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Anderson Tract Habitat Conservation Plan

Prepared for

Anaqua Springs Ranch, Inc.

Prepared by

SWCA Environmental Consultants

FINAL June 2014

ANDERSON TRACT
HABITAT CONSERVATION PLAN

Prepared for

Anaqua Springs Ranch, Inc.
325 E Sonterra Boulevard, Suite 210
San Antonio, Texas 78258
Attn: Tom Dreiss
(210) 241-7693

Prepared by

Amanda Aurora, Senior Scientist / Project Manager

SWCA Environmental Consultants
4407 Monterey Oaks Boulevard
Building 1, Suite 110
Austin, Texas 78749
(512) 476-0891
www.swca.com

SWCA Project No. 25549

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EXECUTIVE SUMMARY

Anaqua Springs Ranch, Inc. (Applicant), is seeking authorization under Section 10(a)(1)(B) of the federal Endangered Species Act of 1973, as amended (ESA), for the incidental taking of the endangered golden-cheeked warbler (GCWA) (*Setophaga chrysoparia*). This habitat conservation plan (HCP) supports an application for an ESA Section 10(a)(1)(B) incidental take permit from the U.S. Fish and Wildlife Service (USFWS). The proposed permit would have a term of ten years from the date of issuance.

The proposed taking would be incidental to the otherwise lawful development of approximately 60.7 acres of land located in northwestern Bexar County, Texas, known as the Anderson Tract. The Applicant requests authorization for the incidental taking of GCWAs associated with the destruction or modification of approximately 60.7 acres of GCWA habitat within the Anderson Tract. Some of this habitat is subject to existing impacts from adjacent developed land uses or recent vegetation changes likely due to extreme drought. The destruction or modification of this habitat is expected to harm no more than two or three individual GCWAs. The impacts of this requested taking may be considered minor with respect to the range-wide, regional, and local status of the GCWA.

To minimize and mitigate for the impacts of the requested taking on the GCWA, the Applicant proposes to: (1) avoid directly taking GCWAs by conducting initial clearing activities during periods when the species is not present in the area; (2) minimize potential indirect habitat effects by taking steps to prevent the spread of oak wilt; and (3) mitigate for destruction or modification of GCWA habitat by purchasing 60.7 GCWA conservation credits backed by high quality GCWA habitat from a USFWS-approved conservation bank with a service area that includes the Anderson Tract.

1. INTRODUCTION AND BACKGROUND

1.1. Overview

Anaqua Springs Ranch, Inc. (Applicant), is seeking authorization under Section 10(a)(1)(B) of the federal Endangered Species Act of 1973, as amended (ESA), for the incidental taking of the endangered golden-cheeked warbler (GCWA) (*Setophaga chrysoparia*)[1]. The proposed taking would be incidental to the otherwise lawful development of approximately 60.7 acres of land located in northwestern Bexar County, Texas, known as the Anderson Tract (Figure 1). This habitat conservation plan (HCP) supports an application for an ESA Section 10(a)(1)(B) incidental take permit from the U.S. Fish and Wildlife Service (USFWS).

1.2. Regulatory Framework

Section 9 of the ESA prohibits *take* of any federally listed endangered wildlife species (16 United States Code [USC] 1538(a)). As defined by the ESA, *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."

Section 10(a)(1)(B) of the ESA (16 USC 1539(a)(1)(B)), authorizes the USFWS to issue a permit allowing take of federally listed threatened or endangered species providing that the taking is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10(a)(2)(A) of the ESA provides that the USFWS must issue an incidental take permit if the applicant meets several substantive criteria, including that the applicant submit a conservation plan that specifies: (1) the impact that will likely result from the taking; (2) the steps the applicant will take to minimize and mitigate the impacts and the funding available to implement those steps; (3) the alternative actions to the taking that were considered and the reasons the alternatives were not chosen; and (4) other measures that the USFWS may require as necessary or appropriate for purposes of the conservation plan (16 USC 1539(a)(2)(A)).

The USFWS's "*Habitat Conservation Planning and Incidental Take Permit Processing Handbook*" (HCP Handbook) also provides guidance on the elements of a habitat conservation plan (USFWS and National Marine Fisheries Service [NMFS] 1996). The USFWS published a final policy addendum to the HCP Handbook in 2000 known as the "five point policy" that provides further guidance for the USFWS and permit applicants regarding the development of HCPs (USFWS 2000). The five point policy addresses the consideration of biological goals and objectives, adaptive management, monitoring, permit duration, and public participation in HCPs, within the limits of federal law and regulation pertaining to the conservation of threatened or endangered species.

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*.

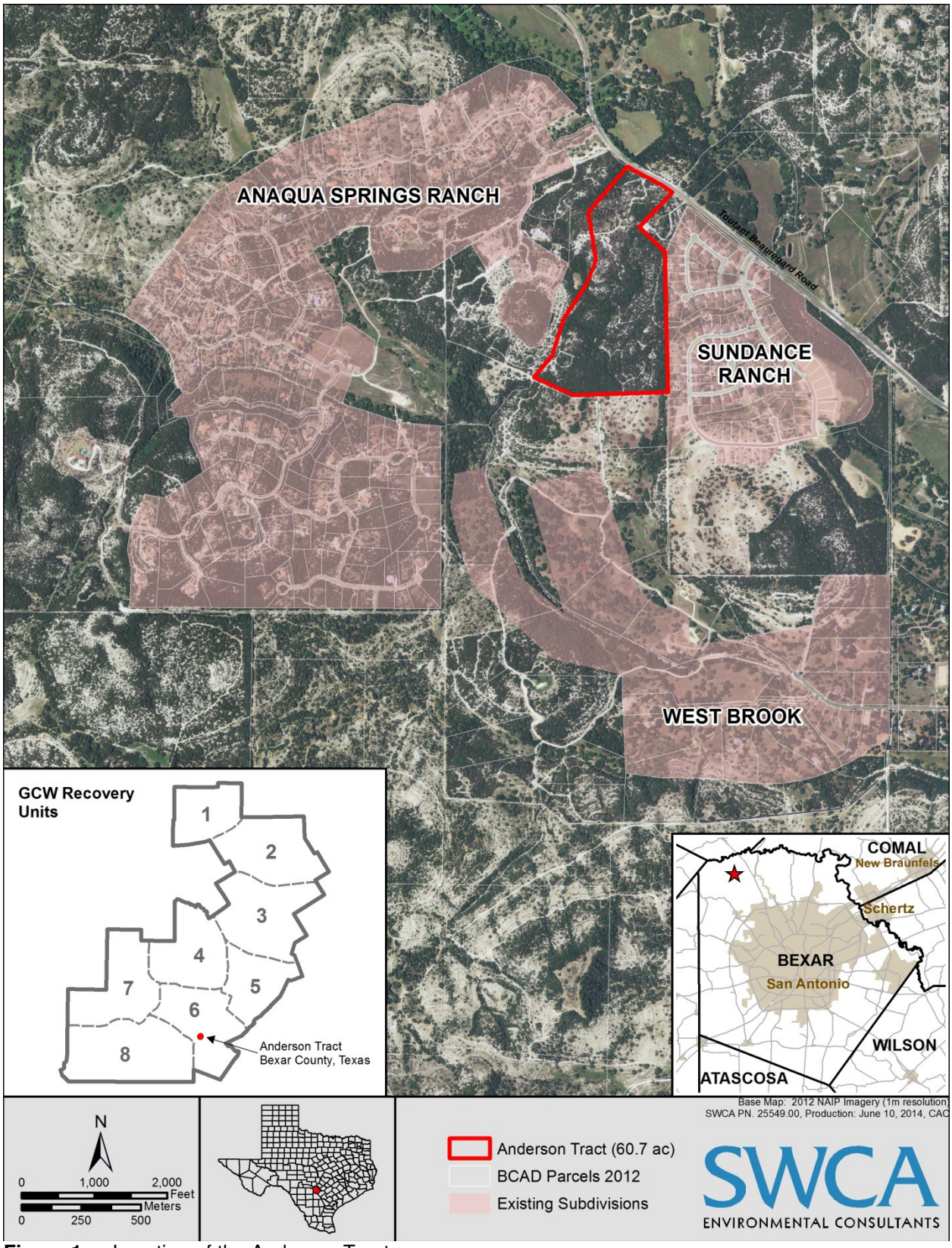

Figure 1. Location of the Anderson Tract

2. PLAN AREA AND COVERED ACTIVITIES

The Anderson Tract is approximately 60.7 acres located along Toutant Beauregard Road in northwest Bexar County, Texas, between the existing Anaqua Springs Ranch and Sundance Ranch subdivisions (Figure 1). The extent of the Covered Activities, described in the following paragraph, is limited to the boundary of the Anderson Tract. The Anderson Tract defines the limits of the Plan Area for the HCP and the Permit Area for the requested incidental take permit.

The activities covered by this HCP involve the otherwise lawful construction of a residential subdivision within the Anderson Tract. The Covered Activities include the removal or modification of vegetation in preparation for construction and the construction of approximately 60, one-acre residential lots and associated infrastructure. The Applicant has not yet established the final layout or design of the proposed development, but construction activities will likely affect the entire property. The Applicant will conduct the Covered Activities in accordance with all applicable local, state, and federal regulations.

3. COVERED SPECIES

This HCP supports a proposed permit that would authorize a certain amount of incidental take of the GCWA (the Covered Species). The GCWA was listed as federally endangered on May 4, 1990 and the USFWS identifies habitat loss and habitat fragmentation as the primary threats to the species (USFWS 1992). This federally endangered migratory songbird uses relatively mature and closed-canopy juniper-oak woodlands in central Texas as breeding habitat during the spring and early summer months.

A list of the special status species occurring in Bexar County is provided in Table 1. These species are protected under state or federal endangered species regulations or are species that are under consideration for such protection. Aside from the GCWA, no other federally listed species, or candidates for such listing, are known or suspected to occur within the Anderson Tract due to a lack of appropriate habitat (Table 1). Therefore, no other federally listed species are covered by this HCP.

Table 1. Special Status Species Occurring in Bexar County, Texas

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Subject Property
AMPHIBIANS			
Cascade Caverns salamander (*Eurycea latitans complex*)	ST	Springs and caves in the Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area	None – Subject Property lacks aquatic habitat and does not occur within the Edwards Aquifer
Comal blind salamander (*Eurycea tridentifera*)	ST	Springs and waters of caves	Highly Unlikely – Subject Property is not associated with any known aquatic cave systems
BIRDS			
American peregrine falcon (*Falco peregrinus anatum*)	ST	Year-round resident and local breeder in west Texas; occupies wide range of habitats during migration	Highly Unlikely – Subject Property offers no breeding habitat or unique migratory habitat (such as landscape edges)
Black-capped vireo (*Vireo atricapilla*)	FE/SE	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover	None – Vegetation structure on the Subject Property is not representative of suitable vireo habitat

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Subject Property
Golden-cheeked warbler (*Setophaga chrysoparia*)	FE/SE	Juniper-oak woodlands	Known – See Section 4.1.3
Interior least tern (*Sterna antillarum athalassos*)	FE/SE	Nests along sand and gravel bars within braided streams, rivers; eats small fish and crustaceans	None – Subject Property lacks aquatic or riparian habitat
Sprague's pipit (*Anthus spragueii*)	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 – Subject Property lacks coastal or inland grassland vegetation
White-faced ibis (*Plegadis chihi*)	ST	Prefers freshwater marshes, sloughs, and irrigated rice fields	None – Subject Property lacks aquatic or wetland habitats
Whooping crane (*Grus americana*)	FE/SE	Potential migrant via plains throughout most of state to coast	Highly Unlikely – Subject Property lacks migratory stop-over or feeding habitats
Wood Stork (*Mycteria americana*)	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 – Subject Property lacks aquatic or wetland habitats
Zone-tailed hawk (*Buteo albonotatus*)	ST	Arid open country, including open deciduous or pine-oak woodland	None – Subject Property lacks appropriate woodland vegetation
FISHES			
Toothless blindcat (*Trogloglanis pattersoni*)	ST	Endemic to the San Antonio Pool of the Edward's Aquifer	Highly Unlikely – Subject Property is not associated with any known aquatic cave systems
Widemouth blindcat (*Satan eurystomus*)	ST	Endemic to the San Antonio Pool of the Edward's Aquifer	Highly Unlikely – Subject Property is not associated with any known aquatic cave systems

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Subject Property
KARST INVERTEBRATES			
Bexar County Endangered Karst Invertebrates: • Bracken Bat Cave meshweaver (*Cicurina venii*) • Government Canyon Bat Cave meshweaver (*C. vespera*) • Madla Cave meshweaver (*C. madla*) • Robber Baron Cave meshweaver (*C. baronia*) • Government Canyon Bat Cave spider (*Neoleptoneta microps*) • Cokendolpher cave harvestman (*Texella cokendolpheri*) • Ground Beetles (*Rhadine exilis* and *R. infernalis*) • Helotes mold beetle (*Batrisodes venyivi*)	FE	Karst features in north and northwest Bexar County	None – Subject Property is located in USFWS Karst Zone 5 (areas not known to be habitat for listed karst invertebrates)
MAMMALS			
Black bear (*Ursus americanus*)	ST	Bottomland hardwoods and large tracts of inaccessible forested areas	None – Subject Property lacks suitable habitats and is located in a partially developed landscape
Gray wolf (*Canis lupus*)	FE/SE	Formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	None – Extirpated from Texas
Red wolf (*Canis rufus*)	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 (*Quadrula mitchelli*)	ST	Probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble	None – Subject Property lacks aquatic habitat
Golden orb (*Quadrula aurea*)	C/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 – Subject Property lacks aquatic habitat
Texas fatmucket (*Lampsilis bracteata*)	C/ST	Streams and rivers on sand, mud, and gravel substrates; Colorado and Guadalupe River basins	None – Subject Property lacks aquatic habitat
Texas pimpleback (Quadrula petrina)	C/ST	mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins	None – Subject Property lacks aquatic habitat

Species Name	Listing Status*	Habitat Characteristics	Likely Occurrence on Subject Property
REPTILES			
Texas horned lizard (*Phrynosoma cornutum*)	ST	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees	Highly Unlikely – Subject Property is densely vegetated with juniper-oak woodlands
Texas indigo snake (*Drymarchon melanurus erebennus*)	ST	Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors	None – Subject Property lands riparian habitat or thornbush-chaparral woodlands
Texas tortoise (*Gopherus berlandieri*)	ST	Open brush with a grass understory is preferred	None – Subject Property lacks suitable habitat
Timber/Canebrake rattlesnake (*Crotalus horridus*)	ST	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay	None – Subject Property lacks appropriate habitats
PLANTS			
Bracted twistflower (*Streptanthus bracteatus*)	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 – Subject Property 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.

* FE = Federally Endangered; FT = Federally Threatened; C = Federal Candidate for Listing; SE = State Endangered; ST = State Threatened

3.1. Golden-cheeked Warbler Habitat Conditions

Prior environmental documentation pertaining to the Anderson Tract includes GCWA surveys conducted by Pape-Dawson Engineers in 2011 and 2012 (Pape-Dawson Engineers, Inc. 2011, 2012). Pape-Dawson Engineers performed these investigations within a survey area that included all 60.7 acres of the Anderson Tract in 2011 and 37 acres of the Anderson Tract in 2012 (Figure 2). The Pape-Dawson investigators described the woodland vegetation within the survey area as generally having the following characteristics (Pape-Dawson Engineers, Inc. 2011, 2012):

- Tree canopy with approximately 85 % to 90% closure;
- Tree canopy height ranging from approximately 15 feet to 40 feet above the ground; and
- Tree canopy composed of approximately 70% to 80% Ashe juniper (*Juniperus ashei*), with the remaining canopy composed of primarily netleaf hackberry (*Celtis reticulata*), Texas oak (*Quercus texana*), and cedar elm (*Ulmus crassifolia*).

The vegetation described by Pape-Dawson Engineers is consistent with the definition of suitable GCWA habitat provided by Campbell (2003), which the USFWS relies upon for habitat assessments (USFWS 2010).

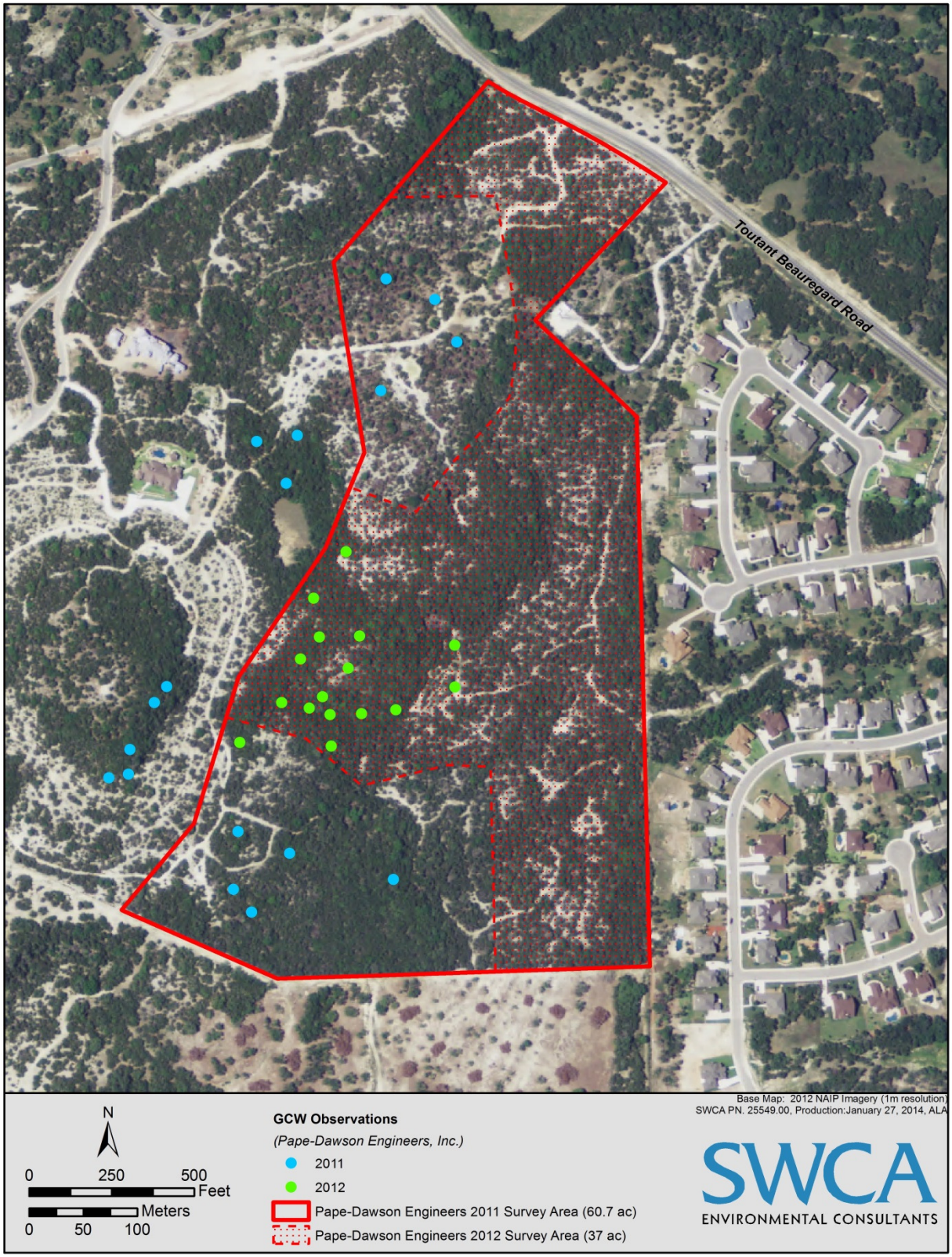

Figure 2. Prior GCWA Survey Data

However, aerial imagery indicates that 8.2 acres of the Anderson Tract has become more open in recent years (Figure 3), with an apparent reduction in cover of live tree cover from at least 70% in 2009 to 35% in 2012 (Figure 4). This analysis also indicates that the overall closure of the woodland canopy across the Anderson Tract was 73% at the time of the 2012 aerial imagery; which is still within the range known to be used by the GCWA, but lower than the estimates provided by Pape-Dawson Engineers (2011, 2012).

In any case, a review of site conditions and landscape context indicate that all of the Anderson Tract provides habitat for the GCWA, albeit with varying degrees of suitability or quality.

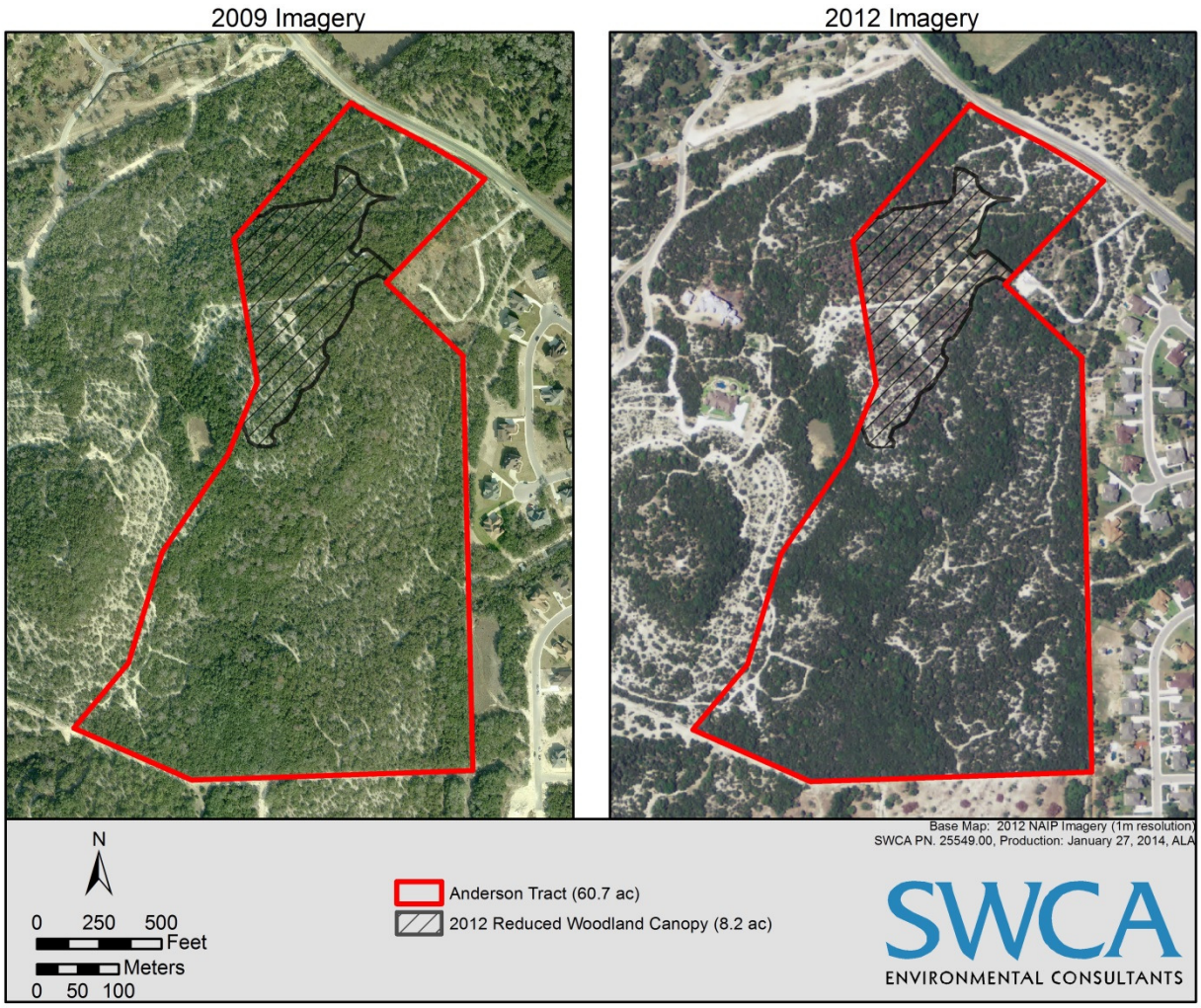

Figure 3. Comparison of Vegetation Conditions 2009 – 2012

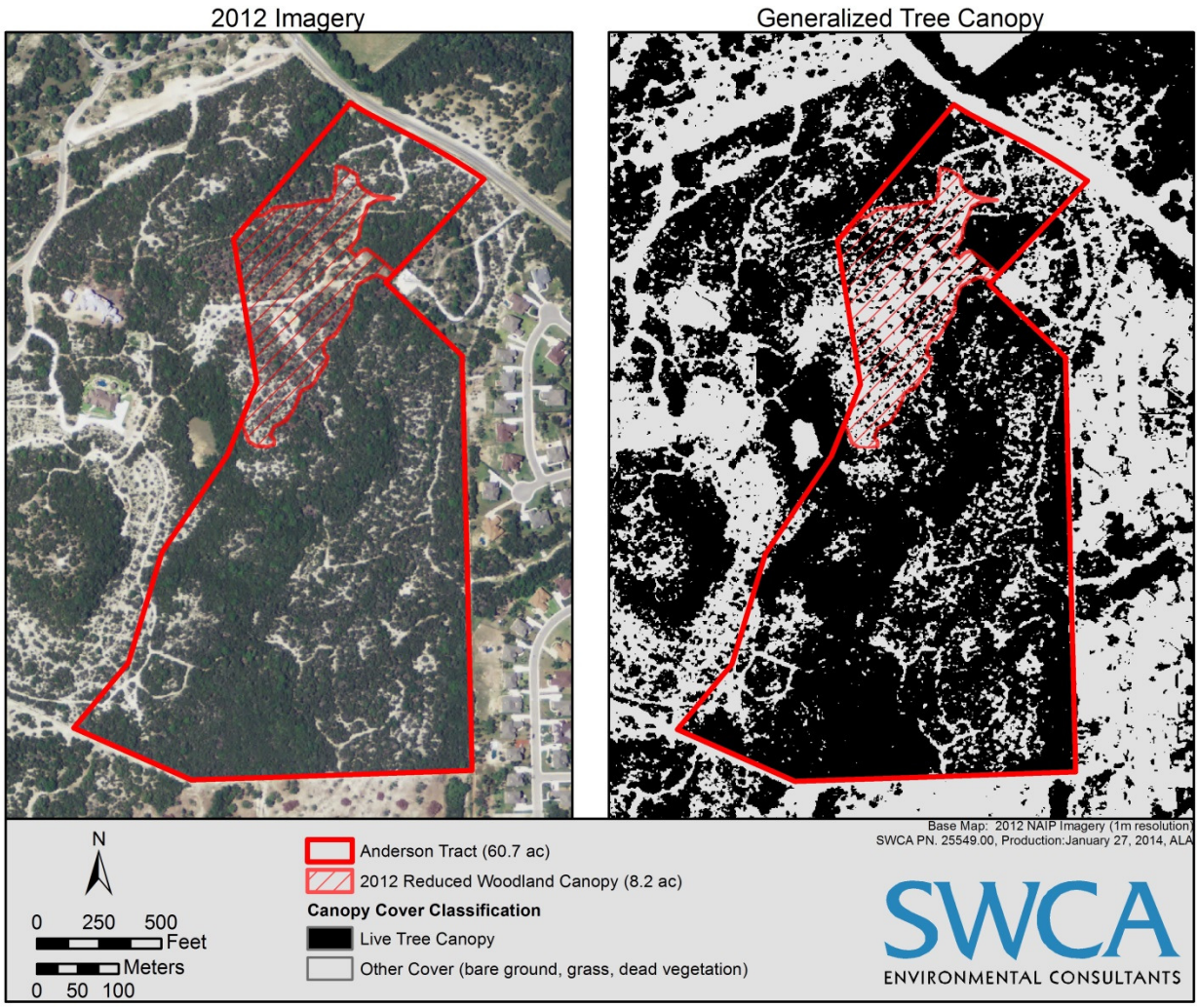

Figure 4. Canopy Cover Classification from 2012 Aerial Imagery

3.2. Golden-cheeked Warbler Survey Data

Pape-Dawson Engineers conducted surveys of all or part of the Anderson Tract for the presence or absence of the GCWA in 2011 and 2012 (Pape-Dawson Engineers, Inc. 2011, 2012) and reports that these surveys were conducted in accordance with the appropriate USFWS protocols. These surveys documented the presence of GCWAs within and adjacent to the Anderson Tract (Figure 2) and the survey reports conclude that these observations were associated with two or three GCWA territories (Pape-Dawson Engineers, Inc. 2011, 2012). Neither of the Pape-Dawson Engineers survey reports indicates the sex or age of the GCWA individuals observed. It is not known if or to what extent actual GCWA pairing, nesting, or fledging activities occurred on the Anderson Tract.

4. INCIDENTAL TAKE AND IMPACTS

4.1. Incidental Take Request

The Applicant requests authorization for the incidental taking of GCWAs associated with the destruction or modification of up to 60.7 acres of GCWA habitat within the Anderson Tract. The destruction or

modification of this habitat is expected to harm GCWAs associated with approximately two or three territories located within or partially within the boundary of the Anderson Tract. The applicant requests an incidental take permit with a duration of ten years from issuance.

4.2. Impacts of the Taking

The impacts of the proposed incidental take of the GCWA from the Covered Activities are expected to be minor. For the purpose of describing the anticipated impacts of the taking in this HCP, the Applicant defines minor impacts as those that may have detectable effects on individual GCWAs but that would not reasonably be expected to significantly influence the status of the species.

The Applicant's rationale for this conclusion is based on: 1) the proposed initial clearing activities will be confined to the non-breeding season when the GCWA is not present on the property, thereby avoiding direct effects to the small number of individual GCWAs that have been documented using the property and 2) off-site impacts from adjacent land uses and other recent reductions in canopy cover have reduced habitat quality within the Anderson Tract. These points are further clarified in the following sections.

4.2.1. Avoidance of Direct Effects and Small Number of Affected Individuals

Available survey data provides evidence that the Anderson Tract supports (at least as of 2012) two or three territorial GCWA males. Breeding activity, indicated by the presence of female GCWAs or fledged juveniles, was not detected during either survey. Studies on the biology of the GCWA have shown that the observation of territorial activity by GCWA males is not certain to be associated with actual pairing or reproductive success. As summarized by Groce et al. (2010), published estimates of pairing success for GCWAs at Camp Bullis (located approximately eight miles southeast of the Anderson Tract) varied from 6% to 64%. Pairing success at the Balcones Canyonlands National Wildlife Refuge (located largely in Burnet County approximately 75 miles northeast of the Anderson Tract) pairing success ranged from 50% to 66%. Groce et al. (2010) also summarized estimates of GCWA reproductive success of 34% to 82% for sites managed by the City of Austin and Travis County. Furthermore, Coldren (1998) documented that only 12 of 49 GCWA territories (24%) in "small" habitat patches similar in scale to the Anderson Tract (i.e., less than 79 acres) appeared to fledge young. Coldren (1998) also reported that proximity to residential land uses, which is the landscape in which the Anderson Tract occurs, is correlated with lower GCWA pairing and reproductive success. Therefore, based on a review of the best available information, the Covered Activities are only reasonably certain to affect at most three male GCWAs that were actually detected using the Anderson Tract in 2011 or 2012.

By observing seasonal clearing restrictions, the Applicant will avoid the potential for direct take of any GCWAs that might otherwise be present within or adjacent to the Anderson Tract when vegetation is being removed or modified. Any GCWAs that previously used modified habitats within the Anderson Tract will have the opportunity to find replacement habitats elsewhere in the area. Breeding season surveys for GCWAs routinely demonstrate areas of occupied and unoccupied habitat within survey areas, without an obvious indication of any differences in the used and unused areas, demonstrating that GCWAs do not fully saturate available habitat (Pulich 1976). Therefore, it is possible that the displaced individuals may still be able to conduct essential breeding, feeding, and sheltering activities in replacement habitats elsewhere with the same or, possibly even improved, levels of success. Therefore, the opportunity for displaced GCWA individuals to successfully relocate to other habitats reduces the potential magnitude of potentially adverse impacts to the species.

While lethal take of GCWAs is not expected to occur as a result of the Covered Activities, we evaluate the possibility as a potential "worst-case scenario" to further demonstrate that the impacts of the Applicant's requested taking are expected to be minor. As described previously, only three GCWA males are reasonably certain to use the Anderson Tract. Evidence of pairing and reproductive success associated with these individuals is lacking and, as described previously, these activities have a relatively low probability of occurrence, particularly for similarly situated properties. SWCA (2007) estimated the GCWA population by county across the range of the species and this work represents the most conservative recent estimate of the size of the GCWA population. SWCA (2007) estimates a population of 432 adult males in Bexar County (approximating the local population), 4,380 adult males in Bexar, Comal, Kendall, and Kerr counties (approximating the regional population), and 20,000 to 27,000 adult males range-wide. Three individual GCWAs represent approximately 0.69 percent, 0.07 percent, and 0.02 percent of the estimated populations, respectively. As the estimated survival probability for adult male GCWAs is already approximately 57 to 69 percent (Groce et al. 2010), the loss of these individuals, if they were not able to relocate to other habitat, would not significantly contribute to any decline in the status of the GCWA. This is especially true if the male GCWAs associated with the Anderson Tract do not successfully breed in habitat within the Anderson Tract, which has not been demonstrated to occur and is otherwise relatively unlikely considering the quality and context of the habitat.

4.2.2. Existing Habitat Impacts

Suitable habitat areas along the edge of Toutant Beauregard Road and the Sundance Ranch subdivision were not shown to be used by the species in either 2011 or 2012, even though these areas were included in the surveyed area both years. As shown in Figure 5, approximately 16.5 acres of the Subject Property (approximately 27% of the total) is within 300 feet of these existing off-site disturbances. These external disturbances have likely decreased the quality of the habitat to the point where these acres do not provide full functional value to the species.

Since the time of the 2011 GCWA surveys by Pape-Dawson Engineers, habitat conditions on a portion of the Anderson Tract appear to have changed. An analysis of aerial imagery from 2009 and 2012 suggests that the density of the woodland tree canopy has been reduced within approximately 8.2 acres of the Anderson Tract from at least 70% in 2009 to 35% in 2012 (Figures 3 and 5). Severe drought conditions during 2011 directly or indirectly contributed to the death of millions of trees across central Texas and affected approximately 6.6 percent of the overall woodland canopy in the region (Texas A&M Forest Service 2012). As evidenced by the noticeable decline of habitat provided in Figure 3, drought conditions may have similarly affected woodlands on the Anderson Tract and reduced canopy cover in the affected area to a level that is likely to have degraded the quality of that previously occupied habitat.

Figure 5. Existing Habitat Impacts

5. CONSERVATION PROGRAM

Applicants for an incidental take permit must demonstrate to the USFWS that they will "minimize and mitigate the impacts of the taking to the maximum extent practicable" (16 USC 1539). When determining whether or not an applicant has met this statutory issuance criteria, USFWS typically considers both the adequacy of the proposed conservation measures and whether or not the proposed measures are the maximum that can be practically implemented by the applicant (USFWS and NMFS 1996).

5.1. Biological Goals and Objectives

The biological goals and objectives of this HCP are: (1) to avoid directly taking GCWAs by conducting Covered Activities during periods when the species is not present in the area; (2) to minimize potential indirect habitat effects by taking steps to prevent the spread of oak wilt; and (3) to mitigate for the loss of GCWA habitat within the Anderson Tract to the maximum extent practicable by securing high quality GCWA habitat with long-term conservation value to the species elsewhere.

To achieve these goals and objectives, the Applicant proposes to implement the conservation measures described in the following sections.

5.2. Seasonal Clearing Restrictions

The Applicant will not conduct clearing of vegetation during the GCWA breeding season, defined as March 1 through July 31, to avoid directly taking GCWAs that may be utilizing habitat within the Anderson Tract. No removal of woody vegetation within the Anderson Tract that would cause the destruction or modification of GCWA habitat will occur during this period.

5.3. Oak Wilt Prevention

During the conduct of Covered Activities, the Applicant will direct its contracted work crews to follow the Texas Forest Service or professional arborist's guidelines for the prevention of oak wilt. The Texas Forest Service recommends eliminating diseased red oaks, handling firewood properly, and painting wounds on healthy oaks to prevent the spread of oak wilt. According to the Texas Forest Service, all wounding of oaks (including those caused by trimming, limbing, and pruning) should be avoided from February through June. This timeline is generally consistent with the seasonal clearing restrictions previously described. The least hazardous periods for trimming are during the coldest days in midwinter and extended hot periods in mid- to late summer. Regardless of season, all trimming cuts or other wounds to oak trees, including freshly-cut stumps and damaged surface roots, should be treated immediately with a wound or latex paint to prevent exposure to contaminated insect vectors.

5.4. Purchase of Conservation Credits

To offset the incidental take of GCWA, the Applicant will purchase GCWA conservation credits from a USFWS-approved conservation bank with a service area that includes the Anderson Tract. Habitats within the Anderson Tract that are subject to pre-existing adverse conditions are shown on Figure 5 (Section 4.2.2) and the adjusted habitat impact acreages considered for areas with existing impacts are summarized in Table 2. These pre-existing adverse conditions include the effects of off-site impacts (estimated to extend 300 feet from the edge of the disturbance) and recent canopy loss that has

substantially degraded the habitat quality. Within the 60.7 acre Anderson Tract, a total of 12.2 acres is considered to have pre-existing adverse conditions impacting the quality of GCWA habitat leaving 48.5 acres of adjusted habitat that is expected to be impacted within the Anderson Tract (Table 2).

Table 2. Adjusted Habitat Impact Acres Considering Discounts for Partial Take

Habitat Category	Acres	Discount for Existing Partial Take	Adjusted Habitat Impact Acres
No Existing Impacts	36.2 ac	0%	36.2 ac
Existing Impacts from Adjacent Land Uses	16.5 ac	50%	8.3 ac
Existing Impacts from Canopy Reduction[1]	8.0 ac	50%	4.0 ac
TOTAL	**60.7 ac**	**n/a**	**48.5 ac**

1 A portion of the area affected by recent canopy reduction (0.2 ac) overlaps with the zone of existing impacts from adjacent land uses. The acreage in this table has been adjusted to avoid double counting the overlap.

If the acres of habitat facing pre-existing adverse conditions are considered already partially taken by 50 percent, which the USFWS has accepted in similar circumstances, then the effective mitigation ratio proposed by the Applicant is 60.7ac:48.5ac or 1.25:1, meaning for every acre impacted the Applicant will preserve 1.25 acres of high quality GCWA habitat. The ratio of mitigation to habitat impact proposed by the Applicant exceeds a 1:1 ratio when considering the effects of the pre-existing adverse conditions present (i.e., off-site impacts and canopy loss).

USFWS-approved conservation banks have been entitled by the USFWS to provide mitigation for impacts that occur within their service areas. The USFWS' standards for conservation banks ensure that the quality of this off-site mitigation is high and provides long-term value to the target species (see USFWS 2003). At the time of this writing, two conservation banks were in operation with a service area applicable to the Anderson Tract and GCWA credits available for purchase: Bandera Corridor Conservation Bank (BCCB) (U.S. Army Corps of Engineers 2013) and the Festina Lente Conservation Bank. Both banks provide GCWA conservation credits backed by exceptionally high quality habitat that is permanently protected, managed, and monitored for the long-term benefit of the species. These banks protect several thousand acres of GCWA habitat that is adjacent or near to other protected properties with GCWA habitat. Together this cluster of protected properties forms a focal area for GCWA conservation that contributes substantially to the recovery of the species.

Other suitable conservation banks may become available prior to the start of Covered Activities and could also provide GCWA conservation credits for the Applicant; the Applicant is not obligated to purchase credits from any particular bank. Other USFWS-approved conservation banks would be expected to provide similarly high conservation value to the GCWA.

The analysis in Section 4 demonstrates that the expected impacts of the proposed loss of habitat will be minor with respect to the local, regional, and range-wide GCWA population. The HCP Handbook states that mitigation for an HCP should be based on sound biological rational, be practicable, and be commensurate with the impacts of the taking (USFWS and NMFS 1996: pg 3-19). The HCP Handbook also states that "no explicit provision of the ESA or its implementing regulations requires that an HCP must result in a net benefit to affected species" (USFWS and NMFS 1996: pg 3-21). The Applicant believes that providing for the perpetual conservation of 60.7 acres of high-quality, occupied habitat with

species-specific management is adequate to balance the impacts of the proposed taking, in accordance with USFWS policy documented in the HCP Handbook.

The HCP Handbook advises (USFWS and NMFS 1996: pg 7-3):

> … where the adequacy of the proposed mitigation is a close call, the record must contain some basis to conclude that the proposed program is the maximum that can be reasonably required by that applicant. This may require weighing the costs of implementing additional mitigation, benefits and costs of implementing additional mitigation, the amount of mitigation provided by other applicants in similar situations, and the abilities of that particular applicant.

The practicability of the proposed mitigation, in relation to the financial aspects of the Applicant's proposed project, is further described in the following paragraphs.

Prior to the initiation of Covered Activities, the Applicant will purchase GCWA conservation credits from a USFWS-approved conservation bank with a service area that includes the Anderson Tract. GCWA conservation credits will be purchased at the 1.25:1 impact ratio for a total purchase of 60.7 GCWA conservation credits. The proposed number of credits to be purchased, in conjunction with the previously stated minimization measures, will be both sufficient to adequately compensate for the minor impacts of the incidental taking and represent the maximum that can be practically implemented by the Applicant.

The decision to purchase 60.7 GCWA conservation credits at $5,000 per credit (a mitigation cost of $307,500; see Section 6 for more detail) is the maximum amount of mitigation practicable for the Applicant to implement. The Applicant's cost basis in the Anderson Tract includes consideration of both land costs and development costs. To be a practical transaction, the lot inventory resulting from the proposed project must be competitively priced for sale to a home builder and provide at least some financial return to the Applicant. Development costs include not only the costs to install streets and other infrastructure, but also the costs involved in obtaining local, state, and federal permits in accordance with applicable regulations (including compliance with the ESA). For low density developments, such as the proposed project, these costs are proportionately higher on a per lot basis than they would be for a higher density development. High density development is not practical for this property given the lack of public wastewater infrastructure that necessitates large lots that can accommodate on-site septic systems.

The cost basis for the Applicant's proposed project, excluding any allowance for profit, includes the following estimates:

- Land Cost Basis = approximately $32,500 per lot
- Development Cost Basis = approximately $45,000 per lot (includes anticipated costs for the proposed conservation measures as previously described)
- Total Cost Basis = $77,500 per lot

The Applicant has been negotiating the sale of developed lots to a home builder. The target purchase price for the interested home builder given the current housing market is $72,000 per lot. Therefore, the proposed conservation measures, including the costs already expended for species surveys and conservation planning, contribute substantially to the Applicant's cost basis for each lot. Given the constraints on development options and the current housing market, the anticipated mitigation cost is the maximum that the Applicant's proposed project can absorb and remain a viable business venture. The Applicant's total costs for developing each lot already exceeds the price that the target home builder is seeking to pay.

5.5. Adaptive Management

The USFWS published the final "five-point policy guidance" on June 1, 2000, as an addendum to the HCP Handbook (USFWS 2000). This policy established the USFWS's intent, where appropriate, to include adaptive management principles in the operating conservation program for an HCP to address uncertainty regarding natural resource management. For this conservation program, adaptive management will be the responsibility of the USFWS-approved third-party conservation bank providing GCWA conservation credits to the Applicant.

6. FUNDING PLAN

The Applicant has already funded and performed pre-activity studies (e.g., GCWA presence/absence surveys, habitat assessments, and canopy cover evaluations) of the Anderson Tract and will purchase conservation credits, as described in Section 5.4, prior to initiation of the Covered Activities. Additionally, the Applicant will minimize for potential GCWA impacts by conducting initial clearing activities during periods when the species is not present in the area and by taking steps toward preventing the spread of oak wilt. Implementation of the avoidance and minimization measures will be funded by the Applicant; although, costs are expected to be minimal since the measures involve only adjustments of project timing and methods. Therefore, there is no chance that incidental take will occur before the mitigation has been performed.

GCWA conservation credits from the BCCB currently sell for $5,000/credit (Jesse McLean, General Manager, Bandera Corridor Conservation Bank, personal communication to Amanda Aurora, SWCA Environmental Consultants, February 5, 2013). At this rate, the cost to purchase 60.7 GCW conservation credits could total approximately $307,500. The Applicant will cover all funding for minimization efforts and the purchase of conservation credits.

7. REPORTING AND COORDINATION

The Applicant will notify the USFWS of the initiation of Covered Activities in writing at least 10 business days prior to the start of work. With the notification, the Applicant will acknowledge that the Covered Activities will not occur during the period of March 1 through July 31 and that work crews have been instructed to observe oak wilt prevention practices. At this time, the Applicant will also provide the USFWS with proof of the purchase of 60.7 GCWA conservation credits from an approved conservation bank with a service area that covers the Anderson Tract.

8. PERMIT DURATION

The Applicant is seeking a renewable incidental take permit from USFWS with a term of ten years from the date of issuance. The requested permit term should be sufficient to implement the conservation program and complete the Covered Activities. However, in the event that the Covered Activities have not been completed before the expiration of the permit, the Applicant may request a renewal to extend the duration of the permit. To request a permit renewal, the Applicant must:

1. Have complied with the terms and conditions of the original permit, including reporting requirements;

2. File a written request for a permit renewal with the USFWS at least 30 days prior to the permit expiration date that references the permit number;

3. Certify that all statements and information presented in the original permit application are still correct or include a list of changes; and

4. Provide specific information concerning the amount of incidental take has occurred under the original permit and the amount of incidental take that remains unused.

If the Applicant files such a request at least 30 days prior to the permit expiration date, then the permit will remain valid while the request is being processed. If the Applicant fails to file a request at least 30 days prior to permit expiration, then the permit will become invalid on the original expiration date.

9. NO SURPRISES POLICY AND ASSURANCES

Under the *No Surprises Rule* (63 FR 8859, codified at 50 CFR 17.22, 17.32, 222.2), the Service assures incidental take permittees that, so long as an approved habitat conservation plan is being properly implemented, no additional land use restrictions or financial compensation will be required of the permittee with respect to the covered species (in this case, the GCWA). These assurances hold even if unforeseen circumstances arise after the permit is issued indicating that additional mitigation is needed. To the extent that changed circumstances are provided for in the habitat conservation plan, the permittee must implement the appropriate measures in response to the changed circumstances if and when they occur. The No Surprises Rule defines "changed circumstances" as "circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the Service and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)."

The Applicant and the USFWS agree that a changed circumstance will have occurred if, at the time the Applicant wishes to begin implementation of the covered activities, GCWA conservation credits from an USFWS-approved conservation bank with a service area covering the Anderson Tract are not available for purchase. The Applicant will notify the USFWS in writing if it finds that this circumstance has occurred and will request additional coordination with the USFWS to obtain authorization for another appropriate form of mitigation. Such alternate mitigation may include, but is not necessarily limited to, the following options:

1. purchase of GCWA conservation credits from a USFWS-approved conservation bank that might not include the Anderson Tract in its service area;

2. purchase of GCWA conservation credits from the Southern Edwards Plateau Habitat Conservation Plan or other regional habitat conservation plan; or

3. payment of an equivalent fee to another conservation entity, such as a land trust or conservation organization, to be used for the conservation of high quality, occupied habitat for the GCWA prior to the conduct of any authorized taking.

USFWS will consider alternate forms of mitigation and, if consistent with the scope and intent of the original mitigation proposal or the alternative options previously described, approval for an alternate form of mitigation will not be unreasonably withheld. The HCP Handbook affirms that "flexibility is needed in addressing the unique circumstances often associated with small landowners and small-scale, low-effect HCPs" (USFWS and NMFS 1996: pg 3-23). The scale of the Anderson Tract HCP is consistent with the type of project that should be considered for this flexibility, in accordance with published USFWS policy.

If additional conservation or mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in this HCP, the USFWS will not require any

conservation or mitigation measures in addition to those provided for in this HCP without the consent of the Applicant, provided that this HCP is being properly implemented.

"Unforeseen circumstances" are changes in circumstances affecting a species or geographic area covered by a habitat conservation plan that could not reasonably have been anticipated by plan developers and the USFWS at the time of the conservation plan's negotiation and development, and that result in a substantial and adverse change in the status of any covered species. The USFWS will have the burden of demonstrating that unforeseen circumstances exist and must base the determination on the best scientific and commercial data available. The USFWS shall notify the Applicant in writing of any unforeseen circumstances the USFWS believes to exist.

The No Surprises policy states that the USFWS may require additional conservation measures of an incidental take permittee as a result of unforeseen circumstances "only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible." The USFWS shall not require the commitment of additional land, water, or financial resources by the permittee without the consent of the permittee, or impose additional restrictions on the use of land, water, or other natural resource otherwise available for use by the permittee under the original terms of the incidental take permit. No Surprises assurances apply only to the species adequately covered by the habitat conservation plan (i.e., the GCWA), and only to those permittees who are in full compliance with the terms of their plan, permit, and other supporting documents, as applicable.

10. ALTERNATIVES ANALYSIS

Section 10(a)(2)(A) of the ESA requires that habitat conservation plans include a description of the "alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized." In this case, alternative development plans that would reduce the level of incidental take by fully or partially avoiding impacts to areas of known or potential habitat on the Anderson Tract are not practical due to the small size of the property and the already low likelihood of continued occupancy of this habitat patch. Therefore, this alternatives analysis only considers a *no take* alternative to the proposed project.

Under a *no take* alternative the Applicant would delay development of the Anderson Tract and/or not remove or modify habitat that would result in an incidental taking of the GCWA. The Applicant would continue to periodically monitor for the occurrence of the GCWA within the Anderson Tract. It is expected that given the increasing levels of disturbance in the general vicinity, that the GCWA will eventually discontinue using the Anderson Tract. At this point, the Applicant would be free to develop the property without risking a violation of the ESA or providing mitigation for incidental take. Ultimately, the Applicant would not seek an incidental take permit under Section 10(a)(1)(B) of the ESA, nor would the authority of such as permit be necessary to proceed with the project. This alternative was not chosen because it does not provide sufficient certainty with respect to the timing of the Applicant's desired activities, even though the Applicant would likely be spared the mitigation costs. The *no take* alternative would provide none of the benefits of the proposed conservation program.

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