



Hays County

Regional Habitat Conservation Plan

PREPARED FOR

HAYS COUNTY COMMISSIONERS' COURT

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EXECUTIVE SUMMARY

The Hays County Regional Habitat Conservation Plan (“RHCP”) was developed by the Hays County Commissioners’ Court with the assistance of the Citizens’ Advisory Committee, Biological Advisory Team, County staff, and a team of environmental, legal, and economic consultants. The RHCP was developed in connection with the County’s application for an Endangered Species Act (ESA) Section 10(a)(1)(B) incidental take permit authorizing the take of two federally endangered songbirds, the golden-cheeked warbler and the black-capped vireo. The ESA requires that an applicant for an incidental take permit prepare a habitat conservation plan that describes, among other things, how the impacts caused by take authorized by the permit will be minimized and mitigated to the maximum extent practicable. Pursuant to ESA Section 10(a)(1)(B), the RHCP describes a locally controlled approach for compliance with the ESA. The County’s permit would authorize incidental “take” of the golden-cheeked warbler and black-capped vireo, and the RHCP describes the mitigation provided for the impacts of such take. The RHCP is also designed to benefit a host of other wildlife species, water resources, and people. The conservation program of the RHCP is based on a phased conservation banking approach with a goal of assembling between 10,000 and 15,000 acres of preserve land over the 30-year duration of the RHCP. The RHCP will help the County serve the needs of its growing population and will promote responsible economic development, good public infrastructure, and open space preservation (including habitat protection for endangered species).

1.0 PURPOSE AND NEED FOR THE HAYS COUNTY RHCP

- The population of Hays County is expected to increase 150% to 300% over the next 30 years, making it one of the fastest growing populations in Texas (see Section 4.1). Population growth will drive new private land development and public infrastructure projects in the county.
- Projected development and infrastructure projects could cause the loss of approximately 22,000 acres of potential habitat for the federally endangered golden-cheeked warbler in Hays County over the next 30 years. Similarly, the county could lose approximately 3,300 acres of potential black-capped vireo habitat (see Section 5.2).
- The ESA prohibits the “taking” of federally endangered or threatened species without authorization. Take includes activities that result in significant habitat modification or degradation resulting in actual death or injury of listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (see Section 1.4.1.1).
- The ESA allows for take of listed species that is incidental to otherwise lawful activities by issuance of an incidental take permit. Application to the U.S. Fish and Wildlife

Service (USFWS) for such a permit requires the development of a habitat conservation plan. As noted above, these plans describe the measures a permit applicant will take to minimize and mitigate the impacts to the listed species to the maximum extent practicable (see Section 1.4.1.1).

- The RHCP will allow the County and other public and private entities to obtain ESA incidental take authorization in a more efficient, streamlined, and timely manner (see Section 7.4). Processing individual incidental take authorizations (i.e., authorization where a RHCP is not available) typically take 1 to 2 years. Under the RHCP, incidental take authorization could be obtained within a matter of weeks and potentially at less cost than obtaining individual incidental take authorization.

2.0 BENEFITS TO HAYS COUNTY AND THE COMMUNITY

- The RHCP will benefit the golden-cheeked warbler and black-capped vireo in Hays County by (see Section 6.1):
 - Creating a preserve system within Hays County that effectively mitigates for incidental take of the golden-cheeked warbler and black-capped vireo and coordinates and consolidates mitigation requirements from projects scattered across the county into larger, more biologically significant preserve blocks. The RHCP preserve system will protect sufficient acres of warbler and vireo habitat to generate enough mitigation credits to balance the anticipated level of participation in the RHCP. The County's goal is to protect and manage between 10,000 and 15,000 acres for endangered species in Hays County in perpetuity.
 - Encouraging compliance with the ESA by providing an efficient means of authorization. By implementing the RHCP and providing an efficient and reliable mechanism for ESA compliance, the County is hopeful that there will be an increase in ESA compliance across Hays County, resulting in more conservation actions for these species.
 - Providing for perpetual management and monitoring of preserve lands to maintain, enhance, or create quality habitat for the golden-cheeked warbler and black-capped vireo.
 - Contributing to the recovery of the warbler and vireo by protecting large areas of habitat for these species in Hays County and helping to promote connectivity among other existing endangered species preserves in the region (see Section 3.2.1.4 and Section 3.2.2.4).
- Implementing the RHCP will benefit Hays County in the following ways (see Section 1.3):

- The RHCP will provide a streamlined process for ESA compliance for County-sponsored projects, such as the construction or improvement of roads, bridges, and other County infrastructure. The RHCP was initiated in response to a need for ESA compliance during the planning and construction of Winters Mill Parkway near Wimberley. With the passage of the 2008 Road Bond program and the general obligation of the County to provide services to its growing population, other County projects are likely to require permitting through the ESA in the coming years. The RHCP will reduce the time and potentially the cost associated with obtaining incidental take authorization for future County projects by streamlining tasks such as assessing impacts and providing appropriate mitigation.
- The RHCP is compatible with other County initiatives to protect open spaces, such as described in the Parks and Open Space Master Plan and envisioned by the 2006 Parks and Open Space bond program. The RHCP preserve system may create opportunities for compatible, nature-based recreational uses (on a case-by-case basis) and will contribute to water quality protection by permanently protecting large blocks of open space.
- The RHCP may give the County a means to secure other funding opportunities for land conservation, such as federal grants for endangered species habitat protection.
- Private landowners, business entities, organizations, and other municipalities may also benefit by implementation of the RHCP (see Section 1.3), including:
 - The RHCP provides a locally created solution to endangered species issues that incorporates stakeholder concerns and gives long-term ESA permitting assurances to the County and RHCP participants.
 - The RHCP offers a new, voluntary option for ESA compliance that would be available to private landowners, businesses, and other entities in Hays County. This new compliance option would reduce the time and cost associated with obtaining incidental take authorization under the ESA, particularly with respect to developing individual HCPs, waiting for applications to be processed by the USFWS, and obtaining appropriate mitigation for project impacts.

With regard to projects that may involve a federal nexus, voluntary participation in the RHCP may assist the federal action agency by providing a convenient mitigation option, should the federal action agency choose to mitigate for effects to threatened or endangered species covered by the RHCP. However, this does not displace the requirement for federal action agencies to consult with the USFWS pursuant to Section 7 of the ESA prior to arranging specific mitigation

(i.e., no mitigation, in lieu fee, or other mitigation activity shall be completed by the federal action agency until conclusion of their Section 7 consultation).

Although voluntary mitigation through an appropriate habitat conservation plan may expedite a consultation, it is no guarantee of such. Further mitigation strategies under Section 7 of the ESA are not bound by those in the RHCP.

- The RHCP will facilitate the protection of open spaces that represent the rural tradition of Hays County and contribute to a high quality of life for all citizens.
- The RHCP is a conservation plan for endangered species, but is anticipated to have broader environmental benefits such as:
 - Coordinated conservation planning with a long-term focus over a regional scale to take better advantage of conservation opportunities in a rapidly changing landscape.
 - Long-term protection and management of natural resources vital to the health of the region's Hill Country ecosystems, including wildlife, woodlands, and water.

3.0 BASIC ELEMENTS OF THE RHCP

- The “permit area” for the RHCP includes all of Hays County, and the County's Permit will have a term of 30 years (i.e., 2010 through 2039) (see Section 1.5).
- The RHCP and Permit will cover incidental take of the endangered golden-cheeked warbler and endangered black-capped vireo (the warbler and vireo are the “covered species” in the RHCP). The RHCP may also benefit 56 other potentially rare or sensitive species in Hays County and will provide funding to study one or more of these species (see Section 3.0).
- Activities that could cause take of the covered species and that would be covered by the Permit include construction, operation, and maintenance of public projects and infrastructure and residential, commercial, and industrial development (see Section 5.1).
- The RHCP will cover up to 9,000 acres of habitat loss for the warbler and up to 1,300 acres of habitat loss for the vireo resulting from participating projects over 30 years. The 10,300 acres of take authorization will be sufficient to provide ESA compliance for the amount of anticipated participation in the RHCP (see Section 5.2).
- To mitigate for take of the covered species authorized by the Permit, Hays County will create a preserve system and operate a “phased” conservation bank (see Section 6.3). Under the phased conservation bank approach, habitat protection would always occur in advance of authorized impacts through the RHCP.

- The preserve system will be assembled on a phased basis as needed to create mitigation credits for the conservation bank and as potential preserve parcels become available from willing partners.
 - The County will preserve between 10,000 and 15,000 acres by the end of the 30-year permit duration, in order to utilize the full amount of take authorization sought in the RHCP (see Section 5.2); however, there is no pre-determined preserve system size, location, or configuration.
 - Habitat for the covered species protected within the preserve system will create mitigation credits for the conservation bank.
 - Banking mitigation credits allows an equivalent amount of take authorization to be accessed. Therefore, mitigation will always be provided before an equivalent amount of take authorization can be used by the County or issued to RHCP participants.
 - Defined processes for habitat determinations and mitigation assessments, and defined mitigation ratios, provide the basis for ensuring that mitigation is commensurate with impacts.
- Preserve system acquisitions may include fee simple land purchases, conservation easements with landowners, or similar agreements (see Section 7.2).
 - Hays County will be committed to manage and monitor the preserve system for the benefit of the covered species, in accordance with the RHCP and terms of the Permit, in perpetuity (see Section 6.4).
 - The County will implement various measures to avoid or minimize impacts to the covered species, including disseminating maps of potential habitat for the covered species, requesting subdivision or development applicants to provide information about endangered species within their project areas, requiring RHCP participants to implement measures that help prevent the spread of oak wilt and to observe seasonal restrictions on clearing and construction in or near habitat for the covered species, and implementing a public education and outreach program (see Section 6.2).

Summary of RHCP Elements

Category	Criteria/Amount	Notes
Environmental Baseline		
Potential GCW Habitat	170,355 acres	estimated from Loomis GCW habitat model (all quality classes) (see Section 3.2.1.3)
Potential BCV Habitat	23,855 acres	estimate reported in Wilkins et al. (2006) (see Section 3.2.2.3)

Summary of RHCP Elements

Category	Criteria/Amount	Notes
Projected Land Development		
Private-sector Projects	48,095 acres	estimated by TXP and CMR (2008) (see Section 4.2.2)
Public-sector Projects	9,600 acres	estimated as 20% of projected private-sector development, based on current distribution of public tax exempt lands vs. residential and commercial lands (see Section 5.2)
Estimated Habitat Loss/Impact		
GCW	22,000 acres	estimates based on projections of land development and distribution of potential habitat across census tracts (see Section 5.2)
BCV	3,300 acres	
Estimated RHCP Participation Rates		
Private-sector	33%	see Section 5.2.1 and Section 5.2.2
Public-sector	75%	
Authorized Incidental Take		
GCW	9,000 acres	expressed as acres of impact to potential habitat; calculated from estimates of habitat loss and participation rates (see Section 5.2.1 and Section 5.2.2)
BCV	1,300 acres	
Preserve System Goal	10,000 to 15,000 acres	assumes preserves will include some areas of non-habitat (see Section 6.3.1)
Minimum Preserve Block Size (typical)	500 acres	smaller preserves may be allowed with USFWS approval (see Section 6.3.1)
Mitigation Credit Creation (typical)		
GCW	1 acre of potential GCW habitat = 1 GCW mitigation credit	actual number of credits created by an acquisition determined by consultation with USFWS (see Section 6.3.2)
BCV	1 acre of dedicated BCV management area = 1 BCV mitigation credit	
Standard Mitigation Ratios		
(actual mitigation ratios may be adjusted to account for existing impacts or exceptional habitat quality/importance)		
Direct Impacts	1 acre of direct impact = purchase of 1 mitigation credit	assessed within project area boundaries where vegetation is physically altered by clearing or development or has a substantial change of use (see Section 7.4.3)

Summary of RHCP Elements

Category	Criteria/Amount	Notes
		and Section 7.4.4)
Indirect Impacts	1 acre of indirect impact = purchase of 0.5 mitigation credit	assessed out to 300 feet from edge of direct impact and may extend outside of project area boundary; may also be assessed on isolated remnant patches of habitat (see Section 7.4.3 and Section 7.4.4)
Participation Fees (as illustrated in the Funding Plan)		
Application Fees	\$500 to \$5,000 per application	actual fee depending on level of service required to process application (see Section 7.4.1)
Mitigation Fees	\$7,500 per mitigation credit	estimated starting fee; may be adjusted at discretion of County (see Section 8.2.2)

4.0 PRESERVE SYSTEM MANAGEMENT AND MONITORING

- All RHCP preserve lands will be managed in perpetuity in accordance with the terms of the Permit and the RHCP (see Section 6.4).
- The objectives of the RHCP preserve management and monitoring program are to maintain the biological value of the preserve system in perpetuity (see Section 6.4.1).
- The RHCP preserve management and monitoring program involves a cyclical, adaptive process including describing baseline conditions, evaluating threats, planning management activities to address threats, and monitoring management targets to evaluate results (see Section 6.4.1).
- The major tasks involved with the preserve system management and monitoring program include completing Baseline Preserve Evaluations (see Section 6.4.3) and Land Management Plans (see Section 6.4.4) and conducting surveys of the covered species and their habitats (see Section 6.4.5). Each of these major tasks will be repeated and/or updated at least once every five years (see Section 6.4.6).
- The County will submit annual reports to the USFWS documenting compliance with the terms and conditions of the Permit and the results of the management and monitoring activities within the preserve system (see Section 7.6).

5.0 PARTICIPATION PROCESS

- Participation in the RHCP by other public or private entities would be voluntary. A potential participant will have no obligation to pay mitigation fees or provide other

compensation to Hays County related to the RHCP; unless incidental take authorization under the Permit is granted (see Section 7.4).

- The County may elect to withhold mitigation credits from sale to participants for its own use or if such participation would not conform with the goals or provisions of the RHCP (see Section 7.4.5).
- Potential participants may use habitat maps developed for the RHCP to provide a preliminary indication of whether mitigation may be needed (see Section 6.2.1).
- The County would determine the specific amount of mitigation needed to participate in the RHCP through an on-site habitat determination and project-specific impact assessment (see Section 7.4.2 and Section 7.4.3).
- Typically, each acre of potential habitat for the covered species that would be directly impacted by a participating project would require the purchase of one mitigation credit from the County. Indirect impacts to potential habitat would require the purchase of 0.5 mitigation credit (see Section 7.4.4 and Section 7.4.5).
- Potential RHCP participants would obtain incidental take authorization under the RHCP through the purchase of the required number of mitigation credits or (on a case-by-case basis at the discretion of the County) by providing preserve land in lieu of mitigation fees (see Section 7.4.7).
- Participation in the RHCP would be formalized by the execution of a Participation Agreement between Hays County and the applicant and the issuance of a Certificate of Participation by Hays County (see Section 7.4.6).
- Participants in the RHCP would be authorized to take covered species up to the amount specified by their Participation Agreement. Participants would also be required to abide by all other terms of the Participation Agreement, which will include minimization measures such as seasonal clearing and construction restrictions (see Section 6.2.3, Section 6.2.4, and Section 7.4.6).

6.0 RHCP FUNDING PLAN

- The funding plan presented in the RHCP is based on a set of assumptions as described in Section 8.0, including those listed below.
 - The RHCP will bank and either use or sell approximately 9,000 warbler mitigation credits and 1,300 vireo mitigation credits during the duration of the plan (see Section 5.2).
 - Parcels comprising the preserve system will include some areas that are not habitat for the covered species. The funding plan assumes that approximately

- 12,000 acres of preserve land will be acquired to create the needed 10,300 mitigation credits (see Section 8.1.1).
- The cost to purchase potential preserve land in fee simple is approximately \$11,500 per acre. The cost to purchase a conservation easement is approximately 50 percent of the fee simple cost (see Section 8.1.1).
 - Approximately 75 percent of the preserve system will be acquired via conservation easement and approximately 25 percent of the preserve system will be purchased by the County fee simple (see Section 8.1.1).
 - Mitigation fees begin at \$7,500 per credit, and increase by \$1,000 every 5 years (see Section 8.2.2).
 - The County will annually budget up to 10 percent of the taxable value created by new development within the County after Permit issuance to help fund RHCP implementation (see Section 8.2.3).
 - The County will contribute approximately \$5 million to the RHCP for preserve land acquisition prior to permit issuance, funded from the 2006 Parks and Open Space Bond, to create a positive initial mitigation credit balance for the RHCP (see Section 8.2.4).
- Hays County will fund or otherwise provide for the RHCP conservation program using three types of resources: 1) participation fees charged to RHCP participants; 2) annual contributions from County tax revenues; and 3) conservation investments from the County or other sources. Other funding sources, such as grants or debt financing may be available, but are not modeled in the funding plan (see Section 8.0 and Section 8.2).
 - The County will evaluate and adjust the RHCP budget annually to adequately implement the program, fund preserve acquisitions, and manage the preserve system in accordance with the terms of the Permit (see Section 8.2.3).
 - The funding plan demonstrates that sufficient funding is available to acquire the target preserve system under the phased conservation bank approach, to provide for the perpetual management and monitoring of the preserve system, and to supply the necessary staff, equipment, and materials to administer the RHCP. The funding plan is an illustration of the resources that would be needed to implement the RHCP as anticipated, based on the stated assumptions (see Section 8.0 and Section 8.3).

Approximate RHCP Budget Summary¹.

	Years 0 – 10	Years 11 – 20	Years 21 – 30	Term Total	Average Annual
Preserve Land	3,914 acres	4,040 acres	4,046 acres	12,000 acres	400 ac/yr
<u>RHCP Costs</u>					
Land Acquisition	\$34.1 million	\$48.2 million	\$65.0 million	\$147.5 million	\$4.9 million/yr
Staffing & Administration	\$1.9 million	\$6.2 million	\$14.6 million	\$22.8 million	\$0.8 million/yr
Preserve Management	\$1.1 million	\$3.1 million	\$6.7 million	\$11.0 million	\$0.4 million/yr
Outreach & Research	\$0.3 million	\$0.1 million	\$0.2 million	\$0.6 million	\$19,000/yr
Contingency	\$0.1 million	\$0.2 million	\$0.4 million	\$0.8 million	\$27,000/yr
Total Costs	\$37.6 million	\$58.0 million	\$87.0 million	\$182.6 million	\$6.1 million/yr
<u>RHCP Revenue</u>					
Application Fees	\$0.1 million	\$0.2 million	\$0.2 million	\$0.5 million	\$17,000/yr
Mitigation Fees	\$26.1 million	\$32.6 million	\$39.2 million	\$97.9 million	\$3.3 million/yr
Allocated Tax Revenue	\$6.4 million	\$25.2 million	\$47.5 million	\$79.2 million	\$2.6 million/yr
County Conservation Investments	\$5.0 million	\$0	\$0	\$5.0 million	n/a
Total Revenues	\$37.6 million	\$58.0 million	\$87.0 million	\$182.6 million	\$6.1 million/yr
Net Cost & Revenue	\$0	\$0	\$0	\$0	\$0

¹All dollar figures include 3 percent annual inflation. Refer to Section 8.0 and Appendix F and Appendix G for more detail.

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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Hays County Regional Habitat Conservation Plan (“RHCP”) was developed by the Hays County Commissioners’ Court with the assistance of County staff, citizen and biological advisory committees, and a team of environmental, legal, and economic consultants. The RHCP describes a locally developed approach for compliance with the federal Endangered Species Act (ESA) in Hays County, Texas. The RHCP focuses on authorizing incidental “take” of the endangered golden-cheeked warbler (*Dendroica chrysoparia*, GCW) and providing, to the maximum extent practicable, for the minimization and mitigation of the impacts of such take. The RHCP also supports take authorization and mitigation for the endangered black-capped vireo (*Vireo atricapilla*, BCV) and may benefit a variety of other wildlife species, water resources, and people. The conservation program of the RHCP is based on a phased conservation banking approach with a goal of assembling between 10,000 and 15,000 acres of preserve land over the 30-year duration of the RHCP. In addition to protecting habitat for endangered species, the RHCP will help the County serve the needs of its growing population and promote responsible economic development, good public infrastructure, and open space preservation.

A habitat conservation plan, such as the RHCP, is a mandatory prerequisite to obtaining an incidental take permit under Section 10(a) of the ESA. Incidental take permits and their associated habitat conservation plans offer non-federal entities a way to comply with the ESA when conducting otherwise lawful activities that are likely to cause “take” of animals protected by the ESA. Hays County is seeking an incidental take permit to cover County actions and to streamline ESA compliance for private citizens, businesses, and other entities in the county.

A typical habitat conservation plan involves a single individual or entity who applies for an incidental take permit and develops a conservation plan to minimize and mitigate the impacts of a single project in a discrete area. In contrast to individual habitat conservation plans, a “regional” habitat conservation plan generally covers a larger geographic area, multiple landowners, and, often, multiple species. Local or regional governmental entities are often the applicants and are responsible for the implementation of the conservation program contained in the plan. Regional habitat conservation plans are not specifically mentioned in the ESA, but the U.S. Fish and Wildlife Service (USFWS), which administers the ESA, encourages their development (USFWS and National Marine Fisheries Service (NMFS) 1996).

Development of the RHCP was funded by a combination of federal grant dollars, County staff services, and local matching funds. The Hays County Commissioners’ Court approved a grant application to the USFWS for a habitat conservation planning grant in April 2005. The USFWS responded favorably to the County’s grant application, awarding \$753,750 to the County to develop a plan. The award was announced in September 2005, and was the largest

HCP planning grant to a county that year. The federal award required a non-federal match of \$251,250, which the County provided through in-kind services and matching funds. The Texas Parks and Wildlife Department (TPWD) administered the grant for the USFWS and negotiated an interlocal agreement with Hays County to disburse the funds in May 2006.

1.2 Purpose and Need for Action

The purpose of the RHCP is to support an ESA Section 10(a)(1)(B) incidental take permit by establishing a conservation program that minimizes and mitigates to the maximum extent practicable the impacts of authorized take of the golden-cheeked warbler and black-capped vireo in Hays County.

The RHCP is needed because population growth in Hays County over the next few decades will drive a variety of new land development and infrastructure projects and result in other land use changes across the county. These anticipated land use changes will increasingly come into conflict with sensitive natural resources, including federally listed species. The RHCP will provide a streamlined mechanism for the County and its citizens to comply with the ESA.

1.3 Benefits of a Habitat Conservation Plan

By developing and implementing the RHCP, the County will achieve a number of benefits for its citizens and the environment, including:

- Supporting populations of federally endangered golden-cheeked warblers and black-capped vireos in Hays County by protecting and managing habitat for these species in perpetuity;
- Local solutions to endangered species issues that incorporate stakeholder concerns and give long-term ESA permitting assurances to the County and RHCP participants;
- New, voluntary options for ESA compliance that would be available to private citizens, businesses, and other entities in Hays County. These new compliance options would reduce the time and cost associated with obtaining incidental take authorization under the ESA;
- Coordinated conservation planning with a long-term focus over a regional scale to take better advantage of conservation opportunities in a rapidly changing landscape;
- Long-term protection and management of natural resources vital to the health of the region's Hill Country ecosystems, including wildlife, woodlands, and water;
- Protection of open spaces that represent the rural tradition of Hays County and contribute to a high quality of life for all citizens; and

- Compatibility with other County initiatives to protect open spaces and provide nature-based recreational opportunities (see Section 6.4.7 regarding public access to preserves), such as the Parks and Open Space Master Plan and the 2006 open space bond program.

The RHCP will also compliment other regional conservation efforts in central Texas. Several conservation plans or sustainability programs are under development or currently operating in the region, including the Balcones Canyonlands Conservation Plan in Travis County, the Williamson County Regional Habitat Conservation Plan, the Comal County Regional Habitat Conservation Plan, the San Marcos River Habitat Conservation Plan, the Barton Springs-Edwards Aquifer Habitat Conservation Plan, the Southern Edwards Plateau Habitat Conservation Plan, and the Edwards Aquifer Recovery Implementation Program. However, the operating areas or missions of these and other central Texas programs do not include incidental take authorization or long-term coordinated protection for the golden-cheeked warbler and black-capped vireo in Hays County. The RHCP will help fill this gap and contribute to the growing trend toward regional solutions for the conservation of rare species and sensitive resources.

1.4 Legal and Regulatory Framework for the RHCP

The development of habitat conservation plans and the issuance of incidental take permits are governed by the provisions of the ESA and related USFWS policy. The ESA specifies the required content of a habitat conservation plan and the criteria for issuance of an incidental take permit. Other legal requirements for the issuance of an incidental take permit are related to the National Environmental Policy Act (NEPA), which requires a broader analysis of the environmental impacts resulting from the activities covered by an ESA incidental take permit. Both laws require opportunities for public involvement and comment in the development of a habitat conservation plan, particularly regional plans.

In addition to the ESA and NEPA, Texas state law contains several procedural and substantive requirements that are applicable to the development of regional habitat conservation plans by local governments. However, the issuance of an incidental take permit by the USFWS is not contingent upon state law.

1.4.1 Federal Law

1.4.1.1 Endangered Species Act and Related Regulation and Policy

Section 9 of the Endangered Species Act (ESA) prohibits “take” of any federally 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.” “Harass” in the definition of take is defined by USFWS regulations as “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering” (50 Code of Federal Regulations (CFR) § 17.3).

Section 10(a)(1)(B) of the ESA (16 USC § 1539(a)(1)(B)), authorizes the USFWS to issue a permit allowing take of species providing that the taking is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.”

Section 10(a)(2)(A) of the ESA provides that the USFWS must issue an incidental take permit provided that the applicant meets several substantive criteria, including that the applicant submit a conservation plan that: (1) describes the impact that will likely result from the taking; (2) identifies the steps the applicant will take to minimize and mitigate the impacts and the funding available to implement those steps; (3) describes what alternative actions to taking were considered and the reasons the alternatives were not chosen; and (4) includes 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 Habitat Conservation Planning and Incidental Take Permit Processing Handbook (“HCP Handbook”) also provides guidance on the elements of a habitat conservation plan.

The ESA does not mention regional habitat conservation plans, but the HCP Handbook encourages the development of regional plans (USFWS and NMFS 1996). ESA implementing regulations also give permittees “no surprises” assurances, which provide certainty as to their future obligations under a habitat conservation plan (50 CFR §§ 17.22, 17.32, 222.2; 63 Federal Register (FR) 8859).

Section 7(a)(2) of the ESA requires that each federal agency must consult with the USFWS to ensure that agency actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat (16 USC § 1536(a)(2)). “Jeopardize” is defined by the regulations as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, number, or distribution of that species” (50 CFR § 402.02). As described in the HCP Handbook, issuance of an incidental take permit is considered an action for which Section 7(a)(2) applies (USFWS and NMFS 1996). With respect to the issuance of incidental take permits, the USFWS functions as both the “action” agency and the “resource” agency, so that the USFWS is actually consulting with itself. According to the HCP Handbook, the consultation must include consideration of the direct and indirect effects on the species, as

well as the impacts of the proposed project on listed plants and critical habitat, if any (USFWS and NMFS 1996).

1.4.1.2 National Environmental Policy Act and Environmental Impact Statements

The issuance of an incidental take permit 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 projects to determine if they will result in significant impacts to the human environment; and (2) review the alternatives available for the project and consider the impact of the alternatives on the human environment (42 USC § 4332(c)). The scope of NEPA is broader than the ESA in that it requires the agency to consider the impacts of the action on the “human environment,” including a variety of resources such as water, air quality, cultural and historic resources, and socioeconomic resources. In the context of a habitat conservation plan and incidental take permit, the scope of the NEPA analysis covers the direct, indirect, and cumulative effects of the proposed incidental take and the beneficial effects of the proposed mitigation and minimization measures described in the habitat conservation plan (USFWS and NMFS 1996).

The HCP Handbook describes the USFWS procedures for complying with NEPA with respect to habitat conservation plans. Most large-scale, regional habitat conservation plans require preparation of an Environmental Impact Statement (EIS) to comply with NEPA.

1.4.2 State Law

Texas state law establishes requirements related to the development of regional habitat conservation plans by Texas governmental entities, including counties and municipalities (Subchapter B, Chapter 83 of the Texas Parks and Wildlife Code). Among other things, state law requires that the governmental entity or entities participating in the development of a regional habitat conservation plan (otherwise known as “plan participants”) must appoint a Citizens Advisory Committee and a Biological Advisory Team, comply with open records and open meetings laws and public hearing requirements, in certain circumstances provide notice to affected landowners, and acquire identified preserves by specific deadlines.

In addition, plan participants are prohibited from:

- Imposing any sort of rule or regulation related to federally listed species (other than regulations involving groundwater withdrawal) unless that rule or regulation is necessary to implement a habitat conservation plan or regional habitat conservation plan for which the plan participant was issued a federal permit (Texas Parks and Wildlife Code § 83.014(a));
- Discriminating against a permit application, permit approval, or provision of utility service to land that has been designated as a habitat preserve for a regional habitat conservation plan, is designated as critical habitat under the ESA, or has

listed species or listed species habitat (Texas Parks and Wildlife Code § 83.014(b));

- Limiting or denying water or wastewater service to land that has been designated as habitat preserve or potential habitat preserve, is designated as critical habitat under the ESA, or has federally listed species or listed species habitat present (Texas Parks and Wildlife Code § 83.014(c));
- Requiring a landowner to pay a mitigation fee or set aside, lease, or convey land as a habitat preserve as the condition to the issuance of a permit, approval, or service (Texas Parks and Wildlife Code § 83.014(d)); and
- Accepting a federal permit in conjunction with a regional habitat conservation plan unless the qualified voters of the plan participant have authorized the issuance of bonds or other debt financing in an amount equal to the estimated cost of acquiring all land for habitat preserves within the time frame required by Chapter 83 (see below) or the plan participant has otherwise demonstrated that adequate sources of funding exist to acquire all land for habitat preserves within the required timeframe (Texas Parks and Wildlife Code § 83.013(d)).

In addition to the above prohibitions, Texas state law stipulates that the mitigation included in a regional habitat conservation plan, including any mitigation fee and the size of proposed habitat preserves, must be based on the amount of harm to each listed species the plan will protect (Texas Parks and Wildlife Code § 83.015(a)-(b)). However, after notice and hearing by the plan participants, a regional habitat conservation plan, its mitigation fees, and the size of proposed habitat preserves may be based partly on any of the USFWS recovery criteria for listed species covered by the plan (Texas Parks and Wildlife Code § 83.015(f)).

According to Texas state law, governmental entities participating in a regional habitat conservation plan must make offers to acquire any land designated in the plan as a proposed habitat preserve no later than four years after the issuance of the federal permit or six years after the initial application for the permit, whichever is later. Acquisition of all habitat preserves identified in a regional habitat conservation plan must be completed no later than the sixth anniversary of the date the incidental take permit was issued (Texas Parks and Wildlife Code § 83.018(c)).

Finally, state law imposes a requirement that before adopting a regional habitat conservation plan, plan amendment, ordinance, budget, fee schedule, rule, regulation, or order with respect to a regional habitat conservation plan, the plan participant must hold a public hearing and publish notice of such hearing in the newspaper of largest general circulation in the county in which the participant proposes the action. Such notice must include a brief description of the proposed action and the time and place of a public hearing on the proposed action. The plan participant must publish notice in accordance with the foregoing requirements,

and must do so not later than the thirtieth day prior to the public hearing (Texas Parks and Wildlife Code § 83.019).

1.4.3 Local Policy and Community Guidance

Other guidance for the RHCP was provided by the Hays County Commissioners' Court, County staff, the Citizens Advisory Committee, the Biological Advisory Team, public comments, and the grant application.

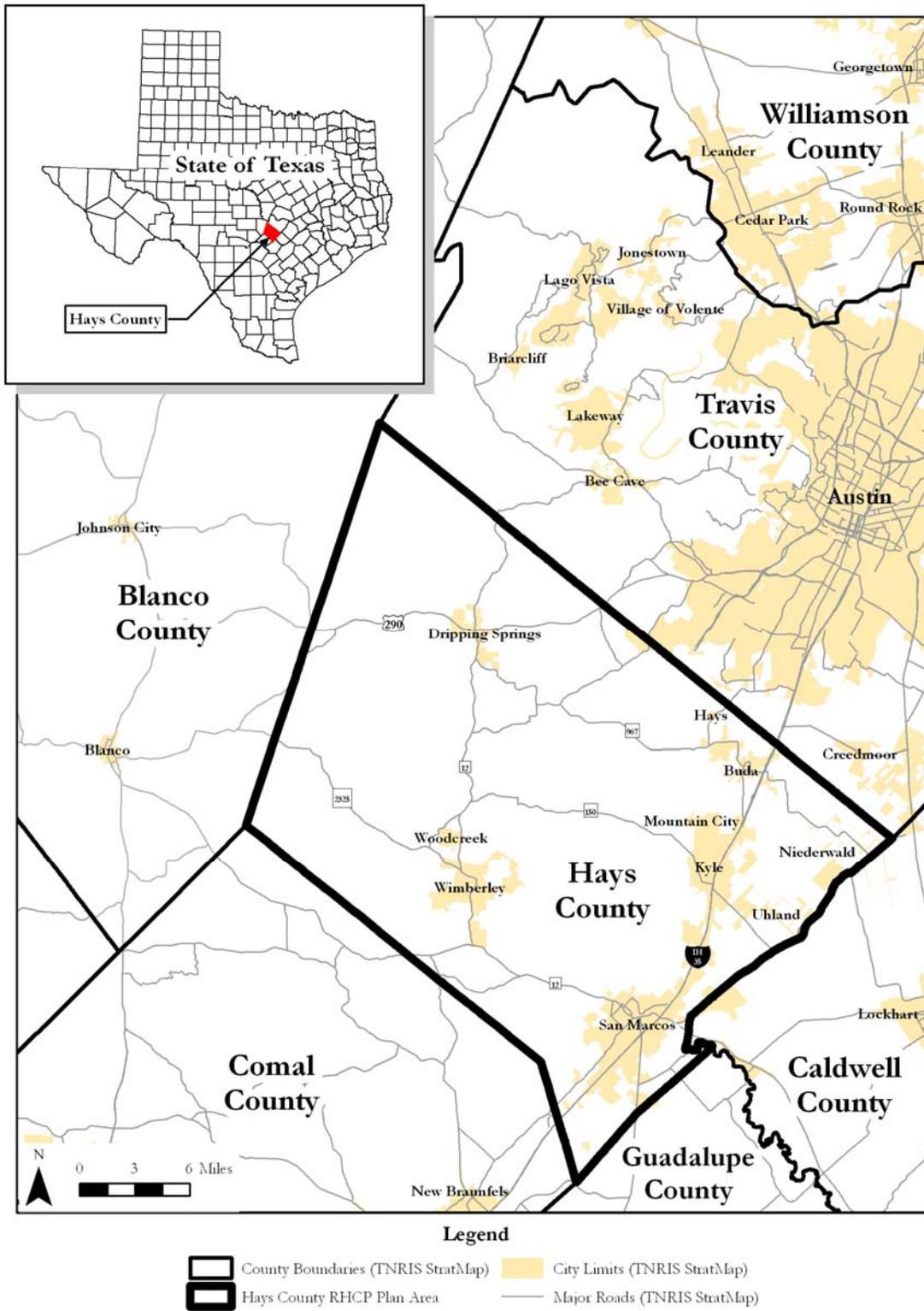
Detailed guidance on the scope of the RHCP was provided by the Citizens Advisory Committee and the Biological Advisory Team. The Citizens Advisory Committee provided input on the preferred conservation strategy, including stakeholder preferences for preserve system size, acquisition mechanisms, and funding. The Biological Advisory Team recommended a list of species to address in the RHCP, including the species that should be considered for incidental take authorization.

1.5 Plan Area and Permit Duration

The Plan Area for the RHCP is the entire extent of Hays County, Texas (Figure 1-1). Public or private entities conducting otherwise lawful activities within Hays County that may cause incidental take of the species covered by the Plan may elect to participate in the RHCP to obtain authorization for incidental take of the covered species.

The proposed term for the incidental take permit (the "Permit") associated with the RHCP is 30 years. While the Permit is valid, Hays County and other voluntary participants in the RHCP have incidental take authorization for the golden-cheeked warbler and black-capped vireo on lands enrolled in the RHCP (provided that all the terms and conditions of the Permit are met). At the end of the Permit term, Hays County will have the option of renewing the Permit. Whether renewed or not, Hays County will manage and maintain all preserve land acquired as mitigation under the RHCP in perpetuity.

Figure 1-1. Hays County RHCP Plan Area and Surrounding Communities.



2.0 NATURAL ENVIRONMENT OF HAYS COUNTY

Hays County is located in central Texas and covers approximately 434,335 acres, based on county boundaries provided by the Texas Natural Resources Information Service (TNRIS) Strategic Mapping Program (StratMap).

2.1 Ecoregions

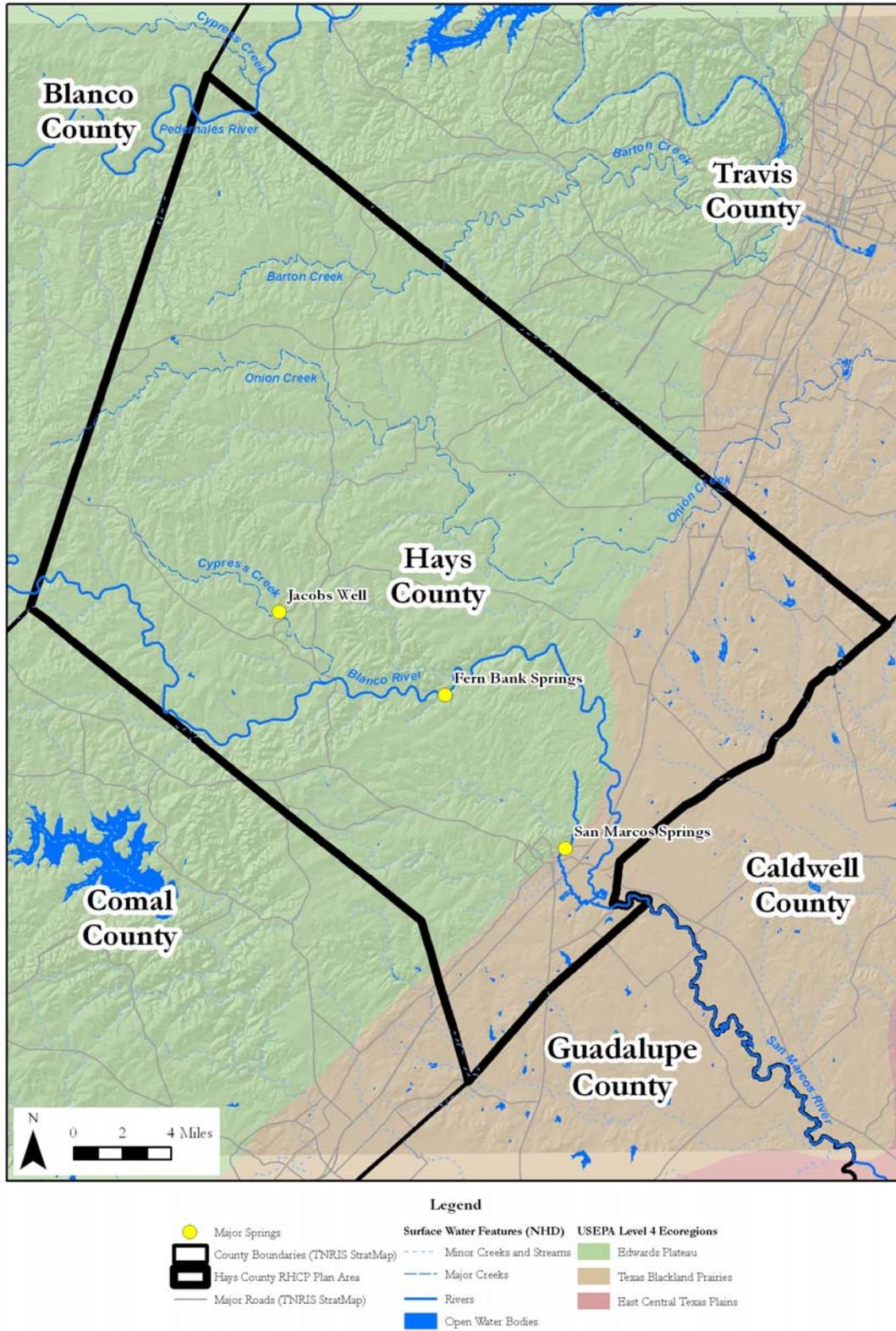
Hays County lies on the edge of the Edwards Plateau and Texas Blackland Prairie ecoregions, as described by the U.S. Environmental Protection Agency (USEPA) (Griffith et al. 2004).

The western three-quarters of Hays County (generally west of Interstate Highway 35) are within the Balcones Canyonlands portion of the Edwards Plateau ecoregion. The Balcones Canyonlands form the southeastern boundary of the Edwards Plateau. Vegetation in this region of Hays County is characterized by a mosaic of plateau live oak (*Quercus fusiformis*), Ashe juniper (*Juniperus ashei*), and honey mesquite (*Prosopis glandulosa*) parks and woodlands. This portion of Hays County has generally shallow, rocky soils over limestone bedrock formations. Some of the limestone formations are highly porous, with numerous caves and other underground cavities that provide channels for surface water to recharge the underlying Edwards Aquifer. The Balcones Canyonlands subregion is crossed by spring-fed streams, many of which have eroded steep-sided canyons in the limestone bedrock. Several large, perennial rivers or streams occur within Hays County over the Edwards Plateau (including the Blanco River, San Marcos River, Pedernales River, Barton Creek, Onion Creek, and Cypress Creek), and many of these waterways are fed by major springs (Griffith et al. 2004, McMahan et al. 1984).

The eastern one-quarter of Hays County (generally east of Interstate Highway 35) is within the Northern Blackland Prairie portion of the Texas Blackland Prairie ecoregion. The majority of the Northern Blackland Prairie subregion (including portion found in Hays County) has been converted to cropland, non-native pasture, and expanding urban uses around major cities. The rolling to nearly level plains of the Northern Blackland Prairie subregion are underlain by interbedded chalks, marls, limestones, and shales. Soils in this part of the county are mostly fine-textured, dark, calcareous, and productive (Griffith et al. 2004, McMahan et al. 1984).

Figure 2-1 shows the boundaries of the ecoregions in Hays County and the locations of major water features and aquifer zones.

Figure 2-1. Ecoregions and Major Water Features in Hays County.



2.2 Vegetation Communities and Land Cover

The 2001 National Land Cover Dataset (a nation-wide land use and land cover map) identifies 15 different land cover types in Hays County, as shown on Figure 2-2. Forests, shrubland, and grasslands or crop fields are the dominant land cover types in the county. Forested areas cover approximately 42 percent of the county, shrubland vegetation covers approximately 30 percent of the county, and grasslands and crop fields cover approximately 21 percent of the county. The dataset identifies only slightly more than five percent of the county as developed land, associated primarily with the cities of San Marcos, Kyle, Buda, Wimberley, and Drippings Springs, and the Interstate Highway 35 and U.S. Highway 290 corridors. Table 2-1 lists the approximate acreage of each land cover type identified by the 2001 National Land Cover Dataset in Hays County.

Table 2-1. 2001 National Land Cover Dataset Land Use/Land Cover Classifications for Hays County.

Category	Approx. Area (acres)	Percent of County
Open Water	1,901	0.4%
Developed, Open Space	15,139	3.5%
Developed, Low Intensity	4,877	1.1%
Developed, Medium Intensity	2,358	0.5%
Developed, High Intensity	1,144	0.3%
Barren Land	486	0.1%
Deciduous Forest	51,339	11.8%
Evergreen Forest	132,510	30.5%
Mixed Forest	156	0.0%
Shrub/Scrub	130,693	30.1%
Herbaceous	75,983	17.5%
Hay/Pasture	5,131	1.2%
Cultivated Crops	10,512	2.4%
Woody Wetlands	2,086	0.5%
Emergent Herbaceous Wetlands	3	0.0%

The U.S. Geological Survey (USGS) identified changes between the 1992 and 2001 versions of the National Land Cover Dataset (USGS 2003). Between 1992 and 2001, Hays County lost approximately 14 percent of its forest cover, with approximately 81 percent of the lost forest cover converted to grassland/shrub cover and approximately 10 percent converted to urban cover (Table 2-2).

Figure 2-2. National Land Cover Dataset 2001 Land Use/Land Cover Classifications for Hays County.

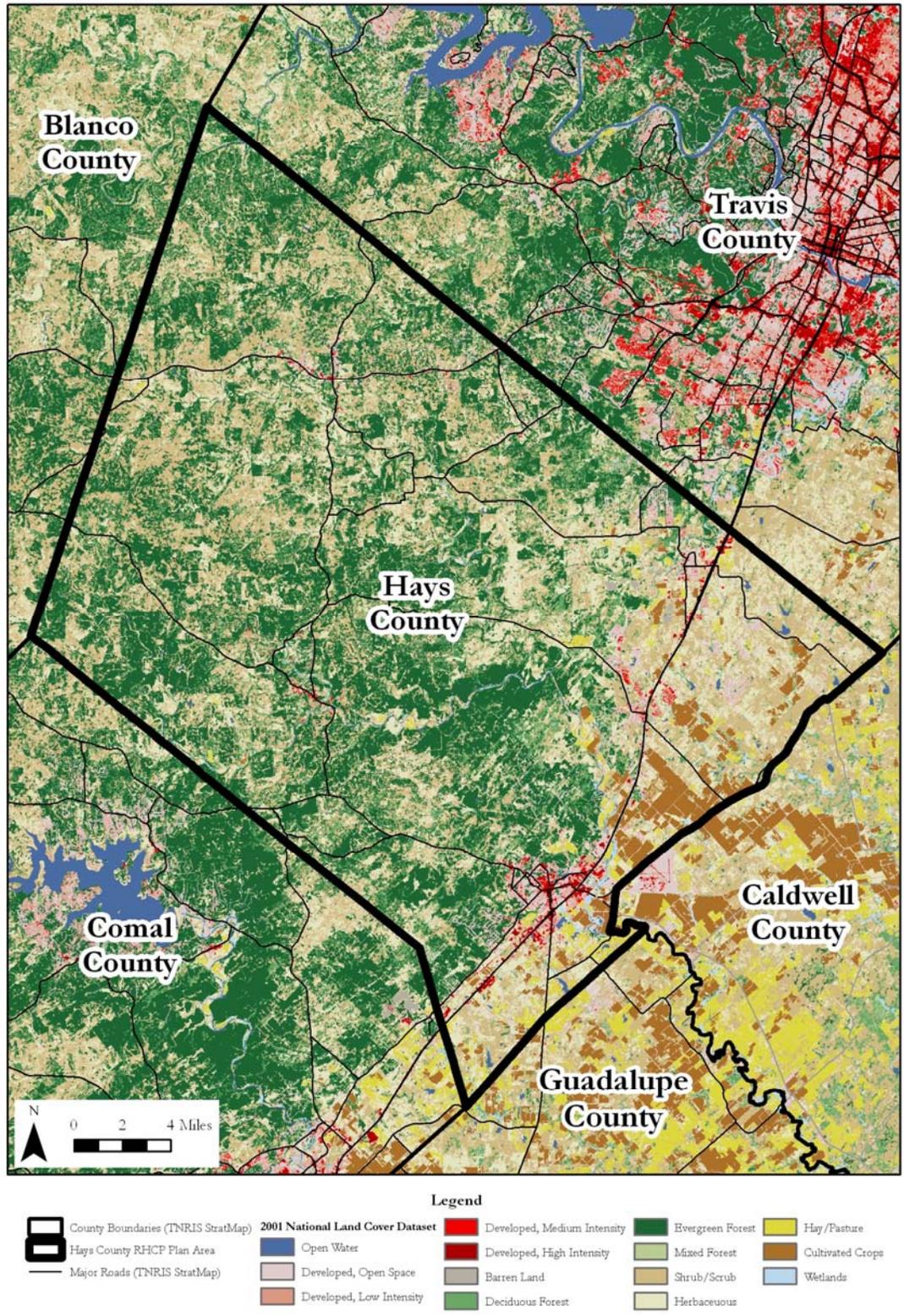


Table 2-2. Land Use/Land Cover Changes Between the 1992 and 2001 Versions of the National Land Cover Dataset¹.

Land Cover Category	Gain (ac)	Loss (ac)	Net Change (ac)	% Change from 1992
Open Water	343	2	341	22%
Urban	4,450	27	4,423	23%
Barren	282	11	271	126%
Forest	2,573	33,684	(31,111)	-14%
Grassland/Shrub	28,822	4,334	24,488	13%
Agriculture	2,649	1,752	897	6%
Wetlands	691	0	691	48%

¹ U.S. Geological Survey. 2003. National Land Cover Database NLCD 1992/2001 Change (edition 1.0). U.S. Geological Survey, Sioux Falls, SD. www.mrlc.gov/multizone.php.

2.3 Aquifers and Geology

Hays County is underlain by the Edwards Aquifer and the Trinity Aquifer.

The Edwards Aquifer (the Balcones Fault Zone region) extends across approximately 4,350 square miles over portions of eleven Texas counties from Bell County to Kinney County. The aquifer is composed of the porous limestones of the Edwards Group, Georgetown Limestone, and Comanche Peak Limestone formations (Ashworth and Hopkins 1995). The aquifer includes three distinct units, two of which (the San Antonio segment and the Barton Springs segment) occur in Hays County. The groundwater divide between the San Antonio and Barton Springs segments of the Edwards Aquifer is thought to occur west of the City of Kyle.

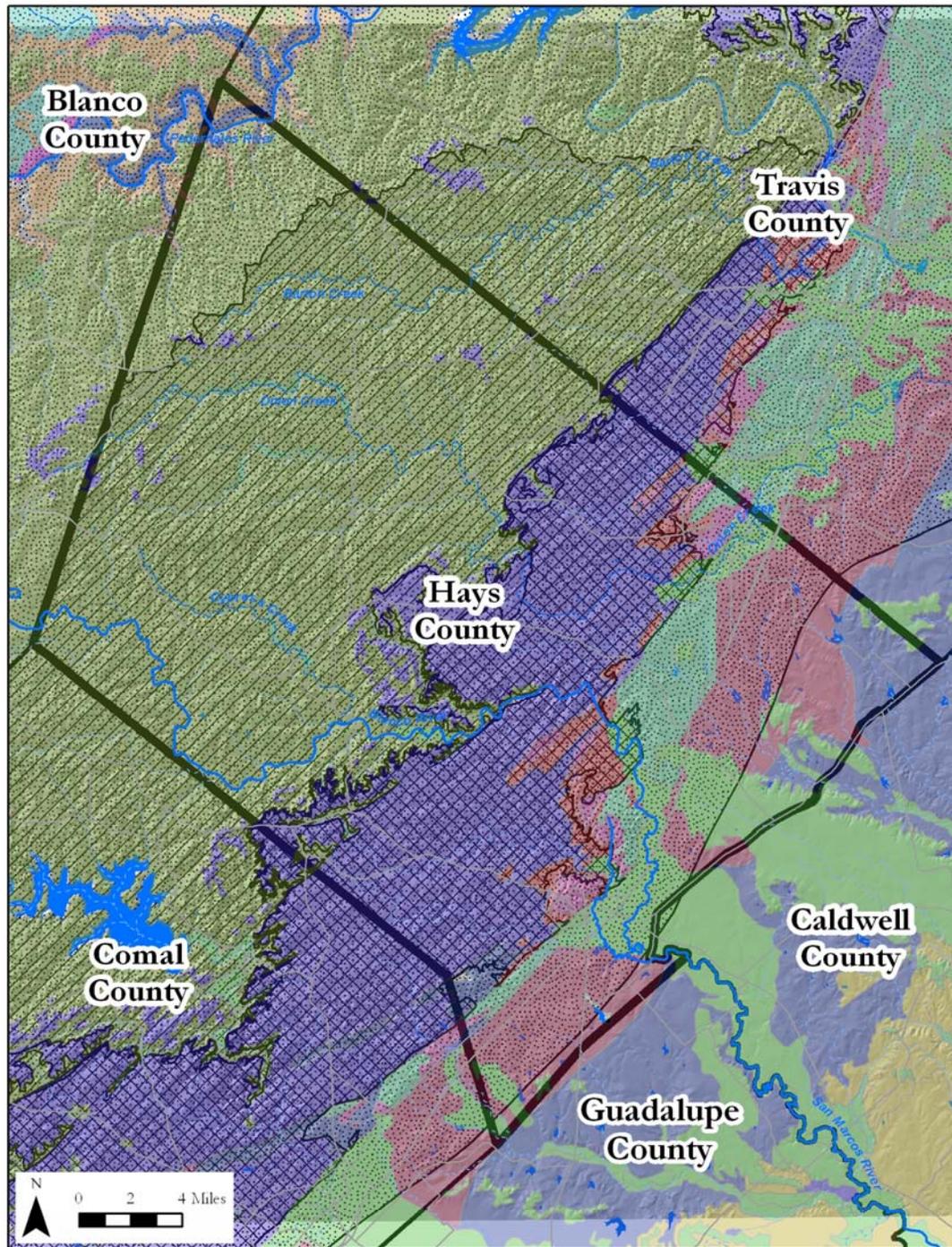
The Trinity Aquifer is composed of Trinity Group geologic formations, which include upper and lower members of the Glen Rose formation in Hays County, and extends across a wide band including 55 counties in the central part of Texas. The Glen Rose formation outcrops at the surface in portions of Hays County west of the Edwards Aquifer recharge zone (Ashworth and Hopkins 1995, Hays Trinity Groundwater Conservation District 2005) (Figure 2-3).

2.4 Water Resources

Hays County is crossed by several rivers and major creeks, including the Blanco River, San Marcos River, Pedernales River, Cypress Creek, Onion Creek, and Barton Creek (Figure 2-1). These major waterways, and the numerous minor streams and creeks that feed them, are valuable surface water resources for the county and support wildlife, riparian habitat, recreational uses, and scenic vistas.

Several notable spring systems occur in Hays County, including San Marcos Springs and Fern Bank Springs (which have been designated as critical habitat for several federally listed species) and Jacob's Well. Many other minor springs also occur across the county, discharging water from the Edwards Aquifer, Trinity Aquifer, and local groundwater sources (Figure 2-1).

Figure 2-3. Geological Formations and Aquifers in Hays County.



Legend			
County Boundaries (TNRIS StratMap)	Surface Water Features (NHD)	Geologic Atlas of Texas (BEG)	Fredericksburg Group
Hays County RHCP Plan Area	Minor Creeks and Streams	Alluvium and Quaternary Deposits	Glen Rose Limestone
Major Roads (TNRIS StratMap)	Major Creeks	Wilcox Group and Midway Group	Hensell Sand
Thirty Aquifer (TWDB)	Rivers	Pecan Gap Chalk and Ozan Formation	Other Cretaceous Formations
Edwards Aquifer Contributing Zone (TCBQ)	Open Water Bodies	Austin Chalk	Marble Falls Limestone
Edwards Aquifer Recharge Zone (TCBQ)		Eagle Ford Group and Buda Limestone	Lower Ordovician Formations
		Del Rio Clay	

3.0 SPECIES ADDRESSED

3.1 Description of Coverage Categories

The RHCP includes measures designed to minimize and mitigate, to the maximum extent practicable, incidental take of golden-cheeked warblers and black-capped vireos by the County and other RHCP participants over the term of the Permit. The conservation measures proposed for the warbler and vireo may also provide some benefits for one or more of 56 other potentially rare or sensitive species in Hays County (Table 3-1). The species addressed in the RHCP fall into three categories:

Species Covered for Incidental Take – The golden-cheeked warbler and black-capped vireo are the “covered species” included in the RHCP. Hays County seeks incidental take authorization for these covered species.

Evaluation Species – There are 40 “evaluation species” included in the RHCP. Evaluation species are currently unlisted, but could become listed in the future (many have been petitioned for listing as threatened or endangered by organizations such as the WildEarth Guardians and the Center for Biological Diversity). Insufficient information about these species currently exists to support the level of analysis required to meet the ESA issuance criteria for an incidental take permit; therefore the County will not seek incidental take coverage for these species at this time. However, conservation measures taken under the RHCP for the covered species (particularly the protection of large blocks of Texas Hill Country habitat) may collaterally benefit the evaluation species. In addition, the RHCP also supports research to help gather information on the biology, habitat, distribution, and/or management of one or more of these species. The research supported by the RHCP may help preclude a possible need in the future to list some of these species, or help streamline the process of obtaining incidental take coverage if any of these species become listed in the future. Most of the rare, sensitive, or little-known karst-dwelling species currently known to exist in Hays County are addressed in the RHCP as evaluation species.

Additional Species – Species placed in this category include several of the currently listed aquatic species, as well as unlisted plants and unlisted aquatic animals. Hays County is not currently seeking incidental take authorization for any of the 16 “additional species” in this category because either: 1) the species are not likely to be impacted by covered activities or any potential impacts would be negligible and difficult to substantiate; 2) insufficient information is available to adequately evaluate take or impacts and mitigation; and/or 3) Hays County lacks mechanisms to address important threats to the species (i.e., Texas counties have few powers with respect to ensuring the protection of aquatic resources; rather the Texas Legislature has made the Texas Commission on Environmental Quality (TCEQ) the primary protector of water quality and groundwater districts the primary protector of water quantity in the state). Further,

some of the important impacts to these and other aquatic species may be addressed by existing voluntary measures for water quality protection in the Edwards Aquifer (i.e., the TCEQ optional measures for water quality protection under the Edwards Aquifer Rules) or the emerging Edwards Aquifer Recovery Implementation Program (this effort is currently underway, and representatives of Hays County stakeholders are participants in the effort). Other entities are also pursuing the development of habitat conservation plans that would cover some or all of the listed aquatic species and their designated critical habitats in Hays County, such as the San Marcos River Habitat Conservation Plan and the Barton Springs-Edwards Aquifer Habitat Conservation Plan. However, as described for the evaluation species, conservation measures taken under the RHCP for the covered species may collaterally benefit one or more of the additional species.

Table 3-1. Species Addressed in the RHCP.

Common Name	Scientific Name	Taxa	Habitat
COVERED SPECIES			
Golden-cheeked warbler**	<i>Dendroica chrysoparia</i>	Birds	Juniper-Oak Woodland
Black-capped vireo**	<i>Vireo atricapilla</i>	Birds	Deciduous Shrubland
EVALUATION SPECIES			
Aquifer flatworm	<i>Sphalloplana mobri</i>	Turbellarians	Aquatic/Karst
Flattened cavesnail	<i>Phreatodrobia micra</i>	Mollusks	Aquatic/Karst
Disc cavesnail	<i>Phreatodrobia plana</i>	Mollusks	Aquatic/Karst
High-hat cavesnail	<i>Phreatodrobia punctata</i>	Mollusks	Aquatic/Karst
Beaked cavesnail	<i>Phreatodrobia rotunda</i>	Mollusks	Aquatic/Karst
a cave-obligate leech	<i>Mooreobdella</i> n. sp. ***	Hirudinea	Aquatic/Karst
a cave-obligate crustacean	<i>Tethysbaena texana</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Allotexiweckelia hirsuta</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Artesia subterranea</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Holsingerius samacos</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Seborgia relicta</i>	Crustaceans	Aquatic/Karst
Balcones cave amphipod	<i>Stygobromus balconis</i>	Crustaceans	Aquatic/Karst
Ezell's cave amphipod	<i>Stygobromus flagellatus</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Texiweckelia texensis</i>	Crustaceans	Aquatic/Karst
a cave-obligate amphipod	<i>Texiweckeliopsis insolita</i>	Crustaceans	Aquatic/Karst
Texas troglobitic water slater	<i>Lirceolus smithii</i>	Crustaceans	Aquatic/Karst
a cave-obligate decapod	<i>Calathaemon bolthuisi</i>	Crustaceans	Aquatic/Karst
Balcones cave shrimp	<i>Palaemonetes antrorum</i>	Crustaceans	Aquatic/Karst
a cave-obligate spider	<i>Cicurina ezelli</i>	Arachnids	Karst
a cave-obligate spider	<i>Cicurina russelli</i>	Arachnids	Karst
a cave-obligate spider	<i>Cicurina ubicki</i>	Arachnids	Karst
undescribed cave-obligate spider	<i>Eidmannella</i> n. sp. ***	Arachnids	Karst
undescribed cave-obligate spider	<i>Neoleptoneta</i> n. sp. 1 ***	Arachnids	Karst
undescribed cave-obligate spider	<i>Neoleptoneta</i> n. sp. 2 ***	Arachnids	Karst
undescribed cave-obligate spider	<i>Neoleptoneta</i> n. sp. eyeless ***	Arachnids	Karst
a pseudoscorpion	<i>Tartarocreagris grubbsi</i>	Arachnids	Karst

Table 3-1. Species Addressed in the RHCP.

Common Name	Scientific Name	Taxa	Habitat
a cave-obligate harvestman	<i>Texella diplospina</i>	Arachnids	Karst
a cave-obligate harvestman	<i>Texella grubbsi</i>	Arachnids	Karst
a cave-obligate harvestman	<i>Texella mulaiki</i>	Arachnids	Karst
a cave-obligate harvestman	<i>Texella renkesae</i>	Arachnids	Karst
a cave-obligate springtail	<i>Arrhopalites texensis</i>	Hexapods	Karst
an ant-like litter beetle	<i>Batrissodes grubbsi</i>	Insects	Karst
Comal Springs diving beetle	<i>Comaldessus stygius</i>	Insects	Aquatic/Karst
Edwards Aquifer diving beetle	<i>Haideoporus texanus</i>	Insects	Aquatic/Karst
a cave-obligate beetle	<i>Rhadine austinica</i>	Insects	Karst
a cave-obligate beetle	<i>Rhadine insolita</i>	Insects	Karst
undescribed beetle	<i>Rhadine</i> n. sp. (<i>subterranea</i> group)***	Insects	Karst
undescribed beetle	<i>Rhadine</i> n. sp. 2 (<i>subterranea</i> group)***	Insects	Karst
Blanco River springs salamander	<i>Eurycea pterophila</i>	Amphibians	Aquatic/Karst
Blanco blind salamander	<i>Eurycea robusta</i>	Amphibians	Aquatic/Karst

ADDITIONAL SPECIES

Hill Country wild-mercury	<i>Argythamnia aphanoides</i>	Plants	Terrestrial
Warnock's coral-root	<i>Hexaletris warnockii</i>	Plants	Terrestrial
Canyon mock-orange	<i>Philadelphus ernestii</i>	Plants	Terrestrial
Texas wild-rice**	<i>Zizania texana</i>	Plants	Aquatic
Texas fatmucket	<i>Lampsilis bracteata</i>	Mollusks	Aquatic
Golden orb	<i>Quadrula aurea</i>	Mollusks	Aquatic
Texas pimpleback	<i>Quadrula petrina</i>	Mollusks	Aquatic
Texas austrotinodes caddisfly	<i>Austrotinodes texensis</i>	Insects	Aquatic
Comal Springs riffle beetle**	<i>Heterelmis comalensis</i>	Insects	Aquatic/Karst
a mayfly	<i>Proclueon distinctum</i>	Insects	Aquatic
San Marcos saddle-case caddisfly	<i>Protoptila arca</i>	Insects	Aquatic
Comal Springs dryopid beetle**	<i>Stygoparnus comalensis</i>	Insects	Aquatic/Karst
Fountain darter**	<i>Etheostoma fonticola</i>	Fishes	Aquatic
San Marcos salamander*	<i>Eurycea nana</i>	Amphibians	Aquatic/Karst
Eurycea species (northern Hays County)* or **	<i>Eurycea</i> species	Amphibians	Aquatic/Karst
Texas blind salamander**	<i>Eurycea rathbbuni</i>	Amphibians	Aquatic/Karst

* Federally threatened species

** Federally endangered species

*** The designation "n. sp." indicates a "new species" within a genus that has not yet been assigned a species name by acknowledged experts.

3.2 Species Covered for Incidental Take**3.2.1 Golden-cheeked Warbler**

The USFWS published an emergency listing of the golden-cheeked warbler as endangered on May 4, 1990 (55 FR 18844). A proposed rule to list the warbler as endangered was also published by the USFWS on the same day. The final rule was published on

December 27, 1990 (55 FR 53153). The USFWS has not designated critical habitat for the golden-cheeked warbler. The Texas Parks and Wildlife Department (TPWD) also lists the species as endangered (TPWD 2007).

Conservation of the golden-cheeked warbler is the primary focus of the RHCP due to the documented presence of the species and the extent of potential habitat in the county.

3.2.1.1 Species Description and Life History

The golden-cheeked warbler is a small (approximately five inches long) insectivorous bird. Adult males have black on the crown, nape, back, throat, and upper breast. The wings are black with two white wing bars. The cheeks are a bright golden-yellow with a black eyeline. The underparts are white streaked with black on the flanks. Adult females are similar but duller; the crown and back are olive-green with some black streaking (Ladd and Gass 1999).

The warbler migrates between wintering grounds in southern Mexico and Central America and breeding grounds on the Edwards Plateau and adjacent areas in central Texas. The species arrives in central Texas in early to mid-March to breed. Nesting activities are typically completed by the end of July, and the species begins migration south in June or July (Ladd and Gass 1999). Most warblers have left central Texas by early to mid-August (Wahl et al. 1990). For the purpose of the RHCP, the breeding season of the golden-cheeked warbler is defined as March 1 through July 31.

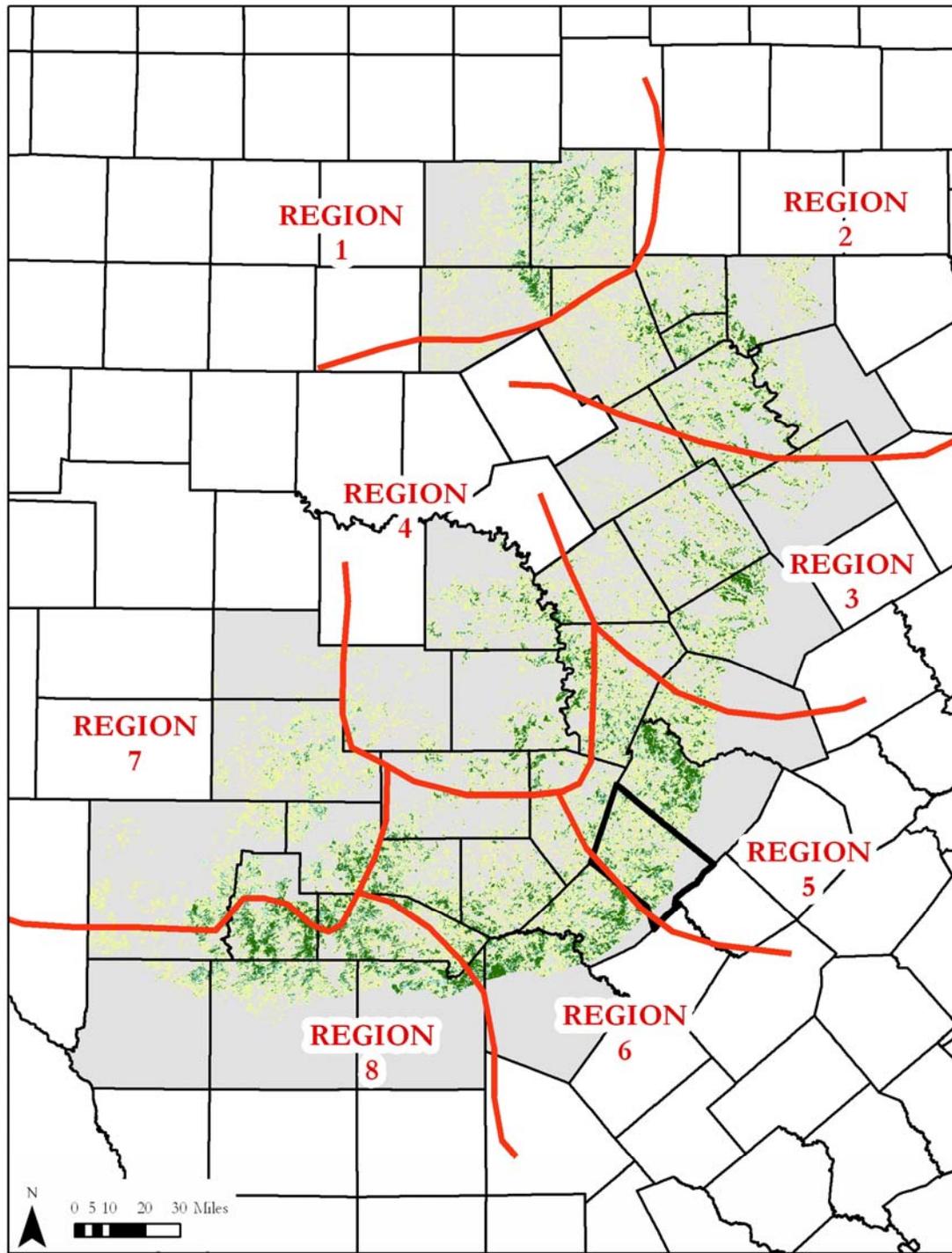
The golden-cheeked warbler is the only bird in Texas that nests exclusively within the state's boundaries (Oberholser 1974). The warbler has been recorded from 41 of the 254 Texas counties, of which 26 are currently known to have breeding populations. Counties with known breeding populations include Bandera, Bell, Bexar, Blanco, Bosque, Burnet, Comal, Coryell, Edwards, Gillespie, Hays, Johnson, Kendall, Kerr, Kimble, Lampasas, Llano, Medina, Palo Pinto, Real, San Saba, Somervell, Travis, Uvalde, Williamson, and Young (Ladd and Gass 1999, SWCA 2003).

Male warblers are territorial during the breeding season and defend territories that have been shown to range from approximately four to ten acres (Ladd and Gass 1999). Coldren (1998) found that territory size was inversely related to reproductive success, such that large territories may be an indicator of poor habitat quality (most likely due to reduced food availability and foraging opportunities). Male warblers announce and defend territories partly by singing high-pitched, buzzy songs loudly from conspicuous perches near the tops of trees. Females do not sing or defend territories, and have less conspicuous behavior (Ladd and Gass 1999).

Early studies found warbler territory densities ranging between 9.5 and 20 pairs per 100 acres (USFWS 1992). Wahl et al. (1990) suggests that an approximate range-wide measure of warbler territory density in areas of suitable habitat was 6.1 territories per 100 acres. Territory

density in high quality habitat has been shown to be greater than 12.1 territories per 100 acres (Wahl et al. 1990).

Figure 3-1. GCW Counties of Occurrence and 1992 Recovery Regions.



- Legend**
- | | |
|--|---|
| County Boundaries (StratMap) | Potential Low Quality GCW Habitat (Loomis 2008) |
| Hays County RHCP Plan Area | Potential Medium Quality GCW Habitat |
| Counties within GCW Breeding Range | Potential High Quality GCW Habitat |
| Approximate GCWA Recovery Region Boundaries (USFWS 1992) | |

More recent studies by the U.S. Army Corps of Engineers and The Nature Conservancy on portions of Fort Hood, by the City of Austin and Travis County on the Balcones Canyonlands Preserve, and by the USFWS on the Balcones Canyonlands National Wildlife Refuge have reported territory densities for intensively studied areas. Reported warbler territory density on several study areas on Fort Hood in Bell County between 1992 and 2007 ranged between approximately 4.3 and 8.9 territories per 100 acres (Jette et al. 1998, Hollimon and Craft 1999, Peak 2005, Peak 2007a). The City of Austin and Travis County have monitored several 100-acre study plots with “prime” habitat on the Balcones Canyonlands Preserve in Travis County between 1998 and 2006, and have reported warbler territory densities that range between approximately 6.5 and 26.3 territories per 100 acres (City of Austin 2006, 2005, 2004, and 2003; Travis County 2007, 2006, 2004, and 2003). The City of Austin has also monitored two 100-acre study plots in “transitional” habitat, and has observed warbler territory densities ranging from approximately 2.3 and 8.0 territories per 100 acres on these plots (City of Austin 2005, City of Austin 2003). Territorial density data from the Balcones Canyonlands National Wildlife Refuge between 1997 and 2008 showed a range of approximately 10 to 18.7 territories per 100 acres in prime habitat and approximately 1.5 to 5.6 territories per 100 acres in transitional habitat (Sexton 2008). However, no studies of warbler density have been conducted in Hays County.

Golden-cheeked warblers eat a diet of insects, spiders, and other arthropods during the breeding season, generally taken from the upper two-thirds of the canopy (Pulich 1976). The warbler forages in both Ashe junipers and deciduous trees present in its breeding habitat (Pulich 1976); however, deciduous trees (particularly oaks) appear to be more important as a foraging substrate in the early part of the breeding season (Wahl et al. 1990). Golden-cheeked warblers generally forage within their territories, but are known to leave the territory to visit springs, seeps, shallow pools, creeks, or local water sources in the landscape (Pulich 1976).

Soon after arrival on breeding grounds in central Texas, male and female golden-cheeked warblers form pairs. Nest building commences within several days of pairing (Ladd and Gass 1999). Female golden-cheeked warblers are thought to select nesting sites and build nests within the territory of her mate (Pulich 1976). Strips of Ashe juniper bark, available only from mature trees, are the primary and most essential component of golden-cheeked warbler nests (Pulich 1976).

Females typically lay three or four eggs in mid-April (rarely five eggs), occasionally laying a second clutch May (Pulich 1976). The incubation period is typically ten to 12 days (Ladd and Gass 1999). Young birds remain in the nest approximately nine to 12 days and are fed by both parents (Ladd and Gass 1999). Parents continue to feed fledglings for approximately one month, after which independent young may join mixed foraging groups that frequently utilize more open habitat (Ladd and Gass 1999).

3.2.1.2 Habitat Description

In Texas, the golden-cheeked warbler is an inhabitant of old-growth or mature regrowth juniper-oak woodlands in the Edwards Plateau, Lampasas Cut-Plain, and Llano Uplift (Pulich 1976, Wahl et al. 1990, USFWS 1992). Regrowth woodlands suitable for warblers typically require 25 to 50 years to mature under favorable conditions (USFWS 1992), depending partially on soil condition and the retention of oaks after clearing (Ladd and Gass 1999). Golden-cheeked warblers are typically found in areas of steep slopes, canyon heads, draws, and adjacent ridgetops (Pulich 1976, Ladd 1985).

Species Composition

Ashe juniper and various oak species are the most common tree species throughout the golden-cheeked warbler's breeding range. The peeling bark of mature Ashe juniper trees is essential for nest building, and deciduous trees (especially deciduous oaks) are important for foraging (Wahl et al. 1990).

Ashe juniper is nearly always the dominant tree in nesting habitat (Ladd and Gass 1999), but has been shown to comprise anywhere between ten and 83 percent of total trees at several sites scattered throughout the range of the species (USFWS 1992). Campbell (2003) reports that the range of juniper canopy cover in suitable golden-cheeked warbler habitat is between ten and 90 percent. Some mature Ashe juniper with peeling bark is necessary to provide material for nest construction.

Spanish oak (*Quercus buckleyi*), plateau live oak, shin oak (*Quercus sinuata* var. *sinuata*), cedar elm (*Ulmus crassifolia*), walnut (*Juglans* spp.), hackberry (*Celtis* spp.), and Texas ash (*Fraxinus texensis*) are common in golden-cheeked warbler habitat, particularly in the central part of the warbler's range (Pulich 1976, Ladd and Gass 1999). Models predicting warbler use of woodland vegetation suggest that a higher density of deciduous oaks is positively associated with increased warbler density (Wahl et al. 1990).

Canopy Cover and Height

Golden-cheeked warblers utilize moderate to dense forest or woodland habitat with a high percent canopy cover in the middle and upper layers (Ladd and Gass 1999). Total tree cover measured at several sites across the breeding range of the warbler averaged 70 percent at 10 feet, 74 percent at 16 feet, and 70 percent above 18 feet (Ladd and Gass 1999). Others have described appropriate habitat as having as little as approximately 35 percent canopy cover (Campbell 2003).

Wahl et al. (1990) found that average canopy height of golden-cheeked warbler habitat was approximately 22 feet. Higher warbler densities have been associated with greater average tree height and greater variability in average tree height (Wahl et al. 1990).

Patch Size and Landscape Matrix

The golden-cheeked warbler is a slightly forest-interior species (Coldren 1998, DeBoer and Diamond 2006) that also utilizes woodland edges, particularly after young have fledged (Kroll 1980, Coldren 1998).

Ladd and Gass (1999) state that prime habitat is found in patches of at least 250 acres, but smaller habitat patches are also utilized by the species (USFWS 1992). Coldren (1998) also found that warblers selected for habitat patches larger than 250 acres, and selected against utilizing smaller patches of habitat. However, much of the available habitat for the species is within these smaller patches. DeBoer and Diamond (2006) found that approximately 32 percent of available warbler habitat range-wide was in patches of less than 250 acres. Arnold et al. (1996) reports that warblers have been observed consistently occupying and successfully reproducing in patches of at least 57 acres. Similarly, Butcher (2008) found evidence to suggest that the minimum patch size needed for warbler reproduction was between approximately 37 acres and 50 acres. However, larger patches have been shown more likely to result in better pairing and reproductive success (Coldren 1998) than smaller patches.

Magness et al. (2006) found that at least 40 percent of the landscape must have woodland cover for a site with suitable habitat to be occupied by golden-cheeked warblers (woodland cover was defined as having at least 30 percent woody canopy cover). The study further found that at least 80 percent of the landscape must have suitable woodland habitat before the probability of occupancy of a site by golden-cheeked warblers exceeds 50 percent. This relationship held at a variety of spatial scales representing approximately 1X, 4X, 6X, and 66X of a typical territory size. The authors assert that the amount of juniper-oak woodland within approximately 500 acres surrounding a site is an important predictor of occupancy (Magness et al. 2006).

Terrain

Golden-cheeked warbler habitat is frequently associated with steep canyon slopes and generally rough terrain (Ladd 1985). DeBoer and Diamond (2006) showed that occupied habitat patches generally had steeper and more variable slopes than unoccupied habitat patches. The Golden-cheeked Warbler Recovery Plan (USFWS 1992) provides a number of possible explanations for the association, including increased water availability favoring the growth of deciduous trees and food availability, greater protection from wild fires, and greater protection from land clearing activities due to the difficulty in accessing and working on steep slopes. However, warblers are not restricted to canyon slopes, and suitable habitat (i.e., mature juniper-oak woodlands) may also be found on adjacent ridge tops and uplands (Ladd and Gass 1999).

Edge Effects

Conditions at the edge of golden-cheeked warbler habitat patches appear to influence the occupancy, territory distribution, territory size, pairing success, and reproductive success of

the species (Coldren 1998). Coldren (1998) found that reproductive success was higher in territories placed at least approximately 500 feet from a patch edge. Peak (2007) and Reidy (2007) found that nest survival decreased as the density of forest edges in the landscape increased. Coldren (1998) suggests that the character of habitat patch boundaries (i.e., “hard” versus “soft” edges, degree of human disturbance of adjacent land uses, amount of edge) may be more important to the species than the presence of natural gaps in woodland canopy cover. Food availability, nest predation (particularly by snakes and birds, such as crows and jays), and nest parasitism by brown-headed cowbirds may also contribute to edge effects, as influenced by patch size and the nature of the surrounding landscape (Engels 1995, Coldren 1998, Stake et al. 2004, USFWS 1992).

The golden-cheeked warbler appears to be less likely to occupy habitat adjacent to land uses with hard edges and high levels of human disturbance, particularly residential and commercial development (Engels 1995, Coldren 1998), and more likely to occupy habitat patches adjacent to soft edges associated with agricultural and grassland uses (Coldren 1998). Warblers also generally placed territories farther from habitat edges with adjacent high-disturbance land uses, such as residential and transportation development (Coldren 1998).

Edge effects have been shown to influence warbler breeding behavior or success at distances between approximately 330 feet to 980 feet from the edge of a habitat patch (Coldren 1998, Sperry 2007). The density of forest edge within 330 feet of a warbler nest has also been shown to influence nest survival, such that nest survival was higher in areas with less forest edge (Peak 2007b).

Other Habitats

Other habitats utilized by golden-cheeked warblers in central Texas, particularly by fledglings and family groups later in the breeding season, include woodlands and woodland edges with less species diversity, canopy cover, and canopy height than is typical for breeding or nesting habitat. Upland oak savannas and drier, sparser juniper woodlands may also be used later in the breeding season (Ladd and Gass 1999).

3.2.1.3 Hays County Golden-cheeked Warbler Population

The golden-cheeked warbler was first reported to occur in Hays County in the early 1890's (Pulich 1976). However, Pulich (1976) found that records of the species in Hays County were not numerous, possibly due to a history of land-clearing activity. Current records of golden-cheeked warblers in Hays County are also sparse, but available data show that the species has been recently recorded from across much of the county.

Several golden-cheeked warbler localities in Hays County were identified from available datasets provided by the USFWS, the Texas Natural Diversity Database, and Loomis Partners, Inc. (Loomis) (generalized warbler locations are shown in Figure 3-2). These localities represent warbler observations recorded by various observers between 1990 and 2005. Each of these

recent warbler localities occur in areas identified as potential habitat by the Loomis warbler habitat model, including some areas identified as potential low or moderate quality habitat and areas with a less than 50 percent probability of occupancy (see discussion of habitat models below).

Pulich (1976) estimated that the warbler population in Hays County was approximately 1,500 pairs in 1962 and approximately 150 pairs in 1974. There are no recent estimates of the total number of golden-cheeked warblers in Hays County reported in the literature.

Pulich (1976) estimated approximately 75,000 acres of “virgin Ashe juniper” in Hays County in 1962 and approximately 7,500 acres of this potential warbler habitat in 1974. The 1992 Golden-cheeked Warbler Recovery Plan (USFWS 1992) reports that approximately 50,644 acres of potential warbler habitat were present in Hays County in 1988, based on estimates adapted from Wahl et al. (1990).

Loomis developed a more recent estimate of the amount of potentially suitable warbler habitat in Hays County based on the average amount of canopy cover in an approximately 10-acre landscape (Loomis 2008, included in Appendix A). The Loomis habitat model estimates that approximately 34,110 acres of potential high quality warbler habitat (i.e., areas of woodland vegetation with an average canopy cover of at least 70 percent) may occur in Hays County (Table 3-2). Areas of potential high quality habitat identified by this recent habitat model are likely to be most comparable to the earlier estimates of available habitat, although other moderate or low quality regrowth habitat may also be used by the species.

When including more marginal potential habitats (identified as woodland areas with as little as 30 percent average canopy cover), the Loomis habitat model suggests that total extent of potential warbler habitat in Hays County may include as much as 170,355 acres (Loomis 2008) (Table 3-2). Since golden-cheeked warblers are known to utilize habitats that are less than prime, the true amount of habitat currently available across the range of the species is likely to lie between the potential high quality habitat estimates and the total potential habitat estimates generated by the Loomis model.

Table 3-2. Potential Golden-cheeked Warbler Habitat¹ and Occupancy Probability² in Hays County.

Habitat Class	Total Acres of Potential Habitat	Acres of Potential Habitat Not Likely to be Occupied	Acres of Potential Habitat May be Occupied	Acres of Potential Habitat Likely to be Occupied
Potential Low Quality Habitat	66,580	13,969	42,193	10,419
Potential Medium Quality Habitat	69,665	6,736	41,389	21,540
Potential High Quality Habitat	34,110	1,013	14,751	18,346
All GCW Habitat Classes	170,355	21,718	98,333	50,305

¹Potential habitat and relative quality classes as identified by the Loomis habitat model. See Loomis (2008) in Appendix A for a discussion of model methodology and results.

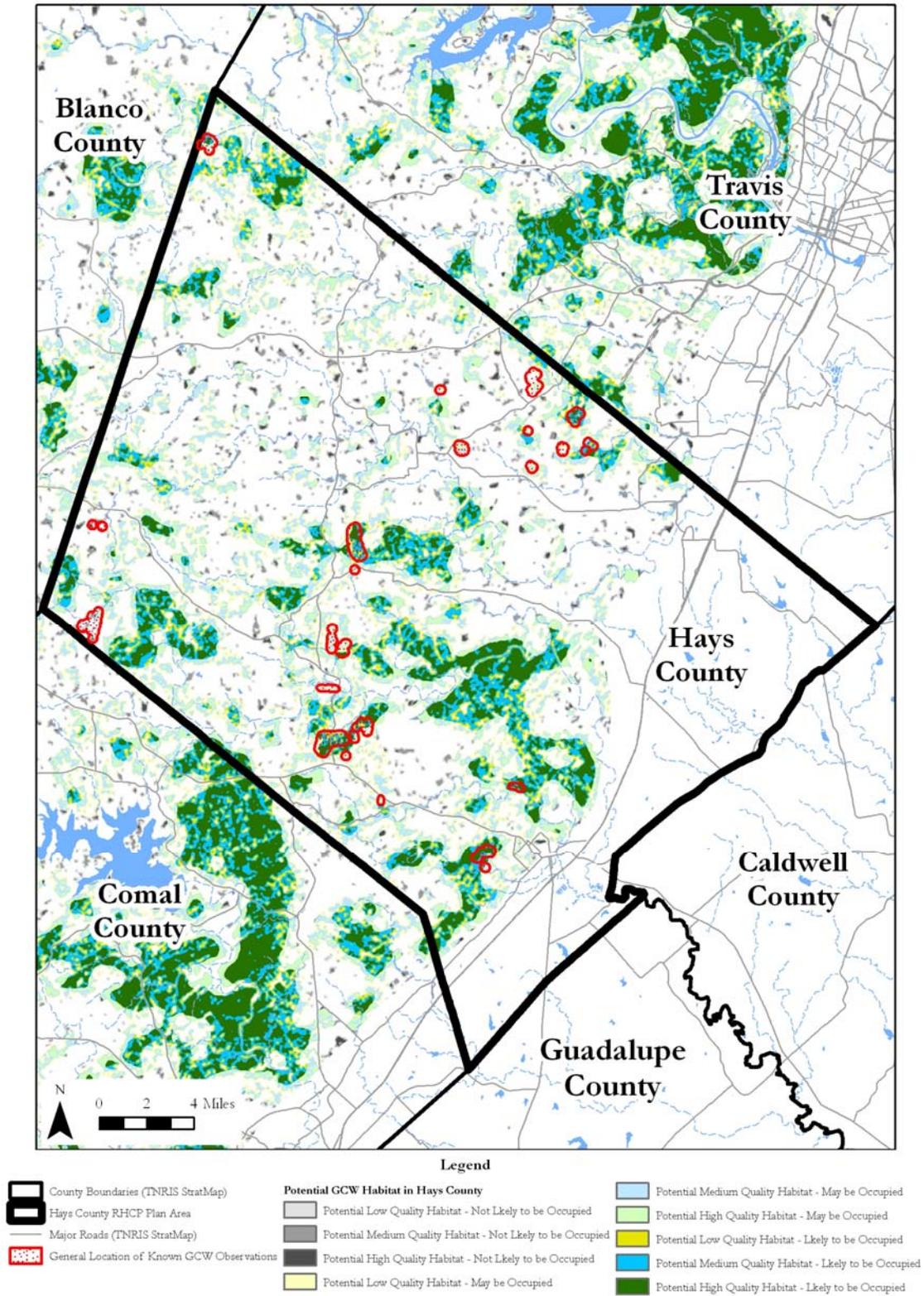
²Occupancy probabilities based on an analysis of the Loomis habitat model using the methodology described in Magness et al. (2006). See Appendix A for a discussion of the Magness occupancy model and the occupancy analysis of the Loomis habitat model.

Not all areas of potential habitat are expected to be used by the species. Magness et al. (2006) developed a spatial model to predict the probability that potential habitat is occupied by the species. Applying the Magness et al. (2006) occupancy model to the Loomis model of potential habitat yields an estimate of 148,638 acres (87 percent) of the potential habitat in Hays County (including potential high, medium, and low quality habitat) with a probability of being occupied by the species (i.e., the habitat occurs in a landscape with at least 40 percent suitable habitat). Only approximately 50,305 acres (30 percent of the total area of potential habitat) has a probability of occupancy that exceeds 50 percent (i.e., the habitat occurs in a landscape with at least 80 percent suitable habitat) (Table 3-2).

The extent of potential warbler habitat in Hays County, as identified by the Loomis model, and the relative potential for occupancy by the species (based on the methodology described by Magness et al. (2006)) is shown Figure 3-2.

For comparison, other researchers have also recently developed or are working on models that identify potential warbler habitat across the range of the species, including the Missouri Resource Assessment Partnership (MoRAP) of the University of Missouri (Diamond 2007) and the Biodiversity and Biocultural Conservation Laboratory at the University of Texas at Austin (Fuller et al. 2008a). The preferred models described in Diamond (2007) suggest that there may be as much as 64,441 acres to 71,784 acres of potential high quality warbler habitat in Hays County (i.e., habitat quality ranks 4 and 5 from preferred models "C" and "D"), and the preferred Diamond (2007) habitat models identify as much as approximately 161,000 acres of potential warbler habitat in Hays County in all quality classes. Fuller et al. (2008a) are working on a niche model based on a maximum entropy algorithm to identify areas with a probability of being suitable warbler habitat. Preliminary work by Fuller et al. (2008a) predicts that approximately 26,608 acres in Hays County may have a "high" probability of being suitable habitat and approximately 67,629 acres in Hays County may have a "good" or "high" probability of being suitable warbler habitat.

Figure 3-2. Potential GCW Habitat in Hays County.



3.2.1.4 Threats and Recovery Goals

Important threats to the golden-cheeked warbler include various factors related to habitat destruction and fragmentation in the species' breeding and wintering ranges. (Wahl et al. 1990, USFWS 1992, Ladd and Gass 1999). Oberholser (1974) discussed three main causes for the decline in the amount of suitable warbler habitat: land clearing for agricultural use, land development, and reservoir construction. Of these, land clearing for agricultural use and land development are activities occurring in Hays County. Nest parasitism by brown-headed cowbirds may also have contributed to the golden-cheeked warbler's population decline (Pulich 1976, USFWS 1992).

Warbler wintering habitat in Central America has been affected by lumbering operations (particularly in pine and pine-oak forests), mining, firewood-cutting, and land-clearing for agriculture (Lyons 1990). Conservation efforts are being undertaken in the affected areas to prevent habitat loss (Alliance for the Conservation of Pine-Oak Forests of Mesoamerica 2008).

The 1992 Golden-cheeked Warbler Recovery Plan (USFWS 1992) identifies the criteria to be met for the warbler to be considered for downlisting from endangered to threatened status. These recovery criteria include the protection of sufficient breeding habitat to ensure the continued existence of at least one viable, self sustaining warbler population in each of the eight recovery regions delineated in the recovery plan, where the potential for gene flow exists across regions to ensure long-term viability of the protected populations (USFWS 1992). Hays County lies predominantly within Recovery Region 5, which also includes all of Travis County and portions of Williamson, Blanco, and Burnet counties (Figure 3-1).

As of the date of this RHCP, the USFWS has started the processes of performing a five-year status review for the golden-cheeked warbler and reconvening the golden-cheeked warbler recovery team. An updated recovery plan for the species (including potential revisions to the boundaries of recovery regions) may be developed by the USFWS, based on the results of five-year status review and the recommendations of any reconvened recovery team. However, for the purpose of developing this RHCP, the existing 1992 Golden-cheeked Warbler Recovery Plan (USFWS 1992) provided guidance for the conservation plan.

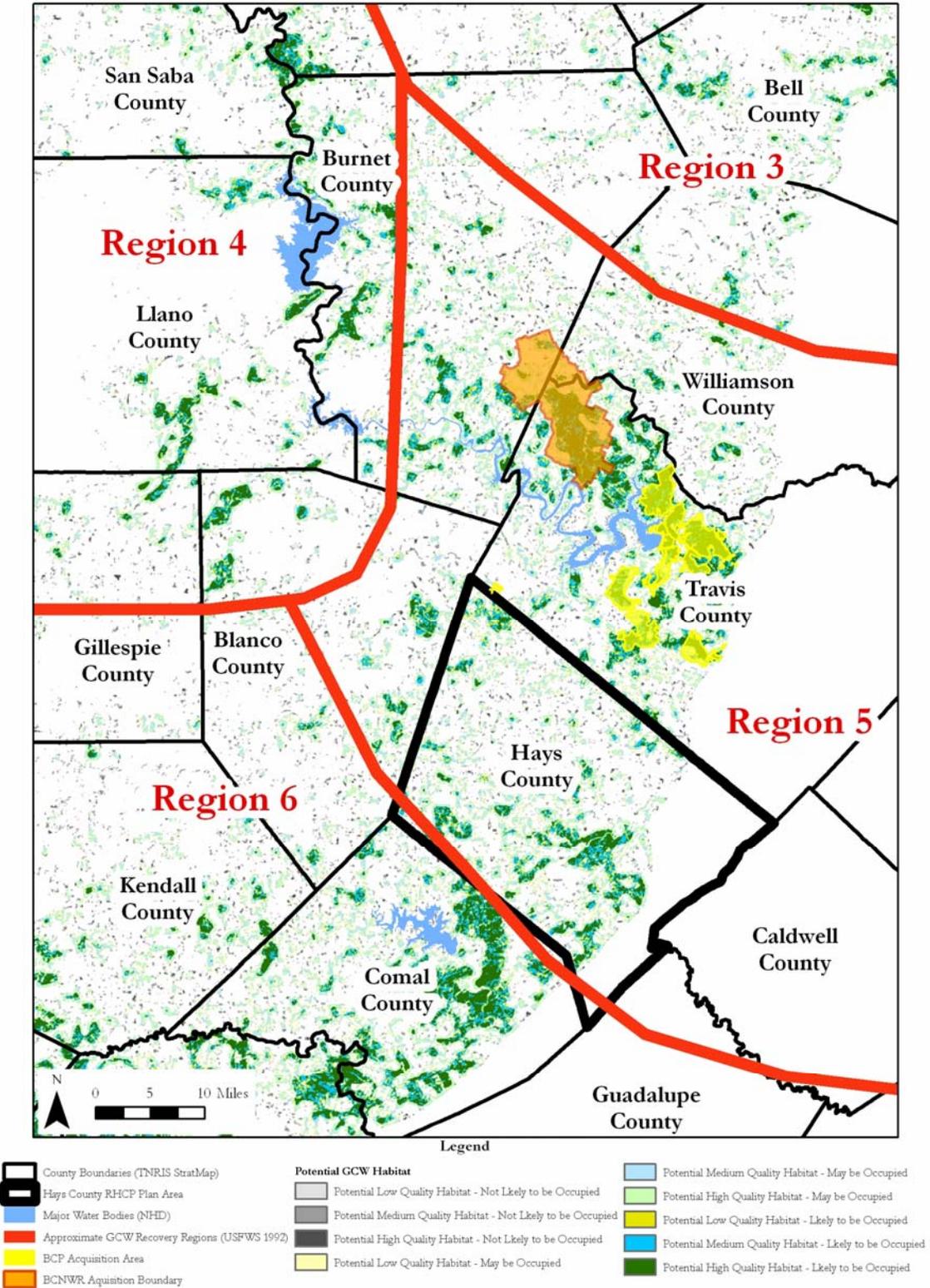
Participants at the "Population and Habitat Viability Workshop" held in August 1995 recommended protection of sufficient habitat for a carrying capacity of 3,000 breeding pairs for each warbler recovery region, with habitat management measures to include prevention of habitat damage by herbivores, habitat restoration, maintenance of high percent canopy cover of trees, oak wilt prevention, predator and nest parasite control, limiting human impacts in habitat, and planning at the landscape level (USFWS 1996a).

Attaining the recovery goals for the golden-cheeked warbler includes the identification of "focal areas" for protection that include a single, viable warbler population or one or more smaller populations that are interconnected (USFWS 1992). Within Recovery Region 5, it

appears that a focal area has already largely been protected through the establishment of the Balcones Canyonlands Preserve and the Balcones Canyonlands National Wildlife Refuge in Travis, Williamson, and Burnet counties (Figure 3-3). Currently, these areas comprise approximately 48,250 acres of permanently preserved and managed lands dedicated to the protection of endangered species. These two preserve systems contain approximately 28,440 acres of potential high quality warbler habitat, based on the results of the Loomis warbler habitat model.

Hays County lacks the very large, contiguous blocks of potential warbler habitat that are present in some adjacent counties (i.e., Travis County and, to a lesser extent, Comal County) (Figure 3-3). The potential warbler habitat in Hays County, while fairly abundant, is distributed in smaller, more isolated patches (Figure 3-2). Therefore, Hays County generally lacks an obvious “focal area” to contribute to the recovery goals for Recovery Region 5. Achieving the recovery goals for the warbler also requires the protection and management of “abundant and scattered patches of habitat” outside of the focal protection areas (USFWS 1992). The RHCP will protect patches of habitat for the golden-cheeked warbler outside of the established and potential focal protection areas to the north and south of Hays County. In this way, the RHCP will contribute to the recovery of the species.

Figure 3-3. Golden-cheeked Warbler Focal Area Preserves in Recovery Region 5.



3.2.2 Black-capped Vireo

The USFWS lists the black-capped vireo as endangered. It was first proposed for endangered status on December 12, 1986 (51 FR 44808) and was given endangered status on October 6, 1987; the rule becoming effective on November 5, 1987 (52 FR 37420). The USFWS has not designated critical habitat for the black-capped vireo. The black-capped vireo was state-listed as threatened on March 1, 1987 and endangered on December 28, 1987.

The USFWS includes Hays County within the black-capped vireo Recovery Region 3 (USFWS 1991). However, the Black-capped Vireo Population and Habitat Viability Assessment Report (USFWS 1996b) recommended that Hays County be included in a redrawn Recovery Region 2. A status review of the vireo by the USFWS was completed on June 19, 2007. The review assessed the current status of the species in the context of these revised recovery region boundaries, and recommended that the species be downlisted to threatened status (USFWS 2007).

3.2.2.1 Species Description and Life History

The black-capped vireo is a small, insectivorous bird that is approximately 4.5 inches long. Characteristic features of the male vireo include a black crown, nape, and face, and white "spectacles" formed by white eye-rings (interrupted over the eye) with a white band connecting the eye-rings. Females of the species are similar, but are duller and have a slate-gray cap. For both sexes, the back of the bird is olive green, the wings and tail are blackish with yellow-green edgings, the breast and belly are white with greenish-yellow flanks, and the wings have two pale yellow wing bars. The bill is black and the irises are brownish-red to red (Oberholser 1974, Farrand 1983).

Black-capped vireos are migratory and are present in Texas during the breeding season. The vireos arrive in Texas from late March to mid-April, with adult males arriving before females and first-year males. The majority of black-capped vireo breeding activities occur between mid-April and the end of July. However, the species is known to produce more than one clutch per season and adults may continue to rear young until mid-September (Grzybowski 1995). Although, Grzybowski (1995) also notes that black-capped vireo populations along the periphery of the Edwards Plateau have a slightly advanced schedule for spring migration and breeding. The birds leave their breeding grounds in the late summer and early fall, generally beginning in August and continuing through September and early October (Grzybowski 1995). Adult males are typically the last to migrate south (USFWS 1991). For the purpose of the RHCP, the breeding season of the black-capped vireo is defined as March 15 through August 31.

The present known breeding range of the black-capped vireo extends from central Oklahoma through Dallas, the Edwards Plateau, Concho Valley, Callahan Divide, and Big Bend National Park in Texas to the Mexican states of Nuevo Leon and Tamaulipas. The species

winters entirely in Mexico along the Pacific slopes of the Sierra Madre Occidental Mountains from southern Sonora to Oaxaca (Wilkins et al. 2006).

Black-capped vireos are territorial, and territories tend to be clustered in patches of suitable habitat. Territory clusters tend to be either small (less than ten territories) and composed of primarily young, second-year males, or large (frequently 15 or more territories) and composed of older, after-second-year males (USFWS 1991). Reproductive success and survivorship has been positively associated with cluster size (USFWS 1991). Second-year males tend to occupy poorer quality habitats that have vegetation characteristics more similar to areas of non-habitat than areas occupied by older males (Grzybowski et al. 1994).

Individual black-capped vireo territories are generally between 2.5 and 25 acres (with most covering approximately two to four acres) (Wilkins et al. 2006, Graber 1957, Tazik and Cornelius 1989). Territories are defended by the male through song and occasionally aggressive behaviors (Graber 1957). Adult male black-capped vireos, particularly those from large territory clusters, exhibit strong site fidelity and usually return to the same site and territory each year. Females also usually return to the same site each year, but may move among territories in the cluster both between seasons and between same-season nesting attempts (Graber 1957). Members of smaller breeding clusters tend to disperse more frequently to other sites (Graber 1957, USFWS 1991).

Nesting begins upon the arrival of females and continues through August. Nests are small, open-cup, hanging structures constructed in the forks of branches in very dense, deciduous foliage. Nests are typically placed one to four feet from the ground. Both sexes are known to contribute to nest building (Graber 1957). Black-capped vireos may complete up to six clutches in a single season, which typically lasts from early April through late July (USFWS 1991). A new nest is constructed for each nesting attempt (Graber 1957).

Egg laying begins the day after completion of the nest. Individual clutches contain three to four eggs (Graber 1957), with an estimated seasonal clutch size of between 12 and 20 eggs (USFWS 1991). Male vireos aggressively guard active nests (USFWS 1991). The incubation period extends from 14 to 19 days, which is longer than most other small, open-cup nesting passerines, and duties are shared by both parents. Hatchlings stay in the nest for nine to 12 days, and are fed by both adults. Females brood newly hatched young for four to six days. Fledglings are attended by one or both parents for usually 30 to 45 days after leaving the nest (Graber 1957, USFWS 1991).

Black-capped vireos are active birds that glean insects, spiders, larvae, and other food items from foliage, usually within the upper strata of the canopy (Graber 1957, Grzybowski 1995).

3.2.2.2 Habitat Description

The black-capped vireo uses heterogeneous scrub habitat that has a patchy distribution of shrub clumps and thickets with a few scattered trees and abundant deciduous foliage to ground level (Graber 1957, 1961; USFWS 1991; Grzybowski 1995). While the habitats occupied by the vireo may differ greatly across its range, the most common and distinguishing habitat element throughout the range of the species is the presence of dense, low, deciduous foliage at ground level to approximately three meters (USFWS 1991, Grzybowski et al. 1994, Maresh 2005). This low, dense, deciduous cover provides foraging and nesting sites, as well as protective cover from adverse weather and predators (Grzybowski et al. 1994).

Other black-capped vireo habitat variables, such as the amount of heterogeneity in vegetation structure, the degree of openness in the woody canopy, and the species composition of the habitat are highly variable throughout the range of the species and within regional areas. Due to the high degree of variation in these other habitat variables, they are thought to be less influential in comprising suitable vireo habitat than presence of low, dense, deciduous foliage (Maresh 2005).

Black-capped vireos may co-occur with golden-cheeked warblers, with vireos utilizing dense, deciduous foliage at the edge of warbler habitat patches (Grzybowski et al. 1994).

Species Composition

Typical plant species in black-capped vireo habitat on the Edwards Plateau include plateau live oak, shin oak, and various sumacs (*Rhus* spp.). Less common species include Texas mountain laurel (*Sophora secundiflora*), agarito (*Berberis trifoliolata*), and beebrush (*Aloysia gratissima*). Ashe juniper is usually not the dominant species, although it may be co-dominant with the oaks (Graber 1961, USFWS 1991, Grzybowski 1995).

Canopy Cover and Height

Black-capped vireos utilize patchy, shrubland habitat. Horizontal woody canopy cover in vireo habitat generally averages between 30 and 60 percent, with most of this cover due to deciduous shrubs (USFWS 2007). However, Maresh (2005) reported that canopy cover at several sites across Texas varied from less than 10 percent to greater than 90 percent. Ashe juniper generally comprises less than 10 percent of the total woody canopy cover. Closely spaced shrub clusters separated by grassy vegetation create the heterogeneous cover required by the species (USFWS 1991).

Dense, vertical cover of deciduous foliage between ground level and approximately 10 feet is a primary characteristic of black-capped vireo habitat. Vireos place nests in this low shrub cover, usually within areas of the densest foliage (USFWS 1991).

While vireos are typically associated with low, shrubby habitat, they have also been observed utilizing dense foliage “aprons” around widely spaced clusters of tall trees in open

woodlands and at the edge of patches of dense woodlands, where the canopy height may exceed 20 feet (Maresh 2005).

Patch Size and Landscape Matrix

Black-capped vireos nest in clusters of individual territories, and the minimum size for a patch of suitable habitat is thought to be between ten and 12 acres (Graber 1957). Graber (1957) also suggests that linear clusters of shrubby vegetation, such as along fence lines and road sides, do not constitute suitable black-capped vireo habitat.

Black-capped vireo habitat may also be associated with certain geologic formations (i.e., Fredericksburg limestones in Texas), poor soils, and topographic features that might create more favorable conditions for maintaining low, patchy, shrublands (USFWS 1991). However, any potential relationships between soils, geology, and vireo habitat are poorly understood.

Fire and Other Disturbances

In many parts of the black-capped vireo range (including the eastern edge of the Edwards Plateau), the shrubland vegetation used by the species is an early successional vegetation type frequently maintained by fire or moderate browsing by wildlife or livestock (heavy browsing can reduce vireo habitat). Other land management practices may also create or maintain suitable habitat conditions for the vireo. In other parts of the species' range, suitable breeding habitat is a stable vegetation type maintained by the abiotic characteristics of the area (Farquhar and Gonzalez 2005).

Some researches have found that black-capped vireos tend to occupy sites with a history of severe disturbance (Grzybowski et al. 1994). Where vegetation succession occurs fairly rapidly, severe disturbances, such as those caused by fire, may retard the growth of Ashe juniper and favor the bushy growth of deciduous species such as oaks and sumacs (USFWS 1991, Wilkins et al. 2006). Periodic disturbance of the habitat may be beneficial for maintaining suitable vireo habitat, depending on site conditions and proper implementation (Grzybowski 1994). Vireos have been shown to recolonize sites as little as two years after a fire (Tazik et al. 1993), and the habitat benefits from such disturbances have been estimated to last up to 20 or 30 years (Tazik et al. 1993, Dufault 2004). Burning intervals suggested for maintaining vireo habitat have ranged from 4 to 10 years (Campbell 2003) or even 25 years (Tazik et al. 1993).

3.2.2.3 Hays County Black-capped Vireo Population

Graber (1957) identified breeding populations of the black-capped vireo in Hays County in the late 1950's located at the El Rancho Cima Boy Scout Camp and at locations within a couple of miles south and east of Wimberley. Accurate locations for these three historic observations are not available. The Texas Natural Diversity Database maintained by the Texas Parks and Wildlife Department (which is a limited dataset based on voluntary submissions of sighting records) identifies three occurrences of the black-capped vireo in Hays County (one

reported in 1993 and the other two reported in 1999) (Texas Parks and Wildlife Department 2008). However, the USFWS has not received any records of the species in the county since 2000 (Wilkins et al. 2006).

The habitat estimates reported in Wilkins et al. (2006), which are based on the results of roadside surveys in the late 1990's (Maresh and Rowell 2000), identify approximately 23,855 acres of potential black-capped vireo habitat in Hays County. However, due to sampling issues associated with the original roadside surveys, the county-wide estimates of potential vireo habitat are likely to overestimate the amount of occupied and potential suitable habitat. Therefore, they may not be reliable and are of limited utility (Wilkins et al. 2006). The distribution of this potential habitat across the county is not available.

The Biodiversity and Biocultural Laboratory at the University of Texas at Austin has been developing a model that predicts the location of suitable vireo habitat in Hays County. Fuller et al. (2008b) have used a niche model constructed using a maximum entropy algorithm to identify areas with a probability of being suitable vireo habitat. Preliminary work by Fuller et al. (2008b) predicts that approximately 2,069 acres in Hays County may have a "high" probability of being suitable vireo habitat and approximately 11,772 acres in Hays County may have a "good" or "high" probability of being suitable vireo habitat.

The current population of black-capped vireos in Hays County is unknown, since a detailed population survey of the county has not been completed and only a few observations of the species have been reported in recent years. However, given the increasingly optimistic status of the vireo overall (the recent status review proposed that the species be downlisted in part due to the larger number of known populations) (USFWS 2007), the documented presence of the species on many private lands in the region (USFWS 2007), and the likely abundance of potential habitat in the county (Wilkins et al. 2006), the species is still likely to occur in Hays County.

3.2.2.4 Threats and Recovery Goals

The major threats to the black-capped vireo cited at the time the species was listed as endangered included habitat loss through conversion to other uses, heavy grazing and browsing pressure by domestic livestock and wildlife, and brood parasitism by brown-headed cowbirds (USFWS 2007). Since listing, new information suggests that vegetational succession may also be a major concern for the species (USFWS 2007). The recent status review of the vireo by the USFWS states that habitat loss, grazing and browsing, brood parasitism, and vegetational succession remain the primary threats to the species, although the relative importance of each of these threats may have changed since the time of listing (USFWS 2007).

The 2007 status review found that habitat loss and fragmentation due to the conversion of rangeland to other uses has likely decreased the amount of available habitat for the black-capped vireo across Texas, particularly on the Edwards Plateau, and remains a major threat (USFWS 2007).

The status review found that fewer domestic livestock on the Edwards Plateau, particularly goats, may have decreased the overall threat from grazing and browsing. However, heavy grazing and browsing by domestic livestock may still have an important negative impact on localized vireo populations. While the density and abundance of domestic livestock on the Edwards Plateau may be decreasing, the populations of white-tailed deer and other exotic, browsing ungulates may have increased, which may be of concern to the species (USFWS 2007).

Brood parasitism by brown-headed cowbirds has been identified as a major factor in the low reproductive success of some black-capped vireo populations. Cowbird abundance is correlated with the number and proximity of domestic livestock feeding areas, and the relative abundance of cowbirds in Texas has generally been decreasing over the last ten years. In addition to the general decline of the abundance of cowbirds in North America, cowbird trapping and removal efforts are likely to have reduced parasitism rates on many of the managed populations. The status review states that the overall threat to the species from brood parasitism in Texas has likely decreased since the time of listing (USFWS 2007).

Vegetational succession, particularly the invasion and growth of Ashe juniper into formerly open rangelands, has limited vireo habitat across much of the range of the species. The status review identifies fire suppression, overgrazing, and drought as contributing factors to the increase of Ashe juniper in the landscape. The status review suggests that vegetational succession may be an increasing threat to the vireo, but little data is available to quantify the magnitude of the threat (USFWS 2007).

In addition to the major threats to the species, the status review identifies predation from red-imported fire ants as a potentially increasing threat to the species (USFWS 2007).

The 2007 status review recommends that the species be down listed from endangered to threatened status (USFWS 2007). The recommendation for downlisting is based on observations that total known population of black-capped vireos in Texas is much larger than that known at the time of listing due to an increase in the overall population size and/or increased survey efforts that identified populations at new locations (including on private lands). Given a larger known population, the magnitude of the major threats to the species may be generally less than previously suspected. However, the status review cautions that threats to this species still exist and its recovery depends on the implementation of management actions to reduce these threats (USFWS 2007).

The 1991 Black-capped Vireo Recovery Plan is currently considered to be out-of-date and in need of revision (USFWS 2007), primarily because the known vireo population is currently much larger than the known population at the time of listing and the relative magnitude of the primary threats to the species is likely to have changed since listing. However, the recovery criteria listed in the 1991 Recovery Plan included a call for the protection of at least one viable vireo population composed of at least 500 to 1000 breeding pairs in each of six

recovery regions in Texas, Oklahoma, and Mexico. It is not clear whether a viable vireo population is currently protected in the recovery region that includes Hays County.

3.3 Evaluation Species

The County is not currently seeking incidental take authorization for the evaluation species addressed in the RHCP, and none are currently listed as threatened or endangered. However, the County recognizes that these species may be rare or sensitive and that some may have the potential to become listed species during the duration of the Permit. The protection of large tracts of land described in the RHCP conservation program will provide collateral benefits to the evaluation species. The RHCP also supports new research to help fill information gaps on the biology, life history, distribution, and/or management of one or more of these species (see Section 6).

The evaluation species include 40 karst species, including terrestrial and aquatic species, that depend on similar habitats. Evaluation species descriptions, known localities, and habitat requirements (as currently known) are described in Appendix B.

Zara Environmental, LLC mapped five cavernous bedrock outcrops in Hays County that provide habitat for terrestrial and aquatic karst species (see report in Appendix C). From youngest to oldest they are the Buda Limestone, the main outcrop of the Edwards Aquifer (Georgetown, Person, and Kainer Formations), outliers of the Kainer Formation that are geographically isolated from other outcrops of Edwards Limestone, the lower member of the Glen Rose Formation, and the Cow Creek Limestone. A detailed description of each of these outcrops, including examples of caves and karst features that occur within those outcrops, is included in Appendix C. Figure 3-4 shows the extent of karst terranes in Hays County and the general locations of known karst features.

Approximately 140,000 acres of Hays County are underlain by the five cavernous bedrock outcrops identified above, and approximately 89 caves, sinkholes, springs, and other karst features are known to occur in the county (Appendix C). Terrestrial karst evaluation species are known to occur in 16 of the karst features in Hays County, and aquatic karst evaluation species are known to occur in 17 other karst features in Hays County. Four of the 89 known karst features in Hays County are known to be occupied by terrestrial and aquatic karst evaluation species (Figure 3-4).

A number of regulations and other programs currently exist or are being proposed to support the conservation of potentially rare or sensitive karst and aquatic species in Hays County. Many of these programs focus on protecting or improving the quality and quantity of water resources in the county, while others aim to protect underground karst and cave habitats. A list of programs that may contribute to the conservation of the evaluation species included in the RHCP is found in Appendix D.

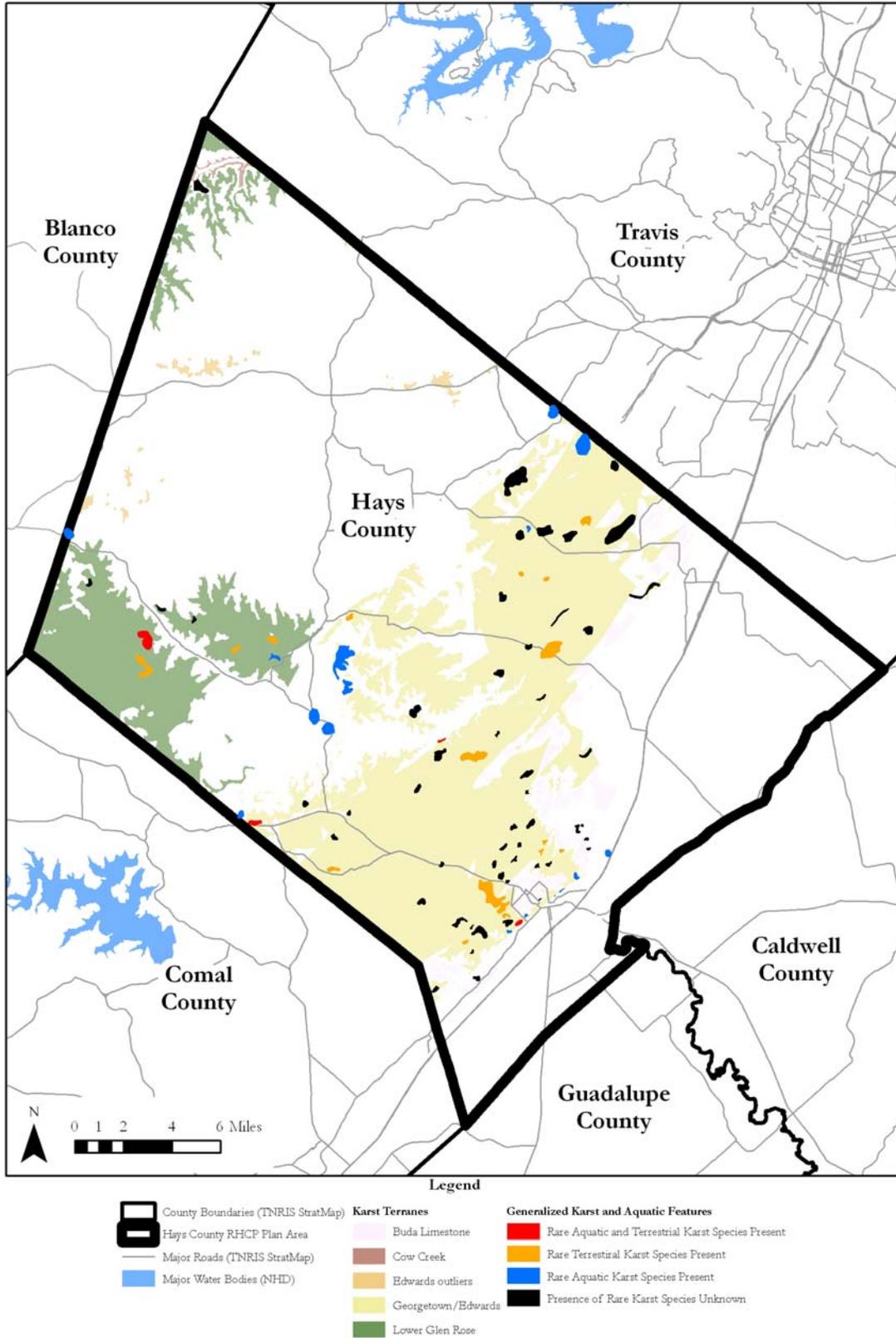
3.4 Additional Species

Conservation measures taken under the RHCP may collaterally benefit 16 “additional” species, including six listed aquatic species, three unlisted plants, and six unlisted aquatic animals. The list of additional species also includes the northern Hays County *Eurycea* salamander, which is likely to be determined to represent additional populations of one of the currently listed salamanders (Dr. Jean Krejca, Zara Environmental LLC, personal communication; see Appendix B). The County is not seeking incidental take authorization for these additional species, but includes measures in the RHCP that may provide collateral conservation benefits to these species.

Species descriptions, known localities, and habitat requirements for the additional species (as currently known) are included in Appendix B.

As for the evaluation species, existing or proposed regulations and other programs may contribute to the conservation of the additional species included in the RHCP. These programs are listed and described in Appendix D.

Figure 3-4. Karst Terranes and General Locations of Karst Features in Hays County.



4.0 POPULATION AND LAND USE

Hays County is situated along the Interstate Highway 35 corridor between the major population centers of Austin and San Antonio. Hays County is included in the Austin-Round Rock Metropolitan Statistical Area (MSA), and was the second fastest growing county in the MSA (which also includes Bastrop, Caldwell, Travis, and Williamson counties) with an estimated 58.9 percent population growth between 1996 and 2006 (Texas A&M University Real Estate Center 2007).

Despite the recent increases in population, which has been primarily focused in the communities along Interstate Highway 35, Hays County remains a mostly rural county with agricultural land uses dominating the landscape.

4.1 Population

4.1.1 Current Population

The 2000 Census reported a population of 97,589 in Hays County. The current population of Hays County, estimated for January 1, 2007 by the Texas State Data Center, was approximately 137,940 (Texas State Data Center 2007). This represents an estimated 41 percent increase in the total population of Hays County since the 2000 census.

Table 4-1. Census 2000 Population and Estimated 2007 Population in Hays County and Local Communities.

Community	Census 2000 Population	Estimated 2007 Population ¹	Percent Change
Hays County	97,589	137,940	41%
Bear Creek	360	400	11%
Buda	2,404	5,339	122%
Dripping Springs	1,548	1,962	27%
Hays	233	243	4%
Kyle	5,314	23,285	338%
Mountain City	671	745	11%
Niederwald	584	498	-15%
San Marcos	34,733	48,997	41%
Uhland	386	456	18%
Wimberley	3,797	4,386	16%
Woodcreek	1,274	1,476	16%

¹Estimated 2007 populations reported by the Texas State Data Center (2007).

The fastest growing communities in Hays County include the cities of Buda and Kyle, which are located along the Interstate Highway 35 corridor between San Marcos and Austin.

4.1.2 Population Projections

To help forecast possible changes within Hays County during the 30-year term of the Permit, population projections were developed for the RHCP by TXP (an Austin-based economic analysis and public policy consulting firm) and Capital Market Research (“CMR,” an Austin-based market research firm specializing in real estate research, land development economics, and market analysis) (TXP and CMR 2008). The projections were based on an analysis of historic and recent demographic and economic data (such as population, income, employment, and economic activity). The RHCP population estimate takes into account the most recently available population estimates for Hays County (July 2007), employment data (quarterly and annual information for 2007), migration rates, and information related to land development activity within Hays County.

Based on the TXP and CMR analysis, the population of Hays County is expected to increase from 97,589 in the year 2000 to an estimated 375,873 by the year 2040 (Table 4-2), which is a projected population increase of approximately 285 percent.

TXP and CMR used historic census tract population estimates and recent household and land development information to allocate the population forecast among the 14 census tracts delineated in the county. Figure 4-1 shows the boundaries of these 14 census tracts in Hays County, as delineated by the U.S. Census Bureau, and in relation to communities in Hays County.

Household and land development information used to help allocate the Hays County population forecast among census tracts included a review of building permit data and septic tank permit data provided by the cities of Buda, Kyle, and San Marcos; the Hays County Health Department; and the Capital Metropolitan Planning Organization. TXP and CMR also compiled a survey of currently approved residential subdivision lots that are available for future development (including a tally of the number of undeveloped residential lots in subdivisions approved for development or those with continued or pending sales efforts). The data provided a record of residential construction in Hays County by census tract since the year 2000.

Several census tracts in Hays County are projected to increase in population faster than the overall growth rate for the county, including the census tracts corresponding to the southern tip of Hays County (Census Tract 10400), the Dripping Springs area (Census Tract 10801), and the Kyle-Buda area (Census Tracts 10902, 10903, and 10904). The most extreme population growth is expected in Census Tract 10904, which is associated with the city of Kyle (Table 4-2).

Figure 4-1. Census Tracts in Hays County.

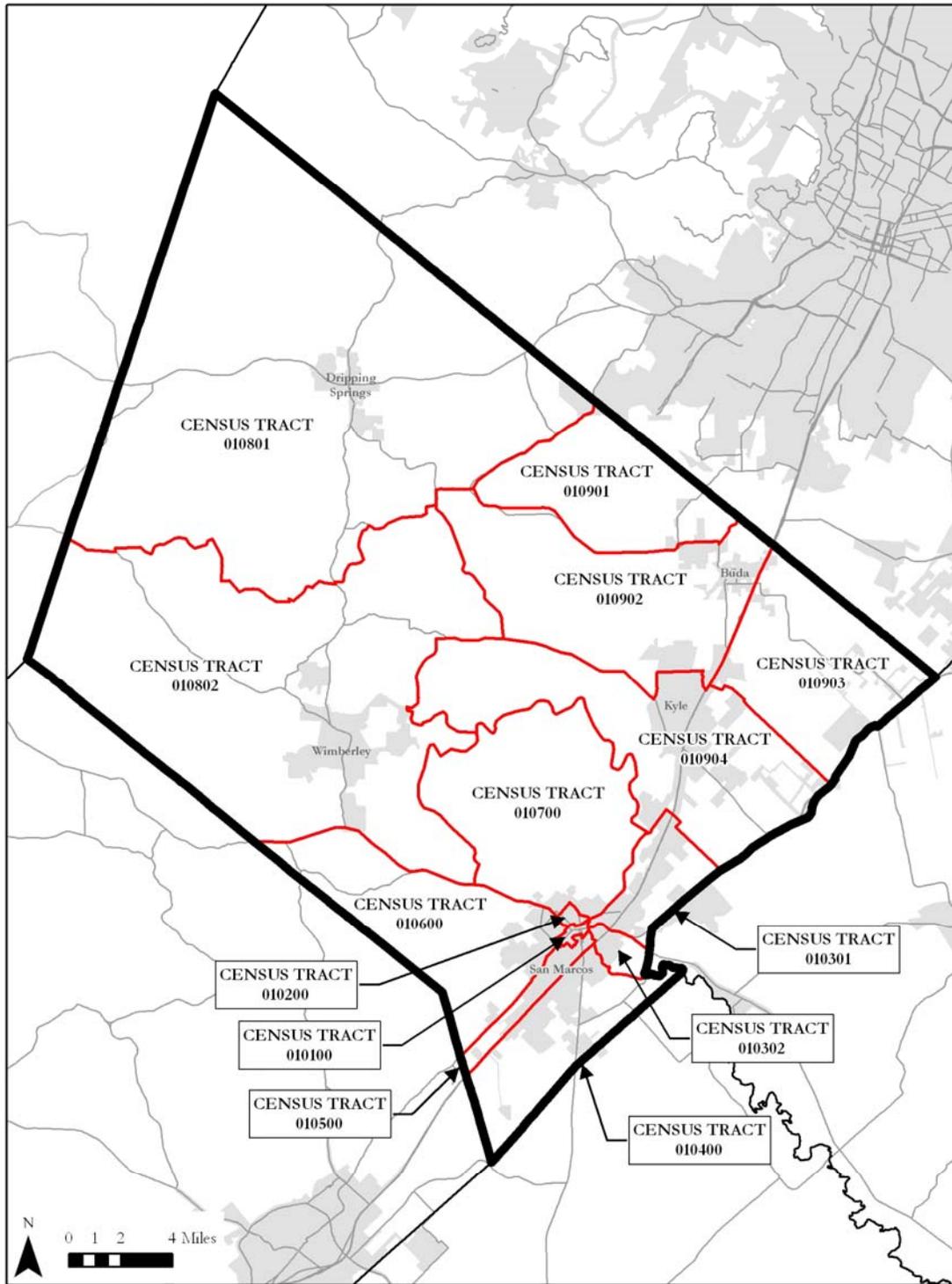


Table 4-2. Projected Population Estimates for Hays County and Census Tracts by Decade (TXP and CMR 2008).

Census Tract	Census 2000 Population	Projected 2040 Population	Estimated Percent Change (2000 - 2040)
Hays County	97,589	375,873	285%
CT 010100	1,908	3,799	99%
CT 010200	5,656	10,513	86%
CT 010301	10,176	22,600	122%
CT 010302	4,326	7,646	77%
CT 010400	4,343	18,691	330%
CT 010500	2,783	7,162	157%
CT 010600	7,904	18,689	136%
CT 010700	8,113	21,050	159%
CT 010801	12,908	66,295	414%
CT 010802	10,153	27,939	175%
CT 010901	6,609	15,872	140%
CT 010902	5,512	28,237	412%
CT 010903	8,643	52,076	503%
CT 010904	8,555	75,304	780%

4.2 Land Uses and Development Activities

4.2.1 Current Land Uses

4.2.1.1 Hays Central Appraisal District Data

The Hays Central Appraisal District (HCAD) maintains a database of real property that includes information regarding the ownership, legal description, market value, improvements, and appraised land use of parcels within the county. The HCAD appraisal database was linked to a geographic database of parcel boundaries developed by the Capital Area Council of Governments (CAPCOG) in 2005. This 2005 geographically linked appraisal district data allowed for an analysis of land uses for different regions of the county.

The 2005 HCAD appraisal database included nine different categories of land uses for parcels within the county. These nine general land use categories included single-family residential (code "A"), multi-family residential (code "B"), vacant (code "C"), agricultural (code "D"), farm and ranch improvements (code "E"), commercial or industrial (code "F"), utility (code "J"), personal property (code "M"), and residential inventory (code "O") groups. The primary land use code for each parcel was identified from the database (i.e., if more than one code was listed for a parcel, the first code was used). Approximately 8 percent of land in the

geographic database for Hays County was unclassified and had no identified land use code (Table 4-3).

Figure 4-2 shows the distribution of land uses across Hays County, based on HCAD land use data.

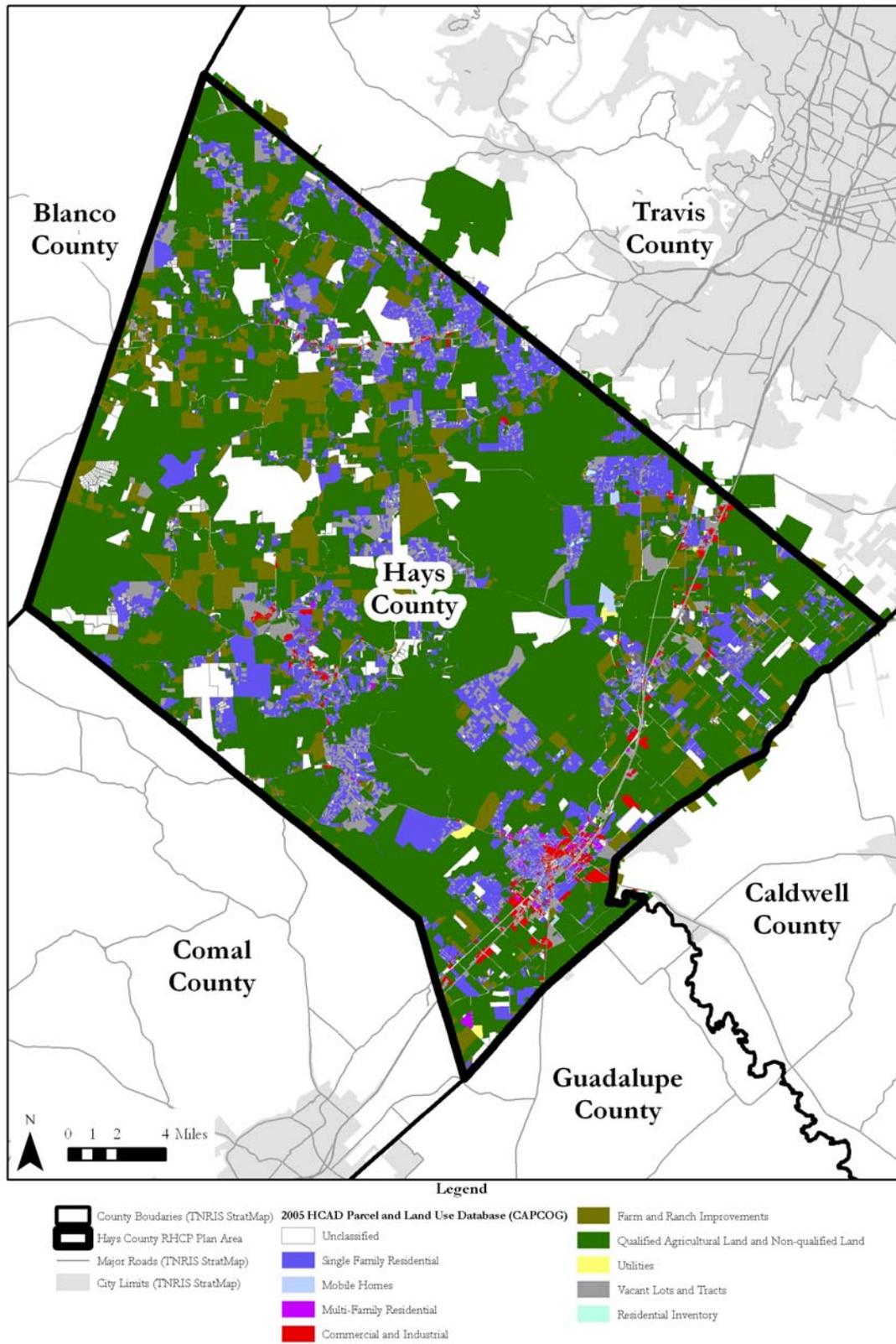
Approximately 71 percent of Hays County was classified as agricultural land or as farm and ranch improvements in 2005. Single family residential use was the next most extensive land use classification in the county, with approximately 14 percent of Hays County land classified as single family residential. Parcels classified as vacant were also common in the county, and composed approximately 8 percent of the acreage of the county. Other land use categories (including multi-family residential, commercial or industrial, and utility uses) each represented less than 1 percent of the acreage of the county (Table 4-3).

Acreage within each of the principal land use categories is shown in Table 4-3.

Table 4-3. Acres Classified by Land Use Type for Parcels in Hays County by Census Tract, based on 2005 HCAD Appraisal Data.

Census Tract	Single-family and Multi-family Residential (Code A or B)	Vacant Land (Code C)	Agricultural Land (Code D)	Farm and Ranch Improvements (Code E)	Commercial or Industrial (Code F)	Utility (Code J)	Personal Property, Residential Inventory, and Unclassified Land (Code M, O, or Blank)
Hays County	58,395	25,379	260,465	41,382	4,195	700	34,801
010100	175	20	1	-	71	2	11
010200	232	39	-	-	94	-	3
010301	971	542	3,510	387	562	20	589
010302	348	91	939	30	96	-	3
010400	1,549	614	9,281	861	570	125	1,190
010500	307	275	1,515	18	472	7	91
010600	5,141	1,754	15,627	661	118	211	840
010700	5,044	2,230	27,787	1,607	169	3	321
010801	17,592	8,167	70,812	18,033	364	8	16,965
010802	13,439	7,444	52,307	11,334	620	23	8,076
010901	3,867	803	14,455	770	95	20	236
010902	3,061	1,574	24,604	2,846	358	202	1,901
010903	3,511	688	16,138	1,923	289	64	1,483
010904	3,159	1,138	23,489	2,912	318	16	3,092

Figure 4-2. 2005 HCAD Parcels and Land Use Codes.



4.2.1.2 Parcel Size Distribution

The 2008 HCAD parcel database for Hays County identifies approximately 57,400 individual parcels in the county. The majority of these parcels are relatively small, such that approximately 91 percent of the parcels are no more than 10 acres. However, the county contains approximately 250 parcels that are of at least 500 acres. In terms of combined acreage, the individual parcels that are at least 500 acres include approximately 165,000 acres (i.e., approximately 38 percent of the area of the county).

4.2.1.3 Currently Protected Open Space

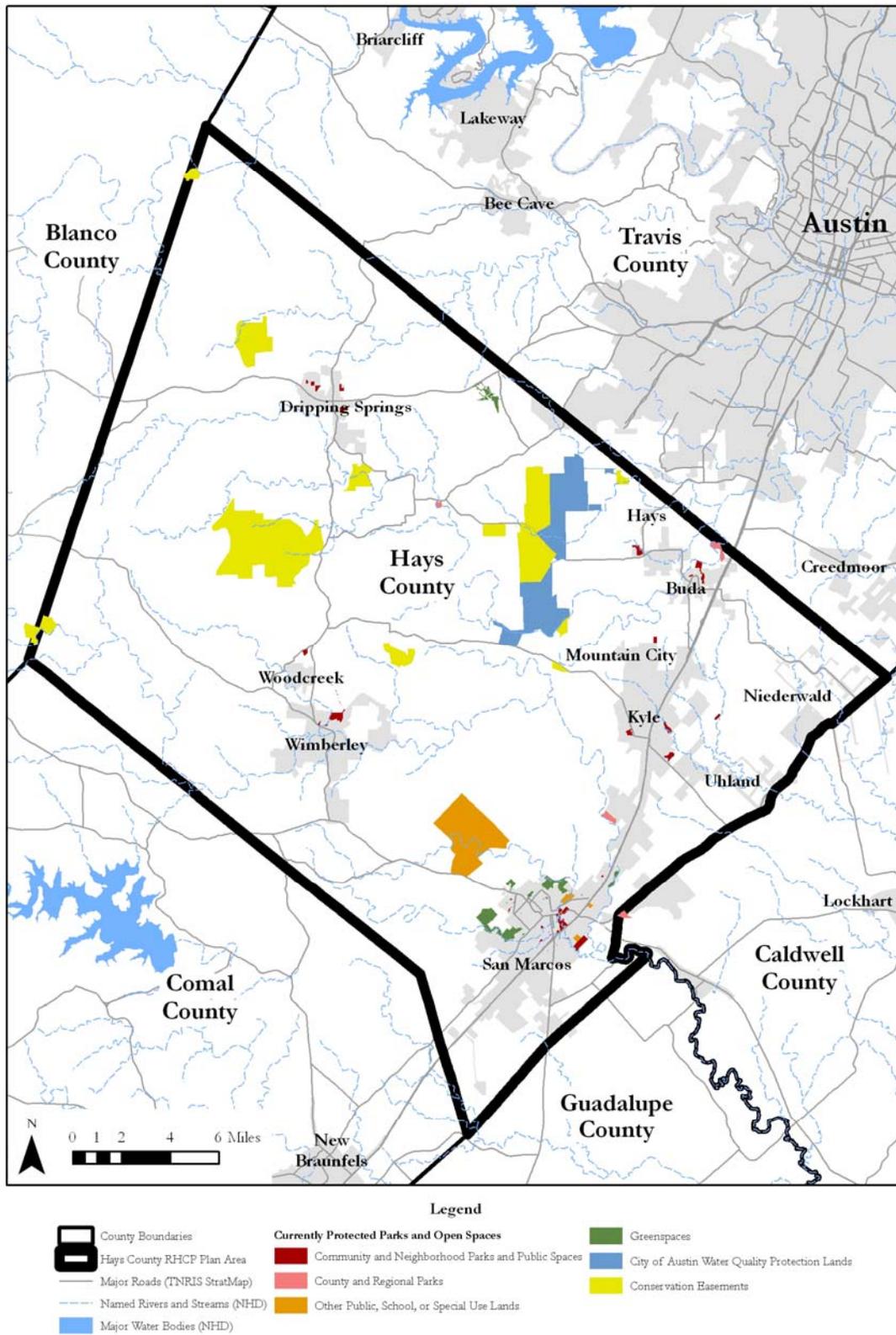
Hays County has a number of community or regional parks, greenbelts/greenspaces, preserves, academic research tracts, and privately owned conservation easements that protect open spaces from intensive development (Figure 4-3). While the primary purpose of these previously protected lands may not be endangered species conservation, a number of these properties may have some conservation value for the species addressed in the RHCP, particularly large tracts with limited public access. Table 4-4 lists the approximate acreage of currently protected parks and open spaces in Hays County.

Table 4-4. Acreage of Currently Protected Parks and Open Spaces in Hays County.

Type of Land	Acres
Community and Neighborhood Parks	705
County and Regional Parks	289
Other Public, School, and Special Use Lands	3,606
Greenspaces	1,053
Conservation Easements	12,569
City of Austin Water Quality Protection Lands	5,517
Total Acres	23,739

These existing protected open spaces include approximately 9,880 acres of potential habitat for the golden-cheeked warbler, including approximately 1,400 acres of potential high quality warbler habitat (based on the Loomis warbler habitat model described in Appendix A). Approximately 13,640 acres of these protected properties lie over the Edwards Aquifer recharge zone. The currently protected open spaces include approximately 13,600 acres of karst terrane that may be suitable for the development of caves or other karst features, and approximately 22 known karst features may be included within these properties. Of the karst features occurring at least partially within the previously protected properties, 13 are known locations for evaluation or additional species addressed in the RHCP.

Figure 4-3. Currently Protected Parks and Open Spaces in Hays County.



4.2.2 Projected Land Development

TXP and CMR used Hays County census tract population forecasts, estimates of the projected number and average size of new residences needed to support the projected population increase, and the estimated area of other new commercial, industrial, and institutional projects to estimate the amount new land development (i.e., the construction of homes, businesses, and related infrastructure) that could be associated with projected population increases in Hays County during the term of the Permit (TXP and CMR 2008).

The land development projections for the RHCP were compiled by TXP and CMR as follows:

1. Hays County Economic and Demographic Assessment: As a starting point, county-wide and city-specific data were collected and analyzed. Collected datasets included total population, employment, labor force, personal income, wages, tax base (sales and property), building permits, and new home unit values. Because Hays County is part of the Austin-Round Rock MSA, similar datasets were collected for the MSA. The analysis assumes that Hays County's growth has been and will largely continue to be influenced by economic forces driving Austin and Travis County.
2. Hays County Real Estate Analysis: TXP and CMR collected historical residential real estate data, compiled by year and census tract, within Hays County. This information was used to assess annual absorption trends and the character of new housing units in the county. Current and future large-scale developments, such as master-planned communities, were identified, as well as any other factors (i.e., existing or planned infrastructure) that would influence the location of future populations.
3. Create Hays County Population and Employment Forecast: TXP and CMR reviewed third-party forecasts of relevant economic and demographic variables, as available (e.g., population, economic activity and employment by major sector, personal income, etc.) at the aggregate county level. Examples include forecasts provided by the Texas State Data Center and Texas Water Development Board. Using the most recent population and employment data, as well as overall regional economic trends (e.g., slowing housing sector and potential for a national recession), a 30-year population and employment forecast was developed.
4. Allocate Population at the Census Tract Level: Combining the results of Steps 1 through 3, TXP and CMR allocated a portion of the population forecast to each census tract using current household density and estimates of the number of acres per housing unit. The initial allocation was then adjusted to take into

account planned subdivisions, the amount of total land available for development, septic permit activity, and recent trends in commercial development.

5. Estimate the Area Affected by New Development: The final step combined the population forecast with current land use trends for each census tract, such as homes per acre and people per household, to estimate the number of acres that may be affected by new land development in census tracts within the county.

Based on the TXP and CMR analysis, approximately 48,095 acres of land in Hays County may be converted from undeveloped land uses to developed land uses during the term of the Permit. The potential impacts from anticipated land development to habitats for the covered species are described in Section 5.2.

5.0 POTENTIAL TAKE AND CUMULATIVE IMPACTS

5.1 Covered Activities

As discussed in Section 4.0, Hays County has experienced rapid population growth that is expected to continue for the next few decades. This population growth will fuel land use changes across the county. Many of these changes will involve the conversion of undeveloped land to developed uses, with the construction of a variety of public and private development projects and the addition of new or upgraded infrastructure. Some of these anticipated development activities may impact the species covered by the RHCP.

The Permit issued in conjunction with the RHCP will authorize incidental take of the covered species that is associated with otherwise lawful activities. These activities include, but are not limited to:

- The construction, use, and/or maintenance of public or private land development projects, including but not limited to single- and multi-family homes, residential subdivisions, farm and ranch improvements, commercial or industrial projects, government offices, and park infrastructure;
- The construction, maintenance, and/or improvement of roads, bridges, and other transportation infrastructure;
- The installation and/or maintenance of utility infrastructure, including but not limited to transmission or distribution lines and facilities related to electric, telecommunication, water, wastewater, petroleum or natural gas, and other utility products or services;
- The construction, use, maintenance, and/or expansion of schools, hospitals, corrections or justice facilities, and community service development or improvement projects;
- The construction, use, or maintenance of other public infrastructure and improvement projects (e.g., projects by municipalities, counties, school districts); and
- Any management activities that are necessary to manage potential habitat for the covered species within the RHCP preserve system that could temporarily result in incidental take.

This RHCP is not intended to restrict or address ordinary ranching practices or juniper (i.e., “cedar”) removal programs that may be covered under other authorizations, such as U.S. Department of Agriculture programs implemented by the Natural Resources Conservation Service (i.e., impacts from 2002 Farm Bill brush clearing programs were addressed by USFWS

Consultation Number 2-12-05-F-021) (USFWS 2004). Not all woodland or brushy vegetation containing junipers constitutes warbler habitat.

5.2 Incidental Take of Covered Species

Land development activities have the potential to impact habitat for the golden-cheeked warbler and black-capped vireo, which could result in incidental take. Approximately 48,100 acres of new development associated with residential and commercial projects is forecast to occur in Hays County during the term of the Permit (see Section 4.2.2). Additional impacts to habitat may occur in relation to the construction or improvement of roads and other public infrastructure. For the purposes of this RHCP, the extent of public sector land development is assumed to add another 9,600 acres of developed land to Hays County during the term of the Permit. This estimate is based on a review of the current distribution of public tax exempt properties and residential/commercial properties identified in the property tax appraisal rolls, whereby public tax exempt properties were found to represent approximately 20 percent of the acreage of residential and commercial properties in Hays County (i.e., 9,600 acres is approximately 20 percent of 48,100 acres). Therefore, the total area of anticipated land development (including both private and public-sector projects) is estimated to be approximately 57,700 acres over the duration of the RHCP.

Not all land development activities will affect the covered species due a number of factors, including the fragmented distribution of potential habitat for the warbler and vireo in Hays County (meaning that some development will occur in areas that are not likely to be suitable habitat for the covered species), the probability that not all areas identified as potential habitat are actually occupied by the species, and the implementation of measures during the land development process that avoid impacting potential habitat.

Incidental take of the covered species under the RHCP will be measured in terms of the direct and indirect impacts to acres of potential habitat resulting from the activities described in Section 5.1. Impacts to habitat will be used as a proxy for impacts to individual birds, breeding pairs, or territories, since reliable estimates of the total population of warblers and vireos in Hays County are not available.

Using habitat as a proxy for take of individual warblers and vireos is consistent with the USFWS approach with respect to both birds, and has been utilized in myriad incidental take permits and ESA Section 7 consultations with respect to those species. This approach also appears consistent with the limited case law addressing the issue of habitat as a proxy. For example, in *Arizona Cattle Growers' Association v. U.S. Fish and Wildlife Service*, the Ninth Circuit Court of Appeals held that the use of ecological conditions, such as impacting acres of potential habitat, may be used as a surrogate for defining the amount or extent of incidental take so long as these conditions are linked to the take of the covered species (273 F.3d 1229, 1249-50 [9th Cir. 2001]; see also *Oregon Natural Resources Council v. Allen*, 476 F.3d 1031, 1037 [9th Cir. 2007]).

Because expressing the numerical value of take of individual golden-cheeked warblers and black-capped vireos is impracticable, as described in greater detail below, the RHCP expresses take as the number of acres of potential habitat for the covered species that will be impacted, directly or indirectly, by covered activities.

While surveys for the warbler and vireo provide valuable information for determining the extent of occupation of a given area, they do not provide a precise mechanism for predicting the number of warblers or vireos that may actually be “taken” by the proposed action. The effectiveness of bird surveys in counting the number of birds in an area can be somewhat limited. For example, males of these species are far more easily observed than females or fledglings during surveys, due to their frequent vocalizations.

Moreover, the acreage of habitat impacted or protected by a particular action is a relatively stable metric of take and mitigation, compared to the number, size, and location of individual bird territories on a property that may vary from year to year. In addition, the impacts of a given activity may not be fully felt in a single season and may be spread over several or even many years, during which utilization of a given area may vary quite significantly for reasons unrelated to the activity in question. This variability is influenced by species preferences or environmental factors that may include natural year-to-year variations in the precise habitat utilized by individual birds, variations in individual bird behavior that influence detectability, variations in the ability of surveyors to detect and accurately map individual birds, and survey methodology. Therefore, estimates of take and mitigation based on impacts to territories as delineated by surveys in any given year are highly variable.

For these reasons, it is not possible to predict the precise number of warblers or vireos that may, over time, be “taken” or “preserved” as a result of the activities covered by or the mitigation measures to be taken pursuant to the RHCP. Therefore, take and mitigation in this document are not characterized by a precise bird count, but by the loss or preservation of habitat for the covered species, the relative quality of which is determined primarily by an assessment of vegetative characteristics that may influence occupancy of habitat by the covered species.

5.2.1 Golden-cheeked Warbler

Table 5-1 estimates the amount of potential warbler habitat (identified by the Loomis warbler habitat model) that may be impacted by the covered activities within Hays County during the term of the Permit.

Table 5-1. Incidental Take Assessment for the Golden-cheeked Warbler.

Census Tract	Estimated Developable Acres ¹	Potential GCW Habitat in Developable Areas (acres) ²	Percent of Developable Land as Potential Habitat	Projected Acres of New Land Development ³	Estimated Habitat Acres Impacted by New Development ⁴
Hays County	327,226	131,479	40%	57,715	21,632
CT 010100	21	-	0%	223	-
CT 010200	39	-	0%	637	-
CT 010301	4,439	-	0%	1,697	-
CT 010302	1,060	-	0%	314	-
CT 010400	10,756	-	0%	1,543	-
CT 010500	1,808	-	0%	929	-
CT 010600	18,042	11,042	61%	1,852	1,130
CT 010700	31,624	17,037	54%	2,676	1,445
CT 010801	97,012	40,054	41%	22,140	9,077
CT 010802	71,085	41,227	58%	11,320	6,566
CT 010901	16,028	7,578	47%	3,004	1,412
CT 010902	29,024	7,517	26%	1,883	490
CT 010903	18,749	-	0%	3,683	-
CT 010904	27,539	7,024	26%	5,814	1,512

¹Land identified by HCAD as vacant land, agricultural land, or farm and ranch improvements, which is most likely to be subject to future development (see Table 4-3).

²Based on the Loomis habitat model (all habitat quality classes) for census tracts located substantially over the Edwards Plateau ecoregion.

³Based on private-sector land development estimates from TXP and CMR (see Section 4.2.2), and including an additional 20 percent for public-sector development projects.

⁴Calculated as the Percent of Developable Land as Potential Habitat multiplied by the Projected Acres of New Land Development for each census tract.

Approximately 22,000 acres of potential warbler habitat may be impacted by the covered activities in Hays County during the term of the Permit (Table 5-1). This loss of potential habitat includes approximately 18,000 acres associated with private-sector activities and approximately 4,000 acres associated with public-sector projects over the 30-year term of the Permit.

Participation in the RHCP will be voluntary, and it is likely that not all of the anticipated impacts to potential habitat will actually be authorized through the RHCP (particularly for private-sector projects). Some project proponents may elect to seek individual authorization for incidental take from the USFWS, some may choose to design projects to avoid impacting potential habitat, and others may determine that ESA compliance is not necessary. Hays County estimates that private-sector participation in the RHCP will approach 33 percent of the total amount of anticipated private-sector habitat loss (i.e., approximately 6,000 acres of the anticipated 18,000 acres of private-sector habitat loss would be authorized under the RHCP).

The County also estimates that most (i.e., approximately 75 percent) of the potential habitat loss associated with public-sector projects would be authorized under the RHCP (i.e., approximately 3,000 acres). Therefore, the amount of incidental take authorization that is likely to be utilized by potential participants in the RHCP (including both public- and private-sector participants) is approximately 9,000 acres.

Hays County seeks incidental take authorization for up to 9,000 acres of direct or indirect impact to potential golden-cheeked warbler habitat in Hays County during the term of the Permit. This amount of incidental take authorization should provide sufficient flexibility under the phased conservation banking approach described in Section 6 to allow the RHCP to accommodate the projected need for incidental take authorization during the Permit term.

5.2.2 Black-capped Vireo

Approximately 23,855 acres of potential black-capped vireo habitat may occur in Hays County, based on estimates by Wilkins et al. (2006). This potential habitat is generally located within the census tracts west of Interstate Highway 35 and probably concentrated over the Fredericksburg limestones that outcrop in the Edwards Aquifer recharge zone (Section 3.2.2.2). However, the actual distribution of this habitat across the county is not known. For the purposes of estimating the amount of incidental take authorization needed to cover impacts to the black-capped vireo in Hays County, the RHCP assumes that 75 percent of the potential vireo habitat (approximately 17,891 acres) is evenly distributed across the Edwards Aquifer recharge zone and 25 percent of the potential vireo habitat (approximately 5,964 acres) is evenly distributed across the remainder of Hays County census tracts west of Interstate Highway 35.

Table 5-2 shows the estimated distribution of potential vireo habitat among census tracts and estimates the amount of potential vireo habitat that may be impacted by new land development activities within Hays County during the term of the Permit.

Table 5-2. Incidental Take Assessment for the Black-capped Vireo.

Census Tract	Developable Acres ¹	Acres of Potential BCV Habitat ²	Percent of Developable Land as Potential Habitat	Projected Acres of New Land Development ³	Estimated Habitat Acres Impacted by New Development ⁴
Hays County	327,226	23,855	7%	57,715	3,298
CT 010100	21	-	0%	223	-
CT 010200	39	-	0%	637	-
CT 010301	4,439	-	0%	1,697	-
CT 010302	1,060	-	0%	314	-
CT 010400	10,756	-	0%	1,543	-

Table 5-2. Incidental Take Assessment for the Black-capped Vireo.

Census Tract	Developable Acres ¹	Acres of Potential BCV Habitat ²	Percent of Developable Land as Potential Habitat	Projected Acres of New Land Development ³	Estimated Habitat Acres Impacted by New Development ⁴
CT 010500	1,808	68	4%	929	37
CT 010600	18,042	3,952	22%	1,852	407
CT 010700	31,624	4,540	14%	2,676	375
CT 010801	97,012	2,969	3%	22,140	664
CT 010802	71,085	3,755	5%	11,320	566
CT 010901	16,028	2,510	16%	3,004	481
CT 010902	29,024	3,655	13%	1,883	245
CT 010903	18,749	-	0%	3,683	-
CT 010904	27,539	2,406	9%	5,814	523

¹Land identified by HCAD as vacant land, agricultural land, or farm and ranch improvements (see Table 4-3).

²Calculated for census tracts located west of Interstate Highway 35 and assuming an even distribution of 75 percent of the potential habitat across the Edwards Aquifer recharge zone and 25 percent across other portions of these census tracts.

³Based on private-sector land development estimates from TXP and CMR (see Section 4.2.2), and includes an additional 20 percent for public-sector development projects.

⁴Calculated as the Percent of Developable Land as Potential Habitat multiplied by the Projected Acres of New Land Development for each census tract.

Approximately 3,300 acres of potential vireo habitat may be impacted by new land development activities in Hays County during the term of the Permit (Table 5-2). This loss of potential habitat includes approximately 2,800 acres associated with private-sector activities and approximately 500 acres associated with public-sector projects over the 30-year term of the Permit.

Participation in the RHCP will be voluntary, and it is likely that not all of the anticipated impacts to potential vireo habitat will actually be authorized through the RHCP. Some project proponents may elect to seek individual authorization for incidental take from the USFWS, some may choose to design projects to avoid impacting to potential habitat, and others may decide that ESA compliance is not necessary.

Hays County estimates that private-sector participation in the RHCP will approach 33 percent of the total amount of anticipated private-sector habitat loss (i.e., approximately 925 acres of the anticipated 2,800 acres of private-sector habitat loss would be permitted through the RHCP). The County also estimates that most (i.e., approximately 75 percent) of the habitat loss associated with public-sector projects would be permitted through the RHCP (i.e., approximately 375 acres). Therefore, the amount of incidental take authorization that is likely to be utilized by potential participants in the RHCP (including both public- and private-sector participants) is approximately 1,300 acres.

Hays County seeks incidental take authorization for up to 1,300 acres of direct or indirect impact to potential black-capped vireo habitat in Hays County during the term of the Permit. This amount of incidental take authorization should provide sufficient flexibility under the phased conservation banking approach described in Section 6 to allow the RHCP to accommodate the potential need for incidental take authorization during the Permit term.

5.3 Cumulative Effects to Covered Species

The ESA requires an analysis of the cumulative effects of a proposed federal action. Under the ESA, cumulative effects are defined as the effects of future, non-federal actions that are reasonably certain to occur within the action area. This cumulative effects analysis is used to help the USFWS determine whether the proposed action is likely to result in jeopardy for a federally listed species or in the destruction or adverse modification of designated critical habitat for a federally listed species (USFWS and NMFS 1998).

Indicators of future, non-federal activities that are reasonably certain to occur may include, but are not limited to, those that have been approved by state or local agencies or governments, activities where such approval is imminent, activities where project proponents have made commitments or assurances that the activity will proceed (including the obligation of funds or venture capital), or the initiation of contracts for the activity. However, the “reasonably certain to occur” standard does not require that the action will occur. Cumulative effects analyses under Section 7 of the ESA do not address the potential impacts of speculative, non-federal actions that may never be implemented, nor do they address the effects of past or present activities in the action area (USFWS and NMFS 1998).

Non-federal activities in Hays County that are reasonably certain to occur include ongoing residential construction in currently platted subdivisions that have not yet reached full build-out and construction of new residential, commercial, and/or mixed-use subdivisions that are currently undergoing the subdivision approval process and are likely to be approved. A number of road improvement projects are included in the approved Hays County 2008 road bond proposition and would also be reasonably certain to occur. A summary of future, non-federal activities in Hays County that are reasonably certain to occur is included in Table 5-3.

Table 5-3. Summary of New Development Associated with Reasonably Certain Projects in Hays County.

Census Tract ¹	Future Capacity in Existing Developments (approx. acres) ²	New Developments Seeking Local Approvals (approx. acres) ³	2008 Road Bond Proposed Transportation Projects (approx. acres) ⁴	All Reasonably Certain Projects (acres)
CT 010500	-	-	-	-
CT 010600	1,541	3,171	295	5,007

Table 5-3. Summary of New Development Associated with Reasonably Certain Projects in Hays County.

Census Tract ¹	Future Capacity in Existing Developments (approx. acres) ²	New Developments Seeking Local Approvals (approx. acres) ³	2008 Road Bond Proposed Transportation Projects (approx. acres) ⁴	All Reasonably Certain Projects (acres)
CT 010700		235	77	312
CT 010801	5,822	1,574	184	7,580
CT 010802	438	685	218	1,341
CT 010901	475	2,087	120	2,682
CT 010902	2,411	35	109	2,555
CT 010904	2,654	2,410	-	5,064
Total	13,341	10,197	1,003	24,541

¹Analysis limited to census tracts located substantially over the Edwards Plateau ecoregion.

²Based on analysis by Capitol Market Research with data from City of Buda, Dripping Springs, Kyle, San Marcos & Wimberley (April 2008). Acreage calculation assumes each developed lot covers approximately 1 acre.

³Based on data provided by Hays County, City of San Marcos, and City of Dripping Springs (October 2008).

⁴Projects identified in the "Hays County 2008 Road Bond Proposition." Acreage estimated based on the approximate project length (as mapped by the Hays County GIS department) and an estimated project width of 200 feet.

While it may appear that approximately 24,500 acres of new land development or road improvements meets the definition for reasonably certain to occur non-federal activities, not all of this future development will affect potential habitat for the covered species. Some of this development may occur in areas that are not potential habitat and some project proponents may choose to design projects to avoid impacting potential habitat. Other project proponents may decide that ESA compliance is not necessary. It is also likely that some portion of this reasonably certain to occur development will seek incidental take coverage through the RHCP and become part of the proposed action (see the estimated RHCP participation rates described in Section 5.2). It should also be noted that the estimate of new land development from future, non-federal reasonably certain to occur activities explained above is less than the total projection of future land development used to develop the incidental take estimate in Section 5.2, since the requirements for assessing cumulative impacts under Section 7 of the ESA are more narrow than the assumptions used to project future land development for the take analysis.

With respect to the warbler, the 24,500 acres of future, non-federal, reasonably certain to occur activities could affect approximately 10,350 acres of potential warbler habitat (based on the amount of development projected for each census tract and the proportion of that census tract mapped as potential habitat). Applying the estimated RHCP participation rates for public and private-sector projects described in Section 5.2 suggests that approximately 3,630 acres of this impact to potential warbler habitat would be authorized under the RHCP. Therefore, the remaining cumulative impacts from future, non-federal, reasonably certain to occur activities

(i.e., those not authorized under the RHCP) would be associated with approximately 6,720 acres of impact to potential warbler habitat.

Similarly for the vireo, the 24,500 acres of future, non-federal, reasonably certain to occur activities could affect approximately 2,660 acres of potential vireo habitat. Applying the estimated RHCP participation rates for public and private-sector projects described in Section 5.2 suggests that approximately 930 acres of this impact to potential vireo habitat would be authorized under the RHCP. Therefore, the remaining cumulative effects from future, non-federal, reasonably certain to occur activities would be associated with approximately 1,730 acres of impact to potential vireo habitat.

This cumulative impacts analysis projects that approximately 6,720 acres of impact to potential warbler habitat and approximately 1,730 acres of impact to potential vireo habitat may be associated with future, non-federal, reasonably certain to occur activities that would not seek incidental take authorization through RHCP. Some of these impacts may be mitigated for through individual ESA authorizations, while others may occur without ESA authorization or mitigation.

When analyzing whether issuance of the Permit to the County and implementation of the RHCP will jeopardize the covered species or result in the destruction or adverse modification of critical habitat, the USFWS determines whether the aggregate effects of the factors analyzed under the environmental baseline, the effects of the proposed action, and the cumulative effects within the action area (when viewed against the status of the species or critical habitat) are likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat.

Table 4-3 shows that approximately 63,290 acres of Hays County (approximately 15 percent of the county) was appraised for developed land purposes (i.e., residential, commercial/industrial, and utility uses) in 2005. It is unknown to what extent this prior land development may have affected the covered species; although some degree of habitat loss or degradation is likely to have occurred. A comparison of land cover changes between 1992 and 2001 suggest that Hays County lost approximately 14 percent of its forest cover during that period (see Table 2-2). It is possible that a comparable amount of potential warbler habitat may have been lost between 1992 and 2001, which could represent a loss of approximately 24,000 acres of potential warbler habitat (i.e., 14 percent of the 170,335 acres of potential warbler habitat in Hays County as identified by the Loomis warbler habitat model).

Assuming that land development has historically affected potential vireo habitat in proportion to the total amount of habitat currently available in the county (i.e., approximately five percent of Hays County may support potential habitat for the black-capped vireo), the approximately 63,290 acres of currently developed land could have affected approximately 3,200 acres of potential vireo habitat.

The environmental baseline conditions in Hays County also include approximately 23,700 acres of previously protected open spaces that are largely protected from future land development. These properties may contain approximately 9,880 acres of potential warbler habitat (based on the results of the Loomis warbler habitat model) and are likely to contain potential vireo habitat as well. While the conservation of the covered species may not explicitly be part of the missions for these previously protected parcels, limiting future development on these parcels reduces the degree of potential threat to habitats contained within them.

The RHCP will support the authorization of up to 9,000 acres of impact to potential warbler habitat and up to 1,300 acres of impact to potential vireo habitat over the duration of the Permit. Further, full implementation of the RHCP will result in the permanent protection (and management) approximately 9,000 acres of potential warbler habitat and 1,300 acres will be managed as vireo habitat.

Therefore, the combined effect of prior actions, the RHCP, and future cumulative activities in Hays County could be the loss or degradation of approximately 40,000 acres of potential golden-cheeked warbler habitat and 6,200 acres of potential black-capped vireo habitat during the period between approximately 1990 and 2040. These figures represent potentially adverse effects to approximately 23 percent of the total amount of potential warbler habitat and approximately 26 percent of the total amount of potential vireo habitat estimated to occur in Hays County.

It is the applicant's view that it is highly unlikely that the cumulative loss of even as much as approximately 25 percent of the potential warbler and vireo habitat in Hays County since the 1990's would cause a substantial adverse effect on either species, either regionally or range-wide.

With respect to the warbler, Hays County does not appear to contain any particularly large blocks of high quality warbler habitat that might be described as a "focal area" as envisioned in the 1992 Golden-cheeked Warbler Recovery Plan. The Balcones Canyonlands Preserve and the Balcones Canyonlands National Wildlife Refuge may already provide a permanently protected viable population of warblers in Golden-cheeked Warbler Recovery Region 5, and the remaining 75 percent of potential warbler habitat in Hays County that would not be subject to cumulative impacts could still provide ample opportunities for the preservation of parcels of interconnecting habitat among existing and/or future focal areas in other counties. Indeed, previously protected open spaces in Hays County may include approximately 9,880 acres of potential warbler habitat (see Section 4.2.1.3) and an additional 9,000 acres of warbler habitat would be protected under the RHCP if the full take authorization was utilized. Therefore, it is the applicant's view that it is unlikely that the aggregate impacts of prior actions in Hays County, the RHCP, and future cumulative activities in the county would substantially and adversely affect the survival or recovery of the golden-cheeked warbler in the wild, either regionally or range-wide.

The aggregate impacts of past activities, the RHCP, and future cumulative activities in Hays County may be more difficult to access for the black-capped vireo, since much less is known about the status of the species or the distribution of its potential habitat in the county, compared to the warbler. However, similar to the warbler, Hays County does not appear to be particularly significant with respect to the overall status of the species in its recovery region. Few observations of vireos have been recorded from Hays County, and none of the records suggest that these observations corresponded to large or robust colonies of breeding vireos. In terms of habitats, possible losses of potential vireo habitat by development in recent decades could be balanced by the creation of new habitats elsewhere in the county. The comparison of the 1992 and 2001 National Land Cover Datasets suggests that there was an approximately 13 percent increase in the extent of grassland or shrubland vegetation across Hays County during that period (indeed, most of the forest cover lost during that time was converted to grassland or shrubland areas). Grassland and shrubland vegetation holds potential for being black-capped vireo habitat. For these reasons, it is the applicant's view that it is unlikely that the aggregate impacts of prior actions in Hays County, the RHCP, and future cumulative activities in the county would substantially and adversely affect the survival or recovery of the black-capped vireo in the wild.

No critical habitat has been designated by the USFWS for either the warbler or vireo, therefore no cumulative impacts on critical habitat for these species are anticipated.

6.0 CONSERVATION PROGRAM

The RHCP conservation program is designed to meet the specific regulatory requirements of the ESA with regard to the species covered for incidental take by the Permit (i.e., the golden-cheeked warbler and black-capped vireo). The ESA requires that the conservation program of a habitat conservation plan include measures to minimize and mitigate impacts to the covered species to the maximum extent practicable. The amount of incidental take sought by the Permit would allow impacts to a maximum of 9,000 acres of potential warbler habitat and 1,300 acres of potential vireo habitat in Hays County.

The conservation program described below includes a number of actions that Hays County commits to implement that minimize and mitigate the anticipated impacts of the incidental take that will be permitted through the RHCP to the maximum extent practicable. The stated commitment to implement these conservation actions is not intended to and does not restrict the County's ability to engage in additional conservation actions at its discretion, should additional resources become available. The conservation actions implemented pursuant to this RHCP will occur within Hays County.

6.1 Goals and Objectives

6.1.1 Community Goals and Objectives

The RHCP may contribute to a number of local community goals, such as: 1) provide a locally-developed method for ESA compliance; 2) maintain open space and quality of life in Hays County; and 3) encourage partnerships with private landowners and local organizations as conservation partners.

The RHCP may simplify compliance with the ESA. It may streamline ESA compliance and reduce uncertainty, time, and costs for the County and other RHCP participants.

The RHCP may compliment the County's initiatives to protect open space and aquifer recharge areas. The RHCP may also compliment County efforts to establish parks and provide water access for county residents.

6.1.2 Biological Goals and Objectives

The biological goals and objectives of the RHCP are to:

1. Create a preserve system within Hays County that effectively mitigates for incidental take of the golden-cheeked warbler and black-capped vireo and coordinates and consolidates mitigation requirements from projects scattered across the county into larger, more biologically significant preserve blocks.

Objectives to accomplish this goal include the establishment of a preserve system that includes between 10,000 and 15,000 acres (which is expected to be sufficient to generate enough mitigation credits to balance the anticipated level of participation in the RHCP).

2. Design the preserve system to provide perpetual conservation value to the golden-cheeked warbler and black-capped vireo.

To help meet this goal, preserve blocks (which may be composed of multiple adjacent parcels) will meet certain design criteria. Preserve blocks will typically contain a minimum of 500 contiguous acres.

3. Encourage compliance with the ESA by providing an efficient means of authorization.

By implementing the RHCP and providing an efficient and reliable mechanism for ESA compliance, the County is hopeful that there will be an increase in ESA compliance across Hays County. Increased compliance with the ESA has long-term benefits for the covered species.

4. Provide for perpetual management and monitoring of preserve lands to maintain, enhance, or create quality habitat for the golden-cheeked warbler and black-capped vireo.

Management of the preserves will include documenting habitat conditions, establishing sound preserve boundaries, limiting (and possibly prohibiting) access to protected habitats, and reducing threats. Required monitoring activities will measure key habitat and population parameters and the results will be used to inform adaptive management decisions.

5. Where possible, maximize the value of the preserve system for multiple rare species in Hays County.

Hays County will consider the conservation benefits to the evaluation and additional species when evaluating potential preserve acquisitions. The County will evaluate acquired preserve lands for the presence of evaluation or additional species to create an inventory of conserved resources within the RHCP preserve system, when resources allow. The County may implement appropriate management practices within the preserve system when these practices are compatible with the management of habitat for the warbler and vireo, and when it is practicable to do so. The RHCP identifies research priorities for evaluation species, and the County will support research projects (as applicable and practicable) to fill knowledge gaps that could assist with the creation or implementation of more focused conservation measures for one or more of these species.

6.2 Avoidance and Minimization Measures

Hays County encourages public and private entities whose activities may impact the covered species in Hays County to avoid and minimize impacts to the species included in the RHCP, including the evaluation and additional species. As described in the sections below, the

RHCP may help Hays County residents avoid or minimize impacts to the species addressed in the RHCP in several ways, including by providing guidance on the location of potential habitat for covered species, encouraging project proponents to include endangered species considerations in project planning, requiring RHCP participants to observe seasonal clearing restrictions and oak wilt precautions, and increasing awareness and understanding of endangered species issues by the general public.

The use of avoidance and minimization measures by project proponents in Hays County may reduce the amount of incidental take for golden-cheeked warblers and black-capped vireos requiring authorization under the RHCP.

6.2.1 Publication and Distribution of Habitat Maps

Hays County has maps of potential habitat for the golden-cheeked warbler that were developed for use in the development and implementation of the RHCP. The County also has maps of karst geology and the general locations of known caves and other major karst features that are published in this RHCP. Maps of potential vireo habitat may also become available during the term of the Permit. Hays County will make these maps or similar information (which could include updates of the information used to develop the RHCP) available to the public for review (the County may charge a nominal fee to cover the costs of producing such information) and promote their use during the land development process. The County will make this information available to the public within six months of Permit issuance.

The public may use the maps of potential habitat as a guideline to help plan the location or design of proposed development projects so that impacts to species may be avoided or minimized, or to help determine if more detailed habitat assessments may be necessary. These maps will not be used to make definitive habitat determinations for the purpose of participation in the RHCP. The County will use on-site habitat determinations to determine the basis for participation in the RHCP.

6.2.2 Hays County Subdivision and Development Process Application Forms

Hays County will encourage participation in the RHCP by requesting that entities seeking subdivision or development approval from the County determine whether a project area may contain potential habitat for one or more of the covered species and provide the basis for that determination. Subdivision or development permit applicants will be encouraged to provide this information (along with other currently requested site information, such as whether a project occurs within an aquifer recharge zone) on the County's "Subdivision Plat Submittal Form for Supplemental Information for Hays County, Texas" or similar form. The County will modify such forms within six months of Permit issuance to include a request for this additional, supplemental project information.

As described above, the County will make maps of potential habitat for the covered species and/or descriptions of habitat conditions for the covered species available to the public to assist with the identification of potential endangered species habitat on project areas. The County may assess a nominal fee to cover the costs of providing such information. If requested by a project proponent, County RHCP staff may conduct habitat assessments of project areas for the covered species (see Section 7.4 for a description of the RHCP participation process, including on-site habitat determinations).

In accordance with state law, the County may not withhold approval of permits or services for reasons related to endangered species issues. The County will not require any subdivision or land development applicant to participate in the RHCP or require the applicant to seek other means of achieving ESA compliance. Participation in the RHCP will be voluntary.

For projects that may affect potential habitat for the covered species, the County will provide information about the RHCP (including contact information for County RHCP staff and the U.S. Fish and Wildlife Service) to subdivision and development applicants and encourage them to seek habitat determinations and participate in the RHCP, if incidental take authorization for the covered species is needed.

To assist in minimizing impacts to the species addressed in the RHCP, the County will also provide subdivision and development applicants with information regarding oak wilt from the Texas Forest Service and the TCEQ Edwards Aquifer Rules, such as TCEQ's "Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer" and "Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates." The County may assess a nominal fee to cover the costs of providing such information.

6.2.3 Seasonal Clearing and Construction Restrictions for Covered Species

With regard to projects authorized for incidental take through participation in the RHCP, Hays County will minimize impacts to the covered species during their respective breeding seasons by imposing seasonal clearing and construction restriction on RHCP participants.

These seasonal clearing and construction restrictions will apply to RHCP participants (including Hays County) between March 1 through July 31 for activities affecting potential golden-cheeked warbler habitat and between March 15 through August 31 for activities affecting potential vireo habitat, unless a survey conducted during that species' breeding season indicated that the species is not present within 300 feet of the planned activity. The survey must be conducted in the same year as the start of the planned clearing or construction activity affecting habitat for the covered species. The dates for seasonal restrictions are supported by the breeding phenologies presented in Ladd and Gass (1999) and Grzybowski (1995), as discussed in Section 3.2.

Notwithstanding the above, construction activities related to specific projects covered for incidental take through the RHCP and that do not involve the removal of potential habitat may continue during the breeding seasons of the covered species within 300 feet of potential habitat and without a breeding season survey demonstrating the species is not present, provided that 1) the construction activities are part of a continuous set of clearing and/or construction activities that began during the non-breeding season; 2) are performed in a reasonably prompt and expeditious manner; and 3) the disturbance activity is mitigated appropriately for all direct and indirect effects on and off of the project site.

The seasonal clearing and construction restrictions will be included as a term in the Permit and individual Participation Agreements (see Section 7.4.6). With respect to projects authorized for impacts to the covered species through the RHCP, the County's subdivision development inspectors will have the right to inspect for compliance with the terms of Participation Agreements with RHCP participants, including those terms related to seasonal clearing and construction restrictions. The County may suspend or revoke the rights of any RHCP participant that is not in compliance with the terms of its Participation Agreement.

6.2.4 Oak Wilt Prevention in GCW Habitat

Hays County will minimize potential impacts to warbler habitat from oak wilt by requiring that all RHCP participants follow the Texas Forest Service or professional arborist's guidelines for the prevention of oak wilt when clearing or trimming trees within or within 300 feet of potential golden-cheeked warbler habitat.

The Texas Forest Service recommends eliminating diseased red oaks (such as Spanish oak), 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 trimming, limbing, and pruning) should be avoided from February through June. 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.

Oak wilt precautions will be included as a term in the Permit and in individual Participation Agreements (see Section 7.4.6). With respect to projects authorized for take of the covered species through the RHCP, the County's subdivision development inspectors will have the right to inspect for compliance with the terms of Participation Agreements, including those related to oak wilt prevention. The County may suspend or revoke the rights of any RHCP participant not in compliance with the terms of its Participation Agreement.

6.2.5 Outreach and Education

Hays County will develop a public education and outreach program to educate landowners and residents about the species addressed in the RHCP, including the evaluation and additional species.

The County will prepare and distribute information about the habitat characteristics of the covered species to encourage participation in the RHCP. The materials will include information about the importance of avoiding disturbance of these species during their breeding seasons.

The County will prepare educational materials about the ESA and the RHCP for distribution to persons or entities applying for subdivision or development-related permits or approvals. These materials will briefly describe the responsibilities of private entities under the ESA, the goals of the RHCP, and how to participate in the RHCP. The purposes of this component of the outreach and education program are to help minimize potential impacts to covered species and to encourage participation in the RHCP. However, the County will not condition approval of subdivision plats, development permits, or other local permits or services on participation in the RHCP or compliance with the ESA. The County will prepare and publish educational materials mentioned above related to the covered species, habitats for the covered species, compliance with the ESA, and participation in the RHCP within six months after Permit issuance.

To help the public avoid or minimize potential impacts to evaluation and additional species, Hays County will prepare and distribute educational materials regarding karst and aquatic habitats in the county. Such materials may include topics such as the use of buffers around streams, springs, and karst features; reducing impervious cover and promoting low density and conservation developments; and the use of other water quality controls to reduce the amount of pollutants entering water ways. The County will also distribute a list of existing regulatory programs pertaining to the conservation of water and karst resources, such as the TCEQ optional measures for water quality protection (see Appendix D for examples of existing and proposed programs). Materials related to the evaluation and additional species and their habitats and conservation will be developed and published by the County within the first two years of Plan implementation.

Hays County will also carry out a program of outreach and education for the general public. The purpose of the program will be to help the public understand the purpose of the RHCP and how to become involved in it. The County will coordinate with other organizations, as appropriate, to participate in forums to educate interested landowners and others about the RHCP. The County will develop a plan and begin implementation of an outreach and education program within two years of Permit issuance.

6.3 Mitigation Measures for Covered Species

Over the term of the Permit, Hays County will assemble a system of preserve lands that will be protected and managed in perpetuity for the primary benefit of the golden-cheeked warbler and black-capped vireo. This preserve system will provide the mitigation needed to offset the impacts from incidental take of the covered species that is permitted through the RHCP.

Under the RHCP, the County will establish a preserve system in the form of a phased conservation bank with a target acquisition goal of between 10,000 and 15,000 acres over the 30-year duration of the RHCP. The County will assemble the preserve system on a phased basis, banking mitigation credits only after parcels are acquired. Each preserve acquisition will be subject to USFWS approval and will generate mitigation credits based on the number of acres of potential habitat for the covered species protected and in accordance with current USFWS policies and guidelines regarding mitigation. The mitigation credits created by preserve acquisitions will be “banked” by the County and may be then used by the County for its own projects or sold to RHCP participants. The banking of mitigation credits will allow an equivalent amount of RHCP take authorization to be accessed (up to the maximum amount authorized for each covered species). Thus, the County will not be able to use or sell more mitigation credits than had been previously created or “banked” by preserve acquisitions. At no time will the County use or sell mitigation credits without sufficient credits in the “bank,” and sufficient mitigation credits will always be available for participating projects prior to the County authorizing such take. Pre-determined processes for habitat determinations and mitigation assessments, defined mitigation ratios, and current USFWS policies and guidelines regarding mitigation provide the basis for ensuring that mitigation is commensurate with impacts (see Section 6.3.2 and Section 7.4).

The preserve system will include County owned and managed lands, and may also include preserve parcels owned and/or managed by other entities that agree to cooperate with the County, such as local municipalities, conservation organizations, or private landowners. Regardless of the property owner, the Permit and RHCP will require the on-going management and monitoring of the preserve system in perpetuity to maintain the conservation value of the protected habitat over time.

By protecting large tracts of land from future development, the RHCP preserve system may also provide collateral conservation benefits to the other species addressed in the RHCP, as well as contribute to the protection of water quality, scenic vistas, and cultural heritage in Hays County. The preserve system may also provide opportunities for certain recreational activities, such as hiking and nature watching, to the extent that such activities do not negatively affect the covered species. As described in the following sections, opportunities for more intensive recreational use of publicly-held preserve lands may also be provided where possible (such as

picnic areas, swimming areas, camping grounds, and playing fields), when impacts to endangered species habitat are avoided.

6.3.1 RHCP Preserve and Conservation Bank

Hays County will acquire preserve blocks on a phased basis using a conservation banking approach over the term of the Permit, with potential preserve acquisitions evaluated as they are needed and become available. In order to utilize the full take authorization, the County will acquire between 10,000 and 15,000 acres of preserve land by fee-simple land acquisitions and/or conservation easements (or other conservation mechanisms) with other landowners. No pre-determined preserve system of any particular size, location, or configuration has been designated for the RHCP.

As shown by Figure 3-2, the distribution of potential warbler habitat in Hays County is relatively patchy and fragmented. Therefore, most large parcels of land in the county that would be suitable for inclusion in the RHCP preserve system would likely contain a mosaic of habitat and non-habitat areas. To assemble a preserve system that generates approximately 9,000 acres of warbler mitigation credits and 1,300 vireo mitigation credits at a typical rate of one credit for each acre of potential habitat (see Section 6.3.2), additional acreage will likely be needed.

A preserve system containing approximately 10,000 to 15,000 acres should be sufficient to create enough mitigation credits to meet the anticipated demand for incidental take authorization through the RHCP, provided that approximately 80 percent of the total preserve system is potential habitat for the golden-cheeked warbler and approximately 12 percent is managed for the benefit of the black-capped vireo. If these assumptions are not met, the County may need to acquire additional acreage to create the desired number of mitigation credits, or suspend the use or sale of mitigation credits under the RHCP until sufficient credits are banked.

The RHCP preserve system will be composed of individual preserve blocks. The individual preserve blocks may be single tracts of land or may be composed of multiple adjacent tracts. However, individual preserve blocks will typically include at least 500 total acres, unless otherwise approved by the USFWS. All preserve acquisitions will be reviewed and approved by the USFWS prior to generating mitigation credit for the RHC and mitigation credits will be awarded in accordance with current USFWS policies and guidelines regarding mitigation,

To help prioritize potential preserve acquisitions as opportunities become available over time, additional guidance regarding preferred preserve characteristics is provided in Appendix E. Attainment of these additional preserve system characteristics is not required to meet the mitigation commitments under the RHCP and the Permit; indeed, circumstances meeting these additional characteristics may not arise during the duration of the RHCP or be practicable to achieve. Rather, the additional guidelines are intended to help the County choose among potential preserve parcels as opportunities become available over time. Actual additions to the

RHCP preserve system will be considered for acquisition as the County deems necessary to implement the RHCP and as appropriate parcels become available from willing partners.

6.3.2 Mitigation Credit Generation

Protection and management of golden-cheeked warbler and black-capped vireo habitat within the RHCP preserve system will create mitigation credits that the County can use to offset incidental take from County projects or sell as mitigation to voluntary RHCP participants.

It is recognized that there are myriad factors involved with each preserve acquisition, and the County and the USFWS will work together on each preserve acquisition to determine, in each instance, how many mitigation credits a particular preserve will generate. The number of mitigation credits allowed for each preserve will be based on, and commensurate with, USFWS policy and guidelines regarding mitigation (such as, but not limited to, the “Guidance for the Establishment, Use, and Operation of Conservation Banks”) in order to ensure that the quality of the mitigation is equal to or greater than the quality of the habitat impacted.

In general, it is anticipated that each preserve parcel will yield one warbler mitigation credit for each acre of potential warbler habitat identified within that parcel. The amount of potential warbler habitat on a preserve parcel will be established by a habitat determination following the process described in Section 7.4.2. Similarly, the amount of vireo mitigation credit generated by an acquisition will be determined by the County and the USFWS, based on the number of acres within a preserve parcel dedicated for vireo habitat management. It is anticipated that each acre dedicated for vireo habitat management will generate one vireo mitigation credit. Variations to the typical habitat acres-to-credit ratio may be possible on a case-by-case basis, considering factors such as relative habitat quality, habitat patch size, proximity to other protected habitats or intensive land uses, and the presence of habitat buffers.

Under the RHCP, the County may use its incidental take authorization only up to the amount of available mitigation credits banked from preserve acquisitions. Potential habitat for the covered species will be permanently protected in the RHCP preserve system before mitigation credits are created or used, such that mitigation is always provided prior to the authorization of impacts. The County will not use or convey to other parties more incidental take authorization than it has mitigation credits available. If more mitigation credits are needed to meet the demand for incidental take authorization, the County may, at the County’s discretion, acquire additional preserve parcels to generate the mitigation credits. The County also will not use or convey to other parties more mitigation credits than the total amount of incidental take authorized by the Permit for each of the covered species.

6.3.3 Role of Existing Protected Open Spaces

Approximately 23,739 acres of parks and open space has been protected in Hays County prior to the development of the RHCP. These previously protected parks and open spaces

include publicly owned lands for water quality protection, privately owned lands protected by conservation easements, lands used by academic institutions for agricultural and natural resource research, and parks and greenbelts. Each of these areas is largely protected from future land development; however, the primary purpose of these protected lands may not be for the conservation of endangered species.

The previously protected lands in Hays County may include approximately 9,880 acres of potential golden-cheeked warbler habitat, based on the Loomis warbler habitat model (see Section 4.2.1.3). It is likely that some of these tracts also contain suitable habitat for the black-capped vireo. Many of these previously protected properties occur over the Edwards Aquifer recharge zone and karst terranes, and some contain karst features known to include one or more of the evaluation or additional species addressed in the RHCP. Though the protected lands appear not to be managed specifically for endangered species protection, the previously protected open spaces may have a role in the RHCP preserve system.

Hays County may seek opportunities to partner with the owners and managers of previously protected open space lands to explicitly protect and manage habitat for the golden-cheeked warbler, black-capped vireo habitat, and other species of concern on these lands. With the approval of the USFWS, increasing conservation value for warbler and/or vireo habitat on previously protected lands may generate mitigation credits (albeit at a reduced rate) for the RHCP on a case-by-case basis. Any areas of warbler or vireo habitat within previously protected open spaces for which the USFWS agrees to award mitigation credits to the RHCP will be permanently protected and managed in accordance with the terms of the Permit.

Previously protected open space parcels may help RHCP preserve parcels meet the recommended minimum preserve block size (i.e., 500 acres), even if the previously protected parcels are not included in the RHCP preserve system. For example, if a potential RHCP preserve parcel containing approximately 200 acres is adjacent to a 400-acre parcel of previously protected open space (such as one of the existing conservation easements in Hays County), the potential RHCP preserve parcel may be considered to have met the recommended minimum preserve block size since the total size of the permanently protected block of open space would exceed 500 acres.

6.4 Preserve Management and Monitoring Program

6.4.1 Management and Monitoring Objectives

All RHCP preserve lands, including County-owned preserve parcels and parcels included in the preserve system via conservation easements or other agreements, will be managed in perpetuity in accordance with the terms of the Permit and the RHCP. The County will also manage RHCP preserve lands in accordance with all other applicable local, state, and federal laws.

The objective of the RHCP preserve management and monitoring program is to maintain the conservation value of the preserve system in perpetuity. Maintaining the conservation value of the preserve system involves eliminating or minimizing threats that could decrease the extent or quality of potential habitat for the covered species within the preserve system, compared to the condition of that habitat at the time of acquisition. The County may elect to, but will not be required, to implement management practices that are designed to increase or enhance the mitigation value of a preserve parcel after acquisition to meet the mitigation commitment under the RHCP.

The RHCP preserve management and monitoring program is a cyclical, adaptive process involving the following general steps:

1. Documenting baseline preserve conditions to provide the basic information needed to inform management and monitoring decisions;
2. Evaluating threats to the covered species and their habitats within the preserve system and planning appropriate management strategies and practices to eliminate or minimize such threats;
3. Implementing management plans; and
4. Monitoring populations of the covered species and their habitats to track the results of management practices or programs, identify trends in populations and habitat conditions, and evaluate whether the management program successfully maintained the conservation value of the preserve system. Monitoring data feeds back into updated baseline evaluations and the cycle repeats.

Specific provisions and minimum requirements for each of these steps are described in the following sections.

Within six months of Permit issuance, Hays County will prepare standard methodologies and formats for the content of required preserve management documents, including the baseline preserve evaluations, land management plans, and annual reports. These documents will be reviewed and approved by the USFWS before use. Hays County will implement (or cause to be implemented) all management and monitoring activities in accordance with these standards.

6.4.2 Preserve Managers

Hays County is ultimately responsible for ensuring that the preserve system is managed and monitored in accordance with the terms of the Permit and the RHCP. However, specific planning and implementation activities for individual preserve parcels/blocks may be tasked to designated preserve managers other than the County.

Preserve managers may include the County, a private landowner, or other entity as determined by specific, legally enforceable agreements (such as the terms of a conservation easement or an interlocal agreement). The County will designate a preserve manager (or multiple

preserve managers, if management duties are to be split between parties) for each preserve parcel at the time of acquisition. All preserve managers will be approved by the USFWS. Preserve managers will coordinate with Hays County and the USFWS, as appropriate, to ensure that preserves are managed in accordance with the terms and conditions of the Permit and the management and monitoring program described in the RHCP.

6.4.3 Baseline Preserve Evaluations

Baseline preserve evaluations for RHCP preserve system acquisitions will document the presence and condition of natural and human resources within the preserve. The evaluations will provide the basic information needed to inform management and monitoring decisions for the preserve system.

The baseline preserve evaluations will be prepared for each preserve parcel and the document will be updated at least once every five years, in accordance with the schedule in Section 6.4.6. The preserve manager will be responsible for the preparation of the baseline preserve evaluations and will ensure that qualified biologists conduct the evaluation. Biologists conducting portions of the baseline preserve evaluations for the RHCP that pertain to the covered species or their habitats must hold or be covered by an USFWS Threatened and Endangered Species permit that authorizes the biologist to conduct surveys for the golden-cheeked warbler and black-capped vireo. This standard will help ensure that those conducting habitat assessments for the RHCP are sufficiently familiar with the habitats used by the covered species. Baseline preserve evaluations (and updates to these documents) will be submitted by preserve managers to Hays County by October 31 of the year in which they are prepared.

The baseline preserve evaluation will include the following minimum information:

- The acreage of potential habitat for the golden-cheeked warbler and black-capped vireo present on the parcel, as identified by a habitat determination (see Section 7.4.2).
- A detailed map showing the specific location and extent of potential warbler and vireo habitat on the parcel.
- An estimate of the relative quality of potential warbler and vireo habitat on the parcel and documentation of the habitat characteristics used to justify the quality estimate.
- An estimate of the number of warblers and vireos occurring on the property and the extent (i.e., number of acres) and location of occupied and unoccupied habitat within the parcel.
- A description and map of other major vegetation communities and special or unique habitats on the parcel that may warrant special management consideration.

- A description and map of all structures or other property improvements on the parcel, including the size or aerial extent, condition, and use of such improvements. Improvements to be described include, but are not limited to, buildings, roads or trails, utilities, and dams and impoundments.
- A description and map of all current land uses on the parcel, including areas used for agricultural purposes, recreational purposes, or easements.
- A description and assessment of potential threats to the covered species or their habitats within the preserve system, such as information including (but not limited to) deer, feral hogs, cowbirds, fire ants, and invasive species. Such assessment will also include the potential impacts of land uses (including recreational uses) within or adjacent to the preserve on the covered species or their habitats, as applicable.
- Other information regarding the property that may be relevant to the management of the parcel in accordance with the terms of the Permit and the goals and objectives of the RHCP.

6.4.4 Land Management Plans

Land management plans will direct management actions within specific preserve blocks or parcels in a manner that is consistent with the management objectives described in Section 6.4.1. Each preserve parcel will be covered by a land management plan; although multiple adjacent parcels may be covered under a single plan. The preserve manager will be responsible for the preparation and implementation of the land management plan for that parcel and will ensure that qualified biologists prepare the document. Biologists preparing land management plans for the RHCP must hold or be covered by an USFWS Threatened and Endangered Species permit that authorizes the biologist to conduct surveys for the golden-checked warbler and black-capped vireo.

Land management plans will be prepared and/or updated by the preserve manager every five years, in accordance with the schedule in Section 6.4.6, unless the preserve manager finds that changed conditions warrant a revised plan before the next scheduled review date. Hays County may also require the review and revision of a land management plan before the scheduled review date, in order to implement adaptive management provisions, respond to changed circumstances, or otherwise maintain compliance with Permit conditions. Land management plans and subsequent updates will be submitted to Hays County by October 31 of the year in which they are prepared, and the County will submit land management plans to the USFWS for review and approval prior to implementation.

Land management plans will rely on the best available information regarding the biology and management of the covered species and the information contained in the most recent baseline preserve evaluation, as described in Section 6.4.3.

At a minimum, land management plans will address the following topics and incorporate the concepts listed below:

1. Creating and maintaining effective preserve boundaries with adequate fencing and appropriate signage forbidding unauthorized access;
2. Limiting use of areas within the preserve, as appropriate, to only those activities that do not appreciably reduce the conservation value of the preserve;
3. Preserving, reproducing, or enhancing the ecological processes that create and maintain habitat for the covered species, including but not limited to vegetational succession, oak regeneration, and fire management/use of prescribed fire to the extent practicable;
4. Minimizing the effects of land uses adjacent to protected habitat to the extent practicable by:
 - a. Managing populations of urban-adapted, non-native, and/or invasive animals within the preserve system, including but not limited to feral cats and dogs, feral hogs, brown-headed cowbirds, white-tailed deer, and red imported fire ants;
 - b. Attempting to prevent the introduction and control the establishment or spread of non-native and/or invasive plants within the preserve system (which may include management of Ashe juniper); and
 - c. Preventing and/or controlling oak wilt and other diseases or infestations affecting the covered species or their habitats.
5. Choosing preserve management practices that minimize adverse effects to the species addressed by the RHCP;
6. Minimizing the potential negative effects of major vegetation management practices (such as selective clearing practices or prescribed burning to create or maintain black-capped vireo habitat or manage stands of Ashe juniper) by:
 - a. Conducting major vegetation management practices outside of the breeding seasons for the covered species (defined as March 1 through July 31 for the golden-cheeked warbler and March 15 through August 31 for the black-capped vireo);
 - b. Limiting the extent of major vegetation management activities in potential habitat for covered species (i.e., management activities that could substantially decrease the extent of potential habitat in the treated area) to avoid impacting the majority of such habitat in a preserve block in a single year; and

- c. To the extent practicable, choosing specific management practices that minimize the disturbance, removal, or compaction of top soil (thereby preserving soil structure and texture) in the treated area, including but not limited to practices that utilize hand tools instead of heavy equipment or, if it is necessary to use heavy equipment, choosing equipment with rubber tires instead of tracks; and
7. Monitoring the sources and impacts of potential threats to the covered species or their habitats, as applicable to each parcel.

Hays County will not be required to implement management practices that are designed to increase or enhance the mitigation value of a preserve block after acquisition to meet the mitigation commitment under the RHCP. However, additional management and monitoring objectives are included in Appendix E to help guide the implementation of such activities should the County have the additional resources and desire to do so. Implementation of management activities to achieve these additional management objectives is not required to meet the mitigation commitments under the RHCP and the Permit; nor is implementation of this additional guidance necessary to meet the ESA incidental take permit issuance criteria.

6.4.5 Preserve Monitoring and Reporting

The preserve manager will be responsible for completion of all required preserve monitoring and reporting for that parcel and will ensure that qualified biologists conduct the work. All personnel conducting surveys or other monitoring studies within the preserve system for the covered species or their habitats will hold or be covered by a valid USFWS Threatened and Endangered Species permit that authorizes the biologist to conduct surveys for the golden-checked warbler and black-capped vireo.

Required monitoring studies within the preserve system will include regular surveys of populations of the covered species and habitat characteristics for the covered species according to the schedule in Section 6.4.6. Standard methods and minimum procedures for these required monitoring studies are specified below and will apply to all preserve parcels within the RHCP preserve system.

In addition to the required species and habitat monitoring, potential threats to the covered species and their habitats within the preserve system will also be regularly monitored, as applicable to each preserve parcel. Types of threat monitoring could include measuring populations of predator/competitor species, invasive plants or infestations/diseases, or the effects of public access or other preserve uses. In terms of threats to populations of and habitats for the covered species, the monitoring needs of preserve parcels will likely differ across the preserve system and may change over time. Therefore, the threats monitoring program for each preserve parcel will be described within the land management plan for that parcel.

Hays County will submit all reports documenting the results of monitoring surveys within the RHCP preserve system to the USFWS by December 1 of each year, as a part of the RHCP annual report (see Section 7.6).

6.4.5.1 Monitoring Populations of Covered Species

Monitoring studies for populations of the covered species will, at a minimum, provide information on the number of warbler and vireos utilizing the RHCP preserve system and identify areas of occupied and unoccupied habitat within the preserve system. These monitoring studies will also be used to track trends in population sizes and habitat use over time.

Territory Mapping Surveys

Preserve managers will estimate the number of warblers and vireos utilizing each preserve parcel and use this information to prepare or update the baseline preserve evaluation for that parcel. This information will be obtained via breeding season surveys completed at least once every five years, as described in Section 6.4.6, for the warbler and vireo using methods that are sufficient to estimate the number of individuals of each species utilizing each preserve parcel during the survey year.

The standard methods to be used for territory mapping surveys of the covered species are described below and are based on bird territory spot-mapping methods. The methodology is adapted from the November 2007 version of the USFWS minimum procedures for determining the presence/absence of golden-cheeked warblers and black-capped vireos, with additional guidance on data collection and territory interpretation provided by the International Bird Census Committee (1970) and Bibby et al. (2000). Alternate survey methods may be used provided that such methods are approved by Hays County and the USFWS in advance and are sufficient to achieve the survey purpose.

The standard methods to be used for territory mapping surveys for the covered species are described below:

1. All personnel conducting population surveys for the covered species will be covered by an USFWS Threatened and Endangered Species permit that authorizes the biologist to conduct surveys for the golden-cheeked warbler and black-capped vireo.
2. Surveys will be completed during the breeding seasons of the covered species, as follows:
 - a. Survey season for the golden-cheeked warbler starts March 15 and ends May 15; and
 - b. Survey season for the black-capped vireo starts April 10 and ends July 1. A minimum of 50 percent of the survey visits for the vireo will be completed between April 10 and May 31.

3. Survey visits may begin 30 minutes before sunrise and will end no later than eight hours after sunrise.
4. Surveys will include all areas of potential habitat for the covered species within a preserve parcel, including areas of potentially low quality or transitional habitat.
5. A complete survey will include at least five survey visits to each 100-acre unit of potential habitat within the preserve parcel, with each visit spaced at least five days apart.
6. Survey time for each visit will be at a rate of at least four hours for every 100 acres of potential habitat surveyed. A minimum of one hour of survey time per visit is required regardless of the number of acres surveyed. Therefore, the total survey time for a complete survey is at least 20 hours per 100 acres of potential habitat (with a minimum of five hours of total survey time for survey areas smaller than 25 acres).
7. Surveys will be conducted on days when weather conditions are suitable for the detection of the covered species. Surveys will not be conducted on days with moderate or heavy rainfall or when sustained winds exceed approximately 25 miles per hour.
8. Survey routes travelled during each visit will be designed to evenly cover the area of potential habitat for the covered species within a parcel (i.e., the survey area). The routes will be varied among visits to ensure that surveyors walk within 300 feet of all portions of the survey area at least once during the five survey visits. Starting and ending points and/or survey direction will also be varied for each survey visit.
9. Surveyors will quietly and slowly walk the survey route and record all detections of the covered species on field notes and maps (i.e., spot mapping observations). GPS receivers capable of at least three meter accuracy will be used to record the location of precise detections in the field.
10. Detections of the covered species will be recorded on detailed field maps and in field notes with standard mapping symbols as described in International Bird Census Committee (1970). Field maps will be at a scale of no more than 1 inch = 400 feet and will contain base information sufficient to identify the observer's location and the location of bird detections, such as aerial imagery and/or topography. New field maps will be used for each survey visit. Additional field notes will be recorded as described below to interpret results.
11. Information about each warbler or vireo detection will be recorded on field maps and/or in field notes, including:

- a. Species (i.e., warbler or vireo), sex, and age (i.e., adult or juvenile);
 - b. Detection type: a precise vs. imprecise detection, a territorial vs. non-territorial detection (i.e., singing male vs. non-singing male), or an aggressive encounter between multiple birds;
 - c. Detection location precision (i.e., a standardized estimate of the precision of a detection location; for example, the true location of the bird is within 30, 60, 90, 120, 180, or 240+ feet of the recorded location);
 - d. Observations of movement for individual birds and observations of contemporary contacts between multiple birds; and
 - e. Other data, as applicable, such as observations of nests or behaviors.
12. Field data for bird detections will be entered into a GIS database (to include all GPS data and digitized versions of non-GPS data – including all point observations, precision buffers, and movement/contemporary lines). Data from individual surveys visits will be overlaid to interpret the results for a complete survey.
13. Bird detection data will be interpreted to estimate territory boundaries for individual warblers and vireos within or immediately adjacent to the preserve parcel, as described in Bibby et al. (2000). Approximate territory boundaries will be digitized and added to the GIS database of the survey results.
14. A report will be prepared for each survey documenting the results of the survey and estimating the number of warbler and vireos utilizing the preserve parcel. Reports will include the following information:
- a. A description of the survey area, including parcel name, location, ownership, total size, acres of potential habitat for each of the covered species (i.e., the size of the survey area), and a general description of habitat conditions;
 - b. Conditions for each survey visit, including date, surveyor name, starting/ending times of survey visits, total survey time, and starting and ending weather conditions (i.e., temperature, wind speed and direction, cloud cover, and precipitation);
 - c. A summary of survey results, including the number of bird detections, the estimated number of warbler and vireo territories completely within, partially within, and immediately adjacent to the survey area.

- d. A set of maps showing: 1) the location of the parcel and the extent of potential habitat within the parcel; 2) the combined survey routes for the complete survey; and 3) the combined survey results for the complete survey including individual bird detections and approximate territory boundaries.
- e. Digital copies of the survey report and the GIS database of survey results (including bird detections, approximate territory boundaries, parcel boundaries, and areas of potential habitat). All GIS data will be submitted in Texas State Plane Coordinates (South Central Zone), NAD83 datum, and map units of feet.

Preserve managers will submit survey reports to Hays County by October 31 of the year in which they were performed. Surveys not conducted in accordance with these standard methods (including the reporting requirements) may be rejected by Hays County and the USFWS for the purposes of meeting the requirements for management and monitoring of the RHCP preserve system.

Habitat Occupancy Surveys

Baseline preserve evaluations for preserve parcels require an estimate of the amount and location of occupied and unoccupied habitats within their boundaries, with respect to the covered species. Occupancy monitoring within the RHCP preserve system will use occupancy modeling methods, as generally described by MacKenzie et al. (2002), MacKenzie et al. (2006), Rhodes et al. (2006), and Royle and Nichols (2003). The purpose of these occupancy surveys is to determine species presence or non-presence in potential habitat within the preserves and to track changes in habitat use over time using a survey methodology that incorporates more statistical rigor than traditional spot-mapping methods.

Occupancy monitoring surveys will be conducted at least once every five years for each preserve parcel, as described in Section 6.4.6.

The standard methods to be used for habitat occupancy surveys of the covered species are described below. Alternate survey methods may be used provided that such methods are approved by Hays County and the USFWS in advance and are sufficient to achieve the survey purpose.

The standard methods for occupancy monitoring surveys for the covered species include the following:

1. All personnel conducting occupancy monitoring surveys for the covered species must be covered by an USFWS Threatened and Endangered Species permit that authorizes the biologist to conduct surveys for the golden-cheeked warbler and black-capped vireo.

2. Surveys will be completed during the breeding seasons of the covered species, as follows:
 - a. Survey season for the golden-cheeked warbler starts March 15 and ends May 15; and
 - b. Survey season for the black-capped vireo starts April 10 and ends July 1.
3. Separate surveys will be conducted for warblers and vireos when habitat for each occurs within the same preserve parcel.
4. Survey visits may begin 30 minutes before sunrise and will end no later than eight hours after sunrise.
5. Surveys will include all areas of potential habitat for the covered species within a preserve parcel, including areas of potentially low quality or transitional habitat.
6. At least ten survey stations per 100 acres of potential habitat will be established, with each station positioned within potential habitat for the survey species and at least 200 meters apart. Survey stations will be arranged in a regular grid and positioned no closer than 100 meters of a preserve parcel edge, to the extent practicable given the size and shape of the particular survey area. The locations of all survey stations will be recorded in the field with GPS receivers capable of at least three meter accuracy.
7. Each survey station will be visited up to five times during the survey season or until presence of the survey species is established during that year. There will be at least 24 hours between visits to a station and all visits to a station will be completed within 30 days of the first visit.
8. Surveys at each station will last up to five minutes per visit or until presence of the survey species is established during that visit.
9. The order in which survey stations are visited will be varied among survey visits.
10. Surveys will be conducted on days when weather conditions are suitable for the detection of the survey species. Surveys will not be conducted on days with moderate or heavy rainfall or when sustained winds exceed approximately 25 miles per hour.
11. Surveyors will denote presence or absence of the survey species at each survey station for each visit to that station. Once presence has been established at a survey station, additional visits to that station are not needed for that year's survey. Presence at a survey station will be established with a visual or auditory observation of the survey species from that station, regardless of the sex, age,

territorial behavior, precise location of the individual bird, or number of individuals of that species observed at that station.

12. Presence/non-presence data for the survey species will be analyzed with occupancy modeling software, such as the PRESENCE software program developed by Darryl MacKenzie of Proteus Research & Consulting Ltd. under contract to the U.S. Geological Survey, to estimate occupancy and detection probabilities (with standard errors) for the survey species.
13. A report will be prepared for each survey documenting the results of the survey and indicating areas of presence or non-presence of the survey species. Reports will include the following information:
 - a. A description of the survey area, including parcel name, location, ownership, total size, acres of potential habitat for each of the covered species (i.e., the size of the survey area), and a general description of habitat conditions;
 - b. Conditions for each survey visit, including date, surveyor name, starting/ending times of survey visits, total survey time, and starting and ending weather conditions (i.e., temperature, wind speed and direction, cloud cover, and precipitation);
 - c. A matrix of detections for the survey species. Detection matrices will identify survey stations in rows and survey visits in columns, with a notation of absence, presence, or no visit for each cell in the matrix;
 - d. A summary of survey results, including estimates (with standard errors) of occupancy and detection probabilities for each of the covered species. Methods or statistical models used to derive occupancy and detection probabilities will be identified and described;
 - e. A map showing the location of the parcel, the extent of potential habitat within the parcel, and the location of survey stations classified by occupancy status; and
 - f. Digital copies of the survey report and the GIS database of survey results (including survey stations classified by occupancy status, parcel boundaries, and areas of potential habitat). All GIS data will be submitted in Texas State Plane Coordinates (South Central Zone), NAD83 datum, and map units of feet.

Preserve managers will submit survey reports to Hays County by October 31 of the year in which they were performed. Surveys not conducted in accordance with these standard methods (including the reporting requirements) may be rejected by Hays County and the

USFWS for the purposes of meeting the requirements for management and monitoring of the RHCP preserve system.

6.4.5.2 Habitat Monitoring for the Covered Species

While regular habitat determinations (as described in Section 7.4.2) to identify the extent of potential habitat for the covered species in the preserve system are required as part of the regular baseline preserve evaluations, these assessments do not measure habitat variables or characteristics that might be important indicators of habitat suitability or quality. Monitoring habitat variables will allow Hays County and RHCP preserve managers identify and track potential changes in the suitability or quality of habitats for the covered species in the preserve system over time. The monitoring methods described in this section are intended to provide long-term data for identifying trends in the composition, structure, and general health of protected habitats for the covered species across the preserve system.

Consistent with habitat monitoring methods used for the Balcones Canyonlands Preserve in Travis County, habitat monitoring in the RHCP preserve system will be based on the Land Condition Trend Analysis (LCTA) process developed by the U.S. Army (see Tazik et al. 1992) to monitor changes in land conditions over time. For the purposes of the RHCP, a modified LCTA methodology will be used that focuses on the collection of data related to land use, surface disturbances, ground cover, canopy cover, species composition, and vegetation structure, as described below. Habitat monitoring surveys will be conducted at least once every five years, as described in Section 6.4.6.

The standard methods for habitat monitoring in the RHCP preserve system using modified LCTA methods for the covered species includes the following:

1. Long-term habitat monitoring plots will be permanently established throughout the preserve system within areas of potential habitat for the covered species.
2. At least one plot will be established for each 100 acres of potential habitat within the preserve system. At least one plot will be established within each preserve parcel.
3. The distribution of plots between areas of warbler and vireo habitat will be made in proportion to the total acreage of these habitats within the preserve system.
4. Plots will be 100 meters long and 6 meters wide, with a 100 meter line transect along the longitudinal axis of the plot.
5. Plots will be randomly located within areas of potential habitat for the covered species. The orientation of each plot will be determined randomly, so long as the plot remains within the area identified as potential habitat for the covered species. The starting point of the line transect for each plot will be recorded with a GPS receiver capable of at least three meter accuracy.

6. Plots will be monitored at least once every five years.
7. Monitoring will include the land use, line transect, and belt transect methods described in Tazik et al. (1992), which characterize land uses and maintenance activities, surface disturbances, ground cover, canopy cover, plant species composition, plant density, plant heights, and plant distributions in the plot. Photographs of each plot will also be taken from the starting point of the line transect.
8. A report will be prepared for each preserve parcel documenting the results of the habitat monitoring. Reports will include plot locations (including GPS coordinates and the orientation of the plot) and all data forms, spreadsheets, maps, sketches, and photographs from each plot.

Alternate habitat monitoring methods may be used provided that such methods are approved by Hays County and the USFWS in advance and are sufficient to achieve the survey purpose.

Preserve managers will submit habitat monitoring reports to Hays County by October 31 of the year in which they were performed. Surveys not conducted in accordance with these standard methods (including the reporting requirements) may be rejected by Hays County and the USFWS for the purposes of meeting the requirements for management and monitoring of the RHCP preserve system.

6.4.6 Schedule for Major Preserve Management and Monitoring Tasks

Each of the major preserve management and monitoring tasks described in Section 6.4 are required to be completed or updated once every five years. To simplify the scheduling and completion of these tasks, since preserve parcels will be acquired on a phased basis over the term of the permit, preserve managers will complete each type of major task across the entire preserve system (as it exists at the time) according to the following schedule:

- Years ending in 0 or 5: Territory Mapping Surveys;
- Years ending in 1 or 6: Habitat Occupancy Surveys;
- Years ending in 2 or 7: Habitat Monitoring Surveys;
- Years ending in 3 or 8: Baseline Preserve Evaluations; and
- Years ending in 4 or 9: Land Management Plans.

Interim surveys, evaluations, or land management plans may be prepared for preserve parcels that are acquired early in the five-year cycle.

6.4.7 Management of Public Access and Other Preserve Uses

Individual preserve parcels will include various types of habitat, and some may be more suitable than others for different levels of public access or non-habitat uses. Land management plans will specify which areas are managed primarily for habitat and which areas may be appropriate for public access or other uses. While the RHCP and Permit may permit certain types of public access and use of the preserve system with approval of the USFWS on a case-by-case basis, inclusion of land in the RHCP preserve system, either by fee simple acquisition by the County or via conservation easements (or other agreements) on land owned by other entities, does not require or imply that public access must be allowed. Public access to RHCP preserves, in accordance with the RHCP and Permit, is at the discretion of the parcel owner and must be approved by the USFWS.

Provisions for other uses of privately owned RHCP preserve parcels will be determined on a case-by-case basis by the specific terms of a conservation easement or similar agreement, as negotiated by the landowner, Hays County, and the USFWS. Access to the preserves by preserve managers in the performance of land management activities will be covered by the Permit.

6.4.7.1 Public Access within the RHCP Preserve System

All public access to RHCP preserve parcels will be in accordance with the terms of the Permit and the provisions stated below. Public access to RHCP preserves may be permitted, but not required or mandated under this RHCP, with USFWS approval on a case-by-case basis. Preserve owners may allow public access only if allowed by the permit, this RHCP, and the land management plan approved by the USFWS. Preserve owners are not obligated to allow public access, and may discontinue public access at any time and for any reason.

Public access within RHCP preserve parcels will be classified as either “passive use” or “active use.” Passive use public access, as defined below, is expected to have no or negligible adverse effects on the covered species or their habitats and may be allowed within areas of potential habitat for the covered species without requiring the use of credits from the RHCP conservation bank. Active use public access may result in more than negligible adverse effects to the covered species and is not allowed in areas of potential habitat (unless such effects are mitigated with credits from the conservation bank, as described below).

Passive use public access is defined as human foot traffic on approved trails or other defined areas outside of the breeding seasons for the covered species. For the purpose of these public access criteria, the breeding season of the golden-cheeked warbler is defined as March 1 through July 31 (see Section 3.2.1.1) and the breeding season of the black-capped vireo is defined as March 15 through August 31 (see Section 3.2.2.1). The use of wheeled vehicles or equipment, such as bicycles or skates, does not meet the definition of passive use (except as needed for preserve users with disabilities). Domestic animals also do not meet the definition of

passive use (except as needed for preserve users with a physical handicap). All approved trails or other defined areas of public use will be identified in the land management plan for a preserve parcel, which will be approved by the USFWS.

A limited number of other public activities may be allowed within areas of potential habitat, if provided for by an approved land management plan, and will be considered to be passive uses. These activities are:

- Groups of no more than ten hikers guided by a preserve manager may be allowed within areas of potential habitat, even during the main portion of the breeding seasons of the covered species.
- Hunting game within areas of potential habitat for the covered species outside of the breeding seasons of the covered species.

All other public uses of RHCP preserve parcels will be considered active uses. Active uses may include, but are not limited to, bicycling (or use of any other wheeled device not required because of physical handicap), dog walking or horseback riding (or activities involving any other pet or domesticated animal), swimming, boating, tubing, rafting, fishing, picnicking, camping, and rock-climbing. All areas of active public use will be delineated in the land management plan for that preserve parcel, which will be approved by the USFWS. Active (as opposed to passive) public uses of the RHCP preserve system will be restricted to areas that are more than 300 feet away from areas of potential habitat for the covered species that occur on lands protected pursuant to this RHCP. If active public uses are proposed within or within 300 feet of areas of potential warbler or vireo habitat within the preserve system, this habitat will not generate mitigation credit for the RHCP. Any potential mitigation needs for the direct and indirect effects of active use areas in potential habitat may be addressed in accordance with the RHCP participation process described in Section 7.4.

In all cases, at least one territory survey, one habitat occupancy survey, and one habitat monitoring survey will be completed within the RHCP preserve parcel prior to allowing any type of public access within that parcel. All parcels proposed for public access will also have an approved land management plan in place prior to allowing any type of public access within that parcel.

6.4.7.2 Infrastructure Management on Preserve Lands

Lands added to the preserve system, whether by fee simple acquisition or conservation easement, may include existing infrastructure facilities. In addition, it may be necessary for certain infrastructure to be placed within the preserve system in the future. Many types of infrastructure facilities may exist within the preserve lands, including electric transmission and distribution lines and substations, water lines, wastewater lines, gas and petroleum pipelines, and public roads. Some infrastructure facilities may be above ground (e.g., most electric facilities), while others may be below ground (e.g., water, wastewater, gas, and petroleum lines). This

section provides the requirements and recommendations for the infrastructure management needed to provide reliable service and to reduce impacts to, and as appropriate, mitigate for the covered species and their habitat.

Existing Infrastructure within Preserve Lands

The owners and managers of infrastructure facilities and easements in the preserve system will utilize best management practices, to the extent feasible and as appropriate for each specific industry (i.e., electricity providers, water service providers, etc.) to minimize, and as appropriate, mitigate for the adverse environmental effects of the operation and maintenance (O&M) of such facilities.

For utility service providers with existing facilities within the RHCP preserves whose O&M activities will take covered species, the County will request that the utility service provider obtain incidental take authorization for the take associated with such activities, which could include participation in the RHCP. Hays County will require utility service providers with infrastructure facilities within the preserve system that seek incidental take coverage through the RHCP to prepare O&M plans and submit them to the County for review and approval in order to receive the benefit of Permit coverage for their activities. The O&M plan will include a description of the facilities, planned/scheduled maintenance procedures, a schedule for implementation of routine management practices (with a preference for conducting such activities outside of the breeding seasons of the covered species), natural resource management considerations (including habitats for the covered species and other resources, such as soils and waters), and emergency maintenance procedures. The County's review and approval of utility infrastructure O&M plans shall not be unreasonably withheld or delayed.

Preserve management plans prepared by the County and managing partners will map and describe utilities and infrastructure within each preserve parcel.

New Infrastructure Corridors

No new infrastructure corridors will be allowed within RHCP preserves except as authorized on a case-by-case basis at the discretion the County with the approval of the USFWS. In such cases, applications to the RHCP for mitigation assessments for new facilities will include a description of the design, temporary and permanent construction easements, erosion and sedimentation control plans (temporary and permanent), restoration plans, draft operation and maintenance plan, and a summary of routing alternatives.

New facilities will avoid crossing preserve lands and will minimize impacts to covered species to the extent feasible. New infrastructure rights-of-way that cannot feasibly avoid crossing preserve lands should be placed within or parallel to existing easements whenever feasible. New infrastructure easements will be assessed for direct and indirect habitat impacts

outside of preserve lands and within preserve lands. Mitigation assessments within preserve lands will be assessed at a level that is at least double the cost of mitigation required outside preserve lands, to compensate for any lost mitigation within the preserve.

6.5 Adaptive Management Provisions

Adaptive management, as described by the USFWS in the Five-point Policy Initiative addendum to the HCP Handbook (65 FR 35242), is an integrated method for addressing uncertainty in the conservation of species covered by a habitat conservation plan. The purpose of adaptive management is to streamline and improve the decision-making process for the conservation program. The RHCP adaptive management provisions are consistent with the guidance provided by the HCP Handbook (USFWS and NMFS 1996).

The USFWS's framework for addressing adaptive management in habitat conservation plans includes: 1) identifying areas of uncertainty and questions that need to be addressed to resolve this uncertainty; 2) developing alternative management strategies and determining which experimental strategies to implement; 3) integrating a monitoring program that is able to acquire the necessary information for effective strategy evaluation; and 4) incorporating feedback loops that link implementation and monitoring to the decision-making process that result in appropriate changes in management.

The RHCP management and monitoring program described in Section 6.4 includes cycles of regular review and revision of baseline assessments, management plans, and monitoring data to adapt to new conditions or incorporate new information. These built-in adaptive strategies address uncertainty regarding effective habitat management practices for the covered species and public access or use issues.

6.5.1 Uncertainty in the Effectiveness of the Preserve Design Criteria

The conservation program identifies the typical design criteria for preserve blocks that will have mitigation value under the RHCP. The design criteria require that individual preserve blocks must typically include at least 500 total acres. Arnold (1996) and Butcher (2008) have shown that golden-cheeked warblers successfully reproduce in patches of habitat as small as approximately 37 acres to 57 acres. The design criteria for RHCP preserves requires that individual preserve blocks include five to eight times this minimum acreage of potential habitat. The preserve design criteria do not require specific preserve parcel or habitat patch configurations for the preserve system.

While the preserve design criteria currently appear to substantially exceed the minimum patch size threshold for warbler reproduction, Coldren (1998) points out that the internal ecosystem processes within a patch of habitat are influenced by the types of land uses adjacent to and in the vicinity of the patch. Habitat patches of similar size and vegetation characteristics may not be ecologically equivalent due to differences in their surroundings. Golden-cheeked

warbler occupancy of habitat patches was shown to be positively associated with adjacent agricultural and grassland uses, but negatively associated with nearby residential or commercial uses (Arnold 1996, Coldren 1998). Therefore, while the minimum patch size for successful warbler reproduction in a largely rural or agricultural landscape may be approximately 37 to 57 acres, the minimum successful patch size in a largely urban or developed landscape may be much larger.

6.5.2 Strategies for Dealing with Uncertainty in the Preserve Design Criteria

The RHCP conservation program is currently thought to be conservative with respect to uncertainty regarding the preserve design criteria. The preserve design criteria are many times larger than the best available estimates of the minimum patch size needed to sustain golden-cheeked warbler reproduction. This safeguard and the requisite approval from the USFWS prior to an acquisition generating mitigation credits are the primary strategy for dealing with uncertainty in the preserve design criteria.

Alternatively, if (due to increases in adjacent or nearby developed land uses) monitoring shows that RHCP preserves blocks are not large enough or do not contain sufficiently large habitat patches to support occupancy by the covered species such that the conservation value of the preserves has been reduced, Hays County will negotiate with the USFWS to amend the RHCP and Permit to increase the standards for the preserve design criteria that would be applied to subsequent preserve acquisitions. The County will also work with the USFWS to modify preserve management practices, within the limits of existing preserve management budgets and contingency funds, as appropriate to help prevent, reduce, or reverse the loss of conservation value on existing preserve blocks.

6.5.3 Monitoring to Assess the Effectiveness of the Preserve Design Criteria

The management and monitoring program described in Section 6.4 requires a detailed baseline assessment of each preserve parcel, including regular monitoring of populations and habitats of the covered species. The management and monitoring program will provide sufficient data to evaluate whether potential habitat within the preserves is used by the covered species.

6.5.4 Process for Revising Preserve Design Criteria

Hays County and the USFWS will review the data from the baseline evaluations and monitoring surveys to determine if the RHCP preserve system is providing adequate mitigation to balance the impacts of incidental take authorized by the permit. If the monitoring surveys show that a preserve block that is completely or substantially surrounded by development has not been occupied by the warbler for five consecutive years, the USFWS may require Hays County to amend the preserve design criteria to be applied to subsequent preserve acquisitions or to modify management practices within existing preserves, as described in Section 6.5.2.

Similarly, if the monitoring surveys show that a preserve block with a designated vireo management area has not been occupied by the species for ten consecutive years, the USFWS may require Hays County to amend the preserve design criteria to be applied to subsequent preserve acquisitions, as described in Section 6.5.2.

6.6 Voluntary Conservation Measures for Evaluation Species

In order to generate additional information about the evaluation species and their habitats, the County will spend \$25,000 per year for first ten years of the RHCP on research or studies of one or more of these species. The County will coordinate the use of these funds with USFWS.

Hays County will also commit to working with the USFWS, as opportunities may arise during the duration of the RHCP, on regional solutions to the conservation of karst and karst-aquatic species, including the evaluation and additional species addressed in the RHCP. This commitment may involve participation in regional workgroups or similar efforts to develop strategies to conserve these species and their habitats, or implementation of measures or programs within the County's regulatory authority to further the conservation of these species.

7.0 PROGRAM IMPLEMENTATION

7.1 Program Administration

Hays County will have the primary responsibility for the implementation of the RHCP and complying with the terms and conditions of the Permit. Hays County may create one or more staff positions dedicated to the administration and implementation of the RHCP and/or contract with outside consultants for assistance with RHCP implementation. Hays County may also designate, with USFWS approval, a separate preserve manager to oversee the management and monitoring of some preserve parcels (see Section 6.4.2).

Activities required to implement the RHCP conservation program are described in Section 6.0. Other activities required to administer the RHCP, including managing the participation process, tracking mitigation credits and debits, completing preserve acquisitions, managing the distribution of research funds, and monitoring/reporting compliance with the terms of the Permit, are described below.

Hays County retains the express right to terminate the RHCP at any time, provided that the County will remain obligated to perform any action that is required by conditions of the RHCP and the Permit to be performed, up to the date of termination. Further, Hays County will be responsible for the perpetual operation and maintenance of all preserves acquired under the RHCP through the date of termination.

7.2 Preserve Acquisitions

Hays County may seek voluntary conservation partners, including private landowners, organizations, or municipalities, to achieve the permanent protection of habitat for the covered species by adding properties to the RHCP preserve system. The County may acquire preserve parcels by fee simple land purchases from willing sellers or by the establishment of conservation easements (or other agreements) with other property owners.

The USFWS will review and approve all RHCP preserve acquisitions prior to the creation of mitigation credits associated with a particular acquisition, and will award mitigation credits in accordance with current USFWS policies and guidelines regarding mitigation.

7.2.1 Fee Simple Purchase by Hays County

Fee simple additions to the RHCP preserve system are those preserve parcels purchased outright by Hays County for the RHCP. Hays County will maintain full control over the use and management of fee simple acquisitions, subject to any pre-existing easements or other encumbrances (such as utility or access easements).

7.2.2 Preserve Management Agreements

Hays County may enter into agreements with other municipalities, land trusts, conservation organizations, or other entities that allow land owned by these other entities to become part of the RHCP preserve system and possibly generate mitigation credit for the RHCP. The preserve management agreements will be negotiated on a case-by-case basis and the specific provisions may vary, but each will be designed to conserve habitat for the covered species and promote the biological goals of the RHCP. The USFWS will review and approve preserve management agreements prior to execution.

In all cases, parcels added to the RHCP preserve system through such agreements will be managed in accordance with the terms and conditions of the Permit and the management and monitoring criteria described in the RHCP.

The USFWS will be a beneficiary to any such agreements with authority to enforce the agreement.

7.2.3 Conservation Easements

Hays County may assemble some of the RHCP preserves through the use of conservation easements that are recorded in the real property records of the County. The property subject to the easement will be incorporated into the RHCP preserve system, but will remain under the ownership of the grantor or successive owners. Conservation easements for the RHCP preserve system will be reviewed and approved by the USFWS prior to the creation of mitigation credits for the Plan.

The County will negotiate the terms of individual conservation easements on a case-by-case basis. In all cases, the easements will be designed to preserve, in perpetuity, the conservation value of the property with respect to the covered species. Conservation easements will include provisions necessary to comply with all applicable terms and conditions of the Permit and the preserve management and monitoring program described in the RHCP. In addition, each conservation easement will provide that the County has the right to enter the property and enforce the terms of the easement, and report the findings to the USFWS.

7.3 Conservation Bank Credits and Debits

RHCP preserve acquisitions will generate mitigation credits for the RHCP conservation bank (see Section 6.3.2) that the County may use to offset the impacts of its activities that adversely affect the covered species or that the County may sell to RHCP participants. The County will track the addition of credits to and the debit of credits from the RHCP conservation bank, as such credits are created or used, to ensure that the bank does not experience a negative credit balance. The County will also ensure that the sale of credits does not exceed the total amount of incidental take authorized by the Permit (i.e., 9000 warbler credits and 1,300 vireo

credits). Either a negative credit balance (even if temporary) or sales exceeding the authorized limit would be a violation of the Permit.

The County will establish a conservation bank ledger prior to the acquisition of the first RHCP preserve parcel to record and track all bank transactions as they occur. The ledger will identify transaction dates, the property and/or conservation partner contributing the credits, the entity purchasing the credits, the number of credits added to debited from the bank, and the resulting bank balance. The ledger will be provided to the USFWS for review as part of the RHCP annual report (see Section 7.6).

Mitigation credit valuation will be in accordance with current USFWS policies and guidelines regarding mitigation and will be approved by the USFWS prior to disbursement of any credits from a given preserve parcel.

7.4 Participation Process

Provided that Hays County has a sufficient number of mitigation credits available, landowners or other entities with projects that impact the covered species may comply with the ESA (with respect to the covered species) by entering into a Participation Agreement with Hays County, which includes paying the appropriate mitigation fee and receiving a Certificate of Participation. Certificates of Participation will only authorize incidental take of the covered species within the Plan Area.

Landowners wishing to participate in the RHCP must submit a completed application to the County, along with an application fee and any additional materials required by the County. Once the required form, materials, and fee have been submitted to the County, and the County has completed any necessary assessments and evaluations, the County will issue a "Determination Letter" that will set forth the amount of authorized take associated with a project. In addition, the Determination Letter will state the applicant's cost of participation in the RHCP and the period within which the Determination Letter will remain effective. The County may determine, at the County's discretion, that it will not extend available credits to a particular applicant if the County determines that it is necessary to retain credits for its own uses or that such participation would not conform with the goals or provisions of the RHCP.

Figure 7-1 summarizes the RHCP participation process and the specifics of each step are described below.

Figure 7-1. Hays County RHCP Participation Process.

STEP 1	Applicant May Choose To:	Submit Application to Hays County RHCP <ul style="list-style-type: none"> • Provide applicant, property, and project information • Pay application fee
STEP 2	Hays County RHCP Staff Will:	Complete a Habitat Determination <ul style="list-style-type: none"> • Review available data • Conduct a site visit • Delineate potential habitat for covered species Review Proposed Site Plans <ul style="list-style-type: none"> • Identify areas with direct and indirect project effects Prepare a Mitigation Assessment <ul style="list-style-type: none"> • Calculate the direct and indirect impacts to potential habitat • Calculate the mitigation credits needed for participation • Issue a Determination Letter to applicant stating mitigation requirements
STEP 3	Applicant May Choose To: Hays County Will:	Complete RHCP Enrollment <ul style="list-style-type: none"> • Sign a Participation Agreement • Provide required mitigation to Hays County Issue a Certificate of Participation <ul style="list-style-type: none"> • Counter-sign the Participation Agreement (at the County's discretion) • Issue Certificate of Participation to participant • Record Certificate in the Hays County Real Property Records
STEP 4	Participant May:	Incidentally Take Covered Species Associated with the Proposed Project <ul style="list-style-type: none"> • Must abide by all terms and conditions of the Participation Agreement

7.4.1 Application to the Hays County RHCP

Potential participants seeking a habitat determination and/or a mitigation assessment for incidental take authorization through the RHCP will submit a completed application to the County.

Information to be provided with the application must include the following:

- Applicant and property owner contact information;
- Identify whether a habitat determination and/or a mitigation assessment is requested;

- Detailed property information, including boundary maps, legal descriptions, and/or digital GIS or CAD data;
- Authorization for County biologists to enter the property for an on-site habitat assessment and the information needed to coordinate access to the property;
- If a mitigation assessment is requested, a detailed site plan for the proposed project that shows the location and extent of all proposed land development and clearing activities and describes the uses of any proposed open spaces or easements;
- Other applicable information about the property and the applicant, such as prior habitat determinations or species survey information, as required by the County; and
- Any applicable fees for processing applications.

The County RHCP staff or consultants contracted by the County will review and process each complete application. Estimated fees for processing an application for a habitat determination and/or mitigation assessment may typically range from \$500 to \$5,000 per application. The County will determine the required application fee for each application on a case-by-case basis, taking into account the level of effort required by the County to process each application. This fee may be adjusted by Hays County at any time to cover processing costs.

Habitat determinations will identify the number of acres of potential golden-cheeked warbler and black-capped vireo habitat present on a project area (see Section 7.4.2). Mitigation assessments will determine the number of acres expected to be impacted by a proposed project and identify the number of mitigation credits needed to obtain incidental take authorization through the RHCP (see Section 7.4.3 and Section 7.4.4). The mitigation assessment will typically be based on a 1:1 mitigation ratio (i.e., one acre of mitigation for each acre of impact) that takes into account the expected direct and indirect impacts to potential habitat. The assessment will be determined from an on-site evaluation and site plans submitted by applicants. The USFWS reserves the right to review and approve all mitigation assessments under the RHCP (see Section 7.4.5)

Participation in the RHCP, even after submission of an application, is voluntary. An applicant will have no obligation (other than application fees) to pay mitigation fees or provide other compensation to Hays County related to the RHCP, unless the applicant enters into a Participation Agreement with the County (see Section 7.4.6).

If a federal agency is involved with a project seeking to mitigate for impacts to the covered species through the RHCP, the federal agency must complete consultation with the USFWS pursuant to Section 7 of the ESA prior to submitting an application for mitigation credits to the County. Section 7 of the ESA requires that all federal agencies consult with the

USFWS to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy critical habitat of such species.

7.4.2 On-site Habitat Determination

On-site habitat determinations will be performed by County biologists (either on staff or under contract by the County) and the USFWS reserves the right to review and approve all habitat determinations under the RHCP. Biologists conducting on-site habitat assessments for the Hays County RHCP must hold or be covered by an USFWS Threatened and Endangered Species Permit that authorizes the biologist to conduct surveys for the golden-cheeked warbler and black-capped vireo. This standard will help ensure that those conducting habitat assessments for the RHCP are sufficiently familiar with the habitats used by the warbler and vireo.

Habitat determinations will involve a review of various published materials and data pertaining to habitat conditions on a project area, as available and applicable. These materials may include aerial imagery, habitat models, prior survey data, soils and geology, topography, and similar information. The County RHCP staff or County-contracted consultants will also conduct a site visit to the project area to determine actual habitat conditions and delineate potential habitat on the site.

Identification and delineation of golden-cheeked warbler and black-capped vireo habitat within the project area boundaries will be made based on the habitat criteria described by the Texas Parks and Wildlife Department (Campbell 2003, et seq.).

The habitat determination will also identify any areas of potential habitat for the covered species that may be of particularly high quality or high importance to the conservation of the species in Hays County, based on characteristics such as (but not limited to) dense canopy cover, very large habitat patch size, demonstrated occupancy by relatively high densities of the covered species, or close proximity to other conservation areas. Similarly, the habitat determination will identify areas with existing indirect impacts resulting from development within or adjacent to the project area. Such existing indirect impacts will be limited to areas of potential habitat within 300 feet of a land cover or land use that is incompatible with the conservation of the covered species. County biologists (either on staff or under contract by the County) will use their best professional judgment when making habitat quality/importance determinations or assessing existing impacts.

The completed habitat determination will include a map showing the project area boundaries and the location and extent of potential habitat within the project area, as delineated from the review of background information and the on-site assessment. The habitat determination will include a calculation of the acreage of potential habitat on the project area. The habitat determination will also identify the location and size of any area determined to be of

particular importance to the covered species and describe the factors contributing to such findings. Similarly, the habitat determination will also identify the location and extent of any area of potential habitat within the project area affected by existing indirect impacts and will document the factors contributing to such findings.

On-site habitat determinations will remain valid for a period of three years, unless land clearing, vegetation management, or other process alters habitat conditions on the site.

Exceptions to on-site habitat determinations will be allowed if the applicant provides survey data (that was collected in accordance with USFWS protocol for warbler and vireo surveys) that demonstrates that a patch of potential habitat that meets the Texas Parks and Wildlife Department (TPWD) warbler or vireo habitat description is unoccupied. Absence of the species from a patch of potential habitat may be established with three consecutive years of presence/absence survey results from within the five years prior to application, or as allowed by the USFWS on a case-by-case basis. All presence/absence surveys and survey reports must be conducted in accordance with USFWS survey protocol for golden-cheeked warblers and black-capped vireos.

Hays County will send a copy of all habitat determinations completed under the RHCP to the USFWS for their review and approval, in accordance with the process described in Section 7.5.

7.4.3 Site Plan Review

A “project area” for the purpose of participation in the RHCP includes all areas subject to land development activities in connection with a single and complete project, as would be shown on a recorded plat or sealed site plan.

Site plans submitted to Hays County with an application for a mitigation assessment must be sufficiently detailed to identify the location and extent of all proposed land development activities that would result in the removal or alteration of woody vegetation within the project area, including lots, streets, drainage improvements, utility infrastructure, easements, and similar areas. Site plans used for participation in the RHCP must be based on recorded plats and/or final site plans, unless authorized on a case-by-case basis by the County.

Site plans submitted to support an application to participate in the RHCP must be provided as a simple hard copy layout on a single sheet and in digital CAD or GIS format. Digital site plan data must be georeferenced to North American Datum 1983 and Texas State Plane grid coordinates (south central zone) and in linear units of feet. Line or area shapes in the digital format must be clearly labeled or attributed to correspond with the information on the hard copy site plan sheet.

Hays County RHCP staff or County-contracted consultants will review site plans submitted by potential plan participants and identify areas of potential warbler and vireo habitat

that will be directly or indirectly impacted by the proposed project. For the purpose of determining the amount of mitigation that potential plan participants must provide to obtain a Participation Certificate through the RHCP, directly and indirectly impacted areas will be defined as follows:

- RHCP direct impact areas: Areas of direct impact will include all areas of potential habitat where the vegetation will be physically affected or altered by clearing or land development activities, or where the proposed use of the area will significantly change from pre-project conditions. The County may assess a nominal fee to cover the costs of providing such information. Direct impact areas will include all areas of potential habitat that occur on portions of individual lots or tracts to be used for residential, commercial, industrial, or institutional use, even if the proposed applicant will not complete the development of those areas before transferring them to another party. Direct impacts will also include areas of potential habitat within community parks, easements, or other open spaces where the addition of improvements, management of vegetation, or use of the area substantially alters the pre-project conditions.
- RHCP indirect impact areas: Areas of indirect impact will include all areas of potential habitat that are within 300 feet of the edge of an area with direct effects. Indirect impact areas may extend outside of a project area. Areas of indirect impact may also include small and isolated remnant fragments of potential habitat that would not be expected to be used by the species after completion of the proposed project.

Impacts to potential habitat will be determined separately for golden-cheeked warblers and black-capped vireos.

7.4.4 Mitigation Ratios

Mitigation ratios will determine the number of mitigation credits needed for a particular project to participate in the RHCP and will be based on the type of impact and the relative quality/importance of the habitat impacted. The USFWS reserves the right to review and approve all mitigation assessments.

Typically, each acre of potential warbler or vireo habitat that will be directly impacted by a proposed site plan (as defined above in Section 7.4.3) will require the purchase of one mitigation credit from the Hays County RHCP. Each acre of potential warbler or vireo habitat that will be indirectly impacted by a proposed site plan (as defined above in Section 7.4.3, even if these impacts occur outside of the project area boundary) will require the purchase of 0.5 mitigation credit from the RHCP. Given the relatively even and fragmented distribution of potential warbler and vireo habitat in Hays County (see Figure 3-2 in particular) it is anticipated that most applicants will participate in the RHCP at these standard mitigation ratios.

Under certain circumstances, Hays County may chose to assess impacts for participating projects at a different mitigation ratio, based on the presence of existing impacts or if the affected habitat is particularly important to the conservation of the covered species. For example, if an area of potential habitat is within 300 feet of an existing county road or residential subdivision (as indicated by the County's habitat determination of the applicant's project area), the County may assess direct and indirect impacts to the affected habitat at 50 percent of the standard mitigation ratios described above. Conversely, if the potential habitat to be affected by the site plan is determined to be of particularly high quality or high importance to the covered species (see Section 7.4.2 for examples of situations that could warrant higher mitigation ratios), then the County may assess mitigation needs at two or three times the standard mitigation ratios described above.

7.4.5 Mitigation Assessments and Determination Letters

Hays County RHCP staff will determine the amount of mitigation needed to authorize incidental take associated with a specific project, based on the results of the on-site habitat determination, the site plan review, and the applied mitigation ratios. Mitigation requirements will be expressed as the number of mitigation credits that the applicant must purchase from the County to participate in the RHCP. When the applicant desires, the County may, at the County's discretion, accept land as mitigation in lieu of purchasing mitigation credits.

The mitigation assessment will apply only to the specific project area and site plan submitted and reviewed during the application process. Any changes to the site plan that would change the extent or location of direct or indirect impacts to habitat will require a new application and mitigation assessment for participation in the RHCP.

The total mitigation assessment for a potential participant to obtain incidental take coverage under the RHCP is the sum of the mitigation credits needed to offset the direct and indirect impacts to potential warbler and vireo habitat, according to the mitigation ratios described above. Mitigation credits will not be required for portions of the project area with no adverse impacts to potential warbler or vireo habitat.

The County will work collaboratively with the USFWS to ensure that mitigation assessments are performed in accordance with the methodology described in this RHCP. The USFWS reserves the right to review and approve all mitigation assessments. The County will provide the mitigation assessment for each individual participant to the USFWS, and the USFWS will notify the County when the assessment is received. Once received by the USFWS, the USFWS will review the mitigation assessment within ten federal working days and notify the County if it has any objections. If the County has not received any objections from the USFWS within ten federal working days after notification of receipt, the County may proceed with the participation process.

The USFWS will review the County's mitigation assessments during a probationary period of five years from the date of issuance of the permit. However, three years after issuance, the USFWS will consult with the County and, if the USFWS is satisfied with the accuracy of the County's mitigation assessments, the Service's review of mitigation assessments may be reduced or eliminated.

The County will issue a Determination Letter to the applicant identifying the amount potential habitat impacted and the number of mitigation credits needed to enroll the project area in the RHCP. Determination Letters will remain valid for a period of three years. The County reserves the right to refuse participation to an applicant, if the County determines that it is necessary to retain credits for its own uses or that such participation would not conform with the goals or provisions of the RHCP, including the creation of a preserve system to protect habitats for the covered species. Hays County will send a copy of all Determination Letters to the USFWS at the time such information is transmitted to the applicant.

7.4.6 Participation Agreements and Certificates of Participation

Applicants who elect to participate in the RHCP will enter into a Participation Agreement with the County. By entering into the Participation Agreement, the applicant agrees to be bound by and comply with the terms of the Agreement and applicable terms of the Permit, and in return, benefits from the authorizations granted by the Permit. Applicants will also be required to comply with all other applicable laws. In each Participation Agreement, the USFWS shall be named as a third-party beneficiary with the right to enforce all terms of the Participation Agreement. Once the applicant has signed the Participation Agreement, the applicant must return it to the appropriate County personnel for the County's signature. The County will submit a copy of the fully-executed Participation Agreement to the USFWS promptly after all signatures have been obtained.

Once all required signatures have been obtained, the County will issue to the applicant, now a "participant," a "Certificate of Participation" and will also return to the participant one fully-executed copy of the Participation Agreement. Hays County will record the issued Certificate of Participation, which will include a specific designation of the land to which the certificate applies, in the Real Property Records of Hays County. A copy of the recorded Certificate of Participation must be posted at the relevant property site during any activities affecting the potential habitat of species addressed in the Certificate of Participation. The Certificate of Participation must be posted from the time vegetation clearing begins until the construction is completed. For residential development, "completed construction" means that all roads and utilities are completed to the extent they meet all applicable legal or other requirements and have obtained all requisite approval (governmental or otherwise). For commercial, industrial, and multi-family developments, "completed construction" means that buildings are suitable for occupancy.

So long as the Permit remains in effect and a participant is in compliance with its Participation Agreement, that participant shall be deemed to have (with respect to the property covered by the Participation Agreement) the full rights, benefits, and authorizations of the Permit. The USFWS agrees that a breach by a participant of its obligations under a Participation Agreement will not be considered a violation by the County or any other participant of this Permit. In the event a participant has materially breached its Participation Agreement and, after reasonable notice by the County and opportunity to cure, such participant fails to cure, remedy, rectify, or adequately mitigate the effects of such breach, then the County or the USFWS may terminate that participant's Participation Agreement.

Certificates of Participation are not transferable, except to subsequent owners of the property to which the certificates apply.

The County will provide to the USFWS for its review and approval the general forms of Participation Agreements and Certificates of Participation that the County will use in its participation process.

7.4.7 Forms of Mitigation

7.4.7.1 Mitigation Fees

Mitigation fees provide the necessary mitigation for an applicant to obtain incidental take coverage from the RHCP and will be based on the results of the completed mitigation assessment. The mitigation assessment (as communicated to the applicant in the form of a Determination Letter) will identify the number of mitigation credits required to mitigate for incidental take on a project area. The price of a mitigation credit will be determined by Hays County and will be set at a level that balances the need to generate revenue for the acquisition and management of lands within the RHCP preserve system and to implement other parts of the conservation program with encouraging vigorous participation in the RHCP.

The fee for purchase of a mitigation credit under the RHCP will be determined at the discretion of Hays County. (For the purposes of illustrating the funding plan in Section 8.0, the fee per credit is assumed to start at \$7,500.) As described in Section 8.1, Hays County may periodically review and adjust this fee, as needed to implement the RHCP. Fee adjustments may be made at any time during the term of the Permit at the discretion of the County.

The RHCP contemplates periodic changes to the participation fees set forth herein, as well as minor changes to the County's budget to satisfy the requirements of the ESA, its implementing regulations, the Permit, and the RHCP. The RHCP has been developed and approved in accordance with all provisions of Chapter 83 of the Texas Parks and Wildlife Code. State law (Texas Parks and Wildlife Code § 83.019(a)) requires that a public hearing be held before a plan participant adopts any "regional habitat conservation plan, plan amendment, ordinance, budget, fee schedule, rule, regulation, or order..." Since the RHCP contemplates periodic fee and budget changes and will be approved pursuant to this requirement, future

periodic changes to participation fees does not require additional public notice and hearing under state law. The County's right to periodically adjust participation fees and modify its budget with respect to the RHCP was set forth with specificity in the RHCP, and the RHCP was adopted after the requisite public hearing. Therefore, additional notice and hearing pursuant to Texas Parks and Wildlife Code Section 83.019(a) is not required.

7.4.7.2 On-site Mitigation Land in Lieu of Fees

RHCP participants may elect to set aside and preserve potential habitat for the covered species within a project area. On-site land contributions that meet the minimum required criteria for RHCP preserves described in Section 6.3.1 (or that are adjacent to existing preserves, such that the total size of the preserve block meets the minimum criteria) may be accepted by the County in lieu of participation fees. All such transactions will be negotiated on a case-by-case basis and will be supported by appraisals and other analyses acceptable to the County. The acceptance of any land in lieu of mitigation fees must also be approved by the USFWS.

The County may also require the commitment of additional funds, resources, or restrictions during the negotiation of a conservation easement on or fee simple dedication of on-site mitigation land to help compensate for any special management or monitoring considerations associated with the site.

The management and monitoring provisions described for other RHCP preserve lands in Section 6.4 will apply to all accepted on-site mitigation land.

7.4.7.3 Off-site Mitigation Land in Lieu of Fees

A potential plan participant may offer Hays County off-site mitigation land (i.e., lands located outside of the project area) in lieu of the participation fees associated with a proposed project. Any off-site mitigation land must be located within the Plan Area. Hays County may accept either a conservation easement on or fee title transfer of the off-site mitigation land, at its discretion.

Acceptance of off-site mitigation land in lieu of participation fees will remain at the sole discretion of Hays County and may involve additional requirements. All such transactions will be negotiated on a case-by-case basis and will be supported by appraisals and other analyses acceptable to the County. The acceptance of any land in lieu of mitigation fees must also be approved by the USFWS.

The management and monitoring provisions described for other RHCP preserve lands in Section 6.4 will apply to all accepted off-site mitigation land.

7.5 Evaluation Species Research Program

As a voluntary measure to help develop new information about the rare, sensitive, or little-known karst species in Hays County, the County will solicit proposals to fund research or

studies on one or more of the karst evaluation species addressed in the RHCP or their habitats. The County will commit to provide \$25,000 per year (in 2009 dollars) for the first ten years of the RHCP to fund such research, as described in Section 6.6. The purpose of the funding is to develop information that the County may use to help evaluate whether and/or how to address such species in the RHCP should one or more become federally listed in the future.

Hays County will develop a process for soliciting and evaluating annual requests for proposals on karst evaluation species and habitats in Hays County during the first year of the RHCP. The proposals will be evaluated with respect to the research priorities described in Section 6.6, and the County will confer with the USFWS on selecting specific research projects chosen for funding through the RHCP.

7.6 Compliance Monitoring and Reporting

Hays County will submit an annual report to the local and regional offices of the USFWS by December 1 of each year to document progress towards achieving the goals and objectives of the RHCP and demonstrate compliance with the terms and conditions of the Permit.

The report will cover the period of October 1 through September 31, which coincides with the County's fiscal year. The due date will provide ample time to collect, review, and summarize data related to RHCP administration and preserve management and monitoring. The report will be prepared by Hays County RHCP staff, with the assistance of those entities with management and monitoring responsibilities under the RHCP.

Specifically, annual reports will include:

- A summary of current participation in the RHCP, including the number of participants and a list of properties and acreages covered for incidental take;
- A summary of the lands and habitat included in the RHCP preserve system, including total acres and acres of habitat protected and managed within County-owned preserves, managing partner preserves, and RHCP conservation easements;
- A summary of the number of mitigation credits generated by RHCP preserve system acquisitions and debited through sale to RHCP participants or used by Hays County (i.e., the conservation bank ledger);
- A summary of the financial status of the RHCP, including administrative and management costs and revenues generated for the RHCP;
- A summary of management activities conducted on RHCP preserve lands for covered species;
- The results of biological monitoring activities conducted on RHCP preserve lands, including all reports documenting surveys of the covered species and their habitats;

- A summary of the status of community education and outreach programs and voluntary conservation measures for the evaluation and additional species, including the results of any research conducted through the RHCP;
- Recommended modifications to the conservation program or preserve management plans via the adaptive management process;
- Any compliance-related issues and actions involving individual participants of the RHCP; and
- Other pertinent information or recommendations, as appropriate.

The USFWS will review the annual reports and determine whether Hays County is in compliance with the terms of the RHCP, the Permit, and other applicable agreements. The USFWS may request additional information from Hays County to determine if the County is in compliance with the terms and conditions of the Permit.

7.7 Permit Amendment Process

Amendments to the RHCP and/or the Permit may be necessary during the term of the Permit. These amendments may include relatively minor changes to the RHCP and/or Permit, or major changes that substantially alter the covered activities, mitigation provided by the conservation program, or other substantive aspects of RHCP implementation. Amendments to the RHCP and Permit will be made in accordance with applicable law and regulations.

Minor amendments are defined as those that have little or no impact on the amount of incidental take authorized by the Permit, the degree of negative impacts to the covered species from covered activities, or the biological effectiveness of the conservation program. Minor amendments may include, but are not limited to:

- Administrative changes addressing the implementation of the RHCP, such as staff duties, participation procedures, fee structures, reporting requirements, and oversight;
- Minor modifications to management or monitoring methods; and
- Similarly minor alterations to the RHCP and/or incidental take permit that could arise from changed or unforeseen circumstances, adaptive management provisions, or other circumstances.

Minor amendments may be incorporated into the RHCP and/or incidental take permit administratively provided that both the County and the USFWS agree on the proposed changes, the proposed amendments are documented in written form, and the proposed amendments do not significantly change the net effect of the covered activities on the species or the amount of incidental take requested by the original plan and incidental take permit.

Major amendments are those that would substantially alter the scope of the RHCP. Major amendments are likely to change the amount of take or impacts authorized by the incidental take permit, and/or have a significant impact on the structure, implementation, or effectiveness of the conservation program. Incorporating major amendments may require completion of a formal amendment procedure similar to the original permit application process. This procedure may include public review through the Federal Register, additional analysis to comply with NEPA requirements, and an internal USFWS ESA Section 7 consultation (USFWS and NMFS 1996).

8.0 FUNDING PLAN

Both the ESA and state law require that a habitat conservation plan indicate the funding that will be available to implement the plan. Under the ESA, the USFWS must find, among other things, that "the applicant will ensure that adequate funding for the plan will be provided." This requirement is, of course, most important in circumstances in which species impacts may precede implementation of the offsetting mitigation actions. In this RHCP, however, no impacts to covered species will be authorized unless mitigation credits already exist as created through the acquisition of RHCP preserves. In other words, by virtue of the RHCP's structure, funding and actual acquisition of preserves will in all events precede any impacts to covered species mitigated by those preserves. There is by definition, therefore, no likelihood that an authorized impact might go unmitigated if funding does not materialize. In these circumstances, the burden to demonstrate the availability of specific funding is lessened.

For this RHCP, Hays County will demonstrate that sufficient funding is available to acquire a preserve system under the phased conservation bank approach, provide for the perpetual management and monitoring of the preserve system, and supply the necessary staff, equipment, and materials to administer the RHCP. This funding plan is an illustration of the resources that would be needed to implement the RHCP as anticipated based on a variety of assumptions described in the sections below.

Under the phased conservation bank approach, the County may not use or extend more take authorization at any given time than can be offset by the number of mitigation credits created via preserve acquisitions. As described in Section 5.2, Hays County anticipates that there will be a need over the term of the Permit to provide approximately 9,000 warbler mitigation credits and approximately 1,300 vireo mitigation credits for use by the County or RHCP participants. This level of need is based on projections of the total amount of habitat loss anticipated over the term of the Permit and estimated levels of participation in the RHCP.

Given the fragmented nature of the potential warbler habitat in Hays County (i.e., most large tracts include a mosaic of habitat and non-habitat), approximately 10,000 to 15,000 acres of preserve land may be needed to protect enough habitat for the County to meet the anticipated need for mitigation credits under the RHCP. For the purposes of illustrating the potential costs to implement the RHCP, the target number of preserve acres modeled in the funding plan assumes that an additional 20 percent more land will be needed to protect a sufficient number of credit-generating potential habitat acres (i.e., 9,000 acres of warbler habitat plus 1,300 acres of vireo habitat). Therefore, this funding plan is based on a preserve size of 12,000 acres (i.e., approximately 20 percent greater than 10,300 acres).

This section demonstrates the availability of reliable and well accepted sources of funding. Hays County will fund or otherwise provide for the RHCP conservation program using three types of resources: 1) participation fees charged to RHCP participants; 2) County tax

revenues; and 3) conservation investments from the County or other sources. The funding plan assumes that participation fees will be a primary source of recurring annual funding for the RHCP, until the County reaches the limit of its incidental take authorization. County tax revenues will supplement participation fees as needed to implement the RHCP during the life of the Permit and will be a stable source of funding in perpetuity. County conservation investments are expected to provide initial RHCP preserve acres.

While the County contemplates using innovative agreements with willing landowners to reduce preserve acquisition costs, as well as seeking other state, federal, and non-governmental organization grants, these potential sources are considered somewhat more speculative and difficult to quantify and therefore have not been used in the illustrative funding models. Moreover, the mix and scale of the available sources depicted in the funding model is not intended to bind the County to a particular allocation of these sources, but to demonstrate that the sources are available and, in a variety of combinations, provide a reliable basis for financing of the RHCP.

Hays County will annually review the funding plan to ensure that adequate funding and program resources are provided to meet obligations under the Permit and establish a budget for other aspects of RHCP implementation. As such, the County may periodically take steps to adjust funding plan components including, but not limited to, increasing or decreasing the annual level of County tax revenues applied to the RHCP, increasing or decreasing the purchase price of a mitigation credit, suspending or otherwise restricting the use or sale of mitigation credits, and utilizing debt instruments to fund preserve acquisitions.

8.1 Cost Estimates

Estimated annual RHCP implementation costs, based on a preserve size of 12,000 acres and other assumptions described throughout Section 8.0, are illustrated in Appendix F. The following sections describe the key components and assumptions of the estimated implementation costs.

8.1.1 Land Acquisition

As described above, the funding plan is based on the assumption that the County will acquire 12,000 acres of preserve land during the term of the Permit in order to create enough mitigation credits to meet the expected need for incidental take authorization through the RHCP. It is anticipated that the RHCP preserve system will be composed of preserve parcels acquired in fee simple directly by the County and through the acquisition of conservation easements on private lands. The funding plan assumes that 25 percent of the land in the RHCP preserve system will be acquired in fee simple and the remaining 75 percent of the preserve system will be acquired as conservation easements. This assumed distribution of fee simple purchases and conservation easement acquisitions matches interest in the community for the use

of conservation easements as a way to partner with current landowners in preserving the county's natural resources and as a means of controlling land acquisition and maintenance costs.

Land acquisition costs used in the funding plan are based on recent sales of large, agricultural tracts in Hays County and assumptions regarding the relative costs of acquiring preserves via fee simple land transactions or by acquiring conservation easements.

The price per acre for land suitable for inclusion in the RHCP preserve system was estimated from a review of sales information for large tracts of undeveloped land across Hays County during 2007 and 2008. Based on this review, the estimated 2009 fee simple purchase price for potential RHCP preserve land is \$11,500 per acre (not including anticipated real estate transition costs).

The funding plan assumes that the per acre cost to acquire preserve lands through the purchase of conservation easements will be 50 percent of the fee simple per acre price (i.e., approximately \$5,750 per acre in 2009, not including anticipated real estate transition costs).

Real estate transactions, such as the purchase of fee simple preserve lands or conservation easements, often include costs associated with land appraisals, land surveys, environmental reviews, attorney fees, recordation fees, trash removal, and initial security measures. The funding plan assumes that these transaction costs will total approximately 3 percent of the fee simple per acre land price (i.e., approximately \$345 per acre in 2009). Therefore, the total acquisition cost for fee simple preserve acquisitions in 2009 is estimated to be \$11,845 per acre and the total acquisition cost for conservation easement acquisitions in 2009 is estimated to be \$6,095 per acre. For the purposes of estimating costs over the 30-year term of the Permit, land prices in the funding plan are inflated annually by 3 percent.

Cumulative preserve acquisition expenses for the RHCP are estimated at approximately \$147.5 million over 31 years (the funding plan assumes that approximately 664 acres will be acquired prior to Permit issuance). Appendix F provides annual land acquisition estimates.

8.1.2 Staffing and Plan Administration

Hays County anticipates that additional County staff will be necessary to administer the RHCP conservation program, including a program manager, biologists, preserve rangers, and maintenance personnel. The County may also opt to contract with non-County professionals to provide the necessary staffing to implement the RHCP, either in addition to or in place of hiring County staff. However, for the purposes of this funding plan, the County assumes that it will hire the necessary staff to implement the RHCP.

The funding plan assumes that one to two biologist-level staff and one maintenance-level staff will be necessary to perform the tasks needed to administer the RHCP and manage the preserve system during the early years of the preserve management program. The biologist-level staff positions will be responsible for initially setting up the RHCP program, in addition to the

other necessary administrative and biological tasks. It is assumed that County RHCP staff will complete most of the RHCP preserve management and monitoring tasks described in Section 6.4, including species and habitat surveys, baseline preserve evaluations, and land management planning. As additional preserve lands are acquired over the term of the Permit, additional biologists, maintenance personnel, and preserve rangers may be needed to adequately manage and monitor the preserve lands.

Staffing costs include salaries and benefits in accordance with County policy and hiring standards. For the purpose of the funding plan, staffing costs are inflated annually by 3 percent.

Other administrative costs addressed in the funding plan include costs associated with providing office space, equipment (such as computers and software), and materials for the RHCP staff. Annual administrative costs are also inflated annually by 3 percent.

Cumulative staffing and administrative costs are estimated to be approximately \$22.8 million over 30 years. Annual estimates for staffing and administrative costs are provided in Appendix F.

8.1.3 Preserve Management

Most of the labor associated with the management of the preserve system will be performed by RHCP staff, including species surveys and habitat monitoring, baseline preserve evaluations, and land management plans. However, the County may contract or use volunteers for the implementation of some services. Table 8-1 provides estimates of the staff time that may be needed to implement the major management and monitoring tasks scheduled in Section 6.4.6.

Table 8-1 Estimated Annual Effort for Major Monitoring and Management Planning Activities for the RHCP Preserve System.¹

Task	Estimated Annual Effort Per 500 Acres
Species Territory Mapping Surveys	200 hours
Habitat Occupancy Surveys	200 hours
Habitat Characterization Studies	200 hours
Baseline Preserve Evaluations	Initial evaluation: 100 hours / Updates: 40 hours
Land Management Planning	Initial plan: 100 hours / Updates: 40 hours

¹Estimates include field time, data management/analysis, and reporting.

Specific preserve management practices that are likely to require assistance for labor and/or equipment may include fencing and signage installation, trash removal, road maintenance, vireo habitat restoration, brown-headed cowbird trapping, deer removal, feral hog removal, and fire ant treatment. Each of these items is addressed in the illustrative funding plan and the estimated budget for each is dependent on the size of the preserve system.

Other costs associated with preserve management and monitoring include the purchase of field equipment and vehicles for RHCP staff.

The estimated budget for each of the preserve management items was based primarily on the recent experience of the Balcones Canyonlands Preserve managers in Travis County.

The funding plan does not address preserve management costs associated with authorized public access to County-owned preserve parcels. If such access is allowed within the preserve system, Hays County will provide the funds necessary to adequately address such costs.

Preserve management costs, as illustrated in Appendix F and not including labor provided by RHCP staff, total approximately \$11.0 million over 30 years.

8.1.4 Education and Outreach

Funding for presentation materials, program flyers and postage is included in the program costs. Education and outreach costs begin in the second year of the program and are budgeted at \$2,500 per year. These costs increase to \$5,000 and \$7,500 in Years 10 and 20 of RHCP implementation, respectively. These costs are also adjusted for inflation by 3 percent annually.

Over the term of the Permit, costs associated with public education and outreach programs are estimated to be approximately \$274,000, as shown in Appendix F.

8.1.5 Research for Evaluation Species

The RHCP conservation program includes a voluntary research program to be focused on the evaluation species of concern (see Section 6.6 and Section 7.5). The research program is proposed for funding at \$25,000 per year for the first ten years of the Plan (adjusted for inflation by increasing costs annually by 3 percent). The total contribution to research for evaluation species is approximately \$287,000 over the first ten years of the Permit.

8.1.6 Contingency Funds

Hays County will budget for miscellaneous contingencies associated with the implementation of the RHCP. The annual contingency budget is \$7,500 in 2008 dollars for the first ten years of the RHCP and escalated by \$5,000 for each subsequent ten year period. The contingency is also adjusted for inflation by 3 percent annually. The County may use the contingency funds to address special or unanticipated needs related to the administration of the RHCP program or the management of the preserve system.

8.1.7 Combined Budget for RHCP Implementation

Cumulative implementation costs for the RHCP, including land acquisitions, staffing and administration, preserve management, education and outreach, research, and contingency costs, are approximately \$182.6 million over the 30-year Permit term. This total cost includes

approximately \$5 million contributed prior to Permit issuance to purchase approximately 664 acres of preserve land. Estimated implementation costs for each ten year period of the Permit, given the assumptions described above, are included in Table 8-2. Appendix F provides detailed implementation cost estimates over the life of the Permit.

Table 8-2. Estimated RHCP Implementation Costs by Decade.

Category	Years 0 - 10 ¹	Years 11 - 20	Years 21 - 30	Entire Plan Duration
Preserve Land Acquisition	\$34,140,622	\$48,297,796	\$65,014,734	\$147,453,152
Staffing and Administration	\$1,906,760	\$6,226,876	\$14,638,290	\$22,771,926
Preserve Management	\$1,135,157	\$3,137,643	\$6,703,102	\$10,975,902
Education, Outreach, and Research	\$314,358	\$81,730	\$164,778	\$560,866
Contingency	\$121,621	\$245,172	\$439,316	\$806,109
Total Implementation Costs	\$37,618,518	\$57,989,217	\$86,960,220	\$182,567,955

¹ Includes conservation investments for preserve acquisitions prior to Permit issuance.

8.2 Revenue Sources

Estimated annual RHCP revenues are shown in Appendix F. The following sections describe the key components and assumptions of the anticipated RHCP funding sources.

8.2.1 Application Fees

As described in Section 7.4.1, Hays County may assess an application fee to potential RHCP participants seeking a habitat determination and/or mitigation assessment for the covered species. The amount of this fee is estimated to range from approximately \$500 to \$5,000 per application, depending on the size of the property, the complexity of the project, and the services requested. Since the amount of the application fee is not fixed and the specific number of applicants is unknown, revenues created from application fees are estimated at \$30 per mitigation credit sold for the purposes of this funding plan. Under this assumption, application fees generate approximately \$502,000 over the term of the Permit. Annual estimates of application fee revenue are provided in Appendix F.

8.2.2 Mitigation Fees

Hays County anticipates selling or using 9,000 warbler mitigation credits and 1,300 vireo credits over the 30 years of the Permit. The County anticipates using some portion of these credits for its own projects. To estimate the revenue generated by the sale of mitigation credits, the funding plan assumes that the County will use five percent of the available credits and will sell the remaining 95 percent of the mitigation credits to RHCP participants.

For purposes of forecasting revenues generated by mitigation fees, the price for each mitigation credit is set at \$7,500 for the initial five years of the Permit and increased by \$1,000 every five years over the balance of the term of the Permit. The funding plan does not adjust these fees for annual inflation. Over the term of the Permit, mitigation fees may generate approximately \$97.9 million for the RHCP.

8.2.3 County Budget Contributions

Hays County will allocate revenues from the County's general maintenance and operations (M&O) fund to support the implementation of the RHCP. On an annual basis, the County's budget contribution will be used to fill gaps between revenues generated from application and mitigation fees (see above) and RHCP implementation costs. Appendix G shows the estimated annual tax base growth, projected M&O fund revenues, and the County's anticipated annual RHCP budget contributions through the life of the Permit.

To help assure affordability by the County, the amount of the annual budget contribution is set not to exceed approximately 10 percent of the cumulative growth in the M&O fund resulting from the taxable value of new development in the County during the life of the Permit. Projections of tax revenue generated by new development are calculated from the projected value of all new commercial or residential structures and projected increases in land values for newly developed properties in the County (see Appendix G, based on an analysis by TXP for the RHCP).

The amount of annual County budget contributions is modeled in the funding plan, based on the assumptions described in this section. However, the actual amount of the allocation will vary from this funding model during implementation according to actual participation in the RHCP, preserve size, and staffing levels at any given time. As such, Hays County will need to adjust the RHCP budget annually, including the size of its budget contribution, as the RHCP is implemented to ensure that adequate funding is provided.

As illustrated in Appendix F and Appendix G, the amount of County general M&O funds that may be needed to implement the RHCP is estimated to be approximately \$79.2 million over 30 years.

The County will continue to budget funds from its general M&O revenues after Permit expiration to ensure that the RHCP preserve system is managed and monitored in perpetuity in accordance with the terms of the Permit and the goals and objectives of the RHCP.

8.2.4 Conservation Investments

Hays County has already invested heavily in parks and open space conservation. On July 8, 2008 the Hays County Commissioners' Court voted to set aside \$13 million in bond funds from the May 2006 Parks and Open Space bond program of for the acquisition of property with "recharge land, habitat for endangered species, open space and access to major waterways."

Specific properties to be acquired with the bond funds that will contain RHCP mitigation value have not been identified, but the RHCP funding plan assumes that the County will dedicate at least \$5 million of the remaining bond to the acquisition of RHCP preserve lands. Under the assumptions described in Section 8.1.1 regarding land acquisitions, \$5 million would acquire approximately 664 acres. The purchase of land using the 2006 bond funds is anticipated before initiation of the RHCP.

8.2.5 Combined RHCP Revenues

RHCP revenues have been estimated for each year of the RHCP following issuance of the Permit. Estimated total revenues for the term of the Permit are approximately \$182.6 million. Estimated revenues for each ten year period of RHCP implementation are included in Table 8-3. Appendix E provides detailed annual revenue estimates for the life of the Permit.

Table 8-3. Estimated RHCP Revenues (Funding Sources) by Decade.

Category	Years 0 - 10 ¹	Years 11 - 20	Years 21 - 30	Entire Plan Duration
Application Fees	\$125,195	\$159,838	\$216,810	\$501,843
Mitigation Fees	\$26,068,000	\$32,585,000	\$39,220,750	\$97,873,750
County General M&O Fund Contributions	\$6,423,411	\$25,244,379	\$47,522,660	\$79,190,450
County Conservation Investments	\$5,001,912	\$0	\$0	\$5,001,912
Total Revenues	\$37,618,518	\$57,989,217	\$86,960,220	\$182,567,955

¹ Includes conservation investments for preserve acquisitions prior to Permit issuance.

8.3 Comparison of Costs and Revenues

Estimated expenditures and revenues for each ten year period of the RHCP are summarized in Table 8-2 and Table 8-3 and detailed annual budget estimates are included in Appendix F. Based on the assumptions stated throughout Section 8.0, the funding plan illustrates that sufficient funds are available to cover anticipated RHCP implementation costs over the term of the Permit.

9.0 NO SURPRISES POLICY

An important incentive to encourage participation in the RHCP is the assurance provided by the USFWS regulation known as the “No Surprises” rule (63 FR 8859, codified at 50 CFR §§ 17.22, 17.32, 222.2). Under the No Surprises Rule, the USFWS 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, even if unforeseen circumstances arise after the permit is issued indicating that additional mitigation is needed.

The No Surprises Rule recognizes that the permittee and the USFWS can reasonably anticipate and plan for some changes in circumstances affecting a species or geographic area covered by a habitat conservation plan (e.g., the listing of additional species as threatened or endangered or a natural catastrophic event in areas prone to such events). 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.

This section describes the changed circumstances anticipated by and provided for in the RHCP and explains the USFWS’s assurances to Hays County with respect to any unforeseen circumstances.

9.1 Changed Circumstances

As defined in the No Surprises rule (63 FR 8859), changed circumstances are defined 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...”

A habitat conservation plan must identify provisions to help compensate for any negative impacts to covered species from changed circumstances to qualify for No Surprises assurances. If circumstances change, the permittee must implement any provisions included in the habitat conservation plan and/or incidental take permit that address such circumstances.

Hays County and the USFWS recognize that many changes in human conditions and attitudes, development pressures, environmental conditions, and scientific understanding of ecological systems, among other things, could and will occur over the 30-year Hays County RHCP planning horizon and duration of the incidental take permit. To address this situation, the RHCP contains a procedure by which the USFWS and the County will deal with reasonably anticipated changes in circumstances affecting the species covered by the RHCP.

Changed circumstances that can reasonably be anticipated by Hays County and the USFWS and that can be planned for are:

1. The levels of funding currently anticipated to adequately cover preserve operation and management costs become inadequate to meet future needs;
2. Protected habitat for covered species within the RHCP preserve system is temporarily lost or substantially degraded due to catastrophic events;
3. Protected habitat for covered species within the RHCP preserve system is lost or substantially degraded and is unable to regenerate, due to global climate change;
4. One or more of the covered species become delisted and no longer have the protection of the Endangered Species Act; and
5. One or more of the covered species becomes extinct.

The following sections describe how Hays County will address each of the changed circumstances listed above, if they occur during the life of the Permit.

9.1.1 Inadequate Funding for Preserve Management

The anticipated costs to Hays County for operating and managing the RHCP preserve system are estimated in Section 8.0. The financial models used to develop the Plan incorporated the best available data to estimate anticipated costs and available funding. The funding plan described in Section 8.0 is adequate for meeting Hays County's obligations to fully implement the RHCP and comply with the terms and conditions of the Permit.

However, in the event that circumstances change with respect to anticipated costs or available revenue, Hays County will implement one or more of the following procedures as needed to ensure that the mitigation value of the preserve system is protected:

1. Use funds budgeted for voluntary conservation actions under the RHCP, as feasible given any encumbrances for the use of these funds, for the implementation of essential preserve management activities;
2. Reduce or suspend funding for non-essential aspects of the RHCP conservation program, such as outreach and education programs, and use funds for the implementation of essential activities;
3. Negotiate alternative preserve management, monitoring, or reporting requirements with the USFWS to reduce the cost of RHCP implementation;

Hays County will notify the USFWS if changes in funding levels occur that substantially affect the implementation of the RHCP and management of the preserve system. The County will coordinate with the USFWS to implement one or more of the procedures described above to ensure protect the mitigation value of the preserve system.

9.1.2 Protected Habitat is Temporarily Lost or Degraded due to Catastrophic Events

Catastrophic events such as wild fires, tornadoes, floods, outbreaks of tree diseases (e.g., oak wilt), prolonged periods of severe drought, and similar events could temporarily remove or degrade potential habitat for the covered species within the RHCP preserve system. Many of these events are a normal part of the central Texas ecosystem and may be reasonably foreseen.

In response to catastrophic events, Hays County will act to minimize damage to potential habitat for the covered species, to the extent practicable. The County will notify the USFWS of loss or damage to habitat within the preserve system within 30 days if more than 100 acres of potential habitat for the warbler or ten acres of potential habitat for the vireo is affected. Hays County will update the baseline assessment and land management plan for an affected preserve block(s) within one year of a catastrophic event that affects more than 100 acres of warbler habitat or ten acres of vireo habitat. The updates to the management plan will focus management activities on regenerating suitable habitat in an amount equal to or in excess of the amount of habitat that was lost or substantially degraded by the catastrophic event.

9.1.3 Protected Habitat is Permanently Lost or Degraded due to Global Climate Change

The RHCP preserve system will permanently protect large areas of potential habitat for the golden-cheeked warbler and black-capped vireo. It is possible that large scale changes to vegetation communities or species distributions due to global climate change could cause the permanent loss of habitat for the covered species within the RHCP preserve system and Hays County. Unlike habitat lost due to reasonably foreseeable catastrophic events, it is possible that global climate change could irreparably change the vegetative conditions of the RHCP preserve system and prevent the regeneration of suitable habitat for the covered species.

Global climate change has the potential to alter the regional distribution of plant and animal communities by large-scale changes in average temperature, levels and frequency of precipitation, groundwater regimes, and fire regimes. Climate change could cause areas currently containing suitable habitat for the covered species to increase or decrease in extent and quality. Climate change could also cause areas not currently considered to be suitable habitat for the covered species, including areas currently outside of the known ranges of the species, to become suitable habitat and the species could adapt to use such habitat.

There is currently insufficient knowledge upon which to base a projection of the potential for the RHCP preserve system to increase or decrease in value to the covered species over the next 30 years as a result of climate change. Nor is there sufficient knowledge at present upon which to design alternative or additional mitigation measures that would compensate for any adverse effects of climate change on the preserves.

Accordingly, if global climate change causes the RHCP preserve system to increase or decrease significantly in relative value with regard to continued survival of one or more of the

covered species, Hays County will consult with the USFWS to determine whether any changes in preserve management practices are appropriate to respond to the effects of climate change. However, any changes to the preserve system or management program agreed to be appropriate for addressing the impacts of climate change will not require the acquisition or management of additional preserve lands.

To the extent that knowledge about the effects of climate change on the covered species is gained over the life of the Hays County RHCP from information collected as part of the RHCP's management program or through research endorsed by the USFWS, Hays County will seek advice from the USFWS about the implications of such knowledge. Hays County will also take such knowledge into account when revising management plans and evaluating subsequent preserve acquisitions.

9.1.4 Covered Species Become Delisted

The goal of the ESA is to conserve endangered and threatened species to ensure their long-term survival in the wild. At that point species are "recovered," and protection of the ESA is no longer necessary. To delist species, the USFWS is required to determine that threats have been eliminated or controlled, based on several factors including population sizes and trends and the stability of habitat quality and quantity. For delistings that result from recovery, the ESA requires the USFWS to monitor the species for at least five years in order to assess their ability to sustain themselves without the protective measures of the ESA. Conservation programs like the RHCP may contribute to the recovery of one or more of the covered species.

If one or more of the covered species becomes delisted due to recovery, Hays County may discuss with the USFWS any potential changes or amendments to the RHCP or Permit conditions that may be appropriate under this changed circumstance.

9.1.5 Covered Species Become Extinct

Despite the presence of conservation programs like the Hays County RHCP, one or more of the covered species could become extinct due to a variety of factors across their ranges, including conditions at wintering grounds.

If one or more of the covered species becomes extinct in the wild, Hays County and the USFWS may negotiate an amendment to the Permit and RHCP to remove the conservation obligations with respect to the extinct species.

9.1.6 Changed Circumstances Not Provided for in the Plan

If additional conservation or mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the RHCP, the USFWS will not require any conservation or mitigation measures in addition to those provided for in the Plan without the consent of the County, provided that the RHCP is being properly implemented.

9.2 Unforeseen Circumstances

“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 County in writing of any unforeseen circumstances the USFWS believes to exist.

No Surprises assurances apply to the species that are “adequately covered” under this RHCP. Species are considered to be “adequately covered” if the RHCP satisfied the permit issuance criteria contained in ESA section 10(a)(2)(B) with respect to that species. The species currently considered adequately covered under this RHCP, and thus benefited by the No Surprises policy, are the golden-cheeked warbler and black-capped vireo.

The No Surprises rule states that 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, and only to those permittees who are in full compliance with the terms of their plan, incidental take permit, and other supporting documents.

In the event of an unforeseen circumstance, the USFWS shall provide at least 30 days written notice of a proposed finding of unforeseen circumstances to Hays County and will work with the County to develop an appropriate response to the new conditions. The County shall have the opportunity to submit information to rebut the proposed finding, if it deems necessary. The USFWS may request that the County alter the conservation program to address the unforeseen circumstance, provided that the requested alterations are limited to the conservation program and maintain the original terms of the RHCP to the maximum extent possible. Pursuant to the No Surprises policy, the USFWS may not require the dedication of additional resources, including land, water, funding, or restrictions on the use of resources otherwise available for development or use by RHCP participants.

10.0 ALTERNATIVES CONSIDERED

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.”

The alternatives considered in the RHCP include a “No Action” alternative that is required for analysis under the National Environmental Policy Act (NEPA). The No Action alternative reflects the status quo, where Hays County does not have a local, comprehensive solution for ESA compliance.

The three other alternatives considered by Hays County are based on a regional habitat conservation plan framework and have several common elements, including:

- The Plan Area will include all of Hays County;
- The plan duration and Permit term will be 30 years from the date of approval;
- The species covered for incidental take include the golden-cheeked warbler and black-capped vireo;
- The area of potential habitat loss for the covered species in Hays County over the term of the Permit would be approximately 22,000 acres for the warbler and 3,300 acres for the vireo;
- The preserve system would be assembled with a mix of fee simple acquisitions and conservation easements;
- Mitigation credit would be generated based on the amount of potential habitat for covered species on a preserve parcel at a rate of one credit for each acre of potential habitat;
- The typical criteria for a preserve block includes a minimum size of 500 acres;
- Perpetual monitoring and management of preserves;
- Voluntary participation in the plan that is open to all project proponents whose projects could impact warbler and/or vireo habitat within Hays County; and
- Mitigation for project participants would be assessed based on the amount of potential habitat impacted by a project and paid as a per acre fee or, in certain circumstances, as land in lieu of fees. The USFWS reserves the right to review and approve all mitigation assessments.

The ability of each alternative to help resolve the anticipated conflicts between the needs of a growing population and sensitive environmental features provide the basis for evaluating the

alternatives. The alternatives are also compared according to their ability to contribute towards the goals and objectives described in Section 6.1.

10.1 No Action Alternative

The “No Action” alternative is the scenario whereby Hays County would not undertake the development of a regional habitat conservation plan nor seek an incidental take permit with a long-term, county-wide scope. This alternative also functions as the “no take” alternative pursuant to the HCP Handbook.

Under this alternative, Hays County would continue to be responsible for compliance with the ESA during the planning and construction of County-sponsored projects. Such projects could include the construction or widening of county roads, the upgrading of low water crossings or bridges, and the construction of new county facilities. Compliance with the ESA under the No Action alternative would occur on a project-by-project basis. The County would not provide assistance to other entities seeking to comply with the ESA, nor would the County be involved in efforts to consolidate mitigation from different permitting actions across the county.

For each Hays County project that could affect endangered species, the County would be responsible for identifying potential habitat on the project area and conducting species surveys to estimate potential impacts. The County would need to coordinate directly with the USFWS to determine mitigation needs and obtain incidental take authorization for each project. The County would also need to identify and obtain appropriate conservation land or other forms of mitigation for each project where mitigation for incidental take was required.

Since mitigation would be assessed on a project-by-project basis, it is likely that mitigation requirements for these individual projects would be higher than under a more coordinated conservation approach. Nevertheless, the resulting mitigation lands would likely be small and scattered across the County, since each mitigation commitment would be tailored to the needs of a single, specific project. It is possible that mitigation for County projects could also be obtained outside of the County.

Compliance with the ESA on an individual project-by-project basis would likely extend schedule and cost of important public infrastructure projects and delay project completion. The County could also have more difficulty finding and obtaining appropriate mitigation for individual projects.

Management and monitoring of relatively small and isolated preserves could also be more difficult and costly under the No Action alternative. Smaller preserves would be more subject to the negative impacts of adjacent land uses, since more of the preserve land would be located near a preserve edge. More intensive management and monitoring could be needed to maintain the mitigation value of these smaller preserves.

Due to the limited conservation value of a system of relatively small and isolated preserves, it is likely that public access to the preserves would not be allowed.

Under the No Action alternative, Hays County would have no involvement with or responsibility for the actions of non-county entities with respect to ESA compliance. Hays County would not dedicate staff or funds to assisting the public with compliance and would have no obligation to provide mitigation for incidental take caused by entities other than the County. Like Hays County, other project proponents in the county would be responsible for determining whether compliance with the ESA is necessary for a particular project and individually negotiating with the USFWS to obtain authorization for incidental take. Individual compliance with the ESA through a Section 7 consultation or a Section 10 incidental take permit is often a time consuming and costly process.

Currently, public knowledge of ESA requirements and the enforcement presence by the USFWS in Hays County is generally low. It is likely that many land development projects in recent years have proceeded without complying with the ESA (only one habitat conservation plan has been approved in Hays County for the golden-cheeked warbler since the species has been listed). The No Action alternative does not include a public education and outreach component by the County to increase awareness of endangered species issues, provide information on how to minimize impacts to covered species, or streamline ESA compliance for other entities. Therefore, the No Action alternative is likely to result in the continued loss and fragmentation of endangered species habitat in Hays County without appropriate mitigation.

10.2 Moderate Preserve System with a Take Limit

One of the regional alternatives considered by Hays County features the acquisition of a modestly sized preserve system of approximately 3,000 acres and limiting the amount of incidental take authorized by the permit. This alternative illustrates a conservation program that could be relatively easy for the County to afford, but might not satisfy the anticipated need for incidental take authorization over the duration of the permit.

Under the Moderate Preserve/Limited Take alternative, Hays County would identify specific criteria for the location, configuration, habitat composition, and acquisition schedule of the 3,000-acre preserve system. The preserve system would be designed and managed to maximize the conservation value of the protected lands. Since maximizing the mitigation value of the preserve lands would be the primary goal of this conservation program, it is likely that public access to the preserves would not be allowed. Hays County would commit to acquiring a preserve system that met the all of the preserve design criteria described in the habitat conservation plan.

In return for the commitment to acquire a well-designed and managed preserve system that met the identified criteria, Hays County would be authorized to incidentally take a limited area of warbler or vireo habitat outside of the target acquisition area. Since the preserve system

would be acquired under a specific set of criteria designed to maximize its conservation value, the amount of incidental take authorized by the permit could be slightly greater than a one-to-one mitigation ratio. Assuming that the USFWS agreed to such a mitigation ratio, the amount of habitat loss for the covered species that could be authorized under this alternative could be as much as approximately 3,600 acres. Increasing the amount of incidental take authorized under the Moderate Preserve/Limited Take alternative would require a major amendment of the incidental take permit.

The conservation program described in this alternative includes a pre-determined preserve system that identifies properties for possible acquisition that are not already owned by the County. Implementing the Moderate Preserve/Limited Take alternative would trigger several provisions of Texas state law related to the development of regional habitat conservation plans by local governments. Under state law, the County must acquire the targeted properties within four years of permit issuance.

Given the rapid pace of population growth in Hays County, it is possible that the County and/or voluntary plan participants could use the 3,600 acres of permitted incidental take before the end of the Permit term. Loss of potential habitat for the covered species in Hays County during the Permit term is projected to reach approximately 22,000 acres for the warbler and approximately 3,300 acres for the vireo. Assuming the participation rates described in Section 5.2, the plan would need to provide approximately 10,300 acres of incidental take authorization to meet the expected need. The 3,600 acres of incidental take authorization allowed under the Moderate Preserve/Limited Take alternative would only be sufficient to cover approximately 35 percent of the expected 30-year need.

10.3 Preferred Alternative: Phased Conservation Bank with a Moderate Preserve Goal (the Hays County RHCP)

The Hays County RHCP incorporates the County's preferred conservation strategy of establishing a conservation bank that would be assembled on a phased basis with a target acquisition goal over the 30-year term of the Permit. Under this alternative, the County would seek incidental take authorization for the covered species that would be sufficient to cover the anticipated need based on estimates of private and public sector land development activities, the amount of potential habitat impacted by those activities, and the level of anticipated participation in the RHCP by project proponents in those sectors (see Section 5.2).

The County would assemble a preserve system on a phased basis, banking mitigation credits as parcels are acquired. The preserve acquisitions would generate mitigation credits based on the number of acres of potential habitat in the preserve. The credits could be used by the County or sold to plan participants. However, the County would not be able to use more take authorization at any given time than it has mitigation credits banked from actual preserve acquisitions. The County has identified a target goal for acquiring between 10,000 and 15,000

acres by the end of the Permit term. A preserve system of this size should contain sufficient acres of habitat for the covered species to generate at least 9,000 acres of warbler mitigation credits and 1,300 acres of vireo mitigation credits at a typical ratio of one credit created for each acre of potential habitat protected in the preserve. The number of mitigation credits created by acquisition of the preserve system should also be sufficient to meet the anticipated need for incidental take authorization for the County and potential RHCP participants over the term of the Permit (see Section 5.2).

Public access to preserves could be allowed where the activity would not appreciably reduce the conservation value of the preserve.

The proposed RHCP utilizing a Phased Bank/Moderate Goal approach would include provisions for public education and outreach regarding endangered species issues and provide information to help the community avoid impacts to sensitive natural resources. The RHCP would also provide some resources, when practicable, for activities specifically designed to benefit other species addressed in the RHCP.

10.4 Large-Scale Preserve System

The Large-Scale Preserve System alternative would create a regional plan administered by Hays County with a conservation program utilizing a pre-determined preserve approach. Under this alternative, the preserve system would be large enough to authorize the incidental take of all remaining warbler or vireo habitat in Hays County outside of the target acquisition area of the preserve system.

Under the Large-Scale Preserve System alternative, Hays County would identify specific criteria for the location, configuration, habitat composition, and acquisition schedule of the preserve system. The preserve system would be designed and managed to maximize the conservation value of the protected lands. Since maximizing the mitigation value of the preserve lands would be the primary goal of this conservation program, it is likely that only very limited public access to the preserves would be allowed. Hays County would commit to acquiring a preserve system that met the all of the criteria described in the habitat conservation plan.

In return for the commitment to acquire a large-scale, well-designed, and appropriately managed preserve system that met the identified criteria, Hays County would be authorized to incidentally take all of the remaining areas of warbler or vireo habitat outside of the target acquisition area. Since the preserve system would be acquired under a specific set of criteria designed to maximize its conservation value, the amount of incidental take authorized by the permit could be greater than a one-to-one mitigation ratio.

Under this alternative, Hays County would assemble a pre-determined preserve system of 30,000 acres. The County would be able to permit incidental take associated with the loss or

degradation of the remaining approximately 143,000 acres of potential warbler habitat and approximately 20,000 acres of potential vireo habitat in Hays County.

The conservation program described in this alternative includes a pre-determined preserve system that identifies properties for possible acquisition that are not already owned by the County. Implementing the Large-Scale Preserve alternative would trigger several provisions of Texas state law related to the development of regional habitat conservation plans by local governments. Under state law, the County must acquire the targeted properties within four years of permit issuance.

10.5 Comparison of Alternatives

The primary characteristics of the four alternatives described above are summarized in Table 10-1.

Table 10-1. Comparison of the Alternatives Considered.

Alternative	Incidental Take Authorized*	Preserve Size	Conservation Strategy
No Action	n/a	n/a	No Regional HCP -- Project-by-project Negotiation and Permitting through USFWS
Moderate Preserve/Limited Take	3,600 acres	3,000 acres	Regional HCP with a Pre-determined Preserve System
Proposed Hays County RHCP (Phased Bank/Moderate Goal)	10,300 acres	10,000 to 15,000 acres	Regional HCP with a Phased Conservation Bank
Large-Scale Preserve System	163,000 acres	30,000 acres	Regional HCP with a Pre-determined Preserve System

* Take is measured in acres of incidental habitat impact for the covered species.

10.5.1 Meeting the Project Purpose

The purpose of the proposed project is for Hays County to develop a regional habitat conservation plan that would allow the County to streamline ESA compliance for its own projects, to coordinate conservation planning for endangered species, and to extend the program to other entities in Hays County.

The No Action alternative would not result in a regional habitat conservation plan and would neither streamline ESA compliance nor coordinate mitigation efforts. Therefore, the No Action alternative would not satisfy the purpose of the proposed project.

The remaining alternatives would each result in the development of a regional habitat conservation plan that would streamline ESA compliance for County projects. Each of these

alternatives would extend incidental take authorization for the covered species to other entities in Hays County seeking to comply with the ESA. These regional alternatives would allow the County to consolidate mitigation requirements into a coordinated, regional preserve system. Therefore, the three regional habitat conservation plan alternatives would satisfy the purpose of the proposed project.

10.5.2 Meeting the Need for Incidental Take Authorization

Hays County currently has approximately 170,355 acres of potential warbler habitat scattered across the county with varying degrees of quality. Of this potential habitat, approximately 22,000 acres of potential warbler habitat and is projected to be lost or substantially impacted by land development activities over the next 30 years. Similarly, approximately 23,855 acres of potential vireo habitat may occur in Hays County, with approximately 3,300 acres of this habitat projected to be lost or degraded over the next 30 years. Given the assumptions described in Section 5.2, approximately 9,000 acres of incidental take authorization for the warbler and 1,300 acres of take authorization for the vireo may be needed over the term of the Permit.

Under the No Action alternative, Hays County would only seek incidental take authorization on a project-by-project basis for County projects. This approach would satisfy the County's need for incidental take authorization, but would not help meet the need for incidental take authorization for any other projects in Hays County.

The Moderate Preserve/Limited Take alternative would only meet a portion of the anticipated need for incidental take authorization over the 30-year permit duration (i.e., only approximately 35 percent of the anticipated need). It is likely that the plan would utilize all of the incidental take authorization before the end of the permit term, which would suspend any new participation in the plan until a major permit amendment to increase the amount of authorization incidental take (and acquire additional preserve land) could be completed. The Moderate Preserve/Limited Take alternative would not meet the expected 30-year need for incidental take authorization in Hays County without a permit amendment.

The flexibility of the proposed RHCP (i.e., the Phased Bank/Moderate Goal alternative) would allow the County to meet the anticipated need for incidental take authorization over the next 30 years. The phased bank approach would allow the County to acquire preserves as needed to meet the actual demand for mitigation credits over the term of the Permit, but would also include a defined goal to demonstrate commitment to the conservation of the covered species. This alternative would provide sufficient incidental take authorization to operate the plan for 30 years.

The Large-Scale Preserve System alternative would provide incidental take authorization in excess of the projected 30-year need. This alternative would allow the incidental take of all remaining potential habitat for the covered species in Hays County outside of the preserve

system. A permit amendment would allow Hays County to continue to operate the plan beyond the original 30-year permit term, since no additional take or mitigation would need to be provided.

10.5.3 Funding and State Law Constraints

The No Action, Moderate Preserve/Limited Take, and the proposed RHCP alternatives are each practical for Hays County to implement given the current financial status of the County. Each of these alternatives is also consistent with the applicable provisions of Texas state law concerning regional habitat conservation plans.

However, the Large-Scale Preserve System alternative is not a practicable alternative in terms of available funding and state law considerations.

The estimated cost to acquire 30,000 acres of preserve land under the Large Scale Preserve System alternative at the current average cost of undeveloped land in Hays County (i.e., approximately \$11,500 per acre) is approximately \$345 million. Undertaking this level of financial commitment within four years is beyond the means of Hays County.

Acquiring 30,000 acres in four years is very likely beyond Hays County's ability to manage. Acquiring an average of 7,500 acres per year for four years would require resources that are well beyond the County's and any other Central Texas local government's ability to assemble and manage in a timely and affordable basis. This level of sustained real estate activity by a local government entity would be unprecedented in the State of Texas.

Finding owners of 30,000 acres of habitat land that are "willing sellers" in a four year period, even by including conservation easements with private landowners, at an affordable price is highly improbable. The potential for individual landowners to delay or disrupt the acquisition program through reluctance or refusal to sell targeted or key properties creates an unacceptable risk under this alternative.

10.5.4 Conclusions

The No Action Alternative would not satisfy the purpose of the proposed project, which is to develop a regional, locally supported option for ESA compliance that allows for coordinated conservation planning. Therefore, Hays County has rejected this alternative.

The Moderate Preserve/Limited Take alternative is structured as a regional habitat conservation plan, but the scale of this alternative would not meet the anticipated need for incidental take authorization over the permit term. Therefore, Hays County has also rejected this alternative.

The Large-Scale Preserve System alternative would provide the highest level of conservation among the four alternatives. However, funding the acquisition of a 30,000-acre pre-determined preserve system would not be possible given the resources available to Hays

County. Further, Texas state law regarding local governments and regional habitat conservation plans would require that the entire preserve be acquired from willing sellers within four years of permit issuance. It is highly unlikely that Hays County would be able to complete the preserve system within these constraints. Therefore, Hays County has rejected the Large-Scale Preserve System alternative.

The proposed RHCP with a Phased Bank/Moderate Goal conservation approach would meet the purpose of the proposed project, would satisfy the need for incidental take authorization over the 30-year term of the Permit, and would be feasible for Hays County to implement. Therefore, the proposed Hays County RHCP is the County's preferred alternative.

11.0 COMPLIANCE WITH ESA ISSUANCE CRITERIA

Hays County anticipates that the RHCP meets the issuance criteria required by Section 10(a)(2)(A) of the ESA. However, legally, the USFWS must determine whether or not the RHCP meets the issuance criteria.

The RHCP describes the impacts that are likely to result from the expected taking in the county over the Permit term, the steps that Hays County will implement to minimize and mitigate the impacts, the funding available to implement those steps, and alternatives that were considered by Hays County in the formulation of the RHCP.

Before issuing an incidental take permit pursuant to Section 10(a)(1)(B) of the ESA, the USFWS must find that the RHCP meets certain “issuance criteria” described in Section 10(a)(2)(B). Specifically, the USFWS must find that the take of listed species will be incidental to an otherwise lawful activity; that the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking; that adequate funding sources are available and committed to long-term implementation of the plan; and that the taking covered by the permit will not jeopardize the survival and recovery of the species in the wild. The following section summarizes how the RHCP meets the issuance criteria.

11.1 Incidental Nature of the Taking

The RHCP covers the impacts associated with take that will be incidental to otherwise lawful activities, and not the purpose of such activities. Incidental take in the county may be caused by the loss of habitat associated with construction of residential developments, commercial developments, roadways and improvements, utilities and other infrastructure, school construction, and other lawful land uses, as described in Section 5.1.

11.2 Minimization and Mitigation of Impacts

As detailed in Section 6.0, Hays County will, to the maximum extent practicable, minimize and mitigate the impacts of taking the covered species.

11.2.1 Minimization Measures

The RHCP encourages public and private entities engaged in land development or infrastructure projects in the county to avoid or minimize impacts to the covered species.

The RHCP promotes the avoidance or minimization of impacts by providing maps and other guidance on the location of potential habitat for the covered species (Section 6.2.1). The County will publish maps of potential habitat for the covered species (as available), karst geology, and the general locations of known caves and other karst features so that potential RHCP participants and other members of the public will have access to the available information.

The County will also modify its application process for subdivision and development approvals by requiring that applicants provide preliminary information on the possible presence or absence of habitat for the covered species within project sites. The County will use this information to encourage (but not require) participation in the RHCP (Section 6.2.2).

The RHCP also includes provisions for minimizing disturbance to the golden-cheeked warbler and the black-capped vireo during their nesting seasons through seasonal restrictions on clearing activities (Section 6.2.3). Preventing the establishment and/or spread of oak wilt disease is also included in the RHCP, to minimize unintended damage to habitats for the covered species (Section 6.2.4).

The County will prepare and distribute materials for the general public to enhance awareness of endangered species issues in Hays County and promote the conservation of natural resources (Section 6.2.5).

The County will utilize its subdivision development inspectors to monitor for compliance with the terms and conditions of Participation Agreements with RHCP participants, such as adherence to site plans used as the basis for determining participation, seasonal clearing and construction restrictions, and oak wilt precautions.

11.2.2 Mitigation of Impacts to Covered Species

The mitigation measures described in Section 6.3 will offset the impacts of the activities covered by the Permit. The conservation measures described in this section will be beneficial to the covered species, evaluation species, and additional species.

The golden-cheeked warbler and black-capped vireo will benefit from the system of preserves that will be established, managed, and monitored in perpetuity pursuant to Section 6.3. The lands included in the preserves will include suitable breeding habitat protected in patches of sufficient size to minimize impacts associated with adjacent land uses. In addition to the protection of breeding habitat, the covered species will benefit from habitat management and monitoring (Section 6.4) and public awareness programs (Section 6.2.5). These efforts are consistent with recommendations in the birds' recovery plans.

All of the species addressed in the RHCP will benefit from the public education efforts that will occur during the implementation of the RHCP. Over the life of the RHCP, it is anticipated that substantial funding will be invested by the County in education and outreach efforts (lectures, videos, brochures) intended to increase public awareness of the species' habitat requirements and conservation needs.

The mitigation measures contained in the RHCP are the maximum that can practicably be implemented by Hays County. As shown in Section 8.0, the County is committing substantial financial resources to implement the RHCP. This commitment is the maximum amount economically and politically feasible for the County.

11.3 Adequacy of Funding

Hays County will ensure that adequate funding for the RHCP and procedures to deal with changed and unforeseen circumstances are implemented. The expected costs and revenue sources for the RHCP over the 30-year period of the Permit are detailed in Section 8.0. The proposed funding sources are reliable and will enable the County to meet the purposes of the RHCP.

11.4 Survival and Recovery of the Species

Section 7(a)(2) of the ESA requires that each federal agency must consult with the USFWS to ensure that agency actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat (16 USC § 1536(a)(2)).

As discussed in Section 5.3, it is the applicant's view that the incidental take authorized by the Permit will not reduce the likelihood of survival and recovery of the covered species in the wild. Rather, implementation of this Hays County RHCP will provide a net benefit to the covered species by preserving larger blocks of contiguous habitat than would be provided by individual permit authorizations that will be managed specifically for those species in perpetuity, and by supporting objectives in the species' recovery plans, including preserve acquisition, preserve management, scientific research, and public awareness.

With respect to the other listed species in Hays County that are not covered for incidental take by the RHCP (i.e., Texas wild rice, Comal Springs riffle beetle, Comal Springs dryopid beetle, fountain darter, San Marcos salamander, Texas blind salamander, and possibly the undescribed northern Hays County Eurycea salamander), it is the applicant's view that issuance of the Permit and issuance of the RHCP will not jeopardize these species or result in the destruction or adverse modification of critical habitat.

The RHCP and Permit authorize incidental take of the warbler and vireo primarily through the clearing of potential habitat for these species that would be associated with a variety of land development activities; it does not authorize the land development itself. This RHCP and permit will not authorize incidental take of species not covered by the permit.

Even assuming that land development is interrelated to the authorized take, it is the applicant's view that the cumulative effects of this interrelated land development in Hays County would likely be negligible when compared to the extent of the Edwards Aquifer recharge and contributing zones. The RHCP assumes that approximately 48,100 acres of land development may occur in Hays County during the 30-year term of the Permit. This area represents less than two percent of the total area of the Edwards Aquifer recharge and contributing zones and any effects would be distributed over 30 years.

It is the applicant's view that additional factors are likely to limit any cumulative impact of potentially interrelated land development on the listed aquatic species in Hays County. Land development activities in Hays County are already subject to a baseline set of water quality protection measures (primarily the Edwards Aquifer Rules), administered by the TCEQ. As described in Appendix D, local water quality ordinances may also apply to land development within city jurisdictions. The RHCP promotes the avoidance and minimization of impacts to listed aquatic species in Hays County through education and outreach efforts and by the protection of large blocks of undeveloped land in the RHCP preserve system. The RHCP encourages the use of the TCEQ optional enhanced measures for water quality protection (which are designed to avoid take of listed aquatic species due to water quality impacts associated with land development) and will distribute these measures to subdivision and development applicants. Other emerging conservation efforts for listed aquatic species include the Edwards Aquifer Recovery Implementation Program, the Barton Springs-Edwards Aquifer Conservation District Habitat Conservation Plan, and the San Marcos River Habitat Conservation Plan.

12.0 COMPLIANCE WITH TEXAS STATE LAW

As described in Section 1.4.2, Texas state law establishes certain requirements related to the development of regional habitat conservation plans by governmental entities, including counties. The requirements are codified as Subchapter B, Chapter 83 of the Texas Parks and Wildlife Code. The law imposes procedural requirements, such as the requirement to establish a Citizens Advisory Committee, appoint a Biological Advisory Team, comply with open records and open meetings laws, comply with public hearing requirements, provide a grievance process to Citizens Advisory Committee members, and acquire pre-determined preserves by specific deadlines.

The RHCP has been formulated in compliance with all of the procedural requirements regarding regional habitat conservation plans. A Citizens Advisory Committee with 17 members (including the requisite number of landowner members) was established in June 2007. A Biological Advisory Team with seven members was established by September 2007. Both committees have held numerous meetings and have discussed the scientific, economic, and policy issues associated with the RHCP. The committees reviewed multiple drafts of the RHCP and provided comments on the drafts. All meetings of the committees have been conducted in compliance with open records and open meeting laws.

Under Chapter 83, governmental entities participating in a RHCP are prohibited from taking any of the actions cited below. Hays County will continue to comply with state law, including but not limited to the following provisions:

1. Imposing any sort of regulation related to endangered species, unless the regulation is necessary to implement an RHCP for which the governmental entity was issued a federal permit (Texas Parks and Wildlife Code § 83.014(a)).
2. Discriminating against a permit application, permit approval, or request for utility service to land that has been designated a habitat preserve for an RHCP (§ 83.014(b)).
3. Limiting water or wastewater service to land that has been designated as habitat preserve (§ 83.014(c)).
4. Requiring a landowner to pay a mitigation fee or set aside, lease, or convey land as habitat preserve as a condition to the issuance of a permit, approval, or service (§ 83.014(d)).

In addition, Chapter 83 stipulates that the mitigation in a regional habitat conservation plan must be based on the amount of harm to each endangered species the plan will protect. However, after notice and hearing, a regional habitat conservation plan may include additional conservation measures if they are based on the USFWS recovery criteria for the species covered by the plan. In this case, the preserve system for golden-cheeked warblers and black-capped

vireos established by the conservation bank will constitute mitigation for the loss of potential habitat that the County will experience over the 30-year term of the Permit. Mitigation will be based on the results of an on-site habitat determination, a review of specific site plans for each participating project, and defined mitigation ratios, as described in Section 7. 4.

Chapter 83 stipulates that governmental entities participating in an RHCP must demonstrate that adequate sources of funding exist to acquire land designated for habitat preserves within four years. In the RHCP, no parcel of land has been designated as a proposed habitat preserve; therefore, the RHCP need not demonstrate that adequate sources of funding exist to acquire any specific parcel within a specific time frame.

Finally, Chapter 83 mandates that a plan proponent must hold a public hearing and publish notice of the hearing in the newspaper prior to adopting a regional habitat conservation plan. In this case, the County held a public hearing on November 18, 2009 after publishing a notice of hearing on the RHCP website (www.hayscountyhcp.com) and in the following printed publications:

- San Marcos Daily Record (October 16, 2009);
- Austin American Statesman (October 19, 2009);
- Hays Free Press (October 21, 2009); and
- Federal Register (Vol. 74, No. 210, Page 56655; November 2, 2009).

13.0 GLOSSARY OF TERMS AND ABBREVIATIONS

Adequately covered - Species are considered to be “adequately covered” by a habitat conservation plan if the plan meets all of the incidental take permit issuance criteria contained in ESA Section 10(a)(2)(B) with respect to that species. The species currently considered adequately covered under the Hays County RHCP are the golden-cheeked warbler and black-capped vireo.

BCV – Abbreviation for the “black-capped vireo,” which is one of the covered species in the RHCP.

Biological Advisory Team (“BAT”) – A committee of scientific and resource management experts assembled to assist with the development of the RHCP, in accordance with the requirements of Texas Parks and Wildlife Code Chapter 83.

CAD – Abbreviation for “Computer Aided Design,” which is computer software typically used by engineers to design development and other land-based projects.

CAPCOG – Abbreviation for “Capital Area Council of Governments.”

Certificate of Participation – Document issued by Hays County to a RHCP participant upon execution of a Participation Agreement and payment of mitigation fees. Hays County will record the issued Certificate of Participation, which will include a specific designation of the land to which the certificate applies, in the Real Property Records of Hays County. A copy of the recorded Certificate of Participation must be posted at the relevant property site during any activities affecting the potential habitat of species addressed in the Certificate of Participation.

Changed circumstances – Changed circumstances are defined in federal regulations 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...”

Citizens Advisory Committee (“CAC”) – A committee of community stakeholders, including landowner representatives, assembled to assist with the development of the RHCP, in accordance with the requirements of Texas Parks and Wildlife Code Chapter 83.

Covered species – Species included in the RHCP for which incidental take authorization under the ESA is sought.

Critical habitat – Specific geographic areas, whether occupied by a listed species or not, that are essential for its conservation and that have been formally designated by rule published in the Federal Register.

Determination Letter – A letter issued to a RHCP applicant by Hays County that identifies the applicant’s cost of participation in the RHCP.

Endangered Species Act (“ESA”) – The Endangered Species Act of 1973, as amended, is federal legislation intended to provide a means to conserve the ecosystems upon which

endangered and threatened species depend and provide programs for the conservation of those species, thus preventing extinction of plants and animals.

Environmental Impact Statement (“EIS”) – A document that describes and evaluates the environmental impacts of a proposed action under the National Environmental Policy Act (“NEPA”).

GCW – Abbreviation for the “golden-cheeked warbler,” which is the primary covered species in the RHCP.

GIS – Abbreviation for “Geographic Information System,” which is computer software that processes geographic data and is commonly used to map and analyze landscape features.

Habitat conservation plan (“HCP”) – A document prepared to support an application to the USFWS for an incidental take permit under Section 10(a)1(B) of the Endangered species Act. A habitat conservation plan must describe the impacts to the species, the steps to minimize and mitigate such impacts, the alternatives considered, and other measures required by the USFWS.

Habitat determination – Habitat determinations are prepared by Hays County for potential RHCP participants and document the location and extent of potential habitat within a project area, as delineated from the review of background information and the on-site assessment. The habitat determination will also include a calculation of the acreage of potential habitat on a project area.

Harm – An action defined by the ESA as an “act that 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.” Harm of federally endangered wildlife is prohibited by Section 9 of the ESA.

HCAD – Abbreviation for “Hays Central Appraisal District.”

Incidental take – Take that results from, but is not the purpose of, carrying out an otherwise lawful activity.

Incidental take permit (“Permit”) – A permit issued by the USFWS to a non-federal entity that authorizes incidental take of a federally endangered or threatened species under Section 10(a)1(B) of the ESA. “Permit” in this document refers to the incidental take permit associated with the RHCP.

Issuance criteria – Before issuing an incidental take permit, the USFWS must find that a habitat conservation plan meets certain “issuance criteria” described in Section 10(a)(2)(B). The USFWS must find that the take of listed species will be incidental to an otherwise lawful activity; that the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking; that adequate funding sources are available and committed to long-term implementation of the plan; and that the taking covered by the permit will not jeopardize the survival and recovery of the species in the wild.

Jeopardy – An action defined by the ESA as an action that would reasonably be expected, directly or indirectly, to appreciably reduce the likelihood of the survival and recovery of the species.

M&O funds – Abbreviation for “Maintenance and Operations Funds.”

Mitigation – Actions that compensate for adverse impacts to a resource.

Mitigation assessment – The amount of mitigation needed to authorize incidental take associated with a specific project under the RHCP, based on the results of an on-site habitat determination and a site plan review. Mitigation assessments are prepared by Hays County for RHCP applicants.

MoRAP – Abbreviation for “Missouri Resource Assessment Partnership.”

MSA – Abbreviation for “Metropolitan Statistical Area.”

National Environmental Policy Act (“NEPA”) – The National Environmental Policy Act requires federal agencies to undertake an assessment of the environmental effects of their proposed actions prior to making decisions. Two major purposes of the environmental review process are better informed decisions and citizen involvement.

NLCD – Abbreviation for “National Land Cover Dataset.”

NMFS – Abbreviation for the “National Marine Fisheries Service.”

No Surprises Rule – Assurances provided by the USFWS that provide certainty as to a permittee’s future obligations under a habitat conservation plan. 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, even if unforeseen circumstances arise after the permit is issued indicating that additional mitigation is needed.

Participation Agreement – An agreement between the County and a RHCP applicant whereby the applicant agrees to be bound by and comply with the applicable terms of the Permit, and in return, benefits from the authorizations granted by the Permit. In each Participation Agreement, the USFWS shall be named as a third-party beneficiary with the right to enforce all terms of the Participation Agreement.

Plan Area – The area of operation for the Hays County RHCP. The Plan Area includes the extent of Hays County, Texas.

RHCP – Abbreviation for the “Hays County Regional Habitat Conservation Plan.” The RHCP supports an application by Hays County for an ESA Section 10(a)1(B) incidental take permit from the USFWS.

RHCP participants – Any non-federal entity, including private citizens, businesses, organizations, or state or local governments or agencies, that voluntarily obtains incidental take authorization for the golden-cheeked warbler and/or black-capped vireo through the Hays County RHCP.

Take – An action defined by the ESA meaning to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct with respect to a

federally listed species. Take may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Take of federally endangered wildlife is prohibited by Section 9 of the ESA.

Tax Increment Allocation (“TIA”) –

TNRIS – Abbreviation for “Texas Natural Resources Information Service.”

TPWD – Abbreviation for the “Texas Parks and Wildlife Department.”

Unforeseen circumstances – 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.

USEPA – Abbreviation for “U. S. Environmental Protection Agency.”

USFWS – Abbreviation for the “U.S. Fish and Wildlife Service.”

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