatus ssp. *tobuschii*	Tobusch fishhook cactus	G5T3/S3	8	6	2
		Seymeria texana	Texas seymeria	G3/S3	6	0	6
		Vitis rupestris	Sand grape	G3/S1	1	0	1

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants (cont'd)							
	Llano Uplift						
		Allium elmendorfii	Elmendorf onion	G2/S2	3	0	3
		Campanula reverchonii	Basin bellflower	G2/S2	25	6	19
		Cuscuta exaltata	Tall dodder	G2G3/S3	3	2	1
		Eriocaulon koernickianum	Small-headed pipewort	G2/S1	13	0	13
		Eriogonum tenellum var. *ramosissimum*	Basin wild-buckwheat	G5T3/S3	12	6	6
		Indigofera miniata var. *texana*	Texas scarlet pea	G5T3Q/S3	25	0	25
		Isoetes lithophila	Rock quillwort	G2/S2	25	5	21
		Marsilea vestita ssp. *tenuifolia*	Narrow-leaf water fern	G5T2Q/S2	25	0	25
		Monarda punctata var. *stanfieldii*	Stanfield's horsemint	G5T3/S3	25	0	25
		Prunus texana	Peach bush	G3/S3	3	0	3
		Streptanthus platycarpus	Broad-pod jewelflower	G3/S3	6	0	6
		Styrax platanifolius ssp. *platanifolius*	Sycamore-leaved snowbell	G3T3/S3	6	0	6
		Tradescantia pedicellata	Granite spiderwort	G2Q/S2	12	4	8
		Valerianella texana	Edwards Plateau cornsalad	G2/S2	25	5	20
	Southern Balcones Escarpment						
		Amorpha roemeriana	Texas amorpha	G3/S3	12	9	3
		Argythamnia aphoroides	Hill Country wild mercury	G2/S2	6	3	3
		Brickellia dentata	Leafy brickell-bush	G3/S3	6	0	6
		Brickellia eupatorioides var. *gracillima*	Narrow-leaf brickell-bush	G5T3/S3	3	2	1
		Caesalpinia brachycarpa	Broadpod rushpea	G2/S2	3	3	0
		Cardamine macrocarpa var. *texana*	Texas largeseed bittercress	G3T2/S2	13	1	12
		Chaetopappa effusa	Spreading leastdaisy	G3/S3	12	19	0
		Clematis texensis	Scarlet virgin's-bower	G3/S3	12	4	8
		Cucurbita texana	Texas gourd	G4?/S3	4	0	4
		Cuscuta exaltata	Tall dodder	G2G3/S3	3	1	2

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants (cont'd)							
	Southern Balcones Escarpment (cont'd)						
		Dalea hallii	Hall's prairie-clover	G3/S3	4	0	4
		Dalea sabinalis	Sabinal prairie-clover	GH/SH	12	0	12
		Desmanthus reticulatus	Net-leaf bundle-flower	G3/S3	6	1	5
		Desmodium lindheimeri	Lindheimer's tickseed	G3G4/S1	13	3	10
		Epipactis gigantea	Giant helleborne	G3G4/S3	2	3	0
		Euphorbia peplidion	Low spurge	G3/S3	6	0	6
		Festuca versuta	Texas fescue	G5/S3	6	7	0
		Glossopetalon texense	Texas grease bush	G1/S1	12	1	11
		Hexalectris nitida	Glass mountain coral-root	G3/S3	3	8	0
		Hexalectris warnockii	Purple-spike coralroot	G2/S2	3	0	3
		Lesquerella engelmannii	Engelmann bladderpod	G4/S4	4	0	4
		Lythrum ovalifolium	Oval-leaved loosestrife	G4/S3	4	0	4
		Mahonia swaseyi	Texas barberry	G3/S3	12	1	11
		Matelea edwardsensis	Plateau milkvine	G3/S3	12	4	8
		Matelea sagittifolia	Arrow-leaf milkvine	G3/S3	1	0	1
		Nesaea longipes	Longstalk heimia	G2G3/S2	3	0	3
		Onosmodium helleri	Heller's false-gromwell	G3/S3	12	4	8
		Pediomelum cyphocalyx	Turnip-root scurf pea	G4/S3S4	12	0	12
		Penstemon guadalupensis	Guadalupe beardtongue	G3/S3	3	0	3
		Penstemon triflorus	Heller's beardtongue	G3/S3	6	0	6
		Perityle lindheimeri var. *halimifolia*	Devil's River rockdaisy	G4TUQ/S3	6	0	6
		Philadelphus ernestii	Canyon mock-orange	G2/S2	12	3	9
		Philadelphus texensis	Texas mock-orange	G2/S2	25	6	19
		Prenanthes barbata	Barbed rattlesnake-root	G3/S3	13	2	11
		Prunus minutiflora	Texas almond	G3/S3	3	1	2
		Salvia penstemonoides	Big red sage	G1/S1	25	4	21

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants (cont'd)							
	Southern Balcones Escarpment (cont'd)						
		Sclerocactus brevihamatus ssp. *tobuschii*	Tobusch fishhook cactus	G5T3/S3	8	10	0
		Seymeria texana	Texas seymeria	G3/S3	6	0	6
		Streptanthus bracteatus	Bracted twistflower	G2/S2	12	6	6
		Styrax platanifolius ssp. *platanifolius*	Sycamore-leaved snowbell	G3T3/S3	6	0	6
		Styrax platanifolius ssp. *stellatus*	Sycamore leaf silverbell	G3T3/S3	25	12	13
		Styrax platanifolius ssp. *texanus*	Texas snowbells	G3T1/S1	12	7	5
		Tragia nigricans	Dark noseburn	G3/S3	25	15	10
		Trichocoronis rivularis	Springrun whitehead	G3/S1	3	1	2
		Valerianella stenocarpa	Narrow-celled corn-salad	G3/S3	25	0	25
		Yeatesia platystegia	Texas shrimp plant	G2G4/S2	1	1	0
	Western Edwards Plateau						
		Acleisanthes crassifolia	Texas trumpets	G2/S2	3	0	3
		Argythamnia aphoroides	Hill Country wild mercury	G2/S2	6	0	6
		Astragalus mollissimus var. *coryi*	Cory's woolly loco	G5T3/S3	25	0	25
		Bauhinia lunarioides	Texas plume	G3/S1	13	1	12
		Bonamia repens	Bonamia repens	G3/S2	13	0	13
		Brickellia dentata	Leafy brickell-bush	G3/S3	6	1	5
		Brickellia eupatorioides var. *gracillima*	Narrow-leaf brickell-bush	G5T3/S3	8	1	7
		Caesalpinia brachycarpa	Broadpod rushpea	G2/S2	8	1	7
		Callirhoe scabriuscula	Texas poppy-mallow	G2/S2	13	8	5
		Cardamine macrocarpa var. *texana*	Texas largeseed bittercress	G3T2/S2	1	1	0
		Cucurbita texana	Texas gourd	G4?/S3	4	0	4
		Cuscuta exaltata	Tall dodder	G2G3/S3	3	3	0

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Vascular Plants (cont'd)							
	Western Edwards Plateau (cont'd)						
		Dalea sabinalis	Sabinal prairie-clover	GH/SH	12	0	12
		Epipactis gigantea	Giant helleborne	G3G4/S3	2	1	1
		Eriogonum nealleyi	Irion County wild buckwheat	G2/S2	25	7	18
		Euphorbia strictior	Panhandle spurge	G3/S3	13	0	13
		Glossopetalon texense	Texas grease bush	G1/S1	12	0	12
		Hesperaloe funifera	Hesperaloe funifera	G3/S1	13	0	13
		Hesperaloe parviflora	Red-flower yucca	G3/S3	13	5	8
		Hexalectris nitida	Glass mountain coral-root	G3/S3	3	2	1
		Hexalectris warnockii	Purple-spike coralroot	G2/S2	3	2	1
		Matelea sagittifolia	Arrow-leaf milkvine	G3/S3	1	0	1
		Pediomelum humile	Rydberg's scurf pea	G1/S1	13	1	12
		Penstemon guadalupensis	Guadalupe beardtongue	G3/S3	3	0	3
		Penstemon triflorus	Heller's beardtongue	G3/S3	6	0	6
		Perityle angustifolia	Rayless rockdaisy	G3/S3	13	0	13
		Perityle cinerea	Gray rock-daisy	G2/S2	3	0	3
		Perityle warnockii	River rockdaisy	G1/S1	13	1	12
		Prunus minutiflora	Texas almond	G3/S3	3	0	3
		Sclerocactus brevihamatus ssp. *tobuschii*	Tobusch fishhook cactus	G5T3/S3	8	5	3
		Selenia jonesii	Jones' selenia	G4/S4	13	4	9
		Seymeria texana	Texas seymeria	G3/S3	6	1	5
		Streptanthus platycarpus	Broad-pod jewelflower	G3/S3	6	0	6
		Styrax platanifolius ssp. *platanifolius*	Sycamore-leaved snowbell	G3T3/S3	6	0	6
		Styrax platanifolius ssp. *texanus*	Texas snowbells	G3T1/S1	12	1	11
		Vitis rupestris	Sand grape	G3/S1	1	2	0
		Yeatesia platystegia	Texas shrimp plant	G2G4/S2	1	2	0

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Communities							
	Eastern Balcones Escarpment						
		Acer grandidentatum - Quercus muehlenbergii - Quercus laceyi / Carex edwardsiana - Chaetopappa effusa Southern Edwards Plateau Forest	Bigtooth maple - chinquapin oak - lacey oak / Edwards Plateau sedge - spreading leastdaisy southern Edwards Plateau forest	G2/S2	8	2	6
		Acer grandidentatum - Quercus muehlenbergii/ Carex edwardsiana Lampasas Cutplain Forest	Bigtooth maple - chinquapin oak / Edwards Plateau sedge lampasas cutplain forest	G1/S2	8	0	8
		Adiantum capillus-veneris - Thelypteris ovata var. *lindheimeri Herbaceous Vegetation*	Southern maidenhair - Lindheimer's maidenfern herbaceous vegetation	G2/S?	12	0	12
		Buddleja racemosa - Ungnadia speciosa/ Aquilegia canadensis - Aristolochia serpentaria Shrubland	Wand butterfly-bush - Mexican-buckeye / Eastern columbine - turpentine-root shrubland	G2?/S?	12	0	12
		Juglans microcarpa - Brickellia laciniata/ Indigofera lindheimeriana Edwards Plateau Shrubland	Little walnut - splitleaf brickelbush / creek indigo Edwards Plateau shrubland	G2?/S4	8	0	8
		Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3/S?	1	0	1
		Panicum virgatum - Andropogon glomeratus - Cladium mariscus ssp. *jamaicense Herbaceous Vegetation*	Switchgrass - bushy broomsedge - sawgrass herbaceous vegetation	G2G3/S5	6	0	6
		Platanus occidentalis - Juglans major Woodland	Sycamore - Arizona walnut woodland	G2?/S5	12	0	12
		Quercus muehlenbergii - Juglans major - Ulmus rubra / Verbesina virginica Forest	Chinquapin oak - Arizona walnut - slippery elm / frostweed forest	G2G3/S5	12	0	12
		Taxodium distichum - Platanus occidentalis Edwards Plateau Forest	Bald-cypress - sycamore Edwards Plateau forest	G2/S3	6	3	3

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Communities (cont'd)							
	Eastern Edwards Plateau						
		Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3/S?	1	0	1
		Quercus fusiformis / Hilaria belangeri Woodland	Plateau live oak / curly-mesquite woodland	G?/S3	6	0	6
		Quercus laceyi - Juniperus ashei Woodland	Lacey oak - Ashe's juniper woodland	G2/S3	5	3	2
		Taxodium distichum - Platanus occidentalis Edwards Plateau Forest	Bald-cypress - sycamore Edwards Plateau forest	G2/S3	6	0	6
	Llano Uplift						
		Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3/S?	1	0	1
		Quercus fusiformis - (Quercus stellata) / Schizachyrium scoparium Granite Woodland	Plateau live oak - (post oak) / little bluestem granite woodland	G2?/SP	5	0	5
		Quercus fusiformis / Hilaria belangeri Woodland	Plateau live oak / curly-mesquite woodland	G?/S3	6	0	6
		Sedum nuttallianum - Selaginella peruviana Granitic Outcrop Sparse Vegetation	Nuttall's stonecrop - Peruvian spikemoss granitic outcrop sparse vegetation	G2/S?	7	0	7
		Taxodium distichum - Platanus occidentalis Edwards Plateau Forest	Bald-cypress - sycamore Edwards Plateau forest	G2/S3	6	0	6
	Southern Balcones Escarpment						
		Acer grandidentatum - Quercus muehlenbergii - Quercus laceyi / Carex edwardsiana - Chaetopappa effusa Southern Edwards Plateau Forest	Bigtooth maple - chinquapin oak - lacey oak / Edwards Plateau sedge - spreading leastdaisy southern Edwards Plateau forest	G2/S2	8	1	7

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Communities (cont'd)							
	Southern Balcones Escarpment (cont'd)						
		Adiantum capillus-veneris - Thelypteris ovata var. *lindheimeri Herbaceous Vegetation*	Southern maidenhair - Lindheimer's maidenfern herbaceous vegetation	G2/S?	12	0	12
		Buddleja racemosa - Ungnadia speciosa/ Aquilegia canadensis - Aristolochia serpentaria Shrubland	Wand butterfly-bush - Mexican-buckeye / Eastern columbine - turpentine-root shrubland	G2?/S?	12	0	12
		Juglans microcarpa - Brickellia laciniata/ Indigofera lindheimeriana Edwards Plateau Shrubland	Little walnut - splitleaf brickelbush / creek indigo Edwards Plateau shrubland	G2?/S4	8	0	8
		Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3/S?	1	0	1
		Panicum virgatum - Andropogon glomeratus - Cladium mariscus ssp. *jamaicense Herbaceous Vegetation*	Switchgrass - bushy broomsedge – sawgrass herbaceous vegetation	G2G3/S5	6	0	6
		Pinus remota - Juniperus ashei - Quercus spp. Woodland	Papershell pinyon - Ashe's juniper - oak species woodland	G2G3/S4	1	1	0
		Platanus occidentalis - (Salix nigra) / Juglans microcarpa - Baccharis salicifolia Woodland	Sycamore - (black willow) / little walnut - seep-willow woodland	G2G3/S5	6	0	6
		Platanus occidentalis - Juglans major Woodland	Sycamore - Arizona walnut woodland	G2?/S5	12	0	12
		Quercus fusiformis / Hilaria belangeri Woodland	Plateau live oak / curly-mesquite woodland	G?/S3	6	1	5
		Quercus laceyi - Juniperus ashei Woodland	Lacey oak - Ashe's juniper woodland	G2/S3	5	1	4
		Quercus muehlenbergii - Juglans major- Ulmus rubra / Verbesina virginica Forest	Chinquapin oak - Arizona walnut - slippery elm / frostweed forest	G2G3/S2	12	0	12
		Taxodium distichum - Platanus occidentalis Edwards Plateau Forest	Bald-cypress - sycamore Edwards Plateau forest	G2/S3	6	2	4

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	#/Area of Viable Occurrences Captured	#/Area of Occurrences Remaining
Communities (cont'd)							
	Western Edwards Plateau						
		Juglans microcarpa - Brickellia laciniata/ Indigofera lindheimeriana Edwards Plateau Shrubland	Little walnut - splitleaf brickelbush / creek indigo Edwards Plateau shrubland	G2?/S4	8	0	8
		Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland	Ashe's juniper / (sideoats grama, hairy grama) woodland	G2G3/S?	1	0	1
		Panicum obtusum - Buchloe dactyloides Herbaceous Vegetation	Vine-mesquite - buffalo grass herbaceous vegetation	G?Q/S?	3	0	3
		Pinus remota - Juniperus ashei - Quercus spp. Woodland	Papershell pinyon - Ashe's juniper - oak species woodland	G2G3/S4	24	3	21
		Platanus occidentalis - (Salix nigra) / Juglans microcarpa - Baccharis salicifolia Woodland	Sycamore - (black willow) / little walnut - seep-willow woodland	G2G3/S5	6	0	6
		Quercus fusiformis / Hilaria belangeri Woodland	Plateau live oak / curly-mesquite woodland	G?/S3	6	0	6
Ecological Systems							
	Eastern Balcones Escarpment						
		Crosstimbers Oak Forests and Woodlands	Crosstimbers oak forests and woodlands	Unranked	3	3	0
		Edwards Plateau and Chihuahuan Riparian Shrublands and Grasslands	Edwards Plateau and Chihuahuan riparian shrublands and grasslands	Unranked	3	0	3
		Edwards Plateau Shaded Cliffs and Rock Outcrops	Edwards Plateau shaded cliffs and rock outcrops	Unranked	8	0	8
		Great Plains Carbonate Glades and Barrens	Great Plains carbonate glades and barrens	Unranked	3	0	3
		Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	2	0	2
		Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	457337 (ha)	359051 (ha)	98286 (ha)

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	#/Area of Viable Occurrences Captured	#/Area of Occurrences Remaining
Ecological Systems (cont'd)							
	Eastern Balcones Escarpment (cont'd)						
		Great Plains Mixedgrass Prairies	Great Plains mixedgrass prairies	Unranked	2	7	0
		South Central Bottomland Forests	South Central bottomland forests	Unranked	2	4	0
		Southern Great Plains Canyon Forests	Southern Great Plains canyon forests	Unranked	8	0	8
		Southern Great Plains Mesquite Woodlands and Shrublands	Southern Great Plains mesquite woodlands and shrublands	Unranked	1	1	0
		Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	2	1	1
		Southern Great Plains Shallow Alkaline Soil Shrublands	Southern Great Plains shallow alkaline soil shrublands	Unranked	45733 (ha)	0 (ha)	45733 (ha)
		Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	2	1	1
	Eastern Edwards Plateau						
		Crosstimbers Oak Forests and Woodlands	Crosstimbers oak forests and woodlands	Unranked	3	4	0
		Edwards Plateau and Chihuahuan Riparian Shrublands and Grasslands	Edwards Plateau and Chihuahuan riparian shrublands and grasslands	Unranked	3	1	2
		Edwards Plateau Shaded Cliffs and Rock Outcrops	Edwards Plateau shaded cliffs and rock outcrops	Unranked	8	1	7
		Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	2	0	2
		Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	548728 (ha)	594996 (ha)	0 (ha)
		Great Plains Mixedgrass Prairies	Great Plains mixedgrass prairies	Unranked	261540 (ha)	35565 (ha)	225975 (ha)
		South Central Bottomland Forests	South Central bottomland forests	Unranked	2	7	0
		Southern Great Plains Canyon Forests	Southern Great Plains canyon forests	Unranked	8	1	7

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	#/Area of Viable Occurrences Captured	#/Area of Occurrences Remaining
Ecological Systems (cont'd)							
	Eastern Edwards Plateau (cont'd)						
		Southern Great Plains Mesquite Woodlands and Shrublands	Southern Great Plains mesquite woodlands and shrublands	Unranked	1	10	0
		Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	2	5	0
		Southern Great Plains Saline Shrublands	Southern Great Plains saline shrublands	Unranked	2	0	2
		Southern Great Plains Shallow Alkaline Soil Shrublands	Southern Great Plains shallow alkaline soil shrublands	Unranked	12001(ha)	25648 (ha)	0 (ha)
		Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	2	2	0
	Llano Uplift						
		Crosstimbers Oak Forests and Woodlands	Crosstimbers oak forests and woodlands	Unranked	1000 (ha)	61496 (ha)	0 (ha)
		Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	2	1	1
		Great Plains Granite Woodlands	Great Plains granite woodlands	Unranked	67290 (ha)	139684 (ha)	0 (ha)
		Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	38603 (ha)	39932 (ha)	0 (ha)
		Great Plains Mixedgrass Prairies	Great Plains mixedgrass prairies	Unranked	2	0	2
		South Central Bottomland Forests	South Central bottomland forests	Unranked	2	1	1
		Southern Great Plains Granite Glades	Southern Great Plains granite glades	Unranked	25	6	19
		Southern Great Plains Mesquite Woodlands and Shrublands	Southern Great Plains mesquite woodlands and shrublands	Unranked	1	0	1
		Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	2	3	0
		Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	2	0	2

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	#/Area of Viable Occurrences Captured	#/Area of Occurrences Remaining
Ecological Systems (cont'd)							
	Southern Balcones Escarpment						
		Crosstimbers Oak Forests and Woodlands	Crosstimbers oak forests and woodlands	Unranked	3	0	3
		Edwards Plateau and Chihuahuan Riparian Shrublands and Grasslands	Edwards Plateau and Chihuahuan riparian shrublands and grasslands	Unranked	3	0	3
		Edwards Plateau Shaded Cliffs and Rock Outcrops	Edwards Plateau shaded cliffs and rock outcrops	Unranked	8	1	7
		Great Plains Carbonate Glades and Barrens	Great Plains carbonate glades and barrens	Unranked	3	0	3
		Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	2	0	2
		Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	415531 (ha)	641581 (ha)	0 (ha)
		Great Plains Mixedgrass Prairies	Great Plains mixedgrass prairies	Unranked	2	1	1
		South Central Bottomland Forests	South Central bottomland forests	Unranked	2	2	0
		Southern Great Plains Canyon Forests	Southern Great Plains canyon forests	Unranked	8	0	8
		Southern Great Plains Mesquite Woodlands and *Shrublands*	Southern Great Plains mesquite woodlands and shrublands	Unranked	1	0	1
		Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	2	10	0
		Southern Great Plains Shallow Alkaline Soil Shrublands	Southern Great Plains shallow alkaline soil shrublands	Unranked	41533 (ha)	70337 (ha)	0 (ha)
		Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	2	0	2
	Western Edwards Plateau						
		Chihuahuan Desert Grasslands (Heavy Soils)	Chihuahuan Desert grasslands (heavy soils)	Unranked	1	0	1
		Chihuahuan Desert Xeric Shrublands	Chihuahuan Desert xeric shrublands	Unranked	3	3	0

Group	Stratification Unit	Scientific Name	Common Name	Global/State Rank	Stratification Unit Goal	#/Area of Viable Occurrences Captured	#/Area of Occurrences Remaining
Ecological Systems (cont'd)							
	Western Edwards Plateau (cont'd)						
		Crosstimbers Oak Forests and Woodlands	Crosstimbers oak forests and woodlands	Unranked	3	1	2
		Edwards Plateau and Chihuahuan Riparian Shrublands and Grasslands	Edwards Plateau and Chihuahuan riparian shrublands and grasslands	Unranked	3	4	0
		Great Plains Freshwater Emergent Marshes	Great Plains freshwater emergent marshes	Unranked	2	0	2
		Great Plains Limestone Upland Forests and Woodlands	Great Plains limestone upland forests and woodlands	Unranked	113335 (ha)	226505 (ha)	0 (ha)
		Great Plains Mixedgrass Prairies	Great Plains mixedgrass prairies	Unranked	161376 (ha)	700 (ha)	160676 (ha)
		South Central Bottomland Forests	South Central bottomland forests	Unranked	2	0	2
		Southern Great Plains Mesquite Woodlands and *Shrublands*	Southern Great Plains mesquite woodlands and shrublands	Unranked	374934 (ha)	777631(ha)	0 (ha)
		Southern Great Plains Riparian Forests and Woodlands	Southern Great Plains riparian forests and woodlands	Unranked	2	8	0
		Southern Great Plains Saline Shrublands	Southern Great Plains saline shrublands	Unranked	2	1	1
		Southern Great Plains Shallow Alkaline Soil Shrublands	Southern Great Plains shallow alkaline soil shrublands	Unranked	258099 (ha)	728952 (ha)	0 (ha)
		Southern Great Plains Streambed Herbaceous Vegetation	Southern Great Plains streambed herbaceous vegetation	Unranked	2	1	1

APPENDIX D: Aquatic Conservation Targets–Progress Toward Ecological Drainage Unit Goals

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Amphibians							
	Colorado River - Edwards Plateau						
		Eurycea sosorum	Barton Springs salamander	G1/S1	1	1	0
		Eurycea sp. *6*	Pedernales River spring salamander	G1/S1	5	0	5
		Eurycea tonkawae	Jollyville Plateau salamander	G1/S1	20	5	15
	Corpus Christi/Frio/Nueces						
		Eurycea sp. *7*	Edwards Plateau spring salamander	G1G3Q/S1S3	12	0	12
	Guadalupe/San Antonio						
		Eurycea nana	San Marcos salamander	G1/S1	1	1	0
		Eurycea neotenes	Texas salamander	G1/S1	5	0	5
		Eurycea pterophila	Blanco River Springs salamander	G2/S2	10	1	9
		Eurycea sp. *7*	Edwards Plateau spring salamander	G1G3Q/S1S3	13	1	12
		Eurycea sp. *8*	Comal Springs salamander	G1Q/S1	1	0	1
	Lower Brazos River						
		Eurycea chisholmensis	Salado Springs salamander	G1/S1	5	0	5
		Eurycea naufragia	Georgetown salamander	G1/S1	10	4	6
		Eurycea tonkawae	Jollyville Plateau salamander	G1/S1	5	1	4
Crustaceans							
	Colorado River - Edwards Plateau						
		Hyalella texana	Clear Creek amphipod	G1/S1	5	1	4

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Fishes							
	Colorado River - Edwards Plateau						
		Cycleptus elongatus	Blue sucker	G3G4/S3	1	0	1
		Gambusia heterochir	Clear Creek gambusia	G1/S1	1	1	0
		Ictalurus lupus	Headwater catfish	G3/S2	1	0	1
		Micropterus treculi	Guadalupe bass	G3/S3	3	2	1
	Corpus Christi/Frio/Nueces						
		Cyprinella lepida	Plateau shiner	G1G2/S1S2	3	2	1
		Cyprinella sp. *2*	Nueces River shiner	G1G2Q/S1S2	5	1	4
		Ictalurus lupus	Headwater catfish	G3/S2	1	3	0
		Micropterus treculi	Guadalupe bass	G3/S3	2	3	0
	Guadalupe/San Antonio						
		Cyprinella lepida	Plateau shiner	G1G2/S1S2	2	1	1
		Etheostoma fonticola	Fountain darter	G1/S1	5	2	3
		Ictalurus lupus	Headwater catfish	G3/S2	1	0	1
		Micropterus treculi	Guadalupe bass	G3/S3	2	1	1
	Lower Brazos River						
		Micropterus treculi	Guadalupe bass	G3/S3	2	0	2
	Lower Pecos River/Devils River						
		Cyprinella proserpina	Proserpine shiner	G3/S2	5	1	4
		Dionda diaboli	Devils River minnow	G1/S1	5	1	4
		Etheostoma grahami	Rio Grande darter	G3/S2	5	1	4
		Gambusia senilis	Blotched gambusia	G3G4/SX	2	0	2
		Ictalurus lupus	Headwater catfish	G3/S2	1	1	0

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Insects							
	Guadalupe/San Antonio						
		Comaldessus stygius	Comal Springs diving beetle	G1/S1	5	1	4
		Heterelmis comalensis	Comal Springs riffle beetle	G1/S1	5	2	3
	Unknown[1]						
		Austrotinodes texensis	Texas Austrotinodes caddisfly	G2/S2	N/A	N/A	N/A
		Baetodes alleni	A mayfly	G1/S?	N/A	N/A	N/A
		Neocylloepus boeseli	Boesel's riffle beetle	G?/S?	N/A	N/A	N/A
		Plauditus texanus	A mayfly	G3/S?	N/A	N/A	N/A
		Procloeon distinctum	A mayfly	G1/S?	N/A	N/A	N/A
		Protoptila arca	San Marcos saddle-case caddisfly	G1/S?	N/A	N/A	N/A
		Pseudocentroptiloides morihari	A mayfly	G2/S?	N/A	N/A	N/A
Mollusks							
	Colorado River - Edwards Plateau						
		Lampsilis bracteata	Texas fatmucket	G1/S?	6	0	6
		Quadrula aurea	Golden orb	G1/S?	5	0	5
		Quadrula houstonensis	Smooth pimpleback	G2/S?	9	0	9
		Quadrula petrina	Texas pimpleback	G2G3/S?	8	0	8
		Truncilla macrodon	Texas fawnsfoot	G2/S?	9	0	9

[1]*Detailed information about the current and historical distribution of these species was unavailable during this first iteration of the Edwards Plateau Biodiversity and Conservation Assessment. As a result, goals could not be determined for these conservation elements. It is hoped that these information gaps will be addressed prior to or during the next iteration of the assessment process.*

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Mollusks (cont'd)							
	Guadalupe/San Antonio						
		Lampsilis bracteata	Texas fatmucket	G1/S?	3	0	3
		Quadrula aurea	Golden orb	G1/S?	4	0	4
		Quadrula petrina	Texas pimpleback	G2G3/S?	1	0	1
	Lower Pecos River/Devils River						
		Popenaias popeii	Texas hornshell	G1/S1	9	0	9
	Unknown[1]						
		Phreatoceras taylori	Nymph trumpet	G1G2/S?	N/A	N/A	N/A
		Texapyrgus longleyi	Striated hydrobe	G1/S1	N/A	N/A	N/A
Reptiles							
	Colorado River - Edwards Plateau						
		Nerodia paucimaculata	Concho water snake	G2/S2	10	6	4
	Guadalupe/San Antonio						
		Graptemys caglei	Cagle's map turtle	G3/S3	13	2	11
Plants							
	Guadalupe/San Antonio						
		Zizania texana	Texas wild-rice	G1/S1	3	1	2

[1]*Detailed information about the current and historical distribution of these species was unavailable during this first iteration of the Edwards Plateau Biodiversity and Conservation Assessment. As a result, goals could not be determined for these conservation elements. It is hoped that these information gaps will be addressed prior to or during the next iteration of the assessment process.*

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Systems[2]							
	Brazos River - Prairie						
		Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component		N/A	3	3	0
		Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie clay mud, sandstone, shale		N/A	3	3	0
	Colorado River - Edwards Plateau						
		Large perennial rivers of the Edwards Plateau		N/A	1	1	0
		Medium perennial rivers in sandstone, shale, alluvium with intermittent headwaters in Ogallala formation sands		N/A	1	1	0
		Medium perennial rivers in central Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component along the Southern Shortgrass Prairie/Edwards Plateau boundary		N/A	1	1	0
		Medium perennial rivers in Edwards Plateau limestones		N/A	1	4	0
		Small perennial rivers in granites of the Llano uplift		N/A	1	1	0
		Small perennial rivers in Edwards Plateau limestones with intermittent headwaters in sands, caliche of the Ogallala Formation		N/A	1	1	0
		Small perennial rivers in shale, sandstone/sand with heavy limestone, marl, caliche component along the Southern Shortgrass Prairie/Edwards Plateau boundary		N/A	1	1	0
		Small perennial rivers in Edwards Plateau limestones		N/A	3	4	0

[2]*For system targets, the number captured includes occurrences found in both Tier 1 and Tier 2 portfolio areas. Viability of system occurrences in Tier 2 areas must still be validated through ground-truthing.*

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Systems (cont'd)							
	Colorado River - Edwards Plateau (continued)						
		Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl		N/A	1	0	1
		Perennial moderate and low gradient streams transitional between granites of the Llano uplift and Edwards Plateau limestone		N/A	3	3	0
		Perennial moderate gradient streams in aquifer sand along the Southern Shortgrass Prairie and Edwards Plateau margins		N/A	1	1	0
		Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component		N/A	3	3	0
		Perennial moderate and low gradient creeks transitional from the Edwards Plateau to blackland prairie in marl and limestone		N/A	1	1	0
		Perennial moderate and low gradient streams in Edwards Plateau limestone		N/A	3	4	0
		Perennial high and moderate gradient streams in Edwards Plateau limestone		N/A	3	5	0
		Perennial moderate gradient streams in Edwards Plateau limestone		N/A	3	4	0
		Perennial moderate and low gradient streams in granites of the Llano uplift		N/A	3	3	0
	Colorado River - Prairie						
		Small perennial rivers in sandstone, shale, alluvium with intermittent headwaters in Ogallala formation sands		N/A	1	1	0
		Intermittent low and moderate gradient streams in sands, sandstone, caliche of the Ogallala formation		N/A	1	1	0

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Systems (cont'd)							
	Colorado River – Prairie (cont'd)						
		Mostly intermittent moderate and low gradient streams in central Southern Shortgrass Prairie redbed shales		N/A	3	3	0
		Perennial moderate and low gradient creeks in recharge sand of the Edwards Plateau		N/A	1	1	0
	Corpus Christi/Frio/Nueces						
		Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand		N/A	1	1	0
		Small perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl		N/A	1	1	0
		Small perennial rivers in Edwards Plateau limestone		N/A	1	2	0
		Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl		N/A	2	2	0
		Perennial high and moderate gradient streams in Edwards Plateau limestone		N/A	3	3	0
		Perennial moderate gradient streams in Edwards Plateau limestone		N/A	1	0	1
	Guadalupe/San Antonio						
		Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand		N/A	1	1	0
		Small perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl		N/A	1	1	0
		Small perennial rivers in Edwards Plateau limestones		N/A	1	2	0

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Systems (cont'd)							
	Guadalupe/San Antonio (cont'd)						
		Perennial moderate and low gradient creeks on the Edwards Plateau margin in blackland prairie marl, mud, clay		N/A	1	0	1
		Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl		N/A	3	3	0
		Perennial high and moderate gradient streams in Edwards Plateau Limestone		N/A	3	4	0
	Lower Brazos River						
		Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand		N/A	1	1	0
		Small perennial rivers in Edwards Plateau limestone		N/A	1	1	0
		Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl		N/A	1	1	0
		Perennial moderate gradient streams in aquifer sand along the Southern Shortgrass Prairie and Edwards Plateau margins		N/A	1	1	0
		Perennial moderate and low gradient creeks transitional from the Edwards Plateau to blackland prairie in marl and limestone		N/A	1	1	0
		Perennial high and moderate gradient streams in Edwards Plateau limestone		N/A	1	1	0
		Perennial moderate gradient streams in Edwards Plateau limestone		N/A	3	3	0
	Lower Pecos River/Devils River						
		Medium perennial rivers in Edwards Plateau limestone		N/A	1	1	0

Group	Ecological Drainage Unit	Scientific Name/System Description	Common Name	Global/State Rank	Ecological Drainage Unit Goal	# of Viable Occurrences Captured	# of Occurrences Remaining
Systems (cont'd)							
	Lower Pecos River/Devils River (cont'd)						
		Small perennial rivers in Edwards Plateau limestone		N/A	1	1	0
		Intermittent moderate gradient streams in limestone of the southwestern Edwards Plateau and trans-Pecos		N/A	3	3	0

APPENDIX E: Terrestrial Portfolio Areas: Captured Target Occurrences, Managed Areas, and Associated Threats

AREA NAME (Area Number); Area in hectares

Targets Captured Within Area (Number of viable occurrences)

Threats Identified for Area

Managed Areas Captured in Portfolio Area

AMISTAD NATIONAL RECREATION AREA (1); 701 ha.

Rydburg's scurf pea (1)

Habitat fragmentation – Smaller landholdings

AUSTIN NW (2); 1439 ha.

Lark bunting (wintering) (1)
Texabama croton (1)

BALLINGER EAST (3); 1247 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Conversion to agriculture
Habitat destruction/conversion – Water development (clearing)

BALLINGER SOUTH (4); 685 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

BANDERA PASS (5); 45981 ha.

Hill country wild mercury (2)
Dark noseburn (1)
Heller's false-gromwell (1)
Black-capped vireo (1)
Great Plains limestone upland forests and woodlands (32161 ha.)

BANDERA PASS (cont'd)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

BARTON CREEK (6); 48321 ha.

Texas amorpha (4)
Heller's false-gromwell (7)
Canyon mock-orange (2)
Texas fescue (1)
Glass Mountain coral-root (3)
Leafy brickell-bush (1)
Texas barberry (1)
Kretschmarr Cave mold beetle (1)
Tooth Cave spider (1)
Tooth Cave ground beetle (1)
Tooth Cave pseudoscorpion (1)
Black-capped vireo (2)
Golden-cheeked warbler (1)
Rufous-crowned sparrow (1)
Great Plains limestone upland forests and woodlands (40824 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime

Barton Creek Habitat Preserve
Ruth P. Lehmann Preserve

BEALS CREEK (7); 685 ha.

Jones' selenia (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

BOERNE (8); 32135 ha.

Sycamore leaf silverbell (2)
Big red sage (1)
Texas fescue (1)
Canyon mock-orange (1)
Spreading leastdaisy (4)
Comal blind salamander (1)
Golden-cheeked warbler (1)
Great Plains granite woodlands (1)
Bald-cypress - sycamore Edwards Plateau forest (1)
Great Plains limestone upland forests and woodlands (22478 ha.)

BOERNE (cont'd)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion - Overgrazing

BRACKETTVILLE (9); 34624 ha.

Broadpod rushpea (2)
Southern Great Plains shallow alkaline soil shrublands (29417 ha.)

Habitat fragmentation – Smaller landholdings

Excessive herbivory – Deer/exotics
Habitat destruction/conversion - Overgrazing

BUFFALO GAP (10); 73193 ha.

Glass Mountain coral root (2)
Purple-spike coral root (2)
Painted bunting (1)
Black-capped vireo (1)
Crosstimbers oak forests and woodlands (1)
Great Plains limestone upland forests and woodlands (51210 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Abilene SP

CAMP BULLIS (11); 15932 ha.

Heller's false-gromwell (1)
Bracted twistflower (1)
Texas fescue (1)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (14329 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime

Camp Bullis
Eisenhower County Park

CENTRAL UVALDE CO. (12); 19917 ha.

Texas almond (1)
Texas grease bush (1)
Texas shrimp plant (1)

CENTRAL UVALDE CO. (cont'd)

Great Plains limestone upland forests and woodlands (17914 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

CITY OF LLANO (13); 1277 ha.

Edwards Plateau cornsalad (1)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Overgrazing

COKE CO. (14); 42960 ha.

Black-capped vireo (1)
Great Plains limestone upland forests and woodlands (32214 ha.)
Southern Great Plains mesquite woodlands and shrublands (8590 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

COLORADO BEND STATE PARK (15); 83027 ha.

Rock quillwort (1)
Basin wild-buckwheat (1)
Golden-cheeked warbler (2)
Black-capped vireo (2)
Rufous-crowned sparrow (1)
South Central bottomland forests (2)
Great Plains limestone upland forests and woodlands (62226 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Colorado Bend SP

COLORADO CITY (16); 1098 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

COLORADO RIVER-NW SAN SABA CO. (17); 40142 ha.

Painted bunting (1)
Southern Great Plains mesquite woodlands and shrublands (32088 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

DOVE CREEK (18); 61826 ha.

Irion county wild buckwheat (1)
Rufous-crowned sparrow (1)
Scaled quail (1)
Cassin's sparrow (1)
Painted bunting (1)
Dickcissel (1)
Bell's vireo (1)
Southern Great Plains mesquite woodlands and shrublands (55639 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

DRY DEVILS RIVER (19); 69904 ha.

Sand grape (2)
Leafy brickell-bush (1)
Painted bunting (1)
Black-capped vireo (1)
Southern Great Plains shallow alkaline soil shrublands (48930 ha.)

Habitat destruction/conversion – Aquifer depletion

DUTCH MOUNTAIN (20); 57497 ha.

Cassin's sparrow (1)
Black-capped vireo (1)
Gray vireo (1)
Rufous-crowned sparrow (1)
Painted bunting (1)
Dickcissel (1)
Golden-cheeked warbler (1)
Papershell pinyon - Ashe's juniper - oak species woodland (1)
Great Plains limestone upland forests and woodlands (17242 ha.)
Southern Great Plains shallow alkaline soil shrublands (34485 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

DUTCH MOUNTAIN (cont'd)

Habitat destruction/conversion – Overgrazing

EASTERN MENARD CO. (21); 17593 ha.

Hill Country wild mercury (1)
Scaled quail (1)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

ELDORADO (22); 49292 ha.

Painted bunting (1)
Dickcissel (1)
Scaled quail (1)
Rufous-crowned sparrow (1)
Lark bunting (breeding) (1)
Cassin's sparrow (1)
Bell's vireo (1)
Southern Great Plains shallow alkaline soil shrublands (41895 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

ELM PASS (23); 30107 ha.

Texas amorpha (1)
Spreading leastdaisy (1)
Heller's false-gromwell (1)
Sycamore leaf silverbell (2)
Big red sage (1)
Rufous-crowned sparrow (1)
Lark bunting (wintering) (1)
Great Plains limestone upland forests and woodlands (21059 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

ENCHANTED ROCK STATE PARK (24); 75890 ha.

Basin bellflower (3)
Rock quillwort (1)
Edwards Plateau cornsalad (1)
Basin wild buckwheat (1)
Tall dodder (1)
Dickcissel (1)
Cassin's sparrow (1)

ENCHANTED ROCK STATE PARK (cont'd)

Painted bunting (1)
Scaled quail (1)
Bell's vireo (1)
Rufous-crowned sparrow (2)
Southern Great Plains granite glades (1)
South Central bottomland forests (1)
Crosstimbers oak forests and woodlands (36 ha.)
Great Plains granite woodlands (60665 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Enchanted Rock SP

GARNER STATE PARK NORTH (25); 1126 ha.

Texas amorpha (1)
Dark noseburn (1)

Habitat fragmentation – Smaller landholdings

GOLDTHWAITE SW (26); 47169 ha.

Rufous-crowned sparrow (1)
Great Plains limestone upland forests and woodlands (35350 ha.)
Southern Great Plains riparian forests and woodlands (2357 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

GOVERNMENT CANYON STATE NATURAL AREA (27); 39226 ha.

Heller's false-gromwell (1)
Texas amorpha (2)
Glass mountain coral-root (1)
Plateau milkvine (2)
Texas fescue (2)
Net-leaf bundle-flower (1)
Spreading leastdaisy (2)
Bracted twistflower (3)
Texas snowbells (1)
Texas mock-orange (1)
Texas garter snake (1)
Black-capped vireo (1)
Dickcissel (1)
Great Plains limestone upland forests and woodlands (37235 ha.)

Habitat fragmentation/destruction – Urban development

GOVERNMENT CANYON STATE NATURAL AREA (cont'd)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Government Canyon SNA
Elizabeth P. Hill Easement
Friedrich Park

GRANITE SHOALS-INKS LAKE STATE PARK (28); 51459 ha.

Basin wild buckwheat (3)
Rock quillwort (2)
Basin bellflower (2)
Tall dodder (1)
Edwards Plateau cornsalad (1)
Granite spiderwort (1)
Bell's vireo (1)
Rufous-crowned sparrow (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodlands (7703 ha.)
Great Plains granite woodlands (35949 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Inks Lake SP

GUADALUPE RIVER STATE PARK (29); 33781 ha.

Canyon mock-orange (1)
Comal blind salamander (1)
Bell's vireo (1)
Painted bunting (1)
Dickcissel (1)
Rufous-crowned sparrow (1)
Bald-cypress - sycamore Edwards Plateau forest (1)
South Central bottomland forests (1)
Great Plains mixedgrass prairies (37 ha.)
Great Plains limestone upland forests and woodlands (23629 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

Guadalupe River SP
Honey Creek SNA

GUNSIGHT MOUNTAIN (30); 25189 ha.

Dark noseburn (2)
Scarlet virgin's-bower (1)
Spreading leastdaisy (2)
Texas amorpha (1)
Texas mock-orange (1)
Rufous-crowned sparrow (1)
Bigtooth maple - chinquapin oak - lacey oak/Edwards Plateau sedge – spreading leastdaisy – southern Edwards Plateau forest (1)
Lacey oak - Ashe's juniper woodland (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodlands (19997 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion - Overgrazing

HAMILTON POOL-WEST CAVE (31); 1895 ha.

Canyon mock-orange (1)
Giant helleborne (1)
Golden-cheeked warbler (1)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Inappropriate recreational use

HILL COUNTRY STATE NATURAL AREA (32); 62162 ha.

Sycamore leaf silverbell (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodlands (59007 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

Hill Country SNA

HORSE MOUNTAIN (33); 63864 ha.

Southern Great Plains shallow alkaline soil shrublands (51074 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

JIM NED CREEK (34); 43938 ha.

South Central bottomland forests (1)

JIM NED CREEK (cont'd)

Southern Great Plains mesquite woodlands and shrublands (39515 ha.)
Southern Great Plains riparian forests and woodlands (4391 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

JOHNSON FORK CREEK (35); 63505 ha.

Tobusch fishhook cactus (3)
Black-capped vireo (2)
Bell's vireo (1)
Painted bunting (1)
Dickcissel (1)
Cassin's sparrow (1)
Rufous-crowned sparrow (1)
Great Plains mixedgrass prairies (6346 ha.)
Southern Great Plains riparian forests and woodlands (6346 ha.)
Great Plains Limestone upland forests and woodlands (44423 ha.)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

KICKAPOO CAVERN STATE NATURAL AREA (36); 24792 ha.

Texas largeseed bittercress (1)
Tobusch fishhook cactus (2)
Narrow-leaf brickellbush (1)
Elf owl (1)
Bell's vireo (1)
Scaled quail (1)
Papershell pinyon - Ashe's juniper - oak species (3)
Great Plains mixedgrass prairies (700 ha.)
Southern Great Plains shallow alkaline soil shrublands (22306 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

Kickapoo Caverns SNA

LAKE TRAVIS (37); 45322 ha.

Texabama croton (4)
Glass Mountain coral-root (1)
Heller's false-gromwell (1)
Giant helleborne (1)
Golden-cheeked warbler (2)
Crosstimbers oak forests and woodlands (3)
Great Plains limestone upland forests and woodlands (36074 ha.)

LAKE TRAVIS (cont'd)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime

LEAKEY (38); 574 ha.

Syacamore-leaf silverbell (1)
Dark noseburn (1)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

LOST MAPLES STATE NATURAL AREA-UPPER SABINAL RIVER (39); 21150 ha.

Tobusch fishhook cactus (2)
Texas barberry (1)
Texas mock-orange (2)
Big red sage (1)
Texas fescue (1)
Plateau milkvine (2)
Glass Mountain coral-root (2)
Spreading leastdaisy (3)
Dark noseburn (3)
Barbed rattlesnake-root (2)
Scarlet virgin's-bower (3)
Giant helleborne (2)
Sycamore leaf silverbell (2)
Texas amorpha (1)
Black-capped vireo (1)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (20017 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

Lost Maples SNA

LOVE CREEK PRESERVE (40); 43607 ha.

Texas mock-orange (1)
Spreading leastdaisy (1)
Tobusch fishhok cactus (1)
Sycamore-leaf silverbell (1)
Dark noseburn (1)
Rufous-crowned sparrow (1)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (41395 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

LOVE CREEK PRESERVE (cont'd)

Habitat destruction/conversion – Overgrazing

Love Creek Preserve

LOWER BLANCO RIVER (41); 32828 ha.

Purple-spike coralroot (1)
Leafy brickell-bush (1)
Canyon mock-orange (1)
Texas fescue (1)
Texas barberry (1)
Glass Mountain coral-root (1)
Texas blind salamander (1)
Golden-cheeked warbler (1)
Black-capped vireo (1)
Black-tailed prairie dog (1)
Great Plains mixedgrass prairies (1)
Great Plains limestone upland forests and woodlands (24608 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime

Ezell's Cave Preserve

LOWER DEVILS RIVER (42); 64308 ha.

Tobusch fishhook cactus (3)
Texas snowbells (1)
Black-capped vireo (2)
Red-flower yucca (3)
Montezuma quail (1)
Texas shrimp plant (2)
Giant helleborne (1)
Tall dodder (2)
River rockdaisy (1)
Texas plume (1)
Chihuahuan Desert xeric shrublands (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains mixedgrass prairies (1)
Edwards Plateau and Chihuahuan riparian shrublands and grasslands (1)
Southern Great Plains shallow alkaline soil shrublands (57884 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Aquifer depletion

Devils River SNA
Dolan Falls Preserve
Dolan Falls Easement
Amistad NRA

LOWER FRIO RIVER (43); 62315 ha.

Sycamore leaf silverbell (1)
Texas largeseed bittercress (1)
Lindheimer's tickseed (1)
Dark noseburn (1)
Bracted twistflower (1)
Cassin's sparrow (1)
Black-capped vireo (1)
Painted bunting (1)
Bell's vireo (1)
Southern Great Plains riparian forests and woodlands (3)
Great Plains limestone upland forests and woodlands (59159 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

Annandale Ranch Easement

LYNDON B. JOHNSON STATE HISTORIC PARK (44); 4 ha.

Great Plains freshwater emergent marshes (1)

MARBLE FALLS (45); 1626 ha.

Basin bellflower (1)
Rock quillwort (1)
Great Plains mixedgrass prairies (1)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

MASON (46); 98001 ha.

Painted bunting (1)
Rufous-crowned sparrow (1)
Bell's vireo (1)
Dickcissel (1)
Cassin's sparrow (1)
Great Plains limestone upland forests and woodlands (78340 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

MASON & NE MASON CO. (47); 87868 ha.

Granite spiderwort (3)
Basin wild-buckwheat (1)
Southern Great Plains granite glades (3)
Great Plains granite woodlands (13170 ha.)
Crosstimbers oak forests and woodlands (61460 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

MID- AND LOWER PECAN BAYOU (48); 45491 ha.

Hill country wild mercury (1)
Southern Great Plains mesquite woodlands and shrublands (31819 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

MIDDLE DEVILS RIVER (49); 28379 ha.

Tall dodder (1)
Red-flower yucca (2)
Bell's vireo (1)
Texas seymeria (1)
Southern Great Plains streambed herbaceous vegetation (1)
Southern Great Plains shallow alkaline soil shrublands (22707 ha.)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Aquifer depletion

MULBERRY CREEK (50); 5806 ha.

Irion County wild buckwheat (2)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

NORTH FT. HOOD (51); 36019 ha.

Glass Mountain coral-root (1)
Sycamore-leaved snowbell (3)
Texabama croton (1)
Hall's prairie-clover (1)
Texas fescue (1)
Golden-cheeked warbler (1)
Black-capped vireo (2)

NORTH FT. HOOD (cont'd)

Rufous-crowned sparrow (1)
Painted bunting (1)
Cassin's sparrow (1)
Dickcissel (1)
Bell's vireo (1)
Bigtooth maple- chinquapin oak- lacey oak/Edwards Plateau sedge-spreading leastdaisy southern Edwards Plateau Forest (1)
Great Plains limestone upland forests and woodlands (30604 ha.)

Habitat destruction/conversion – Changing land use
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Ft. Hood Military Reservation

NE BURNETT CO. (52); 73244 ha.

South Central bottomland forests (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains Limestone upland forests and woodlands (4621 ha.)
Southern Great Plains mesquite woodlands and shrublands (34654 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

NE CROCKETT CO. (53); 66620 ha.

Lark bunting (breeding) (2)
Scaled quail (1)
Southern Great Plains mesquite woodlands and shrublands (63301 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

NE GLASSCOCK CO. (54); 669 ha.

Jones' selenia (1)

Habitat destruction/conversion - Overgrazing

NE VAL VERDE CO. (55); 1402 ha.

Chihuahuan Desert xeric shrublands (1)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Aquifer depletion

NORTH CONCHO RIVER (56); 83538 ha.

Irion County wild buckwheat (1)
Bell's vireo (1)
Cassin's sparrow (1)
Black-capped vireo (1)
Painted bunting (1)
Southern Great Plains riparian forests and woodlands (8353 ha.)
Southern Great Plains mesquite woodlands and shrublands (75174 ha.)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

San Angelo SP

NORTH MCCULLOCH CO. - 1 (57); 16083 ha.

Scaled quail (1)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

NORTH MCCULLOCH CO. - 2 (58); 26935 ha.

Great Plains limestone upland forests and woodlands (24223 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

NW COKE CO. - 1 (59); 1072 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

NW COKE CO. – 2 (60); 683 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

NW REAL CO.-UPPER NUECES RIVER (61); 39631 ha.

Texas snowbells (2)
Giant helleborne (1)
Great Plains limestone upland forests and woodlands (31687 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

NW STERLING CO. (62); 56 ha.

Southern Great Plains saline shrublands (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

ONION CREEK (63); 23129 ha.

Glass Mountain coral-root (1)
Texas fescue (4)
Bracted twistflower (1)
Narrow-leaf brickell-bush (1)
Heller's false gromwell (2)
Scarlet virgin's-bower (1)
Bee Creek Cave harvestman (1)
Black-capped vireo (2)
Great Plains limestone upland forests and woodlands (9247 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Altered fire regime

OZONA NE (64); 701 ha.

Jones' selenia (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

PEDERNALES FALLS (65); 35851 ha.

Canyon mock-orange (2)
Texas barberry (1)
Scarlet virgin's-bower (1)
Glass Mountain coral-root (1)
Giant helleborne (1)
Golden-cheeked warbler (1)
South Central bottomland forests (1)

PEDERNALES FALLS (cont'd)

Bald cypress – sycamore Edwards Plateau forests (3)
Great Plains limestone upland forests and woodlands (25080 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Pedernales Falls SP

SOUTH LLANO RIVER STATE PARK-WALTER BUCK WILDLIFE MANAGEMENT AREA (66); 66330 ha.

Tobusch fishhook cactus (3)
Bell's vireo (1)
Black-capped vireo (2)
Painted bunting (1)
Dickcissel (1)
Rufous-crowned sparrow (1)
Lacey oak - Ashe's juniper woodland (3)
Great Plains mixedgrass prairies (3)
Southern Great Plains canyon forests (1)
Edwards Plateau shaded cliffs and rock outcrops (1)
Southern Great Plains streambed herbaceous vegetation (1)
Great Plains limestone upland forests and woodlands (56346 ha.)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

South Llano River SP
Walter Buck WMA

SALMON PEAK (67); 29363 ha.

Broadpod rushpea (1)
Southern Great Plains shallow alkaline soil shrublands (2935 ha.)
Great Plains limestone upland forests and woodlands (26415 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion - Overgrazing

SAN GABRIEL RIVER (68); 52587 ha.

Texas fescue (1)
Leafy brickell-bush (1)
Golden-cheeked warbler (2)
Black-capped vireo (1)
Great Plains mixedgrass prairies (7877 ha.)
Great Plains limestone upland forests and woodlands (31507 ha.)

SAN GABRIEL RIVER (cont'd)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Altered fire regime

SANDY CREEK (69); 46078 ha.

Edwards Plateau cornsalad (2)
Cassin's sparrow (1)
Dickcissel (1)
Rufous-crowned sparrow (1)
Painted bunting (1)
Bell's vireo (1)
Southern Great Plains granite glades (2)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodlands (32229 ha.)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SE EDWARDS CO. (70); 35165 ha.

Texas snowbells (3)
Black-capped vireo (2)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (31609 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SE KIMBLE CO. (71); 118768 ha.

Black-capped vireo (5)
Crosstimbers oak forests and woodlands (1)
Great Plains limestone upland forests and woodlands (94830 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Eckert James River Bat Cave Preserve

SE REAL CO. (72); 34908 ha.

Tobusch fishhook cactus (1)
Spreading leastdaisy (1)
Bracted twistflower (1)

SE REAL CO. (cont'd)

Texas snowbells (1)
Dark noseburn (1)
Glass mountain coral-root (1)
Sycamore leaf silverbell (1)
Golden-cheeked warbler (2)
Black-capped vireo (2)
Bell's vireo (1)
Rufous-crowned sparrow (1)
Edwards Plateau shaded cliffs and rock outcrops (1)
Southern Great Plains shallow alkaline soil shrublands (1)
Great Plains limestone upland forests and woodlands (33118 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

Garner SP

SE SAN SABA CO. (73); 18 ha.

Edward's Plateau and Chihuahuan riparian shrublands and grasslands (1)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SONORA (74); 704 ha.

Broadpod rushpea (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SOUTH MCCULLOCH CO. (75); 58548 ha.

Black-capped vireo (1)
Painted bunting (1)
Bell's vireo (1)
South Central bottomland forests (2)
Crosstimbers oak forests and woodlands (1)
Great Plains limestone upland forests and woodlands (43877 ha.)

Habitat destruction/conversion – Changing land use
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SOUTHCENTRAL REAL CO. (76); 39736 ha.

Dark noseburn (1)
Big red sage (1)
Sycamore leaf silverbell (1)
Dark noseburn (1)
Tobusch fishhook cactus (1)
Texas mock-orange (1)
Bell's vireo (1)
Black-capped vireo (1)
Cassin's sparrow (1)
Painted bunting (1)
Dickcissel (1)
Rufous-crowned sparrow (1)
Golden-cheeked warbler (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodlands (35929 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

SOUTHCENTRAL SCHLEICHER CO. (77); 710 ha.

Black-tailed prairie dog (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SPRING CREEK (78); 3532 ha.

Irion County wild buckwheat (2)

Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

SPRINGRUN WHITEHEAD (79); 703 ha.

Springrun whitehead (1)

STILLHOUSE HOLLOW LAKE (80); 63426 ha.

Osage Plains foxglove (1)
Painted bunting (1)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (47510 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

SW COKE CO. (81); 75689 ha.

Black-capped vireo (1)
Southern Great Plains mesquite woodlands and shrublands (7568 ha.)
Great Plains limestone upland forests and woodlands (68108 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

SW EDWARDS CO. – 1 (82); 43858 ha.

Edwards Plateau and Chihuahuan riparian shrublands and grasslands (3)
Chihuahuan Desert xeric shrublands (1)
Great Plains limestone upland forests and woodlands (6578 ha.)
Southern Great Plains shallow alkaline soil shrublands (32888 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

SW EDWARDS CO. – 2 (83); 17606 ha.

Gray vireo (1)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

SW REAL CO. (84); 37256 ha.

Glass Mountain coral-root (1)
Cassin's sparrow (1)
Black-capped vireo (1)
Golden-cheeked warbler (1)
Great Plains limestone upland forests and woodlands (35373 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

SW REAL CO. - UPPER NUECES RIVER (85); 718 ha.

Narrow-leaf brickellbush (1)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

SW SAN SABA CO. (86); 88505 ha.

Golden-cheeked warbler (1)
Great Plains granite woodlands (1)
Great Plains limestone upland forests and woodlands (79561 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

TEXAS WILD RICE (87); 1191 ha.

Texas wild rice (1)
Texas blind salamander (1)

UPPER BLANCO RIVER (88); 61351 ha.

Texas fescue (2)
Granite spiderwort (1)
Giant helleborne (1)
Sycamore-leaved snowbell (3)
Texas amorpha (1)
Canyon mock-orange (1)
Scarlet virgin's bower (1)
Golden-cheeked warbler (2)
Black-capped vireo (1)
Rufous-crowned sparrow (1)
Southern Great Plains streambed herbaceous vegetation (1)
Great Plains limestone upland forests and woodlands (52115 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Blanco SP
Wallace Ranch Easement

UPPER CIBOLO CREEK (89); 35028 ha.

Texas fescue (1)
Texas amorpha (1)
Plateau live oak / curly-mesquite woodland (1)
Southern Great Plains shallow alkaline soil shrublands (3500 ha.)
Great Plains limestone upland forests and woodlands (24503 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics

UPPER COLORADO RIVER (90); 48317 ha.

Texas poppy-mallow (2)
Dickcissel (1)
Southern Great Plains riparian forests and woodlands (1)
Southern Great Plains mesquite woodlands and shrublands (43457 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Conversion to agriculture
Habitat destruction/conversion – Water development (clearing)

UPPER DEVILS RIVER (91); 54841 ha.

Black-capped vireo (1)
Southern Great Plains riparian forests and woodlands (1)
Great Plains limestone upland forests and woodland (8228 ha.)
Southern Great Plains shallow alkaline soil shrublands (41142 ha.)

Habitat fragmentation – Smaller landholdings
Habitat destruction/conversion – Aquifer depletion

UPPER GUADALUPE RIVER (92); 44046 ha.

Spreading leastdaisy (2)
Dark noseburn (2)
Texas amorpha (1)
Glass Mountain coral-root (1)
Tobusch fishhook cactus (1)
Narrow-leaf brickellbush (1)
Golden-cheeked warbler (2)
Black-capped vireo (2)
Great Plains limestone upland forests and woodlands (37325 ha.)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

Kerrville-Schreiner SP

UPPER LAMPASAS RIVER AND COWHOUSE CREEK (93); 81286 ha.

Painted bunting (1)
Dickcissel (1)
Black-capped vireo (2)
Great Plains limestone upland forests and woodlands (56861 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

UPPER LAMPASAS RIVER AND COWHOUSE CREEK (cont'd)

Habitat destruction/conversion – Altered fire regime

UPPER PECAN BAYOU (94); 51181 ha.

Crosstimbers oak forests and woodlands (1)
South Central bottomland forests (1)
Great Plains mixedgrass prairies (5114 ha.)
Southern Great Plains mesquite woodlands and shrublands (38357 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

UPPER SABINAL RIVER (95); 18 ha.

Southern Great Plains riparian forests and woodlands (1)

WEST AUSTIN (96); 7323 ha.

Heller's false gromwell (1)
Bracted twistflower (1)
Painted bunting (1)
Glass Mountain coral-root (1)
Scarlet virgin's-bower (1)
Great Plains limestone upland forests and woodlands (1)

Habitat destruction/conversion – Altered fire regime

Bright Leaf SP

WEST NEW BRAUNFELS (97); 13009 ha.

Canyon mock-orange (1)
Lindheimer's tickseed (2)
Texas amorpha (1)
Hill country wild mercury (1)
Tall dodder (1)

Habitat fragmentation/destruction – Urban development
Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

WEST ROCKY CREEK-IRION CO. (98); 66850 ha.

Great Plains limestone upland forests and woodlands (60167 ha.)

WEST ROCKY CREEK-IRION CO. (cont'd)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

WESTERN RUNNELS CO. (99); 685 ha.

Texas poppy-mallow (1)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

WESTERN IRION CO. (100); 76272 ha.

Irion County wild buckwheat (1)
Jones' selenia (1)
Southern Great Plains riparian forests and woodlands (1)
Southern Great Plains mesquite woodlands and shrublands (72482 ha.)

Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime
Habitat destruction/conversion – Water development (clearing)

WESTERN MASON CO.-LLANO RIVER (101); 73334 ha.

Southern Great Plains streambed herbaceous vegetation (1)
Southern Great Plains shallow alkaline soil shrublands (25648 ha.)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing
Habitat destruction/conversion – Altered fire regime

WESTERN UVALDE CO.-UPPER NUECES RIVER (102); 14619 ha.

Painted bunting (1)
Southern Great Plains riparian forests and woodlands (3)

Habitat fragmentation – Smaller landholdings
Excessive herbivory – Deer/exotics
Habitat destruction/conversion – Overgrazing

APPENDIX F: Aquatic Portfolio Areas: Captured Target Occurrences, Managed Areas, and Associated Threats

AREA NAME (Area Number); Area Rating

Targets Captured Within Area (Number of viable occurrences—Note: For systems targets in Tier 2 portfolio areas, this number includes system target occurrences for which viability must still be validated through ground-truthing)

Threats Identified for Area

BARTON SPRINGS (1); Tier 1

Barton Springs salamander (1)

Residential development
Development (of various types other than residential or commercial/industrial)
Recreational use
Groundwater manipulation
Channelization of rivers or streams
Fire management
Commercial/industrial development

BEAVER CREEK (2); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Tree clearing for improved streamflow
Fire management
Grazing practices

BERRY CREEK (3); Tier 1

Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)
Georgetown salamander (1)

Groundwater manipulation
Residential development
Tree clearing for improved streamflow
Fire management
Grazing practices
Commercial/industrial development

BLANCO RIVER (4); Tier 1

Small perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl (1)
Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

BLANCO RIVER (cont'd)

Blanco River Springs salamander (1)
Cagle's map turtle (1)
Edwards Plateau spring salamander (0)
Guadalupe bass (0)

Residential development
Groundwater manipulation
Tree clearing for improved streamflow
Fire management
Grazing practices

BRUSHY CREEK SPRINGS (5); Tier 1

Jollyville Plateau salamander (1)

Development (of various types other than residential or commercial/industrial)
Recreational use
Groundwater manipulation
Residential development
Fire management
Grazing practices

BUCKLEY DRAW (6); Tier 2

Intermittent moderate gradient streams in limestone of the southwestern Edwards Plateau and trans-Pecos (1)

Oil or gas drilling
Grazing practices

BULL CREEK (7); Tier 1

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Jollyville Plateau salamander (3)

Residential development
Development (of various types other than residential or commercial/industrial)
Recreational use
Groundwater manipulation
Channelization of rivers or streams
Fire management
Commercial/industrial development

CEDAR CREEK (8); Tier 2

Perennial moderate gradient streams in Edwards Plateau limestone (1)

Tree clearing for improved streamflow

CEDAR CREEK (cont'd)

Fire management
Grazing practices

CLEAR SPRING (9); Tier 1

Clear Creek amphipod (1)
Clear Creek gambusia (1)

Fire management
Grazing practices

COAL CREEK (10); Tier 2

Perennial moderate and low gradient streams transitional between granites of the Llano uplift and Edwards Plateau limestone (1)

Fire management
Grazing practices

COLORADO RIVER (11); Tier 2

Large perennial rivers of the Edwards Plateau (1)
Guadalupe bass (0)
Smooth pimpleback (0)
Texas fawnsfoot (0)

Residential development
Channelization of rivers or streams
Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices

COLORADO RIVER (Lake Buchanan to Lake LBJ) (12); Tier 2

Large perennial rivers of the Edwards Plateau (1)
Guadalupe bass (0)
Smooth pimpleback (0)
Texas fawnsfoot (0)
Texas pimpleback (0)

Operation of dams or reservoirs
Fire management
Grazing practices

COMAL SPRINGS (13); Tier 1

Comal Springs diving beetle (1)
Comal Springs riffle beetle (1)

COMAL SPRINGS (cont'd)

Comal Springs salamander (0)
Edwards Plateau spring salamander (1)
Fountain darter (1)

Residential development
Development (of various types other than residential or commercial/industrial)
Recreational use
Groundwater manipulation
Fire management
Grazing practices

CONCHO RIVER (14); Tier 1

Medium perennial rivers in Edwards Plateau limestones (1)
Concho water snake (1)
Guadalupe bass (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Oil or gas drilling
Conversion to agriculture or silviculture
Crop production practices
Fire management
Grazing practices

COWHOUSE CREEK (15); Tier 2

Small perennial rivers in Edwards Plateau limestones (1)
Perennial moderate and low gradient creeks transitional from the Edwards Plateau to blackland prairie in marl and limestone (1)

Groundwater manipulation
Military activities
Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices

CYPRESS CREEK (Pedernales) (16); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Groundwater manipulation
Fire management
Grazing practices

DEVILS RIVER (17); Tier 1

Medium perennial rivers in Edwards Plateau limestones (1)
Small perennial rivers in Edwards Plateau limestones (1)

DEVILS RIVER (cont'd)

Intermittent moderate gradient streams in limestone of the southwestern Edwards Plateau and trans-Pecos (1)
Devils River minnow (1)
Headwater catfish (1)
Proserpine shiner (1)
Rio Grande darter (1)
Texas hornshell (0)

Management of/for certain species
Residential development
Groundwater manipulation
Livestock production practices
Oil or gas drilling
Development (of various types other than residential or commercial/industrial)
Grazing practices
Invasive species
Recreational infrastructure development

DOLAN CREEK (18); Tier 1

Intermittent moderate gradient streams in limestone of the southwestern Edwards Plateau and trans-Pecos (1)

Management of/for certain species
Groundwater manipulation
Oil or gas drilling
Development (of various types other than residential or commercial/industrial)
Grazing practices
Invasive species

EAST FRIO RIVER (19); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Edwards Plateau spring salamander (0)

Recreational infrastructure development
Groundwater manipulation
Development (of various types other than residential or commercial/industrial)
Fire management
Grazing practices

ELM CREEK (Llano) (20); Tier 2

Perennial moderate and low gradient streams in granites of the Llano uplift (1)

Fire management
Grazing practices
Mining practices

ELM, BLUFF CREEKS (21); Tier 1

Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component (1)
Texas fatmucket (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Conversion to agriculture or silviculture
Crop production practices
Fire management
Grazing practices

FALL CREEK (22); Tier 2

Perennial moderate gradient streams in Edwards Plateau limestone (1)

Fire management
Grazing practices

FRIO RIVER (23); Tier 1

Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand (1)
Small perennial rivers in Edwards Plateau limestones (1)
Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Edwards Plateau spring salamander (0)
Guadalupe bass (1)
Headwater catfish (1)
Plateau shiner (1)

Recreational infrastructure development
Groundwater manipulation
Development (of various types other than residential or commercial/industrial)
Fire management
Grazing practices

GENTRY CREEK (24); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Tree clearing for improved streamflow
Fire management
Grazing practices

GUADALUPE RIVER (25); Tier 1

Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand (1)
Small perennial rivers in Edwards Plateau limestones (1)
Cagle's map turtle (0)
Edwards Plateau spring salamander (0)
Golden orb (0)

GUADALUPE RIVER (cont'd)

Guadalupe bass (0)
Headwater catfish (0)
Texas fatmucket (0)
Texas pimpleback (0)

Residential development
Groundwater manipulation
Fire management
Grazing practices

HICKS CREEK (26); Tier 1

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Fire management
Grazing practices

HONDO CREEK (27); Tier 2

Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)
Edwards Plateau spring salamander (0)

Fire management
Grazing practices

HONEY CREEK (Llano) (28); Tier 2

Perennial moderate and low gradient streams transitional between granites of the Llano uplift and Edwards Plateau limestone (1)

Fire management
Grazing practices

HONEY CREEK (Guadalupe) (29); Tier 1

Edwards Plateau spring salamander (0)
Guadalupe bass (0)

Fire management
Grazing practices

LAMPASAS RIVER (30); Tier 2

Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand (1)

Groundwater manipulation
Tree clearing for improved streamflow
Fire management

LAMPASAS RIVER (cont'd)

Grazing practices

LAS MORAS CREEK (31); Tier 2

Perennial moderate gradient streams in Edwards Plateau limestone (1)

Tree clearing for improved streamflow
Fire management
Grazing practices

LEON CREEK (32); Tier 2

Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)
Edwards Plateau spring salamander (0)
Texas salamander (0)

Residential development
Groundwater manipulation
Military activities
Channelization of rivers or streams
Fire management
Grazing practices
Commercial/industrial development

LITTLE LLANO RIVER (33); Tier 2

Perennial moderate and low gradient streams in granites of the Llano uplift (1)

Fire management
Grazing practices

LLANO RIVER (34); Tier 1

Medium perennial rivers in Edwards Plateau limestones (1)
Small perennial rivers in Edwards Plateau limestones (2)
Perennial moderate gradient streams in Edwards Plateau limestone (1)
Golden orb (0)
Guadalupe bass (1)
Smooth pimpleback (0)
Texas fatmucket (0)
Texas fawnsfoot (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices

MEDINA RIVER (35); Tier 1

Small perennial rivers in Edwards Plateau limestones (1)
Guadalupe bass (1)

Recreational infrastructure development
Groundwater manipulation
Development (of various types other than residential or commercial/industrial)
Fire management
Grazing practices

MIDDLE CONCHO RIVER (36); Tier 2

Small perennial rivers in Edwards Plateau limestones with intermittent headwaters in sands, caliche of the Ogallala formation (1)

Tree clearing for improved streamflow
Oil or gas drilling
Fire management
Grazing practices

NORTH FORK SAN GABRIEL RIVER (37); Tier 1

Perennial moderate gradient streams in Edwards Plateau limestone (1)
Georgetown salamander (3)

Groundwater manipulation
Residential development
Tree clearing for improved streamflow
Fire management
Grazing practices
Commercial/industrial development

NUECES RIVER, DEVIL'S SINKHOLE (38); Tier 1

Medium perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl, clay, sand (1)
Small perennial rivers in Edwards Plateau limestones (1)
Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Edwards Plateau spring salamander (0)
Guadalupe bass (1)
Headwater catfish (1)
Nueces River shiner (1)

Groundwater manipulation
Development (of various types other than residential or commercial/industrial)
Fire management
Grazing practices

PECAN BAYOU (39); Tier 2

Medium perennial rivers in central Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component along the Southern Shortgrass Prairie/Edwards Plateau boundary (1)

PECAN BAYOU (cont'd)

Small perennial rivers in shale, sandstone/sand with heavy limestone, marl, caliche component along the Southern Shortgrass Prairie/Edwards Plateau boundary (1)
Guadalupe bass (0)

Military activities
Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices

PEDERNALES RIVER (40); Tier 1

Medium perennial rivers in Edwards Plateau limestones (1)
Small perennial rivers in Edwards Plateau limestones (1)
Guadalupe bass (0)
Texas fatmucket (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices

PEDERNALES RIVER HEADWATERS (41); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Guadalupe bass (0)
Pedernales River spring salamander (0)

Tree clearing for improved streamflow
Fire management
Grazing practices

RICHLAND SPRINGS CREEK (42); Tier 2

Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component (1)

Tree clearing for improved streamflow
Fire management
Grazing practices

ROCKY CREEK (43); Tier 2

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Groundwater manipulation
Residential development
Tree clearing for improved streamflow
Fire management

ROCKY CREEK (cont'd)

Grazing practices

SABINAL RIVER (44); Tier 1

Small perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl (1)
Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)
Edwards Plateau spring salamander (0)
Guadalupe bass (1)
Headwater catfish (1)
Plateau shiner (1)

Recreational infrastructure development
Groundwater manipulation
Development (of various types other than residential or commercial/industrial)
Fire management
Grazing practices

SALADO SPRINGS (45); Tier 1

Salado Springs salamander (0)

Development (of various types other than residential or commercial/industrial)
Recreational use
Groundwater manipulation
Residential development
Fire management
Grazing practices

SAN ANTONIO RIVER HEADWATERS/ SALADO CREEK (46); Tier 2

Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)

Residential development
Groundwater manipulation
Channelization of rivers or streams
Fire management
Grazing practices
Commercial/industrial development

SAN FERNANDO CREEK (47); Tier 2

Perennial moderate and low gradient streams in granites of the Llano uplift (1)

Fire management
Grazing practices
Mining practices

SAN GABRIEL RIVER (48); Tier 2

Small perennial rivers transitional from Edwards Plateau limestone to blackland prairie marl (1)
Georgetown salamander (0)
Guadalupe bass (0)

Groundwater manipulation
Residential development
Tree clearing for improved streamflow
Operation of dams or reservoirs
Channelization of rivers or streams
Crop production practices
Fire management
Grazing practices

SAN SABA RIVER (49); Tier 1

Medium perennial rivers in Edwards Plateau limestones (1)
Small perennial rivers in Edwards Plateau limestones (1)
Perennial moderate and low gradient streams in Edwards Plateau limestone (1)
Golden orb (0)
Guadalupe bass
Headwater catfish (0)
Texas fatmucket (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Operation of dams or reservoirs
Fire management
Grazing practices
Mining practices

SANDY CREEK (50); Tier 1

Small perennial rivers in granites of the Llano uplift (1)
Guadalupe bass (0)

Fire management
Grazing practices

SINK CREEK/SAN MARCOS SPRINGS (51); Tier 1

Perennial moderate and low gradient creeks transitional from Edwards Plateau limestone to blackland prairie marl (1)
Edwards Plateau spring salamander (0)
Fountain darter (1)
San Marcos salamander (1)
Texas wild-rice (1)

Residential development
Development (of various types other than residential or commercial/industrial)
Recreational use

SINK CREEK/SAN MARCOS SPRINGS (cont'd)

Groundwater manipulation
Fire management
Grazing practices
Commercial/industrial development

SOUTH CONCHO RIVER/HEAD OF THE RIVER RANCH (52); Tier 1

Perennial moderate and low gradient streams in Edwards Plateau limestone (1)
Guadalupe bass (0)
Texas fatmucket (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Residential development
Oil or gas drilling
Fire management
Grazing practices

SOUTH FORK SAN GABRIEL RIVER (53); Tier 2

Perennial moderate gradient streams in Edwards Plateau limestone (1)

Groundwater manipulation
Residential development
Tree clearing for improved streamflow
Fire management
Grazing practices
Commercial/industrial development

SOUTH FORK GUADALUPE RIVER (54); Tier 1

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)
Cagle's map turtle (1)
Edwards Plateau spring salamander (0)

Groundwater manipulation
Fire management
Grazing practices

SPRING, DOVE CREEKS/HEAD OF THE RIVER RANCH (55); Tier 1

Perennial moderate and low gradient streams in Edwards Plateau limestone (1)
Concho water snake (1)
Texas fatmucket (0)
Texas pimpleback (0)

Tree clearing for improved streamflow
Residential development
Oil or gas drilling
Fire management

SPRING, DOVE CREEKS/HEAD OF THE RIVER RANCH (cont'd)

Grazing practices

TRAVIS COUNTY SPRINGS (56); Tier 1

Jollyville Plateau salamander (1)

Groundwater manipulation
Fire management
Grazing practices

UPPER COLORADO RIVER (57); Tier 1

Large perennial rivers of the Edwards Plateau (1)
Medium perennial rivers in sandstone, shale, alluvium with intermittent headwaters in Ogallala formation sands (1)
Concho water snake (4)

Tree clearing for improved streamflow
Conversion to agriculture or silviculture
Crop production practices
Fire management
Grazing practices

VALLEY CREEK (58); Tier 1

Mostly intermittent moderate and low gradient streams in eastern Southern Shortgrass Prairie shale, sandstone/sand with heavy limestone, marl, caliche component (1)

Tree clearing for improved streamflow
Conversion to agriculture or silviculture
Crop production practices
Fire management
Grazing practices

WALNUT CREEK (59); Tier 1

Perennial moderate and low gradient creeks transitional from the Edwards Plateau to blackland prairie in marl and limestone (1)
Jollyville Plateau salamander (1)

Residential development
Groundwater manipulation
Channelization of rivers or streams
Fire management
Commercial/industrial development

WEST ROCKY CREEK (60); Tier 2

Perennial moderate and low gradient streams in Edwards Plateau limestone (1)

WEST ROCKY CREEK (cont'd)

Tree clearing for improved streamflow
Oil or gas drilling
Fire management
Grazing practices

WHITE CREEK (61); Tier 2

Perennial moderate and low gradient streams transitional between granites of the Llano uplift and Edwards Plateau limestone (1)

Fire management
Grazing practices

WINANS CREEK (62); Tier 1

Perennial high and moderate gradient streams in Edwards Plateau limestone (1)

Fire management
Grazing practices