

DRAFT
ENVIRONMENTAL ASSESSEMENT
FOR THE ANDERSON TRACT
HABITAT CONSERVATION PLAN AND
INCIDENTAL TAKE PERMIT

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1. PURPOSE AND NEED

The U.S. Fish and Wildlife Service (Service) is proposing to issue an incidental take permit (ITP) pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (ESA), to Anaqua Spring Ranch, Inc. (Applicant). The ITP is for the incidental take of the endangered golden-cheeked warbler (*Setophaga [=Dendroica] chrysoparia*, GCWA)¹ on the 60.7 acre Anderson Tract in northwest Bexar County, Texas (Figure 1). This Environmental Assessment (EA) examines the impact that issuance of the ITP (Proposed Action) is expected to have on the human environment.

Issuance of an ITP is a federal action subject to the requirements of the National Environmental Policy Act (NEPA) (42 USC 4321–4327). NEPA requires federal agencies to: 1) study proposed federal actions to determine if they will result in significant environmental impacts to the human environment, and 2) review the alternatives available for the project and consider the impact of those alternatives on the environment (42 USC 4332(c)). NEPA regulations at 40 Code of Federal Regulations (CFR) 1502.14 require that all reasonable alternatives be rigorously explored and objectively evaluated. “Reasonable Alternatives” have been defined by the Department of the Interior as alternatives that are technically and economically practical or feasible and that meet the purpose and need of the proposed action (46 FR 18026). The scope of NEPA requires that the agency consider the impacts of the action on the “human environment,” including a variety of resources such as water, air quality, and cultural and historic resources.

2. PROPOSED ACTION

The Service proposes to issue an ITP to the Applicant to clear approximately 60.7 acres of GCWA habitat located in northwest Bexar County, Texas (Anderson Tract), for residential purposes. The Anderson Tract is located along Toutant Beauregard Road between the existing Anaqua Springs Ranch and Sundance Ranch subdivisions. The layout of the proposed development has not yet been established, but it may be assumed that the entire Anderson Tract would be affected by the construction of homes, roads, utilities, and other attendant features.

The proposed project would result in the loss or degradation of approximately 60.7 acres of habitat for the endangered GCWA that occurs within the boundary of the Anderson Tract. This habitat is associated with approximately two or three GCWA territories that are located within or partially within the boundary of the Anderson Tract. The loss or degradation of this habitat is expected to incidentally take GCWAs in the form of harm. As defined by the Act, *take* means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 USC 1532(19)). *Harm* is further defined by USFWS regulations as “an act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.”

The Applicant has prepared a habitat conservation plan (HCP) that describes measures the Applicant would take to minimize and mitigate to the maximum extent practicable the impacts of the proposed taking. The proposed conservation measures include observing seasonal clearing restrictions during the

¹ The North American Checklist Committee of the American Ornithologist’s Union (AOU) published a change to the scientific name of the GCWA in the 52nd Supplement to the AOU Checklist of North American Birds (Chesser et al. 2011). The scientific name for the GCWA was changed from *Dendroica chrysoparia* to *Setophaga chrysoparia*. However, the Service has not officially accepted this name change with a Federal Register notice; therefore, the use of *Dendroica* is still used here.

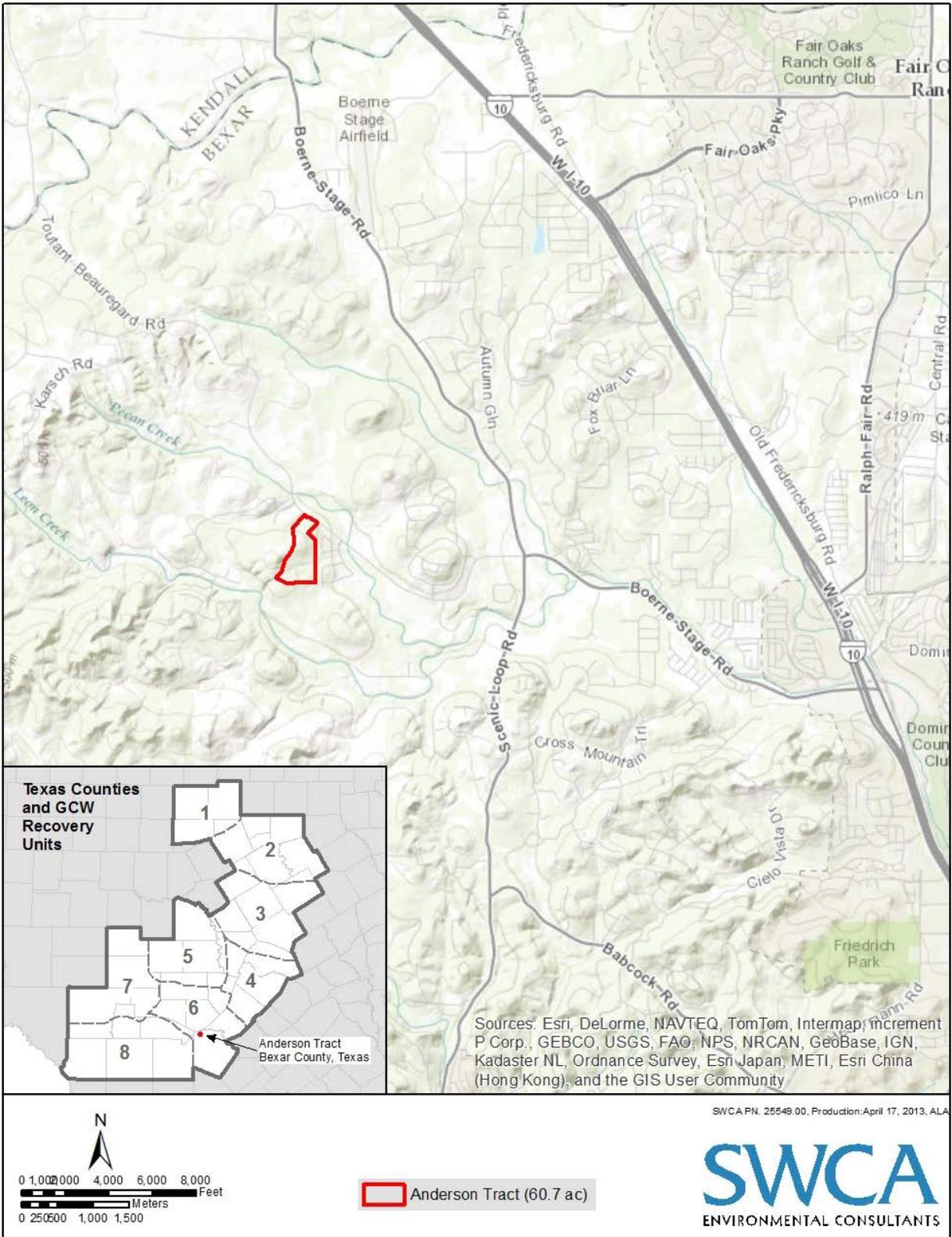


Figure 1. Location of the Anderson Tract

GCWA breeding season (March 1 through July 31), implementing oak wilt prevention measures during clearing activities, and purchasing 60.7 GCWA conservation credits from a Service approved third-party conservation bank (collectively the Conservation Program).

The Applicant would conduct the proposed project in accordance with all other applicable local, state, and federal regulations. Such regulations may include, and are not necessarily limited to, those addressing water quality and quantity (e.g., Texas Commission on Environmental Quality regulations regarding stormwater discharges and protection of the Edwards Aquifer, and local San Antonio Water System aquifer protection ordinances) and cultural resources (e.g., National Historic Preservation Act).

3. ALTERNATIVES CONSIDERED

In addition to the Proposed Action described above, the Service considered the following alternatives.

3.1. No Action

Under a No Action alternative, the Service would not issue the requested ITP for development of the Anderson Tract. Therefore, the Applicant would not implement the Conservation Program described in the HCP, which would result in mitigation that would protect approximately 60 acres of GCWA habitat in perpetuity.

3.2. Lower Mitigation

The Lower Mitigation alternative is similar to the Proposed Action in that the Service would issue an ITP for the proposed project. However, the HCP under this alternative would be modified to include the purchase of only 49 conservation credits for the GCWA. This calculation was based on an assumption that there were indirect impacts already occurring on three sides of this tract: 1) from Toutant Beauregard to the north, 2) from Sundance Ranch Subdivision to the east, and 3) from the cleared lands to the south, which result in a lower mitigation total. All other aspects of the proposed project and the HCP would remain the same.

3.3. Alternatives Eliminated from Further Analysis

The Applicant initially considered an alternative that would modify the proposed development plan for the Anderson Tract to reduce the area directly subject to habitat loss and preserve this habitat on-site for the benefit of the species. However, this alternative was rejected because the small area of preserved on-site habitat would not be expected to retain conservation value for the GCWA, particularly given the level of existing and proposed development in the immediate vicinity. Therefore, this alternative was not considered for further analysis.

4. ENVIRONMENTAL SETTING

4.1. Resources Considered for Detailed Analysis

The following natural and socioeconomic resources may be affected by the proposed incidental taking or Conservation Program.

4.1.1. *Vegetation Communities*

Vegetation on the Anderson Tract consists of a mix of juniper-oak woodlands and juniper shrublands that are typical of the landscape in northwest Bexar County and much of the Edwards Plateau (Texas Parks

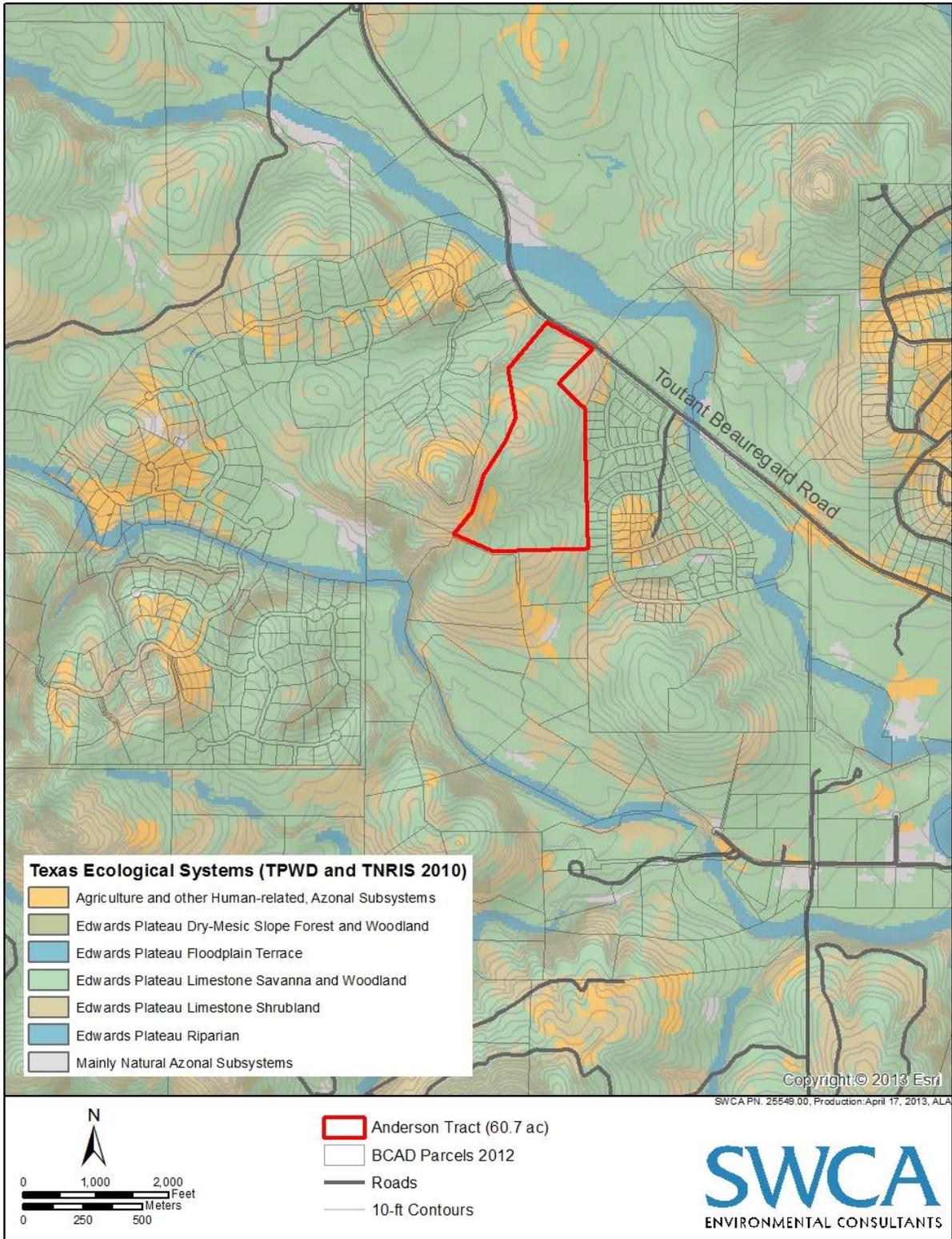


Figure 2. Vegetation Communities in the Vicinity of the Anderson Tract

and Wildlife Department [TPWD] and Texas Natural Resources Information System [TNRIS] 2010) (Figure 2). The Anderson Tract lacks steep-sided canyons or riparian areas that support many of the endemic or rare plants and plant communities of the Balcones Canyonlands region. Vegetation on the Anderson Tract is more specifically described in Pape-Dawson Engineers, Inc. (2011, 2012).

4.1.2. General Wildlife

Wildlife species that would be expected to utilize the habitats present on the Anderson Tract include a number of terrestrial woodland birds, mammals, reptiles, and some amphibians (Kutac and Caran 1994). Wildlife associated with aquatic, riparian, or wetland habitats are not expected to occur on the Anderson Tract due to a lack of such habitats within the property. Many species that would be expected to occur on the property are abundant to common in both undeveloped and suburban settings.

4.1.3. Threatened and Endangered Species

Section 7(a)(2) of the Act requires that each federal agency consult with the Service to ensure that agency actions the Service authorizes, funds, or carries out are not likely to jeopardize the continued existence of listed threatened or endangered species or result in the destruction or adverse modification of critical habitat (16 USC 1536(a)(2)). “Jeopardize” is defined by the regulations as engaging in an action that would reasonably be expected, directly or indirectly, to appreciably reduce the likelihood of the survival and recovery of the species in the wild (50 CFR 402.02). Issuance of an ITP is a federal action (Service and National Marine Fisheries Service [NMFS] 1996). The intra-Service consultation will include consideration of direct and indirect effects on the species, as well as the impacts of the proposed project on listed plants and critical habitat, if any (Service and NMFS 1996).

Table 1. Threatened (T) and Endangered (E) Species Known To Occur Within Bexar County.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Species Group</u>	<u>Listing Status</u>
[unnamed] ground beetle	<i>Rhadine infernalis</i>	Insects	E
[unnamed] ground beetle	<i>Rhadine exilis</i>	Insects	E
Black-capped Vireo	<i>Vireo atricapilla</i>	Birds	E
Braken Bat Cave Meshweaver	<i>Cicurina venii</i>	Arachnids	E
Cokendolpher Cave Harvestman	<i>Texella cokendolpheri</i>	Arachnids	E
Comal Springs dryopid beetle	<i>Stygoparnus comalensis</i>	Insects	E
Comal Springs riffle beetle	<i>Heterelmis comalensis</i>	Insects	E
Fountain Darter	<i>Etheostoma fonticola</i>	Fishes	E
Golden-cheeked Warbler (=wood)	<i>Dendroica chrysoparia</i>	Birds	E
Government Canyon Bat Cave Meshweaver	<i>Cicurina vespera</i>	Arachnids	E
Government Canyon Bat Cave Spider	<i>Neoleptoneta microps</i>	Arachnids	E
Helotes mold beetle	<i>Batrisodes venyivi</i>	Insects	E
Madla's Cave Meshweaver	<i>Cicurina madla</i>	Arachnids	E
Peck's cave amphipod	<i>Stygobromus (=Stygonectes) pecki</i>	Crustaceans	E
Robber Baron Cave Meshweaver	<i>Cicurina baronia</i>	Arachnids	E
San Marcos salamander	<i>Eurycea nana</i>	Amphibians	T
Texas blind salamander	<i>Typhlomolge rathbuni</i>	Amphibians	E

Texas wild-rice	<i>Zizania texana</i>	Flowering Plants	E
whooping crane	<i>Grus americana</i>	Birds	E

The only federally listed species expected to be impacted by the Proposed Action is the GCWA.

The GCWA was emergency listed as endangered on May 4, 1990 (55 FR 18844), and the final rule was published on December 27, 1990 (55 FR 53160). The biology, habitat requirements, threats, distribution, and status of the GCWA are described in Groce et al. (2010).

Presence/absence surveys for GCWAs were performed in 2011 and 2012 on the Anderson Tract (Pape-Dawson Engineers, Inc. 2011, 2012). While the entire property was surveyed over two years, neither of the surveys covered the tract in its entirety. Therefore, estimations of numbers of GCWAs supported on the tract are given as a range (anywhere from 2-3 males) (Figure 3). The survey reports state that suitable woodland habitat for the GCWA exists on the Anderson Tract, generally having the following characteristics:

- Tree canopy with approximately 90 percent closure;
- Tree canopy height ranging from approximately 15 feet to 40 feet above the ground; and
- Tree canopy composed of approximately 70 percent to 80 percent Ashe juniper (*Juniperus ashei*), with the remaining canopy composed of primarily netleaf hackberry (*Celtis reticulata*), Texas oak (*Quercus texana*), and cedar elm (*Ulmus crassifolia*).

These habitat characteristics are consistent with the description in Campbell (2003) of habitat types where GCWAs are expected to occur. The GCWA presence/absence surveys performed in 2011 and 2012 confirmed that some of this suitable habitat was utilized by the species. It is not known if or to what extent actual GCWA pairing, nesting, or fledging activities occur on the Anderson Tract.

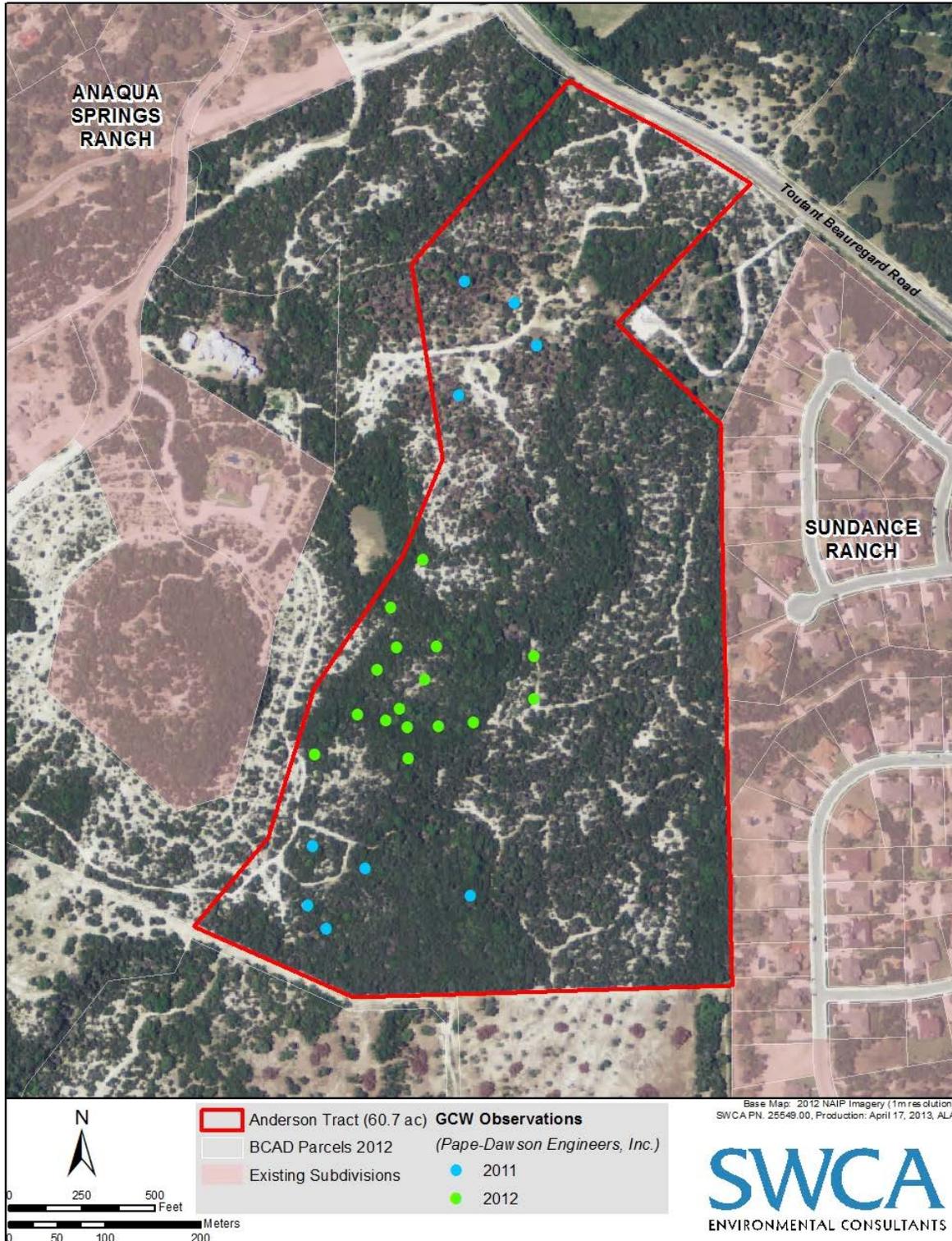


Figure 3. GCWA Observations within the Anderson Tract

4.1.4. Sensitive Species

Texas Parks and Wildlife Department (TPWD) identifies the following species as occurring in Bexar County, Texas, that are protected under state regulations or species that are under consideration for such protection (Table 1). Aside from the GCWA, no other state or special status species are either known or likely to occur within the Anderson Tract. Therefore, these species are not considered for further analysis.

Table 2. Special Status Species Occurring in Bexar County, Texas

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Anderson Tract
AMPHIBIANS			
Cascade Caverns salamander (<i>Eurycea latitans complex</i>)	ST	Springs and caves in the Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area	None – Anderson Tract lacks aquatic habitat and does not occur within the Edwards Aquifer
Comal blind salamander (<i>Eurycea tridentifera</i>)	ST	Springs and waters of caves	Highly Unlikely – Anderson Tract is not associated with any known aquatic cave systems
BIRDS			
American peregrine falcon (<i>Falco peregrinus anatum</i>)	ST	Year-round resident and local breeder in west Texas; occupies wide range of habitats during migration	Highly Unlikely – Anderson Tract offers no breeding habitat or unique migratory habitat (such as landscape edges)
Interior least tern (<i>Sterna antillarum athalassos</i>)	SE	Nests along sand and gravel bars within braided streams, rivers; eats small fish and crustaceans	None – Anderson Tract lacks aquatic or riparian habitat
Sprague’s pipit (<i>Anthus spragueii</i>)	C	Only present in Texas during migration and winter, mid-September to early April; can be locally common in coastal grasslands, uncommon to rare further west	None – Anderson Tract lacks coastal or inland grassland vegetation
White-faced ibis (<i>Plegadis chihi</i>)	ST	Prefers freshwater marshes, sloughs, and irrigated rice fields	None – Anderson Tract lacks aquatic or wetland habitats
Wood Stork (<i>Mycteria americana</i>)	ST	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water; formerly nested in Texas, but no breeding records since 1960	None – Anderson Tract lacks aquatic or wetland habitats
Zone-tailed hawk (<i>Buteo albonotatus</i>)	ST	Arid open country, including open deciduous or pine-oak woodland	None – Anderson Tract lacks appropriate woodland vegetation
FISHES			
Toothless blindcat (<i>Trogloglanis pattersoni</i>)	ST	Endemic to the San Antonio Pool of the Edward's Aquifer	Highly Unlikely – Anderson Tract is not associated with any known aquatic cave systems

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Anderson Tract
Widemouth blindcat (<i>Satan eurystomus</i>)	ST	Endemic to the San Antonio Pool of the Edward's Aquifer	Highly Unlikely – Anderson Tract is not associated with any known aquatic cave systems
MAMMALS			
Black bear (<i>Ursus americanus</i>)	ST	Bottomland hardwoods and large tracts of inaccessible forested areas	None – Anderson Tract lacks suitable habitats and is located in a partially developed landscape
Gray wolf (<i>Canis lupus</i>)	SE	Formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	None – Extirpated from Texas
Red wolf (<i>Canis rufus</i>)	FE/SE	Formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	None – Extirpated from Texas
MOLLUSKS			
False spike mussel (<i>Quadrula mitchelli</i>)	ST	Probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble	None – Anderson Tract lacks aquatic habitat
Golden orb (<i>Quadrula aurea</i>)	ST	Sand and gravel in some locations and mud at others; found in lentic and lotic; Guadalupe, San Antonio, Lower San Marcos, and Nueces River basins	None – Anderson Tract lacks aquatic habitat
Texas fatmucket (<i>Lampsilis bracteata</i>)	ST	Streams and rivers on sand, mud, and gravel substrates; Colorado and Guadalupe River basins	None – Anderson Tract lacks aquatic habitat
Texas pimpleback (<i>Quadrula petrina</i>)	ST	mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins	None – Anderson Tract lacks aquatic habitat
REPTILES			
Texas horned lizard (<i>Phrynosoma cornutum</i>)	ST	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees	Highly Unlikely – Anderson Tract is densely vegetated with juniper-oak woodlands
Texas indigo snake (<i>Drymarchon melanurus erebennus</i>)	ST	Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors	None – Anderson Tract lands riparian habitat or thornbush-chaparral woodlands
Texas tortoise (<i>Gopherus berlandieri</i>)	ST	Open brush with a grass understory is preferred	None – Anderson Tract lacks suitable habitat

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Anderson Tract
Timber/Canebrake rattlesnake (<i>Crotalus horridus</i>)	ST	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay	None – Anderson Tract lacks appropriate habitats
PLANTS			
Bracted twistflower (<i>Streptanthus bracteatus</i>)	C	Shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations	Highly Unlikely – Anderson Tract lacks mesic canyons or steep drainages

Texas Parks and Wildlife Department (TPWD). Annotated county lists of rare species – Bexar County. Last revision: October 2, 2012.

* SE = State Endangered; ST = State Threatened

4.1.5 Water Resources

The Anderson Tract overlies the Trinity Aquifer, one of the major aquifers of Texas (Texas Water Development Board 2012). However, the Anderson Tract is also part of the area contributing surface water that recharges the Edwards Aquifer. The Edwards Aquifer supplies most of the drinking water for the San Antonio community. The entire contributing zone for the San Antonio segment of the Edwards Aquifer covers approximately 4,400 square miles (San Antonio Water System 2013).

The Anderson Tract does not contain any permanent or even intermittent seasonal sources of surface water. Neither the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles nor the high resolution USGS National Hydrologic Dataset identify any water features within the Anderson Tract. The topography of the Anderson Tract suggests that an ephemeral headwater channel could cross the property and drain to Pecan Creek west of the site (Figure 4). However, this feature would only be expected to carry water during or immediately after significant rain events. The Anderson Tract lies outside of any flood zones mapped by the Federal Emergency Management Agency ([FEMA] 2010).

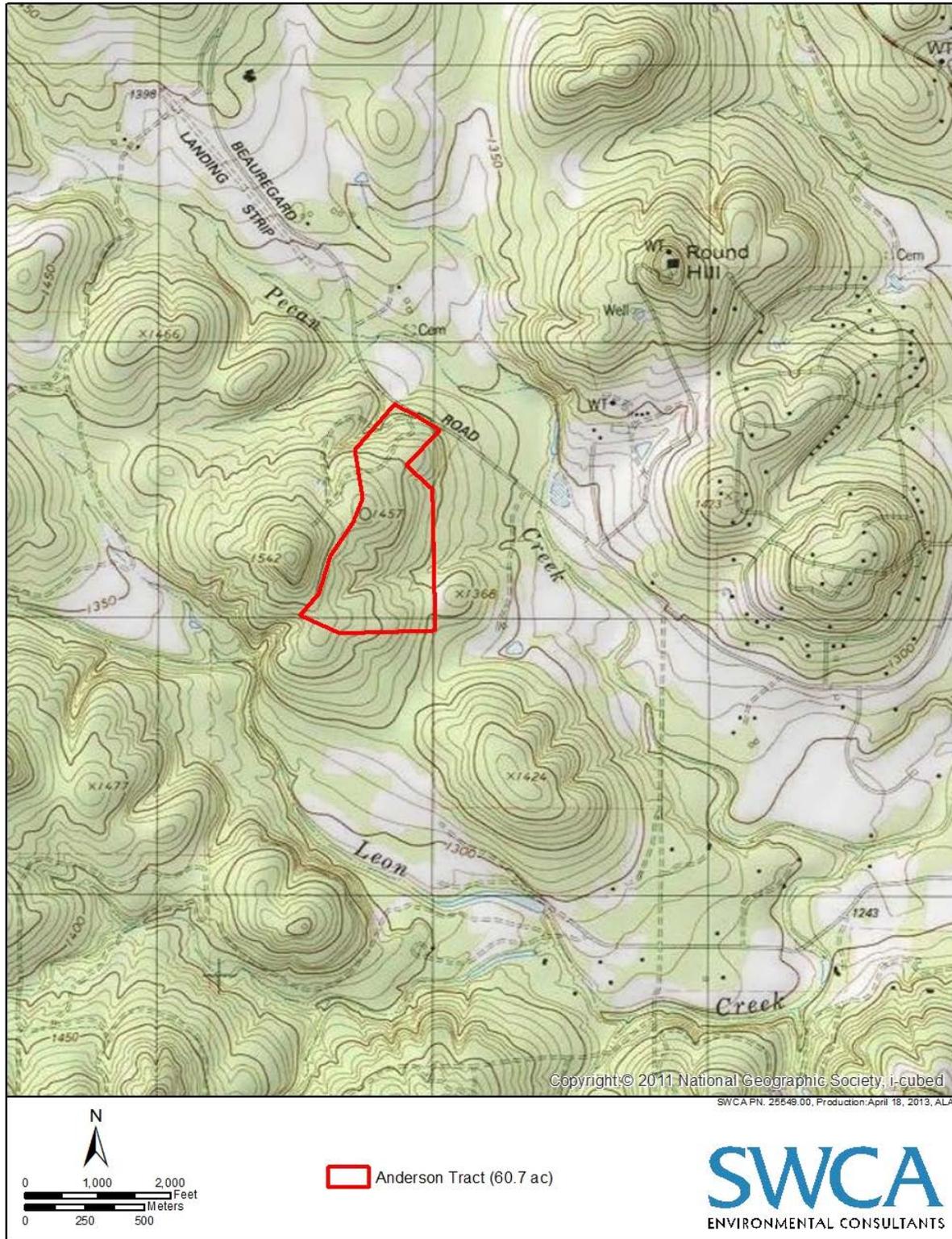


Figure 4. USGS 7.5-minute Topographic Quadrangle for the Anderson Tract

4.1.6. Air Quality

The Clean Air Act requires that the U.S. Environmental Protection Agency (USEPA) set air quality standards, referred to as the National Ambient Air Quality Standards (NAAQS). Areas that do not meet the NAAQS are referred to as *non-attainment* areas. Bexar County is currently in attainment status for all criteria pollutants (USEPA 2012a).

The Anderson Tract is located within a semi-rural part of Bexar County and is not in the immediate vicinity of any large-scale point source emissions (e.g., from industrial plants and fossil fuel-fired power plants) or non-point source emissions (e.g., from automobiles and trucks along major transportation corridors).

4.1.7. Noise

The Anderson Tract is located in an area with a mix of largely undeveloped farm and ranch lands and suburban or ex-urban residential development. Traffic from local residents travelling along Toutant Beauregard Road is likely to be the primary source of ambient noise in the vicinity. However, this road is not a major travel corridor. Construction noise associated with new development and noise from agricultural and land management operations, such as the operation of equipment and machinery for brush management, access road maintenance, and similar activities, is also expected to occur occasionally.

4.1.8. Environmental Justice

Executive Order (EO) 12898 issued in 1994 directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority communities and low-income communities.

The Anderson Tract lies within a lightly populated part of Bexar County (2010 Census Tract 1821.03), with a population density of approximately 37 people per square mile. The human population is denser, exceeding 100 people per square mile, to the south and east of the Anderson Tract (ESRI 2013) (Figure 6). Other characteristics of the local and regional human population are listed in Table 1. The local human population has a lower proportion of minority or low-income residents than the rest of Bexar County or the State of Texas.

The human population of south central Texas, including Bexar, Comal, Blanco, Kendall, Kerr, Bandera, and Medina counties, is expected to increase by approximately 64 percent over the next 30 years from a population of approximately 1.95 million in 2010 to approximately 3.2 million in 2040. Bexar County is expected to experience a population increase of approximately 51 percent over this period, with most of this growth occurring to the west and north of the City of San Antonio (Loomis Partners, Inc. 2011).

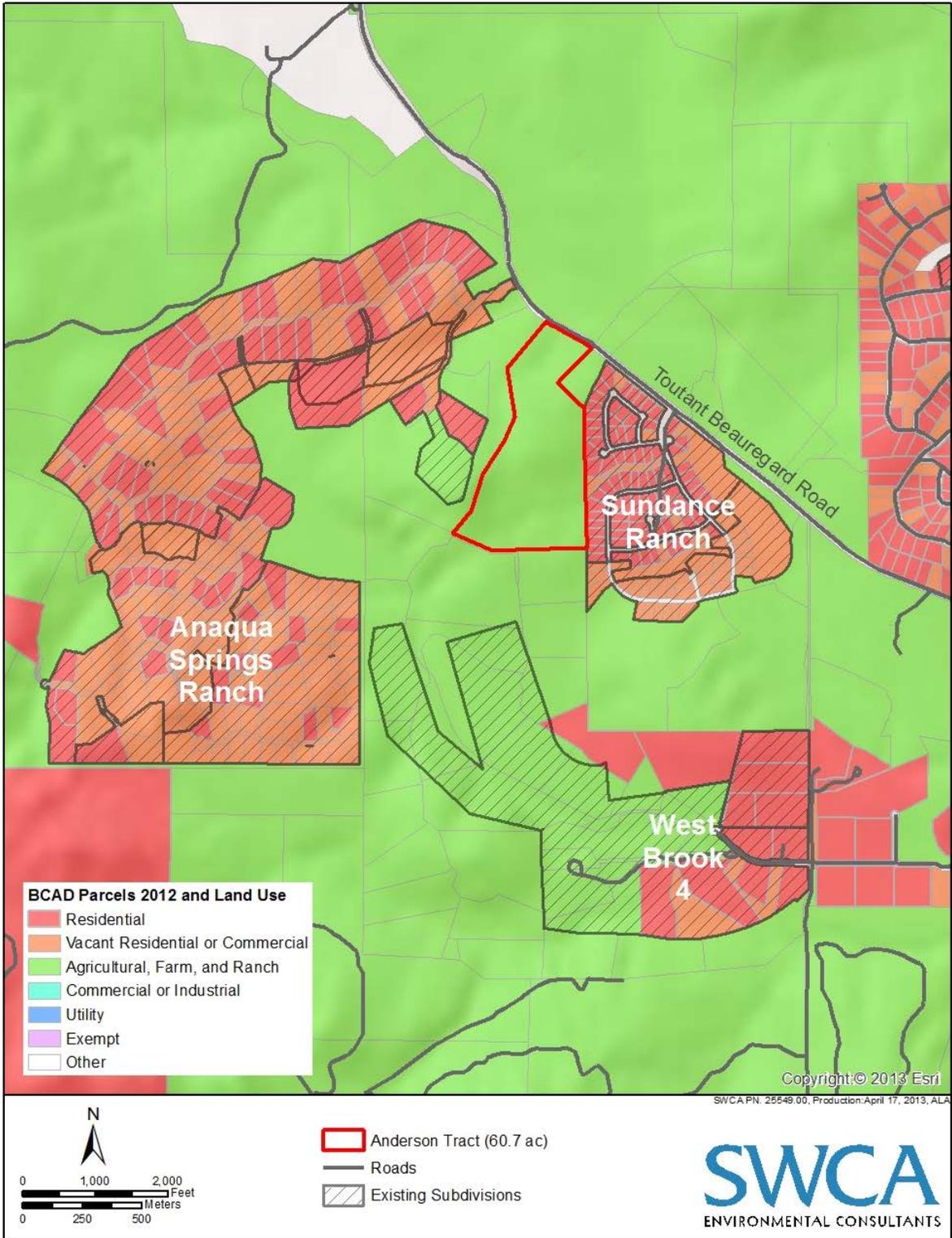


Figure 5. Parcels, Subdivisions, and Land Uses in the Vicinity of the Anderson Tract

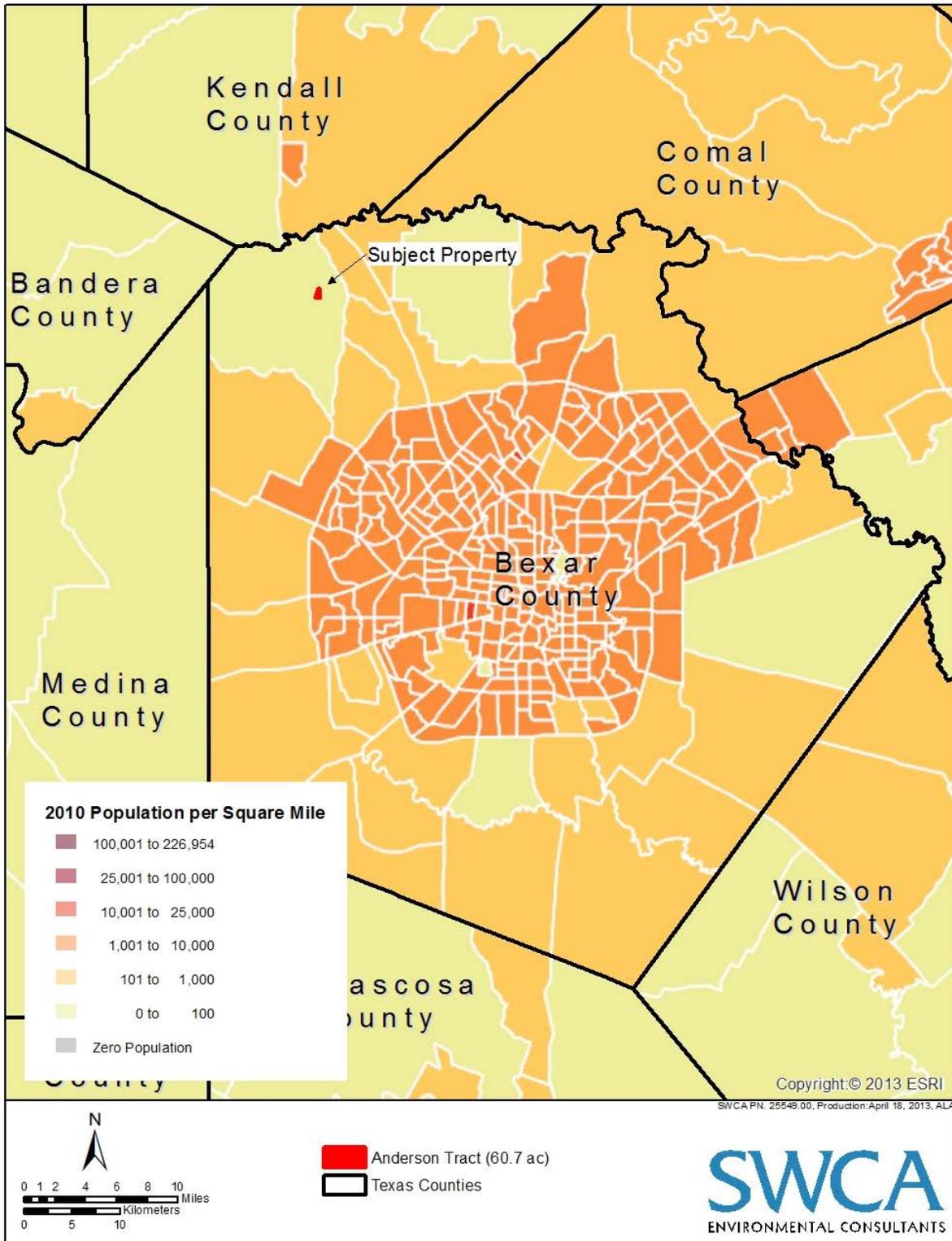


Figure 6. Population Density in the Region of the Anderson Tract

Table 2. Population and Income Characteristics for the Local and Regional Community²

Category	Census Tract (CT) 1821.03	Bexar County	Texas
Population , Race, and Ethnicity (Census 2010 Counts)			
Total Population	2,238 <i>0.1% of county population</i>	1,714,773 <i>6.8% of state population</i>	25,145,561
Hispanic or Latino Population	702 <i>31.4% of CT population</i>	1,006,958 <i>58.7% of county population</i>	9,460,921 <i>37.6% of state population</i>
Non-white Race or Multi-racial Population	165 <i>7.4% of CT population</i>	464,521 <i>27.1% of county population</i>	7,444,009 <i>29.6% of state population</i>
Language (2007-2011 American Community Survey 5-year Estimates)			
Population 5 Years and Over (speaking population)	2,068	1,556,734	22,850,447
English Only Speakers	1,482 <i>71.7% of CT speaking population</i>	890,775 <i>57.2% of county speaking population</i>	14,997,845 <i>56.6% of state speaking population</i>
Speak English Less Than “Very Well”	113 <i>5.5% of CT speaking population</i>	193,453 <i>12.4% of county speaking population</i>	3,305,329 <i>14.5% of state speaking population</i>
Employment and Income (2007-2011 American Community Survey 5-year Estimates)			
Population 16 years and Over (employable population)	1,802	1,278,974	18,747,892
In Labor Force	1,187 <i>65.9% of CT employable population</i>	834,874 <i>65.3% of county employable population</i>	12,285,284 <i>65.5% of state employable population</i>
Not in Labor Force	615 <i>34.1% of CT employable population</i>	444,100 <i>34.7% of county employable population</i>	6,462,608 <i>34.5% of state employable population</i>

² This information is based on U.S. Census Bureau data (2010, 2011). The population and housing census is collected every 10 years and was last published in 2010. The American Community Survey is an ongoing statistical survey and samples a small percentage of the population every year (U.S. Census Bureau website: www.census.gov/acs).

Median Household Income (dollars)	\$81,397 <i>169.3% of county median household income</i>	\$48,083 <i>94.4% of state median household income</i>	\$50,920
Mean Household Income (dollars)	\$182,713 <i>280.0% of county mean household income</i>	\$65,341 <i>92.3% of state mean household income</i>	\$70,777
Percent of People Living Below the Poverty Level	9.8%	17.1%	17.0%

4.1.9. Land Use

The Anderson Tract is currently undeveloped and vacant land located within the City of San Antonio’s extra-territorial jurisdiction. Previously, the site included a single-family residence and was likely used for farming and ranching purposes, but the home and all related structures have since been removed. No cattle or other domestic animals are currently grazed on the Anderson Tract.

Land uses in the general vicinity of the Anderson Tract include mostly a mix of single-family residential lands and farm and ranch lands (Bexar Central Appraisal District [BCAD] 2012a) (Figure 5). Partially built-out residential subdivisions (i.e., Anaqua Springs Ranch, Sundance Ranch, and West Brook) surround the Anderson Tract.

4.1.10. Climate Change

South central Texas experiences a subtropical, subhumid climate (Larkin and Bomar 1983). Between 1931 and 1960, the average daily minimum temperature in Bexar County during January was approximately 42 °F and the average daily maximum temperature during July was approximately 94 °F (Taylor et al. 1966). Precipitation in the region averages approximately 28 inches of rain per year, with most rainfall occurring in the late spring and early fall months (Taylor et al. 1966). Severe or high-impact weather events, including flash floods and periods of drought, are common (Nielsen-Gammon 2008).

According to the American Meteorological Society (AMS), global mean temperatures increased an average of 0.9 °F between 1979-2010 (AMS 2012). This trend is expected to continue, both globally and, in many cases, regionally. Over the next century, climate in Texas is likely to become warmer and experience wider extremes in both temperature and precipitation (USEPA 2014). The average annual temperature throughout Texas could increase by 2 to 11 °F (USEPA 2014). Projected precipitation changes made by the Intergovernmental Panel on Climate Change ([IPCC] 2013) varied greatly between models (IPCC 2013). Part of this variance is due to differences between the models, for example their ability to replicate observed precipitation patterns. Despite this variation between models, all models showed a percentage decrease in precipitation across Texas (IPCC 2013).

Climate change may be influenced by a number of variables, including natural external forces, natural internal processes of the climate system, or human activities (Cohan 2009). In the case of the current and predicted global warming trend, the cause is likely related to greenhouse gases, primarily carbon dioxide (CO₂), accumulating in the earth’s atmosphere as a result of human activity (USEPA 2012b). The primary emission of CO₂ in the United States comes from the combustion of fossil fuels for energy and

transportation-related activities. These activities account for over 70 percent of human-generated greenhouse gases in the United States (USEPA 2012b).

4.2. Resources Not Considered for Detailed Analysis

Resources not considered for detailed analysis are those that are not expected to be affected by the Proposed Action or the alternative actions because they are not known or are highly unlikely to be associated with the proposed project.

Geology – The Glen Rose Limestone formation underlies the Anderson Tract. Neither the authorization of incidental take of the GCWA nor the implementation of the HCP Conservation Program is expected to affect this underlying geology. Therefore, this resource is not considered for further analysis.

Prime Soils and Unique Agricultural Lands – Soils on the Anderson Tract are of the Tarrant-Brackett association, which are shallow and very shallow, clayey and calcareous soils over limestone (Taylor et al. 1966). Soils of this association are not considered to be prime agricultural soils and no unique agricultural lands are present within the Anderson Tract. Therefore, no impacts on these resources are expected as a result of the considered alternatives and they are not considered for further analysis.

Cultural Resources – No structures (historic or otherwise) or archeological sites are known to occur within the Anderson Tract (Texas Historical Commission 2013). Therefore, no impacts to these resources are expected as a result of the considered alternatives and they are not considered for further analysis.

Visual and Aesthetic Resources – The Anderson Tract is located among existing residential subdivisions, is adjacent to a road and a communications tower, and lacks unique or significant physical characteristics or landforms (such as canyon views, riparian corridors, or expansive undeveloped vistas) that would significantly affect the visual or aesthetic qualities of the region. Therefore, this resource was not considered for detailed analysis.

Public Health and Safety – The proposed project is not expected to affect public health and safety since it would be designed and constructed in accordance with all applicable local, state, and federal regulations. Therefore, public health and safety issues are not considered for further analysis.

Energy and Depletable Resource Requirements and Conservation Potential – The proposed project does not include an energy or natural resource extraction element. Therefore, these resources are not considered for further analysis.

5. ENVIRONMENTAL CONSEQUENCES

5.1. Analysis Framework

NEPA requires federal agencies to consider "the direct, indirect, and cumulative effects of the proposed incidental take and the mitigation and minimization measures proposed from implementation of the HCP" (Service and NMFS 1996, page 5-1). In this case, the proposed incidental take involves the removal or alteration of woodland vegetation used by the GCWA, and the Conservation Program involves observing seasonal clearing restrictions, implementing oak wilt prevention measures, and contributing to the permanent protection and management of GCWA habitat off-site.

An *effect* is defined by NEPA regulations as either a direct result of an action that occurs at the same time and place as the action or is an indirect result of an action that occurs later in time or in a different place and is reasonably foreseeable (40 CFR 1508.8). *Cumulative effects* are the incremental environmental impact or effect of the action considered together with impacts of past, present, and reasonably

foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR 1508.7).

The purpose of an EA is to determine whether or not the proposed action has significant effects on the quality of the human environment. The potential significance of an effect should be considered in the context of the direction of the effect (adverse or beneficial), the relative duration of the effect, the relative magnitude or intensity of the effect, and the relative geographic scale of the effect.

NEPA regulations require the analysis of “no action” as a benchmark that enables decision makers to assess the relative magnitude of environmental effects of the action alternatives (Service 2003). If no difference is anticipated between the future condition under the No Action alternative and the action alternatives, then the action may be said to have no effect.

5.2. Summary of Potential Impacts

The intensity of potential impacts to the environment is defined as follows:

- Negligible: Effects would be at or below the level of detection and would be so slight that they would not be of any measurable or perceptible consequence.
- Minor: Effects would be measurable or perceptible, but would be localized within a small area.
- Moderate: Effects would occur over a large enough area that the change would be readily measurable. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major: Effects would be readily apparent and would be substantial in area. Extensive mitigation would be needed to offset adverse effects, and its success would not be assured.

A summary of the potential environmental consequences of the alternative actions is provided in Table 3. More complete descriptions of potential environmental effects are included in the following sections.

Table 3. Potential Environmental Consequences

Resource	No Action Alternative	Proposed Action Alternative	Lower Mitigation Alternative
Vegetation Communities	Negligible	Negligible to minor	Negligible to minor
General Wildlife	Minor	Minor	Minor
Golden-cheeked Warbler	Minor	Moderate	Moderate
Water Resources	Negligible to minor	Negligible to minor	Negligible to minor
Air Quality	Negligible	Negligible	Negligible
Noise	Negligible	Negligible	Negligible
Environmental Justice	Negligible	Negligible to moderate, depending	Negligible to moderate, depending

		on scale (see section 5.3.7 for details)	on (see section 5.3.7 for details)
Land Use	Negligible	Minor	Minor
Climate Change	Negligible	Negligible	Negligible

5.3. Effects Analysis

5.3.1. *Vegetation Communities*

Effects to vegetation communities would be related to the removal or alteration of the existing stands of juniper-oak woodland and juniper shrubland within the Anderson Tract. This natural vegetation would likely be replaced with landscaping or opportunistic plant communities that recolonize disturbed areas after clearing. The Conservation Program under the Proposed Action and Lower Mitigation alternatives also include the protection and management of similar vegetation off-site.

No Action Alternative

Under the No Action alternative, it is expected that the portions of the woodland and shrubland vegetation within the Anderson Tract occupied by the GCWA would not be removed. Vegetation community impacts under the No Action alternative would be negligible, since only natural progression/succession of the vegetation would occur.

Proposed Action Alternative

While the majority of the vegetation onsite will likely be removed, there is some expectation that native, drought tolerant plants will be used throughout the residential landscapes. Regardless, potential adverse impacts to vegetation communities would likely be minor over the long-term since juniper-oak woodlands and juniper shrublands are common across the local and regional landscape. This alternative would also have negligible to minor beneficial effects to native vegetation communities by contributing to the permanent protection and management of approximately 60.7 acres of replacement habitat within the region.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same potentially adverse impacts to the vegetation communities as the Proposed Action alternative. However, the potential beneficial effects would be less due to the reduced protection and management of only 49 acres of GCWA habitat.

5.3.2. *General Wildlife*

Effects to wildlife communities under the No Action alternative would be most closely related to the removal of relatively common woodland and shrubland habitats and disturbances caused by noise and activity associated with machinery and work crews. These direct effects could cause some species that are sensitive to such disturbances to leave the area. Indirectly, replacement of native habitats with residential habitats could also cause other urban-tolerant species to relocate to the Anderson Tract. The Conservation Program under the Proposed Action and Lower Mitigation alternatives would protect and manage similar habitats for the benefit of the GCW, which would also benefit other conspecific wildlife.

No Action Alternative

Under the No Action alternative, wildlife communities utilizing the Anderson Tract would be likely to experience gradual changes due to increasing land development in the surrounding region. These changes would likely be beneficial to some species and negative to others. As currently undeveloped lots in the existing adjacent residential subdivision become built-out, species that are sensitive to urban activity would be expected to be replaced by more urban tolerant species. However, aside from the GCWA, wildlife species likely to be utilizing the Anderson Tract are not known to be particularly unique or sensitive and are commonly found to some extent in both rural and urban environments. Furthermore, for those species typically requiring larger areas or less human activity to thrive, the local and regional landscape offers similar habitats that could support displaced animals.

Proposed Action Alternative

Similar to the No Action alternative, potential adverse impacts to wildlife communities resulting from the Proposed Action would likely be minor over the long-term. Juniper-oak woodlands and juniper shrublands are common across the local and regional landscape and offer replacement habitats.

Contributing to the perpetual protection and management of GCWA habitat off-site by the purchase of credits from an approved conservation bank would be expected to have only minor long-term benefits for similar assemblages of wildlife species, given the abundance of these habitats across the regional landscape.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same potentially adverse impacts to the general wildlife communities as the Proposed Action alternative. The proposed Conservation Program remains minor when compared to the overall scale of the resource.

5.3.3. Golden-cheeked Warbler

The GCWA would be adversely affected by the loss of habitat on the Anderson Tract, but the impacts are mitigated by the proposed Conservation Program.

No Action Alternative

The No Action alternative considers that the proposed land clearing activities would either not occur, or would only occur if the GCWA no longer inhabited the tract. It is possible that over a long period of time the adjacent developments would expand to such a level that the GCWA no longer finds this tract suitable breeding habitat. As such, the loss of GCWAs from the 60.7 acres of the Anderson Tract would have a minor adverse effect on the status of the species.

Proposed Action Alternative

The expected impacts of the proposed action on the GCWA are described in the draft *Anderson Tract Habitat Conservation Plan* (SWCA 2014). Generally, direct impacts to individual GCWAs would be avoided by conducting the proposed vegetation clearing while the species is not present in central Texas.

The known and potential GCWA habitat within the Anderson Tract is adjacent to existing residential development and roads. These adjacent land uses indirectly affect the GCWA habitat on the Anderson Tract, based on an assumption of such impacts extending 300 feet beyond the boundary of the disturbance. A lack of GCWA observations in the habitat immediately adjacent to Toutant Beauregard

Road and the Sundance Ranch subdivision support this assessment. Additionally, extreme drought is the likely cause for a reduction in live trees within 8.2 acres within the Anderson Tract (see Figures 3 and 4 in the HCP). These climatic and external disturbances have likely decreased the quality of the habitat within the Anderson Tract.

In terms of patch size, prime habitat for the GCWA is thought to occur in patches of at least 250 acres (Ladd and Gass 1999). The Service currently considers largely undisturbed habitat patches of at least 500 acres to be the minimum necessary to contribute to the long-term conservation of the species. This informal standard has been incorporated into all of the recent regional HCPs and most of the conservation banking agreements either approved by the Service in central Texas (Williamson County RHCP, Hays County RHCP, Comal County RHCP, Clearwater Ranch CB, and the Bandera Conservation Corridor CB).

However, the loss of small, isolated habitat patches, such as occur on the Anderson Tract, are considered to have at least a moderate effect on GCWAs, since over time more habitat removed results in less overall habitat available for this species. The effect is measurable and mitigation is necessary. However, over the long-term, the permanent preservation of GCWA habitat within a larger patch of habitat (such as at a conservation bank) will offset the adverse effects of this project.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same moderate impacts to the GCWA as the Proposed Action alternative. Additionally, the proposed Conservation Program, while at a lesser scale, will also benefit the GCWA, but at a lesser scale.

5.3.4. *Water Resources*

Effects to water resources may occur in relation to the alteration of surface conditions during land clearing activities, such as increased erosion or sedimentation of local surface waters or increased surface runoff from bare ground.

No Action Alternative

The No Action alternative would have a negligible effect on surface and subsurface water resources, since land clearing would likely not occur or would be delayed. At that time, potentially adverse effects to local and regional water resources may be expected, particularly during the period immediately after the clearing. However, since the Anderson Tract is relatively small and does not contain any well-defined waterways, any such effects would likely be negligible to minor, and would likely self-mitigate as new vegetation or stabilized surfaces are established. Furthermore, water resources are protected by federal and state regulations, including the federal Clean Water Act and the Texas Commission on Environmental Quality's Edwards Aquifer Rules, which apply to activities over the Edwards Aquifer recharge and contributing zones. These protections, such as collection and filtration of runoff from impervious surfaces, would further minimize the risk of adverse effects.

Proposed Action Alternative

Under the Proposed Action alternative, the potentially adverse effects of the No Action alternative would occur sooner in time, but would be otherwise similar in intensity, duration, and scale. The proposed project would be implemented in accordance with all applicable federal, state, and local water resource protection regulations, which would substantially minimize potential impacts to surface and subsurface water resources. The proposed Conservation Program would permanently protect undeveloped land off-

site, but given the size of the conservation credit purchase, the potentially beneficial effects to water resources are likely to also be negligible to minor.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same impacts to water resources as the Proposed Action alternative.

5.3.5. Air Quality

Effects to air quality may arise from the short-duration use of equipment and machinery that could release exhaust or dust into the environment during clearing of woodland vegetation on the Anderson Tract and the long-term increase in automobiles in the area.

No Action Alternative

Land clearing activities would be delayed under the No Action alternative, but are expected to ultimately proceed. Given the size of the Anderson Tract, the potential air quality impacts from the use of equipment and machinery to clear vegetation would last for only a few days. Additionally, it is expected that there will be an increase in exhaust from automobiles within the completed residential neighborhood. However, the Anderson Tract is located within a semi-rural part of Bexar County and is not in the immediate vicinity of any large-scale point source emissions (e.g., from industrial plants and fossil fuel-fired power plants) or non-point source emissions (e.g., from automobiles and trucks along major transportation corridors). Therefore, the effects of the No Action alternative on air quality are negligible.

Proposed Action Alternative

Under the Proposed Action alternative, the potentially adverse effects of the No Action alternative would occur sooner in time, but would be otherwise similar in intensity, duration, and scale. The proposed Conservation Program would not be expected to have any more than a negligible effect on air quality.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same impacts to air quality as the Proposed Action.

5.3.6. Noise

Similar to air quality impacts, effects on area noise levels would likely occur as a result of the short-duration operation of equipment and machinery to clear woodland vegetation from the Anderson Tract and the long-term occupation by residences.

No Action Alternative

As described above, land clearing activities would likely be delayed under the No Action alternative, but are expected to ultimately proceed. The Anderson Tract is located in an area with a mix of largely undeveloped farm and ranch lands and suburban or ex-urban residential development. Traffic from local residents travelling along Toutant Beauregard Road is likely to be the primary source of ambient noise in the vicinity. However, this road is not a major travel corridor. Construction noise associated with new development and noise from agricultural and land management operations, such as the operation of equipment and machinery for brush management, access road maintenance, and similar activities, is also expected to occur occasionally. Given the small size of the Anderson Tract, the potential noise impacts from the use of equipment and machinery to clear vegetation in the beginning of construction would last

for only a few days. The long-term impacts from the increase in automobiles associated with this relatively small development are expected to be negligible.

Proposed Action Alternative

Under the Proposed Action alternative, the potentially adverse effects of the No Action alternative would occur sooner in time, but would be otherwise similar in intensity, duration, and scale. The proposed Conservation Program would not be expected to have any more than a negligible effect on noise.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same impacts to noise as the Proposed Action.

5.3.7. *Environmental Justice*

The proposed project involves preparing the Anderson Tract for future residential development by clearing woodland vegetation. The proposed project could have a temporary positive effect on the local job market as work crews are hired to complete the work. Ultimately, development of the Anderson Tract for residential purposes could increase the average size of the local population (currently at 37 people per square mile), but is not likely to effect the racial, ethnic, or income distribution of the population. On an individual project level, the proposed project could have economic implications for the current and future landowners.

No Action Alternative

Under No Action, the landowner may choose to delay the development of the Anderson Tract. The delay could cause the landowner to miss an opportunity to sell the land to a home builder and result in an undesirable economic loss of moderate intensity. The No Action alternative is not anticipated to result in adverse impacts related to Environmental Justice. The proposed project is not located in a low-income area or in an area with a minority population comprising over half of the population (BCAD 2012a, 2012b). Therefore, a disproportionate burden is not expected to fall upon low-income or minority communities as a result of the proposed project.

For the local and regional population, the No Action alternative would have only a minor effect on the total population and a negligible effect on the demographics of the population. The employment of work crews to clear the land would have a negligible effect on the local economy.

Proposed Action Alternative

The Proposed Action is not anticipated to result in adverse impacts related to Environmental Justice. The proposed project is not located in a low-income area or in an area with a minority population comprising over half of the population (BCAD 2012a, 2012b). Therefore, a disproportionate burden is not expected to fall upon low-income or minority communities as a result of the proposed project.

As with the No Action alternative, the Proposed Action would have only a negligible effect on the population, demography, and economy of the local or regional area.

Lower Mitigation Alternative

The Lower Mitigation alternative is not anticipated to result in adverse impacts related to Environmental Justice. The proposed project is not located in a low-income area or in an area with a minority population

comprising over half of the population (BCAD 2012a, 2012b). Therefore, a disproportionate burden is not expected to fall upon low-income or minority communities as a result of the proposed project.

As with the No Action alternative, the Lower Mitigation alternative would have only a negligible effect on the population, demography, and economy of the local or regional area.

5.3.8. Land Use

The proposed project could contribute to a shift from a predominantly rural environment to a suburban environment.

No Action Alternative

While it would be delayed by an undetermined number of years, eventually it is expected the currently undeveloped and vacant Anderson Tract would be cleared and likely sold for future development as a residential subdivision. Land uses in the vicinity of the Anderson Tract are already shifting from rural farming and rangeland to suburban residential uses. The No Action alternative would have a negligible effect on the mix of land uses in the region.

Proposed Action Alternative

Under the Proposed Action alternative, the transition from rural to suburban would happen within several years or the time necessary for the developer to complete the construction of the residential subdivision. The local area is already undergoing a transition from rural to suburban; therefore the Proposed Action Alternative would have negligible impacts on changing land uses in Bexar County.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in similar effects on land uses as the Proposed Action alternative, including negligible beneficial and adverse effects.

5.3.9. Climate Change

It is possible that the global climate may be affected by the use of equipment and machinery to clear vegetation and vehicles to transport materials and workers to and from the site. These types of machines generate some level of greenhouse gas emissions. All three of the major greenhouse gases: carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O); are produced by the burning of fossil fuels used to run heavy equipment, heavy and light trucks, and passenger vehicles.

No Action Alternative

The proposed land clearing activities would be delayed under the No Action alternative, but are expected to ultimately proceed. Therefore, it is inevitable that some level of greenhouse gases would be emitted through the operation of land clearing-related equipment onsite and the operation of worker and supply vehicles traveling to and from the Anderson Tract. However, the contribution of these emissions to projections of global climate change is immeasurably small and ultimately negligible.

Proposed Action Alternative

The Proposed Action alternative would have similarly negligible effects on global climate as the No Action alternative.

Lower Mitigation Alternative

The Lower Mitigation alternative would result in the same impacts to the global climate as the Proposed Action alternative.

5.4. Cumulative Effects Analysis

The CEQ defines cumulative impacts as the incremental impacts of multiple actions (in the past, present, and future), that can be individually minor, but collectively may have significant effects. Cumulative effects can be further defined as the total effects of the multiple developments and their interrelationships on the environment. This section considers the effects of past, present, and future developments and activities that have been authorized, are under review, or can reasonably be anticipated within the project area. Developments or projects are considered concurrently with the effects of this proposed action. All proposed actions may contribute to the cumulative effects of such activities not only on special status species, but also on society and the human environment within the project area. Cumulative effects of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource, no matter what entity (federal, non-federal, or private) is taking the action.

An analysis for the draft *Southern Edwards Plateau Habitat Conservation Plan (SEP-HCP)* estimated forest land cover across Bexar, Comal, Blanco, Kendall, Kerr, Bandera, and Medina counties at nearly 659,000 acres of forest (based on models of potential GCWA habitat) (Loomis Partners, Inc. 2011). This analysis also projected land development activities over the next 30 years within these 7 counties will result in the loss of approximately 51,000 acres of potential GCWA habitat (i.e., forest cover similar to that present on the Anderson Tract). However, more than 607,500 acres of forested habitat are projected to remain unaffected in the region, over that same period. Therefore, the cumulative losses of vegetation communities similar to those occurring on the Anderson Tract over the next 30 years are projected to affect less than 8 percent of the currently available forest vegetation.

This loss of forest may alter the natural composition and stability of native wildlife communities. The potential significance of this shift is likely to be minor given the current mix of rural and urban land uses already present in the area. Additionally, ambient noise in the local vicinity of the Anderson Tract would be expected to increase over time as the area becomes more developed and traffic on area roads increases. However, much of this transition is already underway and no new highways or primary arterials are currently planned for the area (City of San Antonio 2011). Therefore, the cumulative effects of the proposed project on ambient noise are expected to be negligible.

The potential cumulative effects to water resources in northwest Bexar County are likely to be minor given the existing state and federal protections for these resources. Additionally, the federal Clean Air Act requires monitoring and regulation to ensure that air quality meets federal standards. Therefore, significant adverse cumulative effects to air quality are not expected.

The cumulative socioeconomic effects of the proposed project are expected to be minor for the local and regional scales. Additionally, effects are not anticipated to result in adverse impacts related to Environmental Justice. The proposed project is not located in a low-income area or in an area with a minority population comprising over half of the population (BCAD 2012a, 2012b). Therefore, a disproportionate burden is not expected to fall upon low-income or minority communities.

Cumulatively, the effects of future population growth in northwest Bexar County are expected to result in increased development with a moderate adverse effect on the human environment. However, there are many existing conservation measures that have occurred within the project area that protect many

thousands of acres of natural areas, parks, preserves, greenbelts and open spaces. Therefore, the region will retain a mix of developed and undeveloped land uses over time.

Based on projections made by the IPCC (2007), climate conditions in the region are expected to become warmer and drier. By the year 2050, the average annual temperature in the region could increase by 3.6 to 4.5 °F. Average annual precipitation is predicted to decrease little in the northwestern portion of Bexar County, but could decrease by as much as seven inches or more per year in the southeastern portion of Bexar County (IPCC 2007). The potential significance of these changes to the human environment is not well understood at this time.

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