

Appendix A:
Lake Pointe Incidental Take Permit No: PRT-782186 issued February 15, 1994

SOUTHWEST TRAVIS COUNTY, LTD. PRT-782186

- F. The authorization granted by this permit is subject to full and complete compliance with, and implementation of, the terms and conditions of the Habitat Conservation Plan, associated Implementing Agreement, and all specific conditions contained in this permit.
- G. The permittee is required to coordinate research, monitoring and reporting program to gather biological data on the development and mitigation sites. Two copies of annual reports which include the results of all surveys, studies, and control activities, density determinations, vegetation analysis, and territorial mapping shall be reported to the Regional Director, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, and one copy of the annual report will be provided to the State Supervisor, Ecological Services Field Office, 611 East 6th Street, Suite 407, Austin, Texas 78701. In addition, written survey reports, summarizing the activity for each year for which a survey is required will be provided to the Ecological Services Field Office, 611 East 6th Street, Suite 407, Austin, Texas 78701, by October 1 of each year. The report is to include a map of the golden-cheeked warbler territories or sightings, as well as location of residences or buildings that have been constructed.
- H. The permittee hereby agrees that lands to mitigate the loss of golden-cheeked warblers by managed by the West Travis County Municipal Utility District No. 3, or other public entity approved by the U.S. Fish and Wildlife Service.
- I. Upon locating a dead, injured, or sick golden-cheeked warbler, or any other endangered or threatened species, permittee is required to contact the U.S. Fish and Wildlife Service's Law Enforcement Office, San Antonio, Texas, at (210) 681-8419, for care and disposition instructions. Extreme care should be taken in handling sick or injured individuals to ensure effective and proper treatment. Care should also be taken in handling dead specimens to preserve biological materials in the best possible state for analysis of cause of death. In conjunction with the care of sick or injured endangered/threatened species, or preservation of biological materials from a dead animal, the permittee and his employees have the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.
- J. If during the tenure of this permit, the amount or extent of the incidental take is exceeded, all construction and/or other activities related to the incidental take permit must be stopped and the permittee is required to reinstate formal consultation to avoid violation of Section 9, Endangered Species Act.

EXHIBIT B

REAL PROPERTY RECORDS
TRAVIS COUNTY, TEXAS

12207 0526

06/13/2006 TUE 13:42 [TX/RX NO 9014] 003

Page 3 of 3 Pages

SOUTHWEST TRAVIS COUNTY, LTD. PRT-782186

- K. The permittee must provide a \$90,000 escrow account to be used to fund in part or in whole the acquisition of documented occupied nesting/breeding habitat for the golden-cheeked warbler which is located within a targeted preserve area, or is adjacent to an existing golden-cheeked warbler preserve.
- L. The Permit, Environmental Assessment, Habitat Conservation Plan, and Implementing Agreement will be recorded with the County Clerk, Travis County, Texas, prior to the sale of all or any part of the Lake Point Development, and a recorded copy of the permit will be returned to the Regional Director, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, within 60 days of the date of the permit issuance.

EXHIBIT B**REAL PROPERTY RECORDS
TRAVIS COUNTY, TEXAS****12307 0527****06/13/2006 TUE 13:42 [TX/RX NO 9014] 004**

Appendix B:
Lake Pointe IV Incidental Take Permit No: PRT-817371 issued December 18, 1996

DEC-24-86 11:36 FROM BON TERRE

ID:214 978 8526

PAGE 1/4



UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

Exhibit B
The Permit

3-201
(10/86)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

WALTER J. HUMANN
BON TERRE-B, LTD.
1445 ROSS AVENUE, SUITE 5400
DALLAS TX 75202-2785

2. AUTHORITY-STATUTES

16 USC 1539 (a)

REGULATIONS (Attached)

50 CFR 17.22

3. NUMBER

PRT-817371

4. RENEWABLE

YES
 NO

5. MAY COPY

YES
 NO

6. EFFECTIVE

12/18/96

7. EXPIRES

12/18/26

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

9. TYPE OF PERMIT

ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

128 ACRES IN WEST TRAVIS COUNTY

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the "Special Conditions for Marine Mammals and Native Endangered and Threatened Species" (copy attached).

.....CONTINUED.....

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ON REVERSE ALSO APPLY

12. REPORTING REQUIREMENTS

SEE PERMIT FOR REPORTING REQUIREMENTS

ISSUED BY

[Signature]

TITLE

Regional Director - Region 2

DATE

12/18/96

ORIGINAL

SEARCHED INDEXED

12857 0352

Walter J. Humann - Bon Terre-B, Ltd. - PRT - 817371

2

- E. The permittee is authorized to "take" (kill, harm, or harass) the golden-cheeked warbler at Lake Pointe IV, residential development, Austin, Travis County, Texas.
- F. Mitigation for loss of habitat on Lake Pointe IV development includes the establishment of 92.4 acres as a conservation area on-site.
- G. The permittee will transfer fee simple title with the U.S. Fish and Wildlife Service as a third party beneficiary, of the conservation area to the West Travis County Municipal District V and will be added to 145-acre Lake Pointe Preserve.
- H. The permittee will perform monitoring studies of golden-cheeked warbler as follows:
 - 1. Territorial mapping will be conducted the first spring after permit issuance.
 - 2. Presence/absence surveys will be conducted every other year for the life of the permit, or until three years of surveys fail to detect any warblers, or when buildout is complete. Complete buildout is when 95 percent of house development is complete.
 - 3. A final territory mapping will be conducted three years after development is completed. Monitoring surveys will be conducted consistent with U.S. Fish and Wildlife Service guidelines.
- I. New construction on-site will not be initiated during the warbler breeding/nesting period, between March 1 and August 1, within 300 feet of the edge of a documented warbler territory. Building construction may be conducted year round as long as the vegetation clearing activities associated with building are completed outside the warbler breeding season, or when surveys conducted immediately prior to such activities reveal no warbler territories are present within 300 feet of the construction activities.
- J. The authorization granted by the permit is subject to full and complete compliance with, and implementation of, the terms and conditions of the Environmental Assessment/Habitat Conservation Plan (Section 6.1), Biological Opinion, and all special conditions contained in this permit.
- K. Clearing for construction of buildings, streets, and other areas of impervious cover will be minimized to the greatest extent possible. Areas disturbed during construction, but not occupied by buildings or impervious surface, will be replanted with native plant species.

RECEIVED
 12887 0353

3

- L. Clearing and construction within the development areas will be consistent with the current practices recommended by U.S. Forest Service and Texas Forest Service to prevent the spread of oak wilt.
- M. Any change in ownership of the property or management of lands preserved as mitigation will be approved by the U.S. Fish and Wildlife Service.
- N. The permit, appropriate attachments, and deed to the preserve management entity will be recorded with the County Clerk, Travis County, Texas, prior to commencement of development-related activities. A recorded copy of this action will be returned to the U.S. Fish and Wildlife Service within 60 days of permit issuance.
- O. The current "No Surprises" policy of the U.S. Fish and Wildlife Service provides that additional mitigation land or financial compensation shall not be required of the permittee or their successors beyond the level of mitigation provided for the identified EA/HCP. With respect to this permit, the EA/HCP, and supporting documents adequately address the federally listed golden-cheeked warbler. For the permittee or their successors to be fully covered by the "No Surprises" policy, all of the identified requirements in the permit and associated documents must be met.
- P. The permittee will implement the above mitigative measures and will be responsible for providing all necessary funding. Funding will be per agreement between the permittee and managing entity.
- Q. Annual reports identifying the activities conducted under an issued permit will be provided to the Division of Endangered Species/Permits, Ecological Services, P.O. Box 1306, Albuquerque, New Mexico 87103, with a copy provided to the Austin Ecological Services Field Office address. The final report will be due three years after 95 percent buildout.
- R. This permit and each of its conditions shall be binding on and for the benefit of the permittee and their respective successors and assigns. If this permit requires an amendment because of change of ownership, the U.S. Fish and Wildlife Service will process that amendment without the requirement of the applicant preparing any new documents or providing any mitigation over and above that required in the original permit. The construction activities proposed under the original permit would not be interrupted provided the required special conditions of the issued permit are being followed.

BON TERRE LANDS

12867 0354

4

- S. Upon locating a dead, injured, or sick golden-cheeked warbler, or any other endangered or threatened species, permittee is required to contact the U.S. Fish and Wildlife Service's Law Enforcement Office, Austin, Texas, at (512) 490-0948, for care and disposition instruction. Extreme care should be taken in handling sick or injured individuals to ensure effective and proper treatment. Care should also be taken in handling dead specimens to preserve biological materials in the best possible state for analysis of cause of death. In conjunction with the care of sick or injured endangered/threatened species, or preservation of biological materials from a dead specimen, the permittee and his contractor/subcontractor have the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

- T. The mitigation for this issued permit will fully support and accrue full benefits to the Balcones Canyonlands Conservation Plan Permit PRT-788841.

Unofficial Copy

PERMITS SECTION

12867 0355

COVER SHEET

Title for Proposed Action: Issuance of Endangered Species Act Section 10(a)(1)(B) Permit Allowing Incidental Take of the Endangered Golden-cheeked Warbler (*Dendroica chrysoparia*) During Construction and Operation the 128.2-Acre Lake Pointe IV (The Dalton Tract), Southwest Travis County, Texas.

Unit of Fish and Wildlife Service Proposing Action: Regional Director, Region 2, U>S> Fish and Wildlife Service, Albuquerque, NM.

Legal Mandate for Proposed Action: Endangered species Act of 1973, as amended, Section 10(a)(1)(B), as implemented by 50 CFR 17.22 for Endangered Species.

Document Author: Mary Orms, Fish and Wildlife Biologist, Ecological Services, U.S. Fish and Wildlife Service, 10711 Burnet Road, Suite 200, Austin, Texas 78758.

Unofficial Copy

0357
FISH AND WILDLIFE SERVICE
12887 0357

TABLE OF CONTENTS

1.0 Introduction	1
2.0 Purpose and Need for Action	1
3.0 Description of Affected Environment	1
3.1 Vegetation	1
3.2 Wildlife	5
3.3 Listed, Proposed and Other Species of Concern	8
3.3.1 Plants	8
3.3.2 Listed Animal Species	8
3.3.3 Candidate Animal Species	11
3.4 Wetlands	13
3.5 Geology	13
3.5.1 Geology	13
3.5.2 Soils	13
3.6 Air Quality	15
3.7 Water Quality	15
3.8 Adjacent Land Use	16
3.9 Cultural Resources	16
4.0 Alternatives Including the Proposed Action	16
4.1 Alternative 1 - Proposed Action	16
4.2 Alternative 2 - No Action	21
4.3 Alternative 3 - Alternate Site Location	21
4.4 Alternative 4 - Alternate Site Design	21
4.5 Alternative 5 - Regional Permit	21
5.0 Environmental Consequences	22
5.1 Alternative 1 - Proposed Alternative	22
5.1.1 On-site Impacts	22
5.1.1.1 Vegetation	22
5.1.1.2 Wildlife	23
5.1.1.3 Listed, Proposed, and Candidate Species	24
5.1.1.4 Wetlands	24
5.1.1.5 Geology and Soils	24
5.1.1.6 Air Quality	25
5.1.1.7 Water Quality	26
5.1.1.7.1 Surface Water	26
5.1.1.7.2 Ground Water	26
5.1.1.8 Land Use	26
5.1.1.9 Cultural Resources	26

REAL PROPERTY MAPS
12867 0358
12867 0358

5.1.2 Off-site Impacts	27
5.1.2.1 Vegetation	27
5.1.2.2 Wildlife	27
5.1.2.3 Listed, Proposed and Other Species of Concern	27
5.1.2.4 Wetlands	28
5.1.2.5 Geology and Soils	28
5.1.2.6 Air Quality	28
5.1.2.7 Water Quality	28
5.1.2.8 Adjacent Land Use	28
5.1.2.9 Cultural Resources	28
5.2 Alternative 2 - No Action	29
5.3 Alternative 3 - Alternate Site Location	29
5.4 Alternative 4 - Alternate Site Design	29
6.0 Proposed Habitat Conservation Plan	29
6.1 Amendment Procedures	29
6.1.1 Amendments to Plans in the Lake Pointe IV	32
6.1.2 Minor Amendments to HCP	32
6.2 All Other Amendments	33
7.0 Public and Agency Coordination	34
8.0 References	35
Appendix A	37
Appendix B	41

12867 0359 0359

LIST OF FIGURES

FIGURE		PAGE
1	Lake Pointe IV location	2
2	Bird sightings in vicinity	3
3	Project location on city map	4
4	Aerial photograph	6
5	Location of endangered plants	9
6	Warbler survey - 1995	10
7	Warbler map distribution - statewide	12
8	Soil map	14
9	Development map for PRT-782186	17
10	Proposed project	18
11	Preliminary development plan	19

Unofficial Copy

FORMER PROJECT RECORDS

12867 0360

1.0 INTRODUCTION

Bon Terre - B, Ltd. (Applicant) has filed an application under section 10(a)(1)(B) of the Endangered Species Act (Act) to allow the incidental take of the listed endangered golden-cheeked warbler (*Dendroica chrysoparia*) associated with the otherwise lawful residential development on Lake Pointe IV (the Dalton tract) property. This tract comprises approximately 128.2 acres (Figure 1). The golden-cheeked warbler was identified as occurring within Lake Pointe IV property and on adjacent properties (Figure 2). The proposed development is approximately 11.8 miles (from the intersection of 6th Street and Lamar) southwest of Austin, Travis County, Texas. This property is approximately 1.2 miles from the intersection of FM 2244 and Texas 71 intersection. Lake Pointe IV is bound by Lake Pointe I, II, and III (PRT-782186) on the southeast, south, and southwest; the City of Austin Bohls Ranch Preserve on the north; and Lake Pointe Preserve on the northeast.

Lake Pointe IV lies within the Glen Rose limestone hills along the eastern boundary of the Edwards Plateau west of Austin. The proposed development can be reached by driving west on Bee Caves Road (FM 2244) to Sonoma Drive (Figure 3) and access is through the current Lake Pointe I, II, and III (PRT-782186) development infrastructure. Single family homes will be built on 35.8 acres of the upland ridges. The proposed development consists of 128.2 acres. A mitigation plan has been included in the proposed development that will minimize and mitigate the potential impacts to the golden-cheeked warbler to the greatest extent practicable (section 6.0).

2.0 PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to establish the conditions under which the Applicant will meet the requirements for a permit under the Act. The need for the permit is so that otherwise lawful development may proceed.

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 VEGETATION

The Lake Point IV development site is characterized by juniper/oak woodlands, grassland savanna, and canyons. Some of this land was cleared in 1993. The upland woodlands are dominated by Ashe juniper (*Juniperus ashei*), mainly live oak (*Quercus fusiformes*), post oak (*Q. stellata*), a few Texas oaks (*Q. buckleyi*) close to the canyon rims, sugar hackberry (*Celtis laevigata*), netleaf hackberry (*C. reticulata*), and Texas ash (*Fraxinus texensis*).



Figure 1. Lake Pointe IV location. Location of project on USGS Bee Cave quad map.

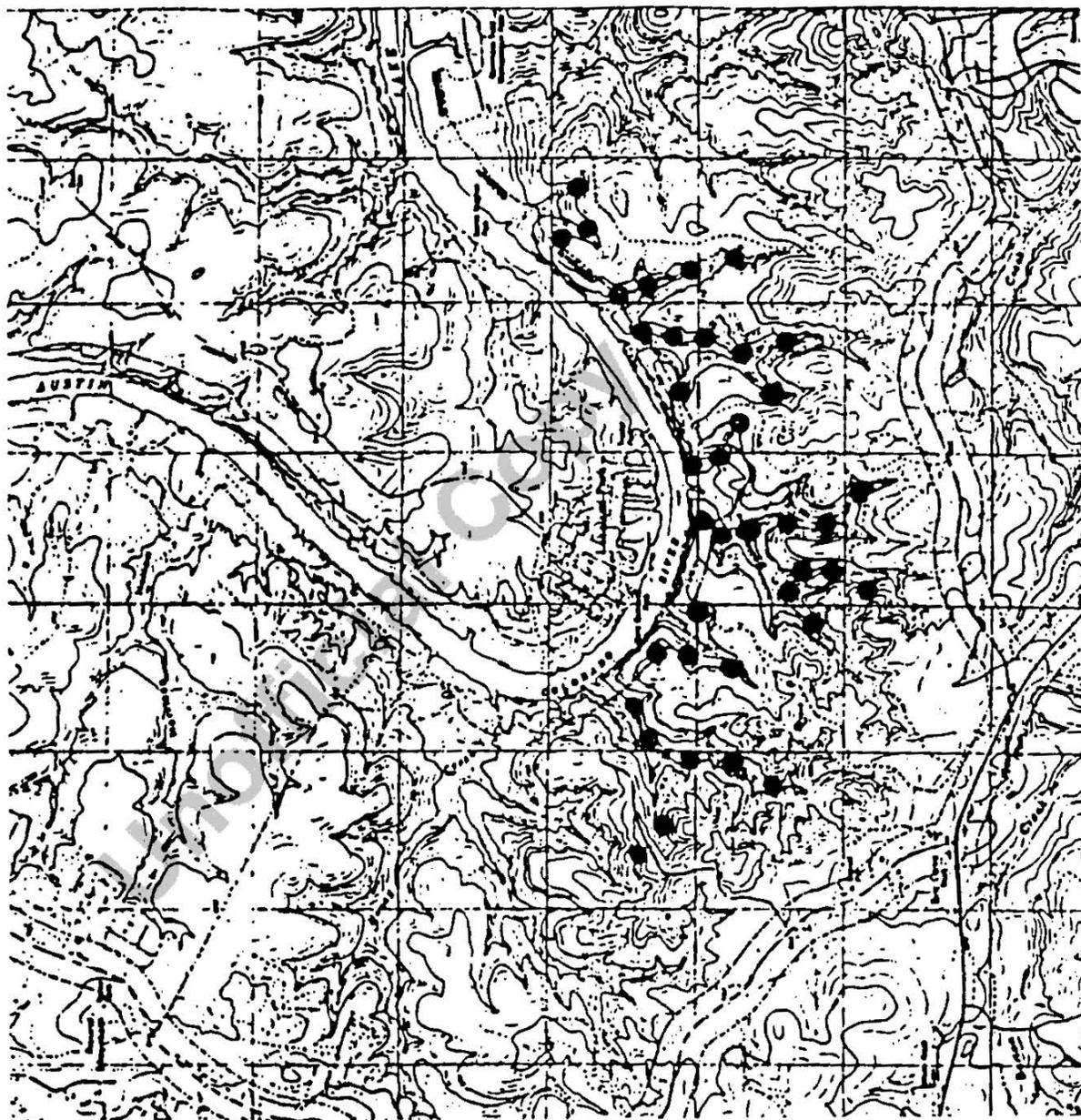


Figure 2. Bird sightings in vicinity of project. Bird sightings on USGS map in the vicinity of Lake Pointe IV.

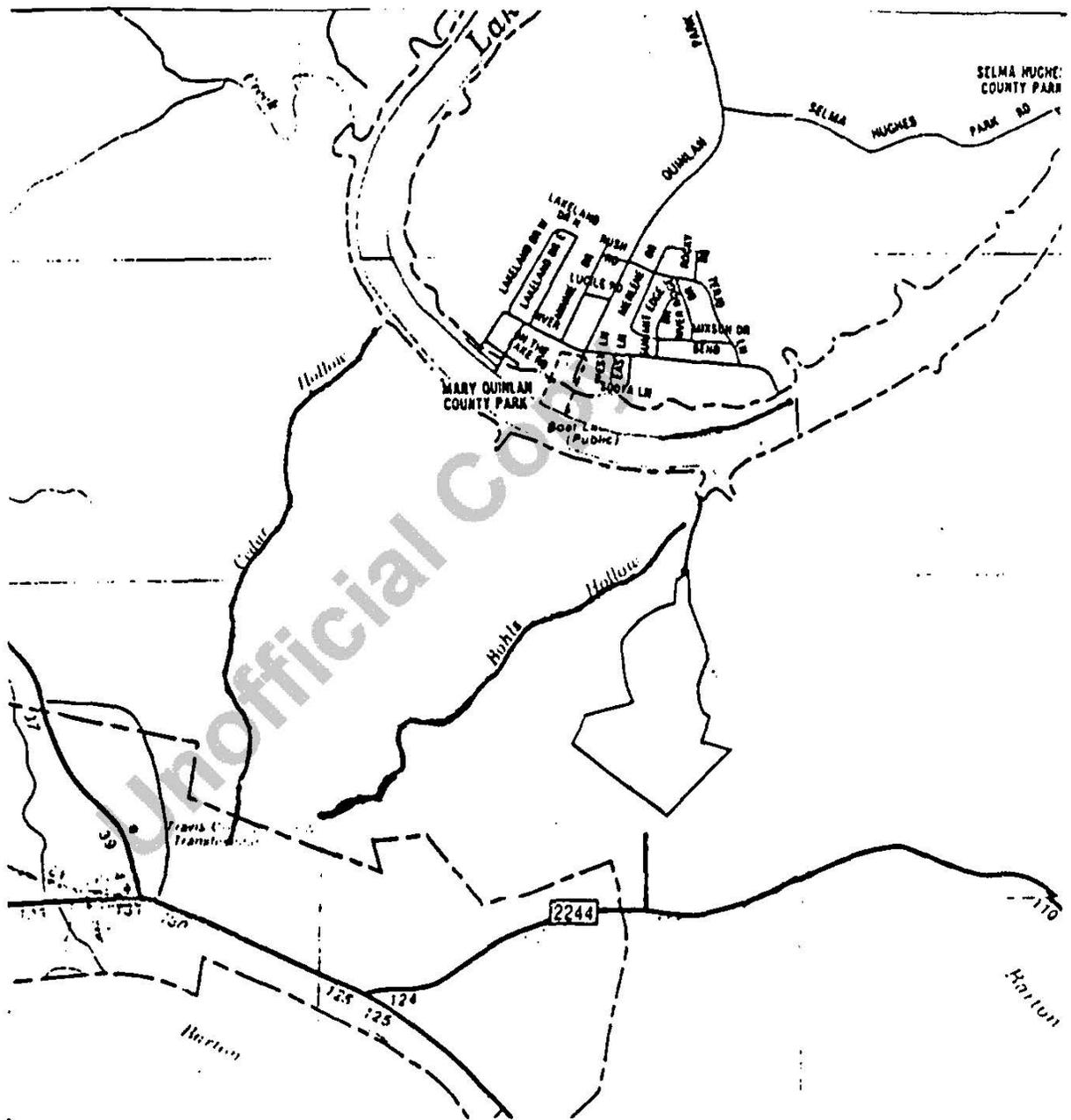


Figure 3. Project location on city map. Lake Pointe IV location on City of Austin street location map.

REAL ESTATE SERVICES

12867 0364

In the more mesic canyons the following tree species are found: Texas oak, American elm (*Ulmus americana*), cedar elm (*U. crassifolia*), black willow (*Salix nigra*), little walnut (*Juglans microcarpa*) escarpment black cherry (*Prunus serotina*), Mexican plum (*P. mexicana*) and a fig tree (*Ficus carica*). The understory consists of red buckeye (*Aesculus pavia*), redbud (*Cercis canadensis*), Texas persimmon (*Diospyros texana*), possumhaw (*Ilex decidua*), yaupon (*I. vomitoria*), flameleaf sumac (*Rhus lanceolata*), and evergreen sumac (*R. virens*).

The shrub layer in both the uplands and canyons consists of the following species: agarita (*Berberia trifoliolata*), sacahuista (*Nolina texana*), kidneywood (*Eysenhardtia texana*), wafer ash (*Ptelea trifoliata*), American beauty berry (*Callicarpa americana*) and elbowbush (*Foresteria pubescens*). Forbs found in the area consist of southern maidenhair (*Adiantum capillus*), falsenettle (*Boehmeria cylindrica*), erect dayflower (*Commelina erecta*), widow's tears (*Commelinantia anomala*), Indian mallow (*Abutilon incanum*), morning-glory (*Ipomea trichocarpa*), milkvine (*Matelea reticulata*), common ragweed (*Ambrosia artemisiifolia*), Texas bull nettle (*Cnidoscolus texana*), long-headed coneflower (*Ratibida columnaris*), tall coneflower (*Rudbeckia grandiflora*), black-eye susan (*R. hirta*), ironweed (*Vernonia baldwinii*), Coreopsis (*Coreopsis tinctoria*), Indian blanket (*Gaillardia pulchella*), evening primrose (*Oenothera serrulata*), and pink evening primrose (*O. speciosa*).

The grasses in the woodlands and grasslands include switchgrass (*Panicum virgatum*), little bluestem (*Schizachyrium scoparium*), seep muhly (*Muhlenbergia reverchonii*), Texas grama (*Bouteloua rigidisetata*), Johnson grass (*Sorghum halapense*), oldfield threeawn (*Aristida oligantha*), and Texas wintergrass (*Stipa leucotricha*). Other plant species found in this area are Texas pricklypear (*Optunia lindheimeri*) trecul yucca (*Yucca treculeana*), and twist-leaf yucca (*Y. rupicola*).

Espey, Huston and Associates (EH&A) conducted an ecological study of the area in 1989. During the 1995-1995 winter and 1996 spring, Central Texas experienced a long-term drought. Many species of plants did not bloom as profusely as in other years. Most of the grassland area was disturbed previously by heavy grazing and clearing, making this area an open savanna (Figure 4).

3.2 WILDLIFE

Wildlife found on the project site is typical of species that can occur within the Balconian biotic province. Amphibians that may occur include the plains leopard frog (*Rana blairii*), probably Rio Grande leopard frog (*R. berlandieri*), possibly southern leopard frog (*R. sphenoccephala*), cliff chirping frog (*Syrrophus marnockii*), Blanchard's cricket frog (*Acris crepitans blanchardi*), Gulf Coast toad (*Bufo valliceps*), Great Plains narrowmouth toad (*Gastrophryne olivacea*), green treefrog (*Hyla cinerea*), and Strecker's chorus frog (*Psuedacris streckeri*).

Reptiles expected in the area are lizards, such as, the green anole (*Anole carolinensis*), six-lined racerunner (*Cnemidophorus sexlineatus sexlineatus*), Texas alligator lizard (*Gerrhonotus liocephalus*), Texas spiny lizard (*Sceloporus olivaceus*), southern prairie lizard (*Sceloporus undulatus consobrinus*), ground skink (*Scincella lateralis*), copperhead (*Agkistrodon contortrix*), western diamondback rattlesnake (*Crotalus atrox*), Texas rat snake (*Elaphe obsoleta lindheimeri*), western coachwhip (*Masticophis flagellum testaceus*), Texas coral snake (*Micrurus fulvius tener*), rough green snake (*Opheodrys aestivus*), bullsnake (*Pituophis catenifer sayi*), eastern blackneck garter snake (*Thamnophis crytopsis ocellatus*), checkered garter snake (*T. marcianus*), and rough earth snake (*Virginia striatula*).

Birds of potential occurrence in the Lake Pointe vicinity comprise a large diverse group, such as, great blue heron (*Ardea herodias*), green-backed heron (*Butorides striatus*), killdeer (*Charadrius vociferus*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), red-tailed Hawk (*Buteo jamaicanensis*), golden-fronted woodpecker (*Melanerpes aurifrons*), ladder-back woodpecker (*Picoides acularis*), mourning dove (*Zenaidura macroura*), chimney swift (*Chaetura pelagica*), black-chinned hummingbird (*Archilochus colubris*), eastern kingbird (*Tyrannus tyrannus*), western kingbird (*T. verticalis*), scissor-tailed flycatcher (*T. forficatus*), eastern phoebe (*Sayonaris phoebe*), purple martin (*Progne subis*), barn swallow (*Hirundo rustica*), blue jay (*Cyanocitta cristata*), scrub jay (*Aphelocoma coerulescens*), American crow (*Corvus brachythynchos*), tufted titmouse (*Parus bicolor*), Carolina chickadee (*P. carolinensis*), Bewick's wren (*T. bewickii*), Carolina wren (*Thryothorus ludovicianus*), blue-gray gnatcatcher (*Poliophtila caerulea*), eastern bluebird (*Sialia sialis*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), northern cardinal (*Cardinalis cardinalis*), indigo bunting (*Passerina cyanea*), painted bunting (*P. ciris*), lark sparrow (*Chondestes grammacus*), rufous-crowned sparrow (*Aimophila carpalis*), and brown-headed cowbird (*Molothrus ater*).

Mammals in development area include Virginia opossum (*Didelphis virginiana*), Mexican free-tailed bat (*Tadarida brasiliensis*), nine-banded armadillo (*Dasypus novemcinctus*), eastern cottontail (*Sylvilagus floridanus*), rock squirrel (*Spermophilus variegatus*), eastern fox squirrel (*Sciurus niger*), Merriam's pocket mouse (*Perognathus merriami*), hispid pocket mouse (*Chaetodipus hispidus*), Texas mouse (*Peromyscus atterwateri*), white-footed mouse (*P. leucopus*), white-ankled mouse (*P. pectoralis*), deer mouse (*P. maniculatus*), fulvous harvest mouse (*Reithrodontomys fulvescens*), northern pygmy mouse (*Biomys taylori*), hispid cotton rat (*Sigmodon hispidus*), eastern woodrat (*Neotoma floridana*), gray fox (*Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and white-tailed deer (*Odocoileus virginianus*).

STATE OF TEXAS
 DEPARTMENT OF WILDLIFE
 12867 0367

3.3 LISTED, PROPOSED AND OTHER SPECIES OF CONCERN

3.3.1 Plants

The Fish and Wildlife Service currently consider 157 plant species of concern. Species of plants have no official status and limited protection by law. In Travis County, four species occur, including the bracted twistflower (*Streptanthus bracteatus*), canyon mockorange (*Philadelphus ernestii*), Texabama croton (*Croton alabamensis* var. *texensis*), and Correll's false dragon-head (*Physostegia correllii*). Espey, Huston & Associates did not find any of the above species during their 1989 study, although some of the species of concern was found in the canyons on the Spillman tract (Figure 5) several miles to the northwest of the proposed development site.

3.3.2 Listed Animal Species

Several endangered karst invertebrates are known from Travis County, including the Tooth Cave spider (*Neoleptoneta myopica*), Tooth Cave pseudoscorpion (*Microcreagris texana*), Bee Creek Cave harvestman (*Texella reddelli*), Bone Cave harvestman (*Texella reyesi*), Tooth Cave ground beetle (*Rhadine persephone*), Coffin Cave mold beetle (*Batrisodes texanus*), and Krestschmarr Cave mold beetle (*Texamaurops reddelli*) (Service, 1993, 1994). These invertebrates are known only from karst features formed in the Edwards and Walnut limestones, comprising the Fredricksburg group (Elliot and Redell, 1989). No caves, sinkholes or significant karst features are known from the Lake Pointe IV property. So far, all karst invertebrates are found north of the Colorado River.

The black-capped vireo (*Vireo atricapillus*), a federally listed endangered species, was found in the vicinity in 1992 by SWCA, Inc., (SWCA) staff members. At the time SWCA classified the vireo as a vagrant. Second year males will wander and use very unlikely habitats (Barrera, personal observation). Espey, Huston & Associates did not find a vireo in their 1989 survey, nor did Environmental Technical Services, Inc., (ETS) during their 1995 survey.

Golden-cheeked warblers, another federally listed endangered species, are found on the property and immediate vicinity. They were found by EH&A, SWCA, and ETS during their respective surveys. Appropriate habitat occurs on both canyons on the property and adjoining property (Figure 6). The golden-cheeked warbler is the only bird that nests exclusively in Texas. Its nesting range includes the eastern one-third of the Edwards Plateau and the southeastern one-quarter of the Cross Timbers and Prairie regions. Golden-cheeked warblers usually nest in mixed deciduous canyons that contain mature

12367 0358

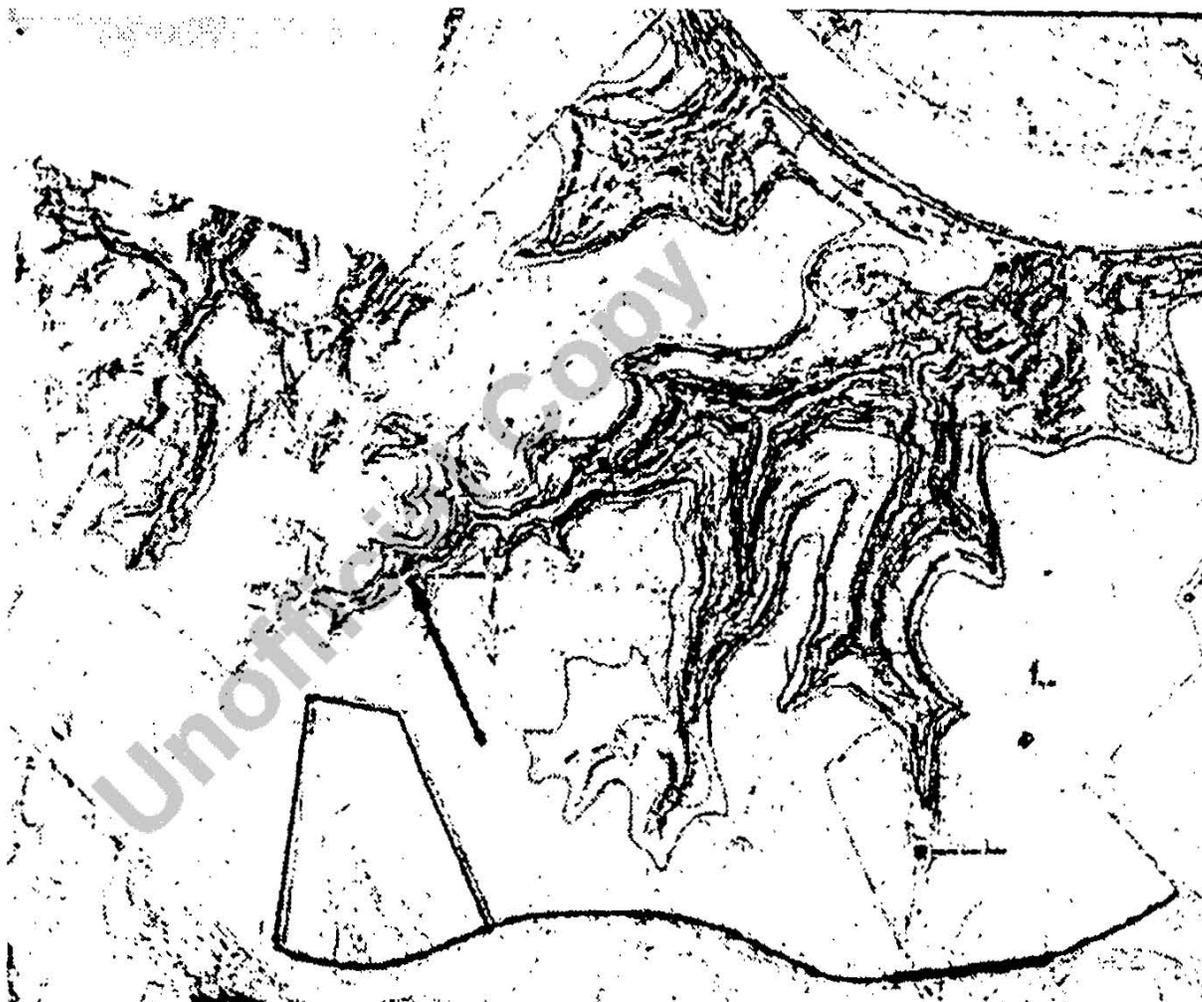


Figure 5. Location of endangered plants. Map showing location of endangered plant species near Lake Pointe IV. Map from the 1989 Espey, Huston & Associates Ecological Study of the Bohls Ranch.

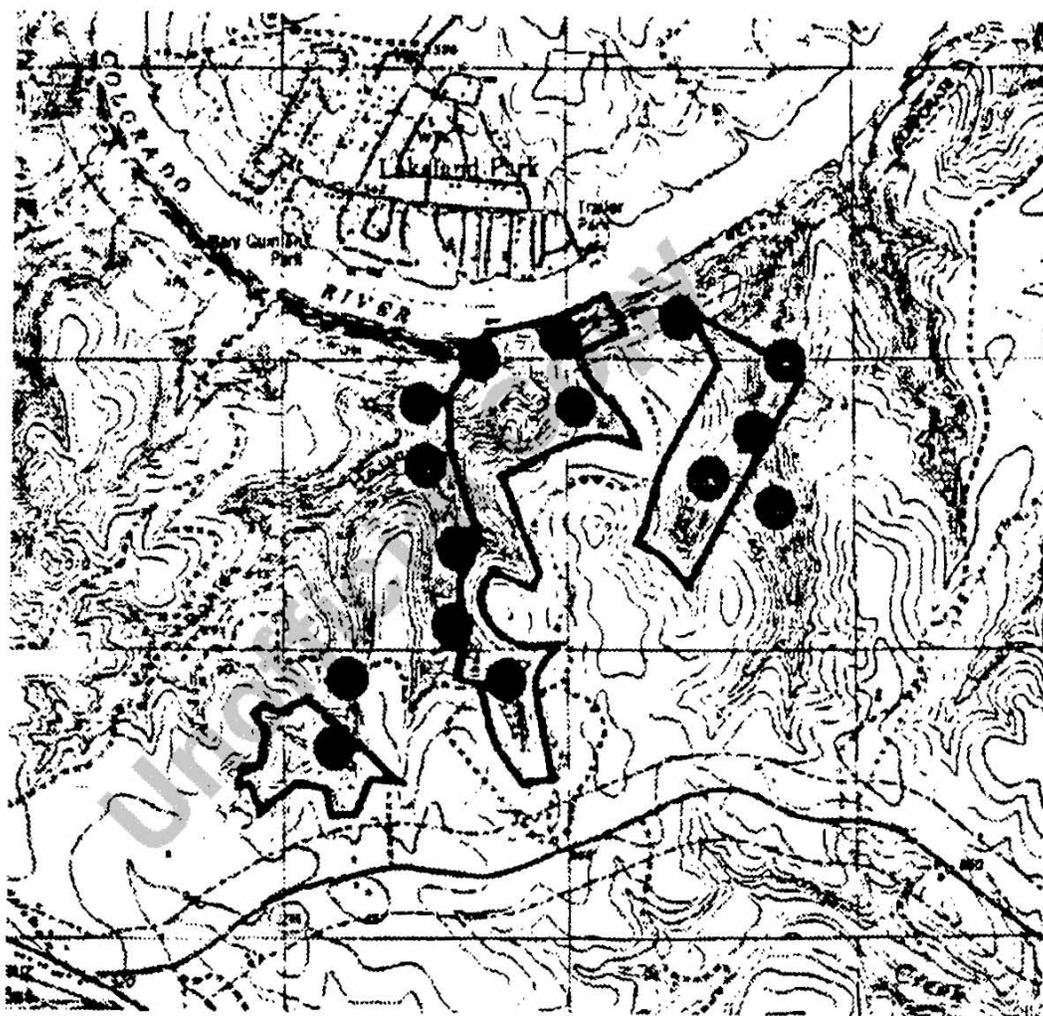


Figure 6. Warbler survey - 1995. Golden-cheeked Warbler location map included in Environmental Technical Service, Inc., 1995 survey report.

Ashe juniper, cedar elm, plateau live, Texas oak or other species of oak. This habitat is usually steep canyons and rough terrain. The project area is included in golden-cheeked warbler recovery unit 5 (Figure 7), as delineated in the warbler recovery plan (Service, 1992).

In 1995, Environmental Technical Services observed a pair of warblers with four young in the western canyon of the Lake Pointe Preserve. A single male was in the same canyon farther north. On the eastern canyon ETS also found several warblers (Figure 6).

3.3.3 Candidate Animal Species

Animal Species of Concern to the Service includes species for which conclusive data on biological vulnerability and threats are not available currently to support proposed rule changes. The Services emphasizes that these taxa are not being proposed for listing presently. There are no specific plans for such proposals, unless additional information becomes available. Further biological research and field study are needed to ascertain the status of taxa in this category.

Animal Species of Concern that occur in the project vicinity include the Barton Springs salamander (*Eurycea sosorum*), Texas horned lizard (*Phrynosoma cornutum*), Texas garter snake (*Thamnophis sirtalis annectens*), loggerhead shrike (*Lanius ludovicianus*), and eastern spotted skunk (*Spiilogale putorius interrupta*). These species are discussed as follows.

The Barton Springs salamander is a member of closely related neotenic aquatic salamanders inhabiting small subterranean streams, spring seepages, and headwaters of creeks along the Balcones escarpment. The greatest threats to salamanders are changes in spring flow, siltation, and chemical contamination (BCCP, 1993). This species is known only from Barton Springs, which is over 7 miles northeast of the property and does not occur on or in the immediate vicinity of Lake Pointe IV. Drainage if the proposed development is north towards Lake Austin and not south towards Barton Creek. Also, the Lake Pointe development stormwater management plan is expected to maintain or improve existing water quality.

Historically, the Texas horned lizard was found throughout the entire state. It occurs in open, flat terrain with sparse, scattered vegetation. Over the past 20 years, the Texas horned lizard has declined in the eastern half of the state and has virtually disappeared from Travis County. This species still maintains healthy numbers in the western and southern part of Texas.

Environmental Services
12367 0371

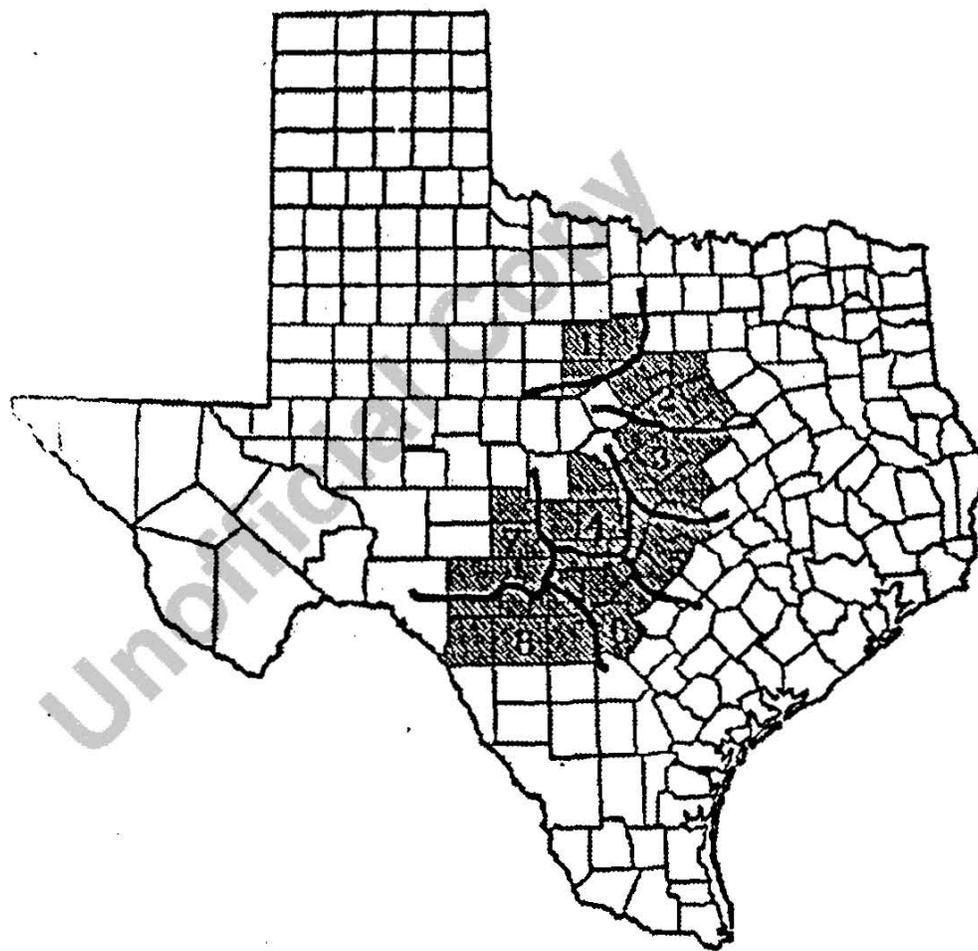


Figure 7. Warbler map distribution - statewide. Golden-cheeked Warbler population from the Golden-cheeked Warbler Recovery Plan.

FEB 19 1983
12867 8372

The Texas garter snake inhabits wet grasslands and may be found in grassy or brushy cover near ponds and streams (Tennant, 1985). This species has not been observed in Lake Pointe IV, and is not expected to occur there.

The loggerhead shrike is a migratory bird that is common in this vicinity during winter. It was observed in the project area and is usually found along fencelines, utility lines, roadsides and areas with scattered trees.

The eastern spotted skunk uses many types of habitat, such as, fields, prairies, croplands, fence rows, farmyards, woodlands and woodland edges (Schmidly, 1983). Although this species has been recorded in Travis County, its range does not include the eastern edge of Edwards Plateau or western Travis County. The spotted skunk is very unlikely to occur in the project area.

3.4 WETLANDS

Lake Pointe IV is located in a hilly terrain that is well drained. The US Geological Survey maps do not designate any areas of this property as a wetland. The Bee Cave 7.5 minute topographic quadrangle shows only ephemeral drainages. There are numerous seeps and springs in the two canyons on this property. One hydric pool was present in an unnamed section of Bohls Hollow in May 1996, even after months of severe drought.

3.5 GEOLOGY AND SOILS

3.5.1 Geology

Lake Pointe IV property is located near the eastern edge of the Edwards Plateau and is underlain by the upper Glen Rose geological formation. This formation consists of alternating layers of limestone, dolomite, and marl; thereby, forming stair-step topography due to different erosion rates. This formation is also slightly permeable and forms springs or seeps when there is horizontal movement of water along the less porous limestone stratum and when it is exposed on the hillsides.

3.5.2 Soils

The soils on the uplands of this tract are classified as the Brackett (BID) soils (Figure 8). The Brackett Association consists of shallow well-drained, gravely, clay loams underlain by interbedded limestone and marl. This soils occupies gently undulating to rolling topography, generally on benches that are separated by outcrops of the underlying limestone and marl. This is a poor topsoil and presents significant limitations to construction of roads and foundations because



Figure 8. Soil map. Soil map from the Soil Survey of Travis, Texas by US Department of Agriculture, Soil Conservation Service.

of the slopes and the existence of underlying bedrock. A large part of the annual rainfall is lost through runoff and seepage from the limestone outcrop (SCS, 1974).

The unnamed canyons, part of Bohls Hollow, are Tarrant soils and rock outcrop series (TdF). This series consists of shallow to very shallow, well drained, stony, clayey soils overlying limestone. Large limestone rocks cover 25 to 85 percent of the surface. Tarrant soils have a surface layer of dark grayish-brown stony clay or stony clayey loam about 7 inches thick over limestone. Slopes in these canyons are approximately 18 to 40 percent. This soil is not suitable for pasture or range, but is better suited for wildlife (SCS, 1974).

3.6 AIR QUALITY

There are no point sources of air pollution in Lake Pointe IV. Emissions from area traffic and dust during periods of dry weather and high winds may occur. These are not expected to produce adverse impacts on the project site.

The Austin metropolitan area and Travis County are currently full attainment areas for all air quality criteria pollutants of the Environmental Protection Agency (EPA) and the Texas Natural Resource Conservation Commission (TNRCC). However, degradation of air quality, particularly from automobile exhaust, has been a concern in the Austin metropolitan area for over 10 years.

3.7 WATER QUALITY

Lake Austin to the north of the property is the predominant surface body of water. However, the water quality in this tract is estimated to be good due to a well-developed vegetation cover. There are a number of springs and seeps in the two adjacent canyons. The west canyon contains a small hydric pool, that was active even during the drought of 1996.

Potential threats to the water quality of Lake Austin include pesticide run-off from landscaped areas, pollutants from urban run-off, construction site erosion into the intermittent creeks and illegal dumping. These threats will be avoided if the provisions in section 6.0 of this document are followed.

Wastewater service for the proposed development is through the pipeline that service southwestern Travis County near the Village of Bee Cave. Clean wastewater is currently used to irrigate the Spillman tract.

3.8 ADJACENT LAND USE

The development areas of Lake Point IV are immediately adjacent to the residential Lake Point I, II, and III (Figure 9). The proposed preserve (undeveloped areas) is adjacent to the City of Austin Preserve system and the Lake Point Preserve. Across Bee Caves road (FM 2244) and to the west, the 190-acre Uplands subdivision in the Barton Creek macrosite, is presently under construction. Lake Pointe IV is within the Village of Bee Cave Extra Territorial Jurisdiction (ETJ) and within the Lake Travis Independent School District.

3.9 CULTURAL RESOURCES

Information for this section was acquired from the records of the Texas Archaeological Research Laboratory (TARL) and the Texas Historical Commission (THC). These records had no previously recorded sites on the Lake Pointe IV property. Significant sites are recorded for land southeast of Lake Pointe I and across Bee Caves Road (FM 2244) to Lake Pointe I. Therefore, it is unlikely that any significant archaeological sites will be found on Lake Pointe IV.

4.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

4.1 ALTERNATIVE 1 - PROPOSED ACTION

The area of Lake Pointe IV is 128.2 acres. Of this total 92.8 acres will be protected as a conservation preserve (Figure 10). The proposed land use plan is shown in Figure 11. The proposed plan includes 35.8 acres which include street and utility infrastructure, and single family residences.

Specific measures proposed as part of the development plan to avoid, minimize, and mitigate for potential impacts to the golden-cheeked warbler include the following:

- Approximately 92.8 acres including the best warbler habitat will be preserved to compensate of the loss of other habitat on site.
- The conservation area will be donated to West Travis County Municipal District # 5 or other entity acceptable to the Service for management compatible with the conservation goals of the BCCP.
- Warbler monitoring studies will be performed in accordance with Service guidelines. The monitoring will include: 1) warbler territory mapping the first spring after permit issuance; 2) presence/absence surveys every other year for



Figure 9. Development map for PRT-782186. Lake Pointe development map.

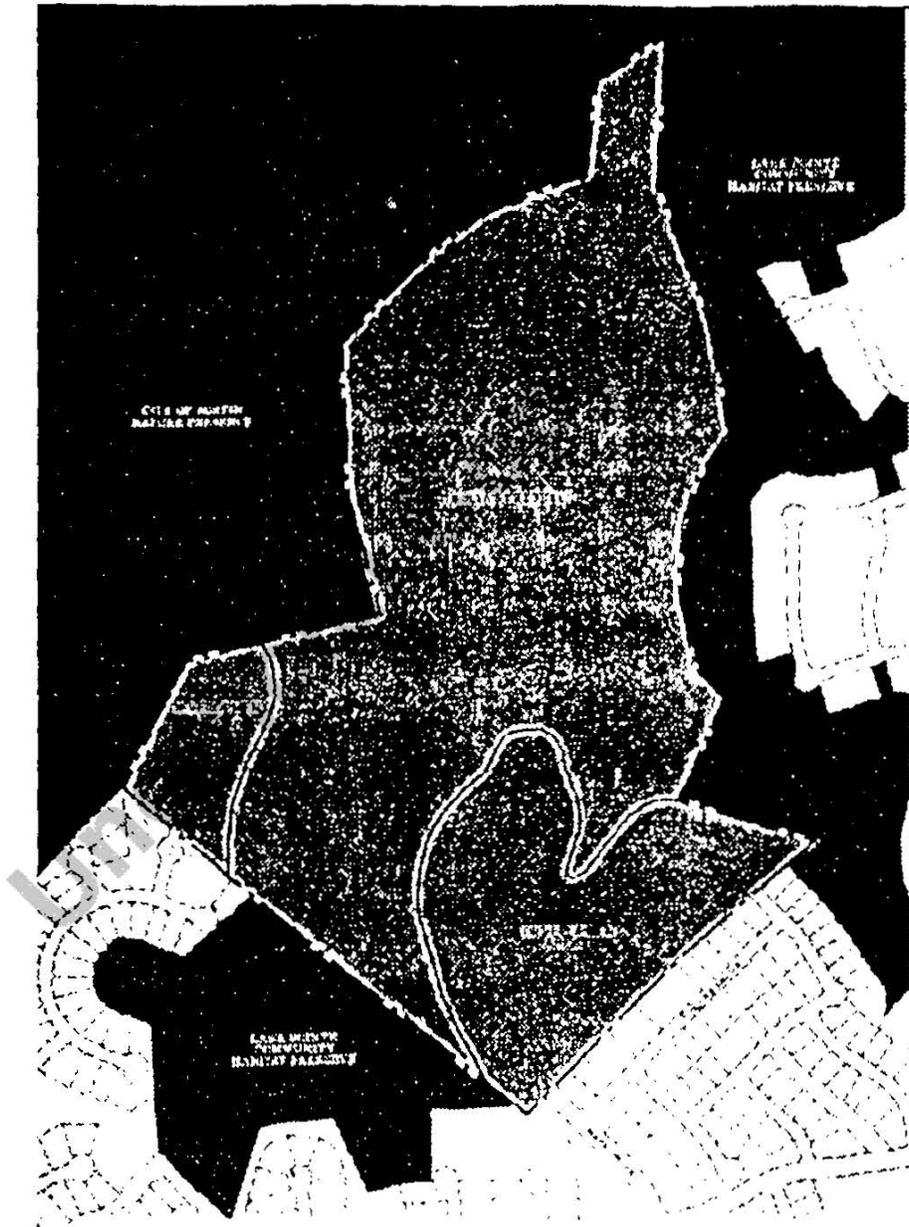


Figure 10. Proposed project. Proposed development site for Lake Pointe IV.



Figure 11. Preliminary development plan. Preliminary Plan for Lake Pointe IV that specifies all road access is through Lake Pointe I, II, and III.

the life of the permit, or until 3 years past not finding any warblers, or when buildout is complete; and 3) another territory mapping study when development is complete. Complete buildout is considered to be the point at which 95 percent of the housing development is completed.

- Vegetation clearing activities, utility infrastructure, and street construction will be conducted outside the warbler breeding season, unless surveys conducted immediately prior to such activities reveal no warbler territories are present within 300 feet of the activities. Building construction may be conducted year round as long as vegetation clearing activities associated with the building are completed outside the warbler breeding season, or unless surveys conducted immediately prior to such activities reveal no warbler territories are present within 300 feet of the construction activities. For purposes of this provision, the warbler breeding season is defined as March 1 through August 1.
- Clearing for construction of buildings, streets, and other areas of impervious cover will be minimized to the greatest extent possible. Areas that are disturbed during construction but not occupied by impervious cover will be replanted with native plants species.
- The following deed restrictions will be recorded on all lots in the Lake Pointe development: 1) prohibit the use of organochlorine and organophosphate pesticides and herbicides. All other types of pesticides will be used in a manner that is in accordance with the manufacturer's directions; 2) prohibit outside cats in the development; 3) restrict dog feeding to inside the home, to minimize the population of raccoons, opossums, and other predators (blue jays, grackles, cowbirds, etc.); 4) limit the use of bird feeders to thistle and hummingbird food only; and 5) prohibit supplemental feed for deer.
- The following deed restrictions will be recorded on lots adjacent to preserve in the Lake Pointe IV development: 1) disturbed areas will be replanted with native hardwood trees and shrubs (not to include Ashe juniper) that will aid the golden-cheeked warbler; 2) outside lights will not be left on all night and will not be broadcast toward the preserve; and 3) all lots will be fenced to restrict the movement of deer.
- Any changes in ownership of the property or management of lands preserved as mitigation will be approved by the Service.
- Clearing and construction within the proposed development areas shall be consistent with the current practices recommend by the US Forest Service and Texas Forest Service to prevent the spread of oak wilt.

The conservation plan is intended to minimize potential adverse impacts to the golden-cheeked warbler.

4.2 ALTERNATIVE 2 - NO ACTION

This alternative assumes the abandonment of the proposed development and no application for a section 10(a)(1)(B) would be submitted. Therefore, related impacts to the warbler would not occur. Abandonment of the proposed development would result in considerable economic loss by Applicant and the subject tract would be subject to alternate uses. Therefore, the no action alternative was rejected.

4.3 ALTERNATIVE 3 - ALTERNATE SITE LOCATION

A similar development could be built on an alternate site, but several factors contribute to the economic feasibility of utilizing the proposed site as opposed to choosing an alternate site, purchasing land, and proceeding with land planning. Considerable time, money and effort have been expended in land planning and in obtaining approval for development plans. Because of the significant economic loss and the associated delays, this alternative was rejected.

4.4 ALTERNATIVE 4 - ALTERNATE SITE DESIGN

The Applicant has coordinated with the Service and other parties (listed in section 7.0) to set aside the best habitat in an optimum configuration for management. The proposed design is 92.8 acres. Further reduction in the developable area would result in an economically unfeasible project, causing a major economic loss to the Applicant. Therefore, this alternative was rejected from further consideration.

4.5 ALTERNATIVE 5 - REGIONAL PERMIT

The Balcones Canyonlands Conservation Plan (BCCP) was issued May 2, 1996. The issuance of the BCCP permit freed Lake Pointe IV and other areas for development, but would result in a greater amount of take than what is currently proposed. For this reason, this alternative was rejected from further consideration.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 ALTERNATIVE 1 - PROPOSED ALTERNATIVE

5.1.1 On-site Impacts

5.1.1.1 Vegetation

The affected land consists of upland woodlands and grassland savannas. The area currently consists of mixed juniper/oak woodland. Impacts to terrestrial vegetation on Lake Pointe IV will include the removal of existing vegetation in the areas used for construction of homes, roads, and associated activities. Plant cover removed will be affected for the life of the project, therefore, it represents irretrievable loss of the resource. Increases in erosion, subsequent plant uprooting and breakage of vegetation are possible during construction. Reduced productivity may be exhibited by adjacent plant communities due to dust accumulation on foliage, foliar injury, and soil compaction. However, these adverse impacts are expected to be temporary and to diminish when construction activities cease.

Selected trees are likely to be preserved for their aesthetic value within each residential lot; however, the resulting plant community will be more open than it currently exists. Direct impacts to vegetation should be limited to the immediate vicinity of construction. Also, part of the property will be left in a semi-native state due to building restrictions related to steep slopes.

One possible long-term impact on the plant community will be increased browsing pressure as a result of the probable increase in the deer population following development. This increased browsing pressure on the more palatable species would alter the vegetative composition of the woodlands. Browsing pressure will also limit recruitment of deciduous species into the canopy. The shift of canopy composition towards a juniper monoculture will result in long term degradation of warbler habitat.

This same phenomenon can result from the increased likelihood of oak wilt infection. Activities associated with site clearing, construction, street infrastructure, and long-term landscape maintenance will place live oaks and other oak species at risk for injury and subsequent infection. Infestations can spread through the roots over wide areas, well beyond the initial site of disturbance. Information on the identification and control of oak wilt as prepared by the US Forest Service and Texas Forest Service is included in Appendix B.

Another potential impact to the plant community can result from the introduction of non-native (exotic) species. This results in competition with and

displacement of the native species. A list of native species recommended for use in landscaping is provided in Appendix A.

5.1.1.2 Wildlife

Development of the project area will result in a net decrease in species density and diversity for most wildlife populations. Factors affecting this decrease are habitat loss, habitat modification, and increased human activity.

Many organisms have specific habitat requirements that include a complex of environmental gradients, such as temperature, moisture, soil composition, vegetation structure, and vegetation composition. Loss and habitat modification of habitat will make the developed areas unsuitable for species specifically adapted to the existing habitats on site. Factors causing these changes include removal of existing vegetation; introduction of exotic species; also alteration of soils, terrain characteristics and other surface features.

Effects of increased human population include increase noise, pedestrian and vehicular traffic, which add further limitations on physical space. Wildlife habitats and populations will become stressed due to increases in development and human populations. Wildlife in the newly developed areas will be displaced into adjacent areas. This will result in increased competition for nesting, foraging, breeding, and feeding areas.

Although, an overall decrease in wildlife population is expected with the proposed development, some species will benefit by the proposed action. This is the result of alteration of habitat and landscaping of homes in the newly developed area. Some species of wildlife are suited for coexistence with urban development. Planting of mast-producing trees, such as pecans and oaks will benefit fox squirrels and white-tailed deer. The practice of backyard deer feeding, in the absence of control factors (hunting and natural predators), results in unusually high populations and destructive deer populations. Other mammal species expected to increase in numbers include such species as Virginia opossum, raccoon, house mouse (*Mus musculus*), and black (roof) rat (*Rattus rattus*). Populations of some bird species will also increase, often to the detriment of resident avian species. These include house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), blue jay, great-tailed grackle (*Quiscalus mexicanus*), and brown-headed cowbird. Detrimental effects include competition for nest sites, other resources, nest predation, and nest parasitism.

5.1.1.3 Listed, Proposed, and Candidate Species.

None of the plant species listed, currently proposed for listing, or classified as candidates for listing as threatened or endangered in Texas are known to occur in the project area. Adverse impacts to these are not expected to occur.

There are no known karst features in the Lake Pointe IV property, so no adverse impacts to the federally listed cave invertebrates are expected. The black-capped vireo is not expected to occur in the development area, so no adverse impacts are expected. The Barton Springs salamander does not occur in the development area; therefore, no adverse impacts are expected to this species.

The Texas horned lizard, Texas garter snake, and loggerhead shrike may occur in the area; although, these species were not observed in the area. Populations of these species could be displaced due to habitat loss resulting from development of the area. However, the loggerhead shrike may benefit from these habitat changes.

The golden-cheeked warbler, a federally listed endangered species, could be incidentally taken by the proposed development. Warblers outside of the proposed conservation area may be directly impacted by habitat loss due to clearing and construction. Increased competition for breeding, foraging, nesting and feeding areas are factors. Additional impacts may occur as a result of increases in population of brown-headed cowbirds, scrub jays, blue jays and great-tailed grackles, which present threats of nesting success. Habitat loss will also increase pressures from mammalian and reptilian predators due to displacement of these populations. Other factors that may have adverse impacts are increased noise levels from construction, traffic, other human activities, and increased human harassment in nesting areas by the local residents.

5.1.1.4 Wetlands

No jurisdictional wetlands are known to exist on the property, therefore, no adverse impacts are expected to occur. All areas with wetland characteristics occur in the two adjacent canyons. Potential impacts to these areas are expected to be minimized by the erosion and sedimentation control measures that will be installed during construction.

5.1.1.5 Geology and Soils

The geology of the area will not be affected by development, except for minor changes due to removal of topsoil. Where this is anticipated, implementation of adequate erosion control measures and proper restoration will be necessary.

The soils of Lake Pointe IV have the potential for high erosion rates. If disturbance is anticipated, adequate erosion control measures and proper restoration should be implemented. During construction, it is important to properly design and maintain erosion/sedimentation control measures to maintain soil resources and water quality. Control measures are particularly important near ravines and canyon heads to remove immediate impacts on the thin gravely soils of the Bracket and Tarrant series.

To prevent increased erosion during development, it is important to maintain a soil and vegetation cover on sloping terrain, cut banks and drainages or erect commonly accepted procedures for runoff control, such as benches, berms and diversion ditches. These diversions should be constructed across the slope on an approximate known contour so that surface runoff is intercepted prior to gaining sufficient volume and velocity to cause erosion.

Another source of erosion is runoff from impervious cover. Native trees and vegetation remaining in place will support soil stability and will work well in stabilizing the waterway on slopes. Restoration or landscaping with native trees, shrubs, and forbs are effective in stabilizing soils and slopes. The native species are better adapted to the existing soil and rain regime conditions.

5.1.1.6 Air Quality

Increases in emissions of various pollutants during the construction phase are expected. Fugitive dust emissions from earth-moving operations and diesel emissions from heavy construction equipment will be the primary sources. Fugitive dust from construction activities is identical to naturally occurring windblown fugitive dust. Emissions are temporary, are typically widely distributed over the construction site, and are composed of relatively large particles. These large particles are captured by the natural defense mechanisms of the respiratory system, not posing any significant health risk. Dust from construction activity can become a nuisance, especially on dry windy days. If this is a problem, the area can be watered as necessary to reduce the dust to an acceptable level.

Diesel emissions are not expected to have significant impact because of the low number of sources. Some components of diesel emissions are toxic at high concentrations, but the concentrations of these emissions are expected to be low, thus posing on risk to public health or welfare.

Traffic within Lake Pointe IV will increase, as will traffic on the surrounding roadways. Traffic-related air pollutants emissions, mainly nitrogen oxides (NO₂), carbon monoxide (CO) and hydrocarbons (HC), will definitely increase.

5.1.1.7 Water Quality

5.1.1.7.1 Surface Water

All water drains north into tributaries to Lake Austin. The Applicant will follow the Lower Colorado River Authority (LCRA) non-point source pollution control ordinance for Lake Travis to minimized negative effects of the proposed development on Lake Austin.

Several potential threats to water quality in Lake Austin include pesticide run-off from landscaped areas, pollutants from urban run-off, construction site erosion into canyons, and illegal dumping. Increased nutrient loading from potential development may cause local algae's blooms, resulting in decrease water clarity. Apart from following LCRA's non-point source pollution control ordinance, the Applicant plans an education program and deed restrictions on the use of pesticides, herbicides and fertilizers.

5.1.1.7.2 Ground Water

Lake Pointe IV is underlain by limestone's of the Glen Rose Formation. However, a number of seeps and springs are present in the adjacent canyons. Precautions should be taken to protect local recharge for these features. The utilization of silt fences, rock berms, and other barriers to sediment transport would rectify damage to water quality and flow.

5.1.1.8 Land Use

Increased urbanization of the surrounding ranch land in the vicinity of Lake Pointe IV is occurring; therefore, increased traffic on existing roads and a general alteration of the undeveloped property will have adverse effects on existing land use.

5.1.1.9 Cultural Resources

Although there are no recorded archeological sites on Lake Pointe IV, there may be some unrecorded sites. Impacts to these sites may be greater because they may contain intact archaeological deposits and could contain significant information. If any such sites may occur in the conservation area, the impact can be lessened through education of the local residents and the proposed fencing of the area.

5.1.2 Off-site Impacts

5.1.2.1 Vegetation

No direct off-site impacts to vegetation are expected. Indirect impacts may occur because of: 1) introduction and spread of non-native plant species; 2) the likely increase of deer population; and 3) increased likelihood of infestation of oak wilt.

5.1.2.2 Wildlife

Displacement of certain wildlife species is expected to occur from the development site to the adjacent areas. This short-term pressure will occur, however, local populations will stabilize after a short adjustment period. No direct long-term negative impacts are expected. Over population of white-tailed deer is expected to occur resulting from reduction of available habitat. Population control by hunting could be instituted in the adjacent preserve areas.

5.1.2.3 Listed, Proposed and Other Species of Concern

Negative impacts to the golden-cheeked warbler may occur in the immediate vicinity of the proposed project. The warbler may exhibit a decline in population because of increase pressure from brown-headed cowbirds, other predators, and possible habitat degradation due to increased deer population and oak wilt.

Positive impacts will occur because of the addition of 92.8 acres to South Lake Austin macrosite. This preserve will be dedicated and managed for the long-term preservation of the endangered golden-cheeked warbler. Approximately 4,491 acres were proposed for the South Lake Austin macrosite. This acreage included the land starting at the Double J&T, encircling Lake Austin to Lake Point. It also includes the disjunct 115-acre Commons Ford tract. The City of Austin currently owns the 1729-acre Double J&T tract, 820-acre Reicher tract, 462-acre Bohls tract and the disjunct 115-acre Commons Ford tract. These 92.8 acres will unite 147 acres of the present Lake Pointe Preserve making a contiguous tract of approximately 1,522 acres. This macrosite now has a total of 3,366 acres. Plans exist to acquire the lands adjoining the existing preserves to make up the proposed 4,491 acres of the South Lake Austin macrosite for the BCCP preserves (Davis, 1996). At present there are two section 10(a)(1)(B) permits pending, the 420-acre Schramm Ranch and 128.2-acre Lake Point IV.

5.2 ALTERNATIVE 2 - NO ACTION

Under this alternative, many of the environmental consequences described in section 5.1 would not occur. Since the site is privately owned, there is constant pressure for development, and this could result in the near future, possibly under the regional section 10(a)(1)(B) permit. The whole developable site could be developed. Until that time, the property would continue to be subject to land uses that may directly or indirectly impact the warbler.

5.3 ALTERNATIVE 3 - ALTERNATE SITE LOCATION

This alternative cannot be addressed without site-specific information for the site. The project impacts discussed under section 5.1 would not occur. As stated above, there is constant development pressure for this site. If development under the BCCP section 10(a)(1)(B) permit occurred on the Lake Pointe IV property, all developable area would be developed. The present plan has scaled back development from 60 acres to 35 acres; therefore, conserving more land for the use of the warbler.

5.4 ALTERNATIVE 4 - ALTERNATE SITE DESIGN

An alternative land plan involving further reduction in development would reduce the direct and indirect impacts to the warblers residing in the area. The highest quality habitat is included in the 92.8-acre conservation unit. Further expansion of the conservation area would protect less valuable habitat, and would make the development project less economically feasible. There would be no assurance that incidental "take" would be less, if the development were scaled back.

6.0 PROPOSED HABITAT CONSERVATION PLAN

Section six contains the Applicant's specific conservation proposals for the project. Any statements where the Service differs with these proposals will be in italics.

As part of the proposed action, an HCP is proposed to minimize the potential take described above and to assure that this action does not reduce the potential for

survival and recovery of the warbler in the wild, as mandated by requirements of 50 CFR Part 17.22(b)(1)(iii). The HCP includes the following items:

- Mitigation for loss of habitat on Lake Pointe IV development includes the establishment of 92.4 acres as a conservation area on site.
- The Applicant will transfer fee simple title of the conservation area to the West Travis County Municipal District V and will be added to 145-acre Lake Pointe Preserve. The planned preserve also is adjacent to the City of Austin Bohls Ranch Preserve. The addition of the planned preserve will increase the contiguous acreage in the South Lake Austin macrosite. Uses that are incompatible with the conservation need of the golden-cheeked warbler will be recorded on a deed restriction.
- The Applicant will perform monitoring studies of golden-cheeked warbler as follows:
 1. Territorial mapping will be conducted the first spring after permit issuance.
 2. Presence/absence surveys will be conducted every other year for the life of the permit, or until 3 years past not finding any warblers, or when buildout is complete.
 3. Another territory mapping will be conducted when development is completed. Complete buildout is when 95 percent of house development is complete. Monitoring surveys will be conducted consistent with Service guidelines.
- New construction on site will not be initiated during the warbler breeding/nesting period, between March 1 and August 1, within 300 feet of the edge of a documented warbler territory. Building construction will be conducted year round as long as the vegetation clearing activities associated with building are completed outside the warbler breeding season, or unless surveys conducted immediately prior to such activities reveal no warbler territories are present within 300 feet of the construction activities.
- Clearing for construction of buildings, streets and other areas of impervious cover will be minimized to the greatest extent possible. Disturbed areas during construction, but not occupied by buildings or impervious surface, will be replanted with native plant species.

- Clearing and construction within the development areas will be consistent with the current practices recommended by US Forest Service and Texas Forest Service to prevent the spread of oak wilt.
- The following deed restrictions will be recorded on all lots in the Lake Pointe development
 1. Prohibit the use of organochlorine and organophosphate pesticides and herbicides. All other types of pesticides will be used in a manner that is in accordance with the manufacturer's directions.
 2. Prohibit outside cats in the development, because cats are natural enemies of birds.
 3. Restrict dog feeding to inside the home, to minimize the population of raccoons, opossums, and other predators (blue jays, grackles, cowbirds, etc.) that are harmful to the warbler.
 4. Limit the use of bird feeders to thistle and hummingbird food only. Larger seed will attract avian predators (cowbirds, blue jays, and grackles).
 5. Prohibit supplemental feed for deer. Overpopulation of deer will degrade warbler habitat as discussed in section 5.1.1.2.
- The following deed restrictions will be recorded on lots adjacent to preserve in the Lake Pointe IV development
 1. Disturbed areas will be replanted with native hardwood trees and shrubs (not to include Ashe juniper) that will aid the golden-cheeked warbler.
 2. Outside lights will not be left on all night and will not be broadcast toward the preserve.
 3. All lots will be fenced to restrict the movement of deer.
- Any change in ownership of the property or management of lands preserved as mitigation will be approved by the Service.
- The permit, appropriate attachments, and deed to the preserve management entity will be recorded with the County Clerk, Travis County, Texas prior to commencement of development related activities. A recorded copy of this action will be returned to the Service within 60 days of the permit issuance.

- The Applicant will implement the above mitigative measures and will be responsible for providing all necessary funding. Funding will be per agreement between the Applicant and managing entity.
- Annual reports identifying the activities conducted under an issued permit will be provided to the Regional Director, Albuquerque, New Mexico with a copy provided to the Austin Field Office. The final report will be due 3 years after 95 percent buildout.
- The Austin Field Office will be notified immediately if a dead, injured, or sick individual of an endangered or threatened species is found. Sick or injured individuals will be handled carefully to insure their effective treatment. Dead specimens will be handled scrupulously to preserve biological materials for analysis of cause of death.

6.1 AMENDMENT PROCEDURES

It is important to establish procedures whereby the section 10(a)(1)(B) permit can be amended. The Applicant and the Service must be consulted on all proposed amendments. However, it is extremely important that the cumulative effect of amendments will not jeopardize any endangered species or species of concern. Amendments must be evaluated based on their effect on the habitat as a whole. The types of proposed amendments and the applicable amendment procedures are discussed below.

6.1.1 Amendments to Plans in the Lake Pointe IV Development Area

It is not within the Service purview to approve land plans, therefore, changes to the proposed land plans shown in Figure 10 do not require an amendment to this HCP. All local agencies having jurisdiction are authorized to approve revisions to development plans for the subject development area, in accordance with applicable law, which do not alter the conditions set forth in this HCP and supporting documents.

6.1.2 Minor Amendments to the HCP

Minor amendments involving routine administrative revisions or changes to the operation and management program that does not diminish the level or means of mitigation will require minor amendments. Such minor amendments should not alter the terms of the section 10(a)(1)(B) permit.

APPLICANT'S RECORDS
11/21/2006 11:17:46

Upon the written request of the Applicant, the Service will review and approve minor amendments to the HCP. This may be accomplished by information notice sent to the parties in the permit, if the amendment does not conflict with the primary purpose of this HCP.

6.2 ALL OTHER AMENDMENTS

All other amendments will be considered an amendment to the section 10(a)(1)(B) permit, subject to any other procedural requirements of federal law or regulation that may be applicable to amendment of such a permit.

Unofficial Copy

7.0 PUBLIC AND AGENCY COORDINATION

The Applicant has been actively pursuing public and agency acceptance of the proposed development for a year, and is continuing to make significant efforts through numerous meetings with concerned groups, individuals, public officials and agencies, to properly coordinate this proposed action with all potentially concerned entities.

The following agencies, organizations, and people have been consulted or coordinated with during the process of addressing the proposed development of Lake Pointe IV.

Alma Barrera, Environmental Consultant
Bon Terre - B, Ltd.
Bury Pittman Engineering
Carter and Burgess, Inc.
City of Austin, Environmental and Conservation Services Department
City of Austin, Reality Department
Environmental Technical Services
Espey, Huston & Associates
Garcia Designs, Inc.
Lower Colorado River Authority
Malone/Wheeler, Inc.
Murfee Engineering
Southwest Travis County, Ltd.
Texas Forest Service
Travis Audubon Society
Travis County, Austin, Texas
U. S. Department of Agriculture, US Forest Service
U.S. Fish and Wildlife Service, Ecological Service, Austin Field Office
Vernon Henry and Associates
Village of Bee Cave, Planning Department

8.0 REFERENCES

- Ajilvsgi, G. 1984. Wildflowers of Texas. Shearer Publishing, Fredericksburg, Texas, 414 pp.
- Balcones Canyonlands Conservation Plan (BCCP). 1993. Balcones Canyonlands conservation plan phase I application document. Prepared by the City of Austin, Travis County and Lower Colorado River Authority. Austin, Texas.
- City of Austin, Environmental and Conservation Services Department and Lower Colorado River Authority, Water Efficiency Department. Undated. Quality landscaping that conserves water and protects the environment. Austin, Texas. 30 pp.
- Correll, D.S. and M.C. Johnston. 1979. Manual of the vascular plants of Texas. The University of Texas at Dallas, Richardson, Texas. 1881 pp.
- Cox, P.W. and P. Leslie, 1995. Texas trees, a friendly guide. Corona Publishing Company, San Antonio, Texas, 374 pp.
- Davis, J. 1996. City of Austin. Personal communication to A. Barrera. Austin, Texas. June 3.
- Davis, W.B. 1978. The mammals of Texas. Texas Parks and Wildlife Department, Bull. 41., Austin, Texas. 294 pp.
- Davis, W.B. and D. J. Schmidly, 1994. The mammals of Texas. Texas Parks and Wildlife Department, Nongame and Urban Program, Austin, Texas, 338 pp.
- Enquist, M. 1987. Wildflowers of the Texas Hill Country. Lone Star Botanical, Austin, Texas. 275 pp.
- Espey, Huston & Associates, Inc. 1989. Bohls Ranch Ecological Survey. Prepared for Cornerstone Development Corporation, Austin, Texas. Unpub.
- Espey, Huston & Associates, Inc. 1996. Environmental assessment and habitat conservation plan for the Reed Estate property. US Fish and Wildlife Service. Austin, Texas. Unpub. 43 pp.
- Gould, F. W. 1978. Common Texas grasses - an illustrated guide. Texas A&M University, College Station, Texas. 267 pp.
- Grzybowski, J. A. 1991. Black-capped Vireo (*Vireo atricapillus*) recovery plan. US Fish & Wildlife Service. Albuquerque, New Mexico. 74 pp.

- Hatch, S.L., K.N. Gandhi, and L.E. Brown, 1990. Checklist of the vascular plants of Texas. MP-1665. Texas A&M University, Texas Agricultural Experiment Station, College Station, Texas, 158 pp.
- Horizon Environmental Service, Inc. 1996. Environmental assessment and habitat conservation plan for Summit at West Rim on Mt. Larson. Unpub. US Fish & Wildlife Service. Austin, Texas. 22 pp.
- Keddy-Hector, D. P. 1992. Golden-cheeked warbler (*Dendroica chrysoparia*) recovery plan. US Fish & Wildlife Service. Albuquerque, New Mexico. 88 pp.
- Loughmiller, C. and L. 1994. Texas Wildflowers, University of Texas Press, Austin, Texas, 271 pp.
- Lynch, Bro. D., 1994. Native & naturalized woody plants of Austin & the Hill Country. St. Edwards University, Acorn Press, Austin, Texas, 165 pp.
- Mase, R. 1996. Endangered species survey for Lake Pointe subdivision. Unpub. US Fish & Wildlife Service. Austin, Texas. 5 pp.
- National Geographic Society. 1983. Field guide to the Birds of North America. Nat'l. Geog. Soc. Washington, D. C. 464 pp.
- O'Donnell, L., W. R. Elliott, and R. A. Stanford. 1994. Recovery plan for endangered karst invertebrates in Travis and Williamson Counties, Texas. US Fish & Wildlife Service. Albuquerque, New Mexico. 154 pp.
- Schmidly, D. J. 1983. Texas mammals east of the Balcones fault zone. Texas A&M University Press. College Station, Texas. 400 pp.
- Soil Conservation Service (SCS). 1974. Soil survey of Travis County, Texas. U.S. Department of Agriculture. 123 pp. + 83 maps.
- SWCA, Inc. 1993. Environmental assessment and habitat conservation plan for Lake Pointe. US Fish & Wildlife Service. 30 pp.
- Tennant, A. 1985. A field guide to Texas snakes. Texas Monthly Press. Austin, Texas. 260 pp.
- Treefolks. Undated. Tree growing guide for Austin and the Hill Country. Austin, Texas. 2 pp.

USDA Forest Service. 1994. How to identify and manage oak wilt in Texas. US Department of Agriculture, Texas Oak Wilt Suppression Project, and Texas Forest Service. Southern Forest Experiment Station. New Orleans, Louisiana. 4 pp.

Unofficial Copy

Unofficial Copy

APPENDIX A

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED

Appendix A - Native plants that can be used to xeriscape.

Common Name	Scientific Name
Bald Cypress*	<i>Taxodium distichum</i>
Joint Fir**	<i>Ephedra antisyphilitica</i>
Dwarf Palmetto**	<i>Sabal minor</i>
Spanish Dagger**	<i>Yucca treculeana</i>
Twisted-leaf Yucca**	<i>Yucca rupicola</i>
Buckley Yucca**	<i>Yucca constricta</i>
Devil's-shoestring**	<i>Nolina lindherimeriana</i>
Sacahuista, Bunch-grass**	<i>Nolina texana</i>
Sotol**	<i>Dasyilirion taxanum</i>
Cat-brier***	<i>Smilax bona-nox</i>
Black Willow*	<i>Salix nigra</i>
Eastern Cottonwood*	<i>Populus deltoides</i>
Black Walnut*	<i>Juglans nigra</i>
Arizona Walnut*	<i>Juglans major</i>
Little Walnut*	<i>Juglans microcarpa</i>
Pecan*	<i>Carya illinoensis</i>
Bur Oak*	<i>Quercus macrocarpa</i>
Chinkapin Oak*	<i>Quercus muhlenbergii</i>
Post Oak*	<i>Quercus stellata</i>
Shin Oak**	<i>Quercus sinuata</i>
Plateau Live Oak*	<i>Quercus fusiformis</i>
Shumard Oak*	<i>Quercus shumardii</i>
Texas Oak*	<i>Quercus buckleyi</i>
Blackjack Oak*	<i>Quercus marlandica</i>
Sugar Hackberry*	<i>Celtis laevigata</i>
Netleaf Hackberry*	<i>Celtis reticulata</i>
Cedar Elm*	<i>Ulmus crassifolia</i>
American Elm*	<i>Ulmus americana</i>
Texas Mulberry*	<i>Morus microphylla</i>
Bois-d'arc*	<i>Maclura pomifera</i>
Agarita**	<i>Berberis trifoliolata</i>
Texas Barberry**	<i>Berberis swaseyi</i>
Carolina Snailseed***	<i>Cocculus carolinus</i>
Spicebush**	<i>Lindera bensoin</i>
Mock-orange**	<i>Philadelphus ernestii</i>
Sycamore*	<i>Platanus occidentalis</i>
Southern Dewberry***	<i>Rubus trivalis</i>
Laurel Cherry*	<i>Prunus caroliniana</i>
Escarpment Black Cherry*	<i>Prunus serotina</i>
Texas Almond**	<i>Prunus minutiflora</i>

Appendix A - con't

Common Name	Scientific Name
Mexican Plum*	<i>Prunus mexicana</i>
Creek Plum**	<i>Prunus rivularis</i>
Huisache*	<i>Acacia smallii</i>
Catclaw Acacia**	<i>Acacia roemeriana</i>
Honey Mesquite*	<i>Prosopis glandulosa</i>
Pink Mimosa**	<i>Mimosa borealis</i>
Cat's-claw Mimosa**	<i>Mimosa biuncifera</i>
Redbud*	<i>Cercis canadensis</i>
Retama*	<i>Parkinsonia aculeata</i>
Texas Mountain Laurel**	<i>Sophora secundiflora</i>
Texas Sophora**	<i>Sophora affinis</i>
Indigo Bush**	<i>Amorpha fruticosa</i>
Texas Kidneywood**	<i>Eysenhardtia texana</i>
Black Dalea**	<i>Dalea frutescens</i>
Rattlebush**	<i>Sesbania drummondii</i>
Texas Desert-rue**	<i>Thamnosia texana</i>
Wafer-ash**	<i>Ptelea trifoliata</i>
Prickly Ash**	<i>Zanthoxylum hirtutum</i>
Allthorn Goatbush**	<i>Castela texana</i>
Narrow-leafed Thyrallis**	<i>Thyrallis augustifolia</i>
Maidenbush**	<i>Andrachne phyllanthoides</i>
Encinilla**	<i>Croton fruticosus</i>
Brush Myrtle-croton**	<i>Bernardia myricaefolia</i>
Flameleaf Sumac**	<i>Rhus lanceolata</i>
Evergreen Sumac**	<i>Rhus virens</i>
Fragrant Sumac**	<i>Rhus aromatica</i>
Possumhaw**	<i>Ilex decidua</i>
Yaupon**	<i>Ilex vomitoria</i>
Boxelder*	<i>Acer negundo</i>
Red Buckeye**	<i>Aesculus pavia</i>
Western Soap-berry*	<i>Sapindus saponaria</i>
Texas Buckeye**	<i>Ungnadia speciosa</i>
Texas Colubrina*	<i>Colubrina texensis</i>
Redroot**	<i>Ceanothus herbaceus</i>
Indian Cherry**	<i>Rhamnus caroliniana</i>
Alabama Supple-jack***	<i>Berchemia scandens</i>
Lotebush**	<i>Ziziphus obtusifolia</i>
Brasil**	<i>Condalia hookeri</i>
Mustang Grape***	<i>Vitis mustangensis</i>
Sweet Mountain Grape***	<i>Vitis monticola</i>
Spanish Grape***	<i>Vitis berlandieri</i>

REAL ESTATE SERVICES
 12867 0400

Appendix A - con't

Common Name	Scientific Name
Seven-leaf Creeper***	<i>Parthenocissus heptaphylla</i>
Virginia Creeper***	<i>Parthenocissus quinquefolia</i>
Heart-leaf Ampelopsis***	<i>Ampelopsis cordata</i>
Pepper-vine***	<i>Ampelopsis arborea</i>
Ivy Treebine***	<i>Cissus incisa</i>
Carolina Basswood**	<i>Tilia caroliniana</i>
Drummond Wax-mallow**	<i>Malva viscus arboreus</i>
Wright Pavonia**	<i>Pavonia lasiopetala</i>
Pencil Cactus, Tasajillo****	<i>Opuntia leptocaulis</i>
Texas Prickly Pear****	<i>Opuntia lindheimeri</i>
Silk-tassel**	<i>Garrya linhiemeri</i>
Rough-leaf Dogwood**	<i>Cornus drummondii</i>
Texas Madrone*	<i>Arbutus xalapensis</i>
Coma*	<i>Bumelia lanuginosa</i>
Texas Persimmon**	<i>Diospyros texana</i>
Sycamore-leaf Snow-bell**	<i>Styrax platanifolia</i>
Red Ash*	<i>Fraxinus pennsylvanica</i>
Texas Ash*	<i>Fraxinus texensis</i>
Elbow-bush**	<i>Forestiera pubescens</i>
Butterfly-bush**	<i>Buddleja racemosa</i>
Anacua*	<i>Ehretia anacua</i>
Texas Lantana**	<i>Lantana horrida</i>
Common Bee-brush**	<i>Aloysia gratissima</i>
American Beautyberry**	<i>Callicarpa americana</i>
Mustard Tree**	<i>Nicotiana glauca</i>
Cenizo**	<i>Leucophyllum frutescens</i>
Trumpet-vine***	<i>Campsis radicans</i>
Northern Catalpa*	<i>Catalpa speciosa</i>
Buttonbush**	<i>Cephalanthus occidentalis</i>
Black-haw**	<i>Viburnum rufidulum</i>
American Elder**	<i>Sambucus canadensis</i>
Trumpet Honeysuckle***	<i>Lanicera sempervirens</i>
White Honeysuckle**	<i>Lanicera albiflora</i>
Coral-berry**	<i>Symphoricarpos orbiculatus</i>
Damianita**	<i>Chrysactinia mexicana</i>

- * Tree
- ** Shrub
- *** Vine
- **** Cactus

Unofficial Copy

APPENDIX B

REGALAO ESTATAL DO GOV DO RJ
12867 0402

INTEGRATED OAK WILT MANAGEMENT

Early detection and prompt action are essential for successful management of oak wilt. The specific measures taken depend on several circumstances outlined in this brochure, but should include appropriate combinations of the following:

1. Prevent New Infections

- Cut and dispose of diseased red oaks immediately.
- Avoid wounding oak trees, including pruning, from February through June and paint all wounds and fresh stumps regardless of season.
- Handle oak firewood cautiously -- burn all firewood before spring and never store unseasoned oak wood from infected trees near healthy oaks.
- Cover unseasoned firewood from infection centers and unknown origin with clear plastic and bury the edges of the plastic.

2. Stop Spread through Roots

- Install a 3-4 foot-deep trench at least 100 ft beyond the perimeter of infection centers to break up root connections.
- Cut or uproot all trees within the 100-ft barrier (except those injected with fungicide).

3. Inject fungicide into high-value oak trees with high risk of infection.

4. Plant oak wilt resistant trees and favor a diversity of tree species in the landscape.

David Appel, Department of Plant Pathology & Microbiology, Texas A&M University, College Station, TX.

R. Scott Cameron, Texas Forest Service, Lufkin, TX.

Dan Wilson, Southern Forest Experiment Station, Stoneville, MS.

Jerral Johnson, Texas Agricultural Extension Service, College Station, TX.

Financial assistance for this publication was provided by the Texas Oak Wilt Suppression Project, Texas Forest Service, and the USDA Forest Service.

HOW TO

Identify and Manage Oak Wilt in Texas



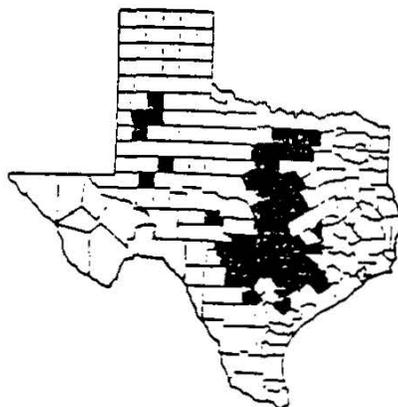
United States
Department of
Agriculture



Forest
Service

Southern Forest
Experiment Station
New Orleans, LA
August, 1994

12867 0403



OAK WILT IN TEXAS

Oak wilt, potentially one of the most destructive tree diseases in the United States, is killing oak trees in central Texas in epidemic proportions. Oak wilt is an infectious disease caused by the fungus *Ceratocystis fagacearum* which invades and disables the water conducting system in susceptible trees. All oaks (*Quercus* spp.) are susceptible to oak wilt to some degree, but some species are affected more than others. Red oaks, particularly Spanish oak (*Q. buckleyi*), Shumard oak (*Q. shumardii*), and blackjack oak (*Q. marilandica*), are extremely susceptible and may play a unique role in the establishment of new oak wilt infections. White oaks including post oak (*Q. stellata*), bur oak (*Q. macrocarpa*), and chinkapin oak (*Q. muehlenbergii*) are resistant to the fungus and rarely die from oak wilt. Live oaks (*Q. fusiformis* and *Q. virginiana*) are intermediate in susceptibility to oak wilt, but are most seriously affected due to their propensity to grow from root sprouts and form vast interconnected root systems that convey the fungus among adjacent trees. The successful management of oak wilt depends on correct diagnosis and an understanding of how the pathogen spreads between these different oak species.

SPREAD OF OAK WILT

Spread through Roots

Live oaks tend to grow in large, dense groups with interconnected roots. The fungus may be transmitted from one tree to another through these root

connections. Root transmission is the only proven means of spread among live oaks. As a result, patches of dead and dying trees (infection centers) are formed. Infection centers in Texas live oaks have been documented to expand at an average rate of 50 ft per year, varying from no spread to 150 ft in any one direction. Occasionally, the oak wilt fungus is transmitted through connected roots between red oaks, but movement through roots is slower and occurs over shorter distances than in live oaks.

Establishment of New Infections

Red oaks play a key role in the establishment of new infection centers. The oak wilt fungus may be spread overland by insect vectors and by man through movement of wood from infected red oaks. Specialized spore-producing structures called fungal mats form beneath the bark of certain diseased trees in late fall and especially in spring. Fungal mats have not been found on live oaks. Individual fungal mats produce spores only for a few weeks. The fruity odor of fungal mats attracts many kinds of insects, the most important of which are believed to be sap-feeding nitidulid beetles. The fungus may be transmitted by these small beetles as they emerge from mats to feed on fresh wounds on healthy oaks. Fungal mats are most commonly formed on standing trees, but they also can develop on logs, stumps, and fresh firewood cut from diseased red oaks.

IDENTIFICATION OF OAK WILT

Foliar symptoms, patterns of tree mortality, and the presence of fungal mats can be used as indicators of oak wilt. However, laboratory isolation of the fungus may be required to confirm the diagnosis. In case of doubt, a trained expert should be consulted.

Patterns of Tree Mortality

Following initial appearance of symptoms, most live oaks defoliate and die over a 1- to 6-month period. Some live oaks take longer to die, and a few untreated trees may survive many years in various states of decline. A few oaks in oak wilt centers escape infection or may be resistant to the fungus and apparently remain unaffected by the disease.

Red oaks seldom survive oak wilt and often die within 3-4 weeks following the initial appearance of

RECEIVED
 12867 0404

symptoms. During summer months diseased red oaks often can be spotted from a distance because of their bright autumn-like coloration in contrast to the surrounding greenery.

Foliar Symptoms

Leaves on diseased live oaks often develop chlorotic (yellow) veins that eventually turn necrotic (brown), a symptom called veinal necrosis. Defoliation may be rapid, and dead leaves with brown veins often can be found under the tree for months after defoliation. Leaves may exhibit other patterns of chlorosis and necrosis, such as interveinal chlorosis, marginal scorch, or tip burn. But these symptoms are less reliable than veinal necrosis for diagnosing oak wilt in live oaks.



Foliar symptoms of oak wilt on red oaks are less distinct. In early spring, the young leaves simply wilt, turning pale green and brown. More mature leaves show water soaking or turn pale green or bronze starting at leaf margins and progressing inward.

Fungal Mats

Fungal mats are reliable indicators for diagnosis of oak wilt. They most often form in spring on red oaks which developed advanced symptoms of oak wilt the previous late summer or fall. Red oak infections in late spring and summer usually do not give rise to fungal mats due to high temperatures and low moisture conditions. Fungal mats can be found by looking for inconspicuous narrow cracks in the bark leading to hollow areas between the bark and wood. They often have a distinct fermenting fruity odor. Fungal mats can be exposed for inspection by chopping away the loose bark.



Laboratory Diagnosis

Oak wilt may be confirmed by isolating the fungus from diseased tissues in the laboratory. Samples can be submitted to the Texas Agricultural Extension Service Plant Diagnostic Clinic at Texas A&M University in College Station. A county extension agent, Texas Forest Service forester, or trained arborist should be consulted for proper collection and submission of samples.

DISEASE MANAGEMENT

There are currently three primary approaches used for oak wilt management in Texas. Successful control usually depends on an integrated program incorporating measures from all three approaches. New oak wilt infections can usually be prevented by eliminating diseased red oaks, handling firewood properly, and painting wounds on healthy oaks. The second approach involves trenching or other measures to disrupt root connections responsible for root transmission of the pathogen. Finally, injections of fungicide into individual, high-value trees may reduce crown loss and extend the life of the tree. These measures will not cure oak wilt, but will minimize tree losses.

Preventing New Infections

Since insects may transmit spores from fungal mats on infected red oaks that die in late summer and fall, such trees should be cut and burned or buried by early fall. If this is not possible, these trees should be injected with herbicide or deeply girdled with an ax and stripped of all bark 2-3 ft above the soil line. Drying of the wood before fall discourages formation of fungal mats.

TEXAS A&M UNIVERSITY
PLANT DIAGNOSTIC CLINIC
2887 0405

All wounding of oaks (including pruning) should be avoided from February through June in areas where diseased red oaks occur. The least hazardous periods for pruning are during the coldest days in mid-winter and extended hot periods in mid- to late summer. Regardless of season, all pruning cuts or other wounds to oak trees, including freshly cut stumps and damaged surface roots, should be treated immediately with a wound paint to prevent contact with contaminated insect vectors.

Transporting unseasoned firewood from diseased red oaks is a potential means of spreading the oak wilt fungus. Oak wilt cannot be transmitted by burning infected firewood, but fungal mats may form on firewood in storage. Presently, no vectors have been proven to transmit the fungus from live oaks to other oak trees, but diseased wood from any oak species should never be stored near healthy oak trees unless precautions are taken. It is best to purchase wood that has been thoroughly dried for at least one full year. If firewood from diseased trees is stored near healthy oak trees, it should be covered with clear plastic with the edges buried to prevent insects from leaving the pile.

Stopping Spread through Roots

To reduce or stop the underground spread of the oak wilt fungus through roots, measures can be taken to break the connections between live oaks or dense groups of red oaks. The most common technique is to sever roots by trenching at least 3-4 ft deep with trenching machines, rock saws, or ripper bars. Correct placement of the trench is critical for successful protection of uninfected trees. There is a delay between colonization of the root system by the fungus and appearance of symptoms in the crown. Therefore, all trees with symptoms should be carefully identified first. Then, the trench should be placed a minimum of 100 feet beyond these symptomatic trees, even though there may be "healthy" trees at high risk of infection inside the trench. Trees within the 100-foot barrier, including those without symptoms, may be uprooted or cut down and removed to improve the barrier to root transmission. Tree removal should be initiated after trenching, starting with healthy trees adjacent to the trench and gradually working inward to include symptomatic trees.

Oak wilt infection centers are more easily suppressed when detected before they become too large. The untreated trees immediately outside the treated area should be closely monitored for several years. If the pathogen appears to have crossed a barrier, the same measures (new trenching and treatment of trees within the barrier) should be repeated while the diseased site is still small.

Fungicide Treatment

The fungicide propiconazole (Alamo™) can be used to reduce oak wilt symptoms in live oaks if applied before infection (preventative treatment). Limited success also may be achieved in trees treated during the earliest stages of infection (therapeutic treatment). The fungicide is injected into the tree's water conducting vascular system through small holes drilled into the root flairs at the base of the tree. Treatment success depends on the health condition of the candidate tree, application rate, and injection technique. Injection should only be done by trained applicators.

Fungicide injection does not stop root transmission of the fungus. This treatment is therefore best used in conjunction with trenching, or to protect individual high value trees in situations where trenching is impractical. Healthy live oaks at high risk of infection in advance of an expanding infection center are preferred candidates for injection. Foliar symptoms can be used in selecting trees as candidates for preventative or therapeutic treatments. A tree with foliar symptoms of oak wilt, as well as any symptomless tree immediately adjacent to a tree with symptoms, should receive a therapeutic treatment. If symptoms are observed in more than 30% of the crown, it is unlikely a fungicide injection will be effective. Symptomless trees at greater distances from the symptomatic trees (i.e. 75-150 ft.) are ideal for preventative treatments. Injection of these trees will give the best results.

Following tree selection, there are several steps in the injection process that require careful attention. Mixing the fungicide solution, exposing and drilling holes in the flair roots, connecting the injection apparatus to the tree, and monitoring uptake must be done according to label specifications and directions. Treatment may take several hours. Information and training are available through county extension offices. The services of a professional arborist may be required to assure proper injection.

FILED

97 FEB -7 PM 12: 22

DANA S. BRADY
COUNTY CLERK
TRAVIS COUNTY, TEXAS

Return:

Joel H. Robuck
3816 Bryn Mawr
Dallas, TX. 75225

Unofficial Copy

STATE OF TEXAS COUNTY OF TRAVIS
I hereby certify that this instrument was FILED on
the date and at the time stamped hereon by me, and
was duly RECORDED in the Volume and Page of the
named RECORDS of Travis County, Texas, on

FEB 7 1997



Dana S. Brady
COUNTY CLERK
TRAVIS COUNTY, TEXAS

RECORDER'S MEMORANDUM-At the time of
recording this instrument was found to be inadequate
for the best photographic reproduction, because of
illegibility, carbon or photo copy, discolored paper,
etc. All blockouts, additions and changes were present
at the time the instrument was filed and recorded.

RECEIPT#: B00064145 TRANS#: 84217 DEPT: REGULAR RECORD \$137.00
CASHIER: KHFR1 FILE DATE: 2/7/97 TRANS DATE: 2/7/97
PAID BY: CHECK# 7680
2867 0407

3.0 LITERATURE CITED

Balcones Canyonlands Conservation Plan Annual Report 2003

Butler/EH&A Team. 1992. Balcones Canyonlands Conservation Plan, Final Draft EH&A Doc. No. 920043. Prepared for the Balcones Canyonlands Conservation Plan Executive Committee.

U. S. Fish and Wildlife Service, 1996. Final Environmental Impact Statement/Habitat Conservation Plan for Proposed Issuance of a Permit to Allow Incidental Take of the Golden-cheeked Warbler, Black-capped Vireo, and Six Karst Invertebrates in Travis County, Texas. U. S. Fish and Wildlife Service, Albuquerque, N. M.

Travis County Natural Resource Program, Balcones Canyonlands Conservation Plan: GIS permit area and habitat map, 1996.