

**FINAL  
ENVIRONMENTAL ASSESSMENT and  
HABITAT CONSERVATION PLAN  
for  
ISSUANCE of an ENDANGERED SPECIES  
SECTION 10(a)(1)(B) PERMIT  
for  
INCIDENTAL TAKE of the HOUSTON TOAD (*Bufo houstonensis*)  
during  
CONSTRUCTION and OPERATION  
of a  
HIGH ADVENTURE BOY SCOUT CAMP  
on  
GRIFFITH LEAGUE RANCH in BASTROP COUNTY, TEXAS**

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## 1 INTRODUCTION

The 4,848-acre Griffith League Ranch is located about eight miles northeast of Bastrop, Texas in the unique “Lost Pines” area of north central Bastrop County.<sup>1</sup> The tract lies within a triangular area bounded on the north by U.S. Highway 290, by Texas Highway 21 on the east and Texas Highway 95 on the west (Figure 1). The main entrance to the property is off Farm Road 2336 and Oak Hill Cemetery Road. A southern entrance can be accessed via Farm Road 1441 at the end of Pine Path. An aerial view of the tract is depicted in Figure 2. Figure 3 represents topography, hydrology, and existing site improvements on the ranch.

Mary Lavinia Griffith Sanders, sole owner of the tract and long-time resident, bequeathed her Griffith League Ranch to the Boy Scouts of America, Capitol Area Council #564 (BSA/CAC) in 1993. Recognizing the role which the Boy Scouts of America plays in educating young men and women, she requested that “The Property shall be used as a memorial park in memory of the creators of the Republic of Texas, being those men who signed the Texas Declaration of Independence.” Additionally, she sought to leave her ranch “to those who would contribute most to Texas’ future”, who would preserve the property “in its entirety, substantially as it presently exists” so that “leaders might come from the hubbub of urban life to the serenity of the ranch for inspiration and learning, and to that end some sort of conference center might be built within the ranch” (Appendix A, Paschall 2000).

Scouting plays a vital role in the lives of many young men and women across the nation. It provides educational opportunities within peer groups, teaches citizenship and leadership and develops skills and confidence in young people that will serve them throughout their lives (See Appendix B). The demand for scouting programs is growing nationwide, particularly in areas such as central Texas that are undergoing rapid urbanization. Scout camps are filled to capacity. There is an immediate need to expand existing camps and to plan for, acquire and develop new camps for the future. Development of Griffith League Ranch as a Boy Scout camp would assist BSA/CAC to meet its challenge, in a unique environmental and historical setting, of providing quality scouting programs for the area’s youth.

BSA/CAC proposes to develop Griffith League Ranch as a “high adventure” Boy Scout camp. The facility, designed to serve Scouts between the ages of 14 and 21, would present more challenging and rigorous programs than those typically found in camps designed for younger Scouts. The Griffith League Ranch Boy Scout Camp would be similar in design and operation to the well-known Philmont Scout Ranch near Cimarron, New Mexico. The proposed development includes a conference center complex for use by Scouts and others. This center would provide an education and training venue for Scouts and Scout Leaders, educational institutions, governmental agencies, and corporations throughout the region.

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<sup>1</sup> All references herein to acreage are approximations reflecting rounding to the nearest acre and based upon conceptual design.

In developing Griffith League Ranch Scout Camp, BSA/CAC recognizes an opportunity to conserve a relatively large tract of “Lost Pines” habitat in Bastrop County. Due to increasing growth in the Austin/Central Texas area, the demand for residential property and services has increased in Bastrop County (Bastrop Chamber of Commerce, 1999). One result of this growth has been subdivision and fragmentation of larger properties into smaller units and an increase in numbers of new homes, businesses and related infrastructure. Habitat fragmentation and development threaten not only the unique loblolly pine (*Pinus taeda*) - oak savannah ecosystem of Bastrop County’s Lost Pines, but the very survival of the endangered Houston toad (*Bufo houstonensis*), as well. Much of Griffith League Ranch is covered with loblolly pine-oak savannah, a vegetation community that provides habitat for the Houston toad.

Because of this, in addition to providing educational and recreational Scouting opportunities for the area’s youth, BSA/CAC intends to manage its property to conserve a significant portion of the area’s unique Lost Pines ecosystem. This would consequently provide long-term benefits for the Houston toad. For BSA/CAC, their management of Griffith League Ranch represents a solid commitment to land stewardship and education, with an additional goal of enhancing the survival, persistence and expansion of existing populations of the endangered Houston toad in its home range.

In accordance with the Endangered Species Act of 1973, as amended (Act), and 50 CFR 17.22, BSA/CAC has filed an application with the U. S. Fish and Wildlife Service (the Service) for a Section 10(a)(1)(B) Incidental Take Permit. This permit would allow incidental take of the federally endangered Houston toad during the otherwise lawful construction, operation and occupation of a high adventure Boy Scout Camp on Griffith League Ranch. BSA/CAC prepared a Habitat Conservation Plan (HCP) to address its preferred development plan, the Preferred Alternative (Chapter 3). Implementation of the HCP (Chapter 6) would avoid, minimize, and mitigate potential impacts on the Houston toad to the greatest extent practicable.

## **2 PURPOSE OF AND NEED FOR ACTION**

The entire Griffith League Ranch is situated within an area known to be Houston toad habitat. (Appendix C). The property lies partially within federally designated critical habitat for the Houston toad (Figure 4). Houston toads are known to occur on the tract (Forstner 2000, 2001, 2002a, 2003). Habitat destruction and habitat fragmentation are the primary threats to the species (U.S. Fish and Wildlife Service 1984, Seal 1994).

Because BSA/CAC’s proposed development and use of Griffith League Ranch could adversely impact or cause “take” of the federally listed endangered Houston toad, the Act requires in Sections 10(a)(1)(B) and 10(a)(2)(A) that BSA/CAC prepare an HCP and obtain an Incidental Take Permit prior to proceeding with development. The Incidental Take Permit would allow BSA/CAC to “take” the Houston toad incidental to the otherwise lawful development and use of Griffith League Ranch. The purpose of the HCP is to identify and avoid, minimize or mitigate adverse impacts (take) on the species, thereby contributing to its long-term survival and recovery.

Since the issuance of an Incidental Take Permit by the Service is a federal action which could result in take of the Houston toad, the agency is required by Section 7(a)(2) of the

Act to participate in an intra-service consultation to assure that their action “is not likely to jeopardize the continued existence” of the species. Issuance of an incidental take permit by the Service is also a federal action requiring National Environmental Policy Act (NEPA) documentation and analysis with an opportunity for public review and comment.

This combined Environmental Assessment and Habitat Conservation Plan (EA/HCP) serves to meet both the requirements of NEPA and the mandates of the Act. A separate intra-Service section 7 consultation will be conducted before any permit is issued. The EA/HCP describes the proposed project, the alternatives considered, including the preferred action, and the existing environment. It evaluates the environmental consequences of implementing each alternative, including effects on the Houston toad and federally designated critical habitat. The HCP (Chapter 6) defines mitigation measures proposed by BSA/CAC to offset the effects of development and use (take) on the Houston toad and prevent “jeopardy” to the species. This EA/HCP would establish the conditions under which BSA/CAC would meet the requirements for a Section 10(a)(1)(B) permit under the Act. This document would also serve as a management guide to promote the protection and recovery of the Houston toad on Griffith League Ranch.

### **3 ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE**

This chapter identifies and describes three options considered by BSA/CAC for the development and operation of a high adventure Boy Scout camp on Griffith League Ranch. These alternatives include: A) the Preferred Alternative, B) an Alternative Site Design and C) a No Action alternative. Chapter 4 provides a description of the environment on Griffith League Ranch. The environmental effects of each alternative action, including levels of take of the Houston toad and reasons for selection or rejection of alternatives, are analyzed in Chapter 5 Environmental Consequences. Levels of “take” of the Houston toad that could occur under each alternative are also discussed.

The HCP, presented in Chapter 6, was developed in consultation with the Service’s Ecological Services Office in Austin, Texas, and the Regional Office in Albuquerque, New Mexico. It is designed to avoid, minimize, rectify, reduce or eliminate, and/or mitigate impacts resulting in take of the Houston toad as a consequence of implementing the Preferred Alternative. BSA/CAC would also facilitate research, conduct education programs to promote recovery of the Houston toad, and prevent its take as a result of management action or use of the ranch. The HCP proposes mitigation measures to offset impacts of the Preferred Alternative on the Houston toad.

Initial plans for developing Griffith League Ranch as a Boy Scout camp began in 1993 shortly after Lavinia Griffith Sanders bequeathed her property to BSA/CAC. The original concept plan called for considerable development. It maximized use of the property to meet both BSA/CAC objectives and fulfill the wishes of Mrs. Sanders. When BSA/CAC became aware that portions of the tract are within potential--and actual--Houston toad habitat, professional planners and biologists were contracted to assess the implications that the presence of an endangered species would have on development and use of the tract.

Upon learning that much of the ranch includes prime Houston toad habitat and that the species does, in fact, occur on the tract, BSA/CAC began to modify their original plans with a view toward reducing impacts on the Houston toad. The Alternative Site Design presented in this chapter is the result of scaling down the original concepts in an effort to reduce adverse impacts on the Houston toad and its habitat. The Preferred Alternative is the product of further modification of the plan. Its goal is to avoid impacts or assure minimal adverse impacts on the species while still fulfilling the aims and needs of BSA/CAC to provide outstanding outdoor educational and recreational opportunities for America's youth. Development of Griffith League Ranch is a long-term project driven by fund-raising opportunities. Dependent upon BSA/CAC's ability to promote the necessary funding, full build-out as proposed in the Preferred Alternative or the Alternative Site Design could take twenty to thirty years. While the number of phases and the components of each phase have not been fully determined at this stage of planning, the first phase would promote low-impact activities such as hiking, orienteering, camping with a "leave-no-trace" ethic, skills and confidence training, education related to land stewardship, and education related to the presence of the Houston toad (Appendix B). Subsequent phases of development would be dependent upon fund-raising campaigns, the results of research and the preparation of ranch (natural resources) management plans designed to avoid or minimize impacts on the Houston toad.

### **3.1 ALTERNATIVE A - THE PREFERRED ALTERNATIVE**

Implementation of the Preferred Alternative would allow BSA/CAC to meet its goal of providing outstanding outdoor education and recreation opportunities for older Scouts while providing the best possible stewardship for a significant portion of the Lost Pines ecosystem. The Preferred Alternative represents the minimum scale development plan. Originally, the development plans called for extensive development without regard to placement. Once the presence of the Houston toad was discovered, the plans were scaled back numerous times, the number and size of facilities were reduced, and facilities were selectively placed based upon concerns for the toad. In addition, most development and facilities were congregated in an area that was determined to be the least suitable for the Houston toad. After this significant reduction from the initial plans for Griffith League Ranch, BSA/CAC reached a delicate balance in developing the components of the Preferred Alternative that will provide both a safe-haven for the Houston toad and an opportunity for BSA/CAC to provide outstanding education and recreational opportunities for America's youth. Accordingly, after careful consideration, BSA/CAC determined that the Preferred Alternative embodies the best alternative for both the co-existence of the Houston toad and the educational and recreational opportunities for the youth of America.

The site plan of the camp's conceptual design under the Preferred Alternative was begun coincident with the development of scientific data depicting the actual habitat use of the entire Griffith League Ranch by the Houston toad. The research began on February 7, 2000, and continues through to the present. As this crucial information was assembled, development concepts and scope were fluidly adapted to the emerging description of Houston toad occurrence, relative densities, and current distribution on the property.

The Preferred Alternative, detailed below, represents a direct compromise of development and site design in favor of minimizing impacts to the Houston toad. This strategy was derived from research specifically examining the population of Houston toads on the Griffith League Ranch itself. Hence, the Preferred Alternative incorporates significant minimization of impacts to the Houston toad as an integral part of its conceptual design and layout. From the outset the Preferred Alternative sought to ameliorate potential impacts to the toad by moving construction away from areas known to be used by the toad. The main center of activity will be placed in an area of the ranch not currently used by the Houston toad. The Preferred Alternative would cluster activities into a central region as opposed to the Alternative Site Design that spreads a greater number of facilities throughout a larger area of the Griffith League Ranch. Soil types, vegetation and proximity to active breeding ponds were all factors considered in site selection. Under the Preferred Alternative, buildings that have significant impermeable surfaces and irreversible impacts to the environment (e.g. conference center) have been located in areas of the ranch that have not shown Houston toad activity over three annual activity cycles (Forstner 2000, 2001, 2002a, 2003). This location for the proposed conference center directs most visitor vehicular traffic and parking to the main gate area thereby limiting the traffic from entering more sensitive areas of the ranch known to be more suitable to the Houston toad. The Preferred Alternative more stringently clusters development to a main area, and this design also achieves a minimum of disruption to existing forested areas by placing the golf course and conference center complex within existing pastures. The main roadway into the ranch would remain short and bisect an area that does not currently support Houston toads.

While high disturbance activities are clustered in the Preferred Alternative, low disturbance activities are spread throughout the property so as to keep the impact of these activities as low as possible. Low and moderate disturbance activities such as biking and hiking would be spread throughout an area instead of clustered in order to avoid elevating these disturbance activities into high disturbance activities. Accordingly, the Preferred Alternative provides comparatively minimal impact by clustering some activities and dispersing others.

Development of the ranch would occur in several phases. Phases would be determined by the success of fund-raising campaigns, the results of research, and the preparation of the various Ranch Management Plans. Complete build-out as proposed in the Preferred Alternative could extend for the life of the permit. Development would be mitigated as it occurs according to the area of disturbance (Table 1) and the mitigation ratio established by the HCP. Development in Phase 1, the initial construction contemplated would include:

- 1) Construction of about 4,330 feet of an 18-foot wide all-weather entrance road to the Base Camp Complex;
- 2) Construction of the main ranch gateway and wrangler quarters at the camp entrance;
- 3) Construction of a ranger's residence near the camp entrance;
- 4) Construction of six 16-person dormitories as part of the Youth Leadership Skills Training Center (Base Camp Complex);

- 5) Construction of five camping pods for the Youth Leadership Skills Training Center (Base Camp Complex);
- 6) Construction of the Challenging Outdoor Physical Experience Course (COPE Course);
- 7) Construction of the Field Sports Education Area to include rifle and pistol ranges, a sporting clay range, a skeet range, a trap shooting range and an action archery range;
- 8) Construction of a non-denominational spiritual renewal chapel;
- 9) Construction of approximately 20 miles of hiking and horseback trails;
- 10) Construction of the Chisholm Trail Outdoor Learning Center, to include a horse stable; feed and tack room, a blacksmith shop, a wooden windmill, two split-rail catch pens, and one three-acre camping pod with restroom and shower facilities;
- 11) Construction of the Fort St. Louis Outdoor Learning Center, to include a trading post and theme center, the Fort St. Louis stockade and a Native-American village with teepees for overnight camping; and
- 12) Construction of the Native Texan Wild Game Preserve and Observation Area, to include fencing and construction of three observation towers.

Use will gradually increase over time to a peak operation during the months of June, July, and August, when about 720 Scouts and Scout leaders would visit the camp each week for one-week experiences. Weekend and weekday use during other times of the year would probably not exceed 100 persons per day, such use being confined mostly to the conference center/base camp area. This projected rate of use equates to 62,540 user-days and 35,120 user-nights per year, or 97,660 total visits annually. Some 48 percent (30,240) of the day-use visits and 72 percent (25,920) of the projected overnight visits would occur during the six-week summer scouting season in June and July. By way of comparison, Bastrop State Park's visitation for the five-year period 1996-2000 ranged from 290,151 to 515,337 user-days and 32,702 to 53,542 user-nights per year, or from 322,853 to 566,215 total visits per year (Mask 2001). A staff of about six permanent, year-round employees would manage the camp, with an additional 46 temporary workers employed during peak season.

While at the camp, Scouts would be introduced to new skills and challenges designed to provide an appreciation of the cultural and natural heritage of the state of Texas. Through appropriately designed activities, Scouts would learn of the pre-history, history and natural history of Griffith League Ranch and its environs. They would be involved in natural resources management projects and on-site learning activities, including projects and activities related to threatened and endangered species, the Endangered Species Act and management of the Houston toad. Activities would emphasize low-impact uses such as "leave-no-trace" camping and land use, hiking, orienteering, backpacking, and other wise land stewardship practices.

The Griffith League Ranch conference center complex, when not being used by Scouts, would be made available to corporations, governmental and non-governmental entities, non-profit educational groups, schools and universities for conferences, seminars, training, and group retreats. Non-Scout users would be provided opportunities to acquaint themselves with both the historical and environmental aspects of the tract. BSA/CAC staff or volunteers would provide education about the Houston toad and

endangered species management. During the Houston toad breeding/dispersal season, user activity near breeding sites, particularly at night, would be restricted or closely supervised.

To mitigate anticipated impacts on the endangered Houston toad if the Preferred Alternative is implemented, BSA/CAC would commit to managing Griffith League Ranch in such a manner as to foster a healthy and biologically diverse ecosystem and promote the long-term survival and recovery of the Houston toad. Lands would be set aside by conservation easement on Griffith League Ranch to mitigate habitat impacted by the Preferred Alternative. In addition to the creation of the conservation easement, the HCP provides the opportunity for BSA/CAC to enter into a Conservation Bank Agreement with the Service. Credits in the Conservation Bank not used by BSA/CAC could be sold to others having a need to mitigate for impacts on the Houston toad within its range. Chapter 6 restricts use and development on the tract and proscribes low-impact uses and management procedures that would avoid and minimize impacts on the Houston toad. In addition, BSA/CAC would prepare several ranch management plans, such as vegetation and wildlife management plans, and consult with the Service regarding impacts to the Houston toad. These ranch management plans would consider and minimize management impacts on the Houston toad. The HCP and the management plans would emphasize research-based adaptive management of the tract's natural resources. These management plans would not result in greater impacts to the Houston toad than outlined in this EA/HCP.

### **3.1.1 Camp Entrance Complex**

The main entrance to the camp would be through the 50-acre extension of the main tract on the northwest side of the property. All of the proposed development (shown on Figure 5) in this extension would be in existing pasture. While this parcel is not known to support Houston toads, it does offer some suitable soils and a few pines. The adjacent property appears to have good habitat for the species, and Houston toads have been heard calling from that area (Forstner 2001, 2002).

The entrance road would be an all-weather, gravel-surfaced roadway having a width of 18 feet with five-foot shoulders. This "main road" would extend about 4,330 feet from the gate to the Conference Center/Base Camp Complex. The entrance would be appropriately marked with informational and directional signs.

The focal point of the entrance complex would be a 2,300 square-foot Main Gateway and the Chisholm Trail Outdoor Learning Center (described below). A 1,800 square-foot Ranger residence would be constructed outside the fenced pasture near the southwest corner of the extension. This residence would be connected to the entrance road by a 400-foot driveway (secondary service road) about eight feet in width. A pod containing three group campsites for Scout crews utilizing the Chisholm Trail Outdoor Learning Center (see discussion below) would be located in a small patch of open woodland to the south of the corral.

### **3.1.2 Conference Center/Base Camp Complex**

The Conference Center/Base Camp Complex would be the zone of most intensive use and development on the property. It would serve Scouts and Scout leaders and be the primary use area for non-Scout groups. Constructed between the two fingers of a proposed 187-acre lake in the western corner of the property (see discussion below and Figure 5), the complex would include a 5,000 square-foot Conference and Training Center, a 4,000 square-foot Museum, a 3,500 square-foot Ranch Headquarters, a 2,000 square-foot computer lab, and six dormitories (2,000 square-feet each) with a capacity of 16 persons per dorm. A two-acre all-weather surfaced parking lot with a capacity of 200 vehicles would be located adjacent to the conference center, ranch headquarters, and museum.

An open-air chapel would be located near the lake between the dormitories and Base Camp. Two 400-foot sand beach areas would be established: one between the dorms and computer lab for use by dorm residents and the other between the chapel and Base Camp for use by Scouts camping at the Base Camp.

These facilities, with their associated infrastructure such as trails and utilities, would be situated in, or on the edge of, existing pastureland to minimize impacts on Houston toad habitat. Information about the Houston toad and its management would be exhibited at the museum and check-in area. Site bulletins with information about the species and explanations of activity restrictions in toad habitat would be posted in dorm rooms, on bulletin boards, and on informational kiosks. Extensive efforts would be made in this zone to raise awareness of the Houston toad's presence on the tract and management efforts directed toward its survival and recovery.

A three-hole, environmentally friendly golf course would be developed north of the conference center along the north side of the lake's northernmost finger. By using a design with three tee options for each fairway, nine holes of golf could be played on the course. The golf course would occupy about 34 acres of existing pastureland, part of which would be revegetated with native plants. The course would require less maintenance (mowing, fertilizer/chemical treatments) than those of standard golf course design, and BSA/CAC would seek Audubon certification of the course. Both the location and design of the course would minimize impacts on the Houston toad. Houston toads have not utilized the only potential breeding site for Houston toads in the area, Pond 4, during the three breeding seasons from 2000 to 2002 (Forstner 2000, 2001, 2002a).

A gated, unsurfaced secondary service road having a width of 10 feet with three-foot shoulders would extend from below the parking lot to the Base Camp area. In addition to providing access for service vehicles, this roadway would serve as foot-trail access between the conference center, base camp, and shooting ranges.

Developed in existing woodlands along the edge of the proposed lake, the Base Camp would consist of five camping pods of about three acres each. Each pod would accommodate three campsites. Each campsite would have a capacity of 34 persons. Undisturbed native vegetation would separate each camping pod and individual campsites. A typical group campsite would include picnic tables and adequate "living space" for one crew (Figure 6). "No-trace," "light-on-the-landscape" camping would be

emphasized and ground fires would be prohibited. Use of camping pods would be rotated on an annual basis so that no more than two of the five pods would be utilized in any given year. Two restroom/shower buildings (400 square-feet each) would service the Base Camp, beach, and shooting ranges.

Shooting ranges for rifle, pistol, shotgun, sporting clays, and trap/skeet and an action archery course would be located just off the service road in woodlands to the east of the Base Camp. Shooting ranges would be designed to recycle lead. Skeet, trap and sporting clay ranges would utilize steel shot. Combined, these ranges would occupy about 15 acres. Trees and brush would be cleared as necessary to accommodate the ranges, and the ranges would be planted in native grasses and forbs requiring infrequent mowing. Narrow (24-inch) unimproved footpaths would connect the shooting and archery ranges, camping pods, beaches and conference center.

### **3.1.3 Challenging Outdoor Personal Experience (COPE) Course**

A Challenging Outdoor Personal Experience (COPE) course (also referred to as a Ropes Course) in the Leadership Skills Outdoor Learning Center would be developed on about 20 acres east of the Conference Center/Base Camp Complex (Figure 5). This course would consist of a 15-element low course, an 11-element high course, and an eight-element course for persons with disabilities. The course would also feature a zip line, a climbing-rappelling wall, and a staging shelter. Anchor poles would be erected instead of utilizing trees for anchor points. Access to and through the courses would be over unimproved 24-inch footpaths from the Conference Center Complex. Each COPE element would utilize a space having a radius of from 30 to 100 feet. Elements would be separated by at least 100 feet of natural growth. Wood chips would be used as ground cover in heavy use zones to protect the soil from compaction or erosion.

### **3.1.4 Outdoor Learning Centers (Program Areas)**

Six Outdoor Learning Centers (OLC), or program areas, in addition to the Leadership Skills OLC would be constructed at outlying locations on the tract (Figure 5). The basic design of an OLC (Figure 6) would be similar to that of the Base Camp. The typical OLC would consist of three camping pods (three acres each) with three group campsites in each pod. Each campsite would accommodate a crew of 34 persons. A typical group campsite would include picnic tables and adequate “living space” for a crew. The three camp pods would share a common theme center (2,500 square-feet), restroom/shower building (800 square-feet), septic system, and potable water source. The theme center of each area would be designed to complement the activities of that particular area. Staff quarters would be included in the theme center building. “No-trace camping” and “light-on-the-landscape” uses would be emphasized. Ground fires would be prohibited until approval of the Fire Management Plan and then will be limited to established fire pits in camping pods and established group activity areas. Unimproved 24-inch foot trails would connect campsites to the theme center and restroom/shower building. Camp pod use would be rotated on an annual basis to reduce impacts to vegetation and soil. Wood chips would be used for ground cover in heavily utilized areas to prevent soil compaction or erosion.

Information on the Houston toad, its management on Griffith League Ranch and nearby lands, on endangered species in general, and on the Lost Pines ecosystem would be provided at each program area in the form of signs, information kiosks, programs or educational activities. Educational endeavors would promote minimization of impacts on the Houston toad and the landscape, foster resource stewardship, and benefit natural and cultural resources. Education would be a key component in preventing take of the Houston toad by the users of Griffith League Ranch.

#### **3.1.4.1 *Chisholm Trail Outdoor Learning Center***

The Chisholm Trail Outdoor Learning Center would be centered on a 7,920 square-foot horse stable with tack and feed room, a corral with two split-rail catch pens, a 400 square-foot vintage log blacksmith shop, chuck wagons, and a wooden windmill (Figure 5). The theme of this area would be horses and horsemanship, longhorn cattle, roping, and branding. Development would deviate slightly from the typical OLC design. The focal point would be the corral with its adjacent buildings. Rather than constructing a separate theme center, the proposed ranch structures (stable, corral, and blacksmith shop) would be used for program activities. The adjacent pasture would be fenced for approximately 12 longhorn cattle, except for calving, and 45 horses. An open stand of trees to the south of the corral would shelter a single three-acre camping pod and restroom/shower facility. The pod would contain three group campsites with a capacity of 34 persons each. The stables and corral would serve as the trailhead for horse trails that would wind through the tract.

The corral would be the starting point for a horseback trip that would use trails ending in a pasture adjacent to Alum Creek in the eastern corner of the ranch. Scouts would sleep under the stars in the pasture, cowboy style, and would be fed from a chuck wagon near the creek. After camping overnight, the crew would ride back to the corral. A restroom/shower building would be constructed at the edge of the eastern pasture to provide adequate sanitation. Animal wastes (manure) would be removed and composted on a frequent cycle to prevent flies and stream pollution from runoff. Garbage would be removed from the area by staff, or packed out by Scouts, on a daily basis to prevent pest problems.

Portions of some pastures would serve as hayfield and grazing areas for cattle and horses. Existing pasture fences would be maintained to contain livestock within those pastures. Pasture vegetation would be restored to native grass prairie-type vegetation. To eliminate adverse impacts on the Houston toad, livestock would be watered from aboveground troughs to prevent pollution and trampling of pond-side vegetation at existing stock tanks. Those existing stock tanks that occur within pastures would be fenced to exclude livestock.

#### **3.1.4.2 *Texan Outdoor Learning Center***

The Texan Outdoor Learning Center would be located east of Pond 12 (the Finger Pond) along an existing ranch road trace (Figure 5). This OLC would be of typical design. A total of about 10 acres (including the camping pods) would be developed. The old ranch road trace would be re-opened as a secondary service road and foot trail between the

OLC and the main service road. A foot trail along the road trace would connect the Texan OLC with the Finger Pond.

Activities would center on a theme of subsistence ranching/farming, animal husbandry, weaving and pottery/tool making. Small pens for a few farm animals (goats, chickens, pigs, etc.) would be constructed near the theme center. These animals would be used in educational programs on a seasonal basis. The farm animals would be watered from aboveground troughs so as to minimize impacts on the Houston toad. All livestock, stable and feed wastes would be managed so as not to allow impact on existing drainages or water bodies. Manure from the pens and stables would be composted for use in complementary programs.

### ***3.1.4.3 Republic of Texas Outdoor Learning Center***

The Republic of Texas Outdoor Learning Center would be located on the ridge east of Price Creek and along the southwest side of an existing ranch road trace (Figure 5). A portion of the old road trace would be reopened as a secondary service road and foot trail to connect Republic of Texas OLC with the main service road. A segment of the horse trail system would follow parts of the old road trace from near this OLC toward the southern property line.

The theme of the Republic of Texas OLC would be gardening and orchard care, leatherwork, meat smoking, Dutch oven cooking, and fishing. In addition to the typical program area design, the theme center would include an 800 square-foot smokehouse, a two-acre orchard, and a one-acre vegetable garden. A total of about 14 acres would be disturbed at this site. Pesticide use would be restricted and only done in close consultation with the Service to prevent potential impacts to the Houston toad.

### ***3.1.4.4 Frontier Life Outdoor Learning Center***

Being near the site of an abandoned sawmill, the theme of the Frontier Life Outdoor Learning Center would include forest management education and forest stewardship educational programs and hands on activities such as woodcarving, woodworking, and furniture making. The site, situated to the east of the existing north-south ranch road (Figure 5), has been registered with the Texas Historical Commission (THC) as a locality having potential historical significance. A determination of historical significance would be sought before disturbing the site. Development and activities at this OLC would be centered on historical use of the area for logging and sawmill operations. A short secondary road and foot trail off the main service road would provide access to the Frontier Life OLC.

In addition to the typical OLC design, a small demonstration saw mill requiring an area of about 200 square feet would be established near the theme center. The total area of disturbance would be about 10 acres. The source of trees for use at the sawmill would include trees removed during construction of the camp, hazard trees removed for safety purposes, timber cut as part of a Service approved wild land fire management program, and trees selectively logged as part of an approved forest management plan. With the exception of timber cut for construction of the camp, no clear cutting would take place on the Griffith League Ranch. The main purpose of the Frontier OLC would be to educate

campers on the history of the area and provide a small demonstration to illustrate past sawmill practices. To provide a complete picture of the effect of these historical activities, programs would be implemented to educate campers and adult leaders about the environmental impacts of logging and sawmill operations.

#### ***3.1.4.5 Fort St. Louis Outdoor Learning Center***

The Fort St. Louis Outdoor Learning Center (Figure 5) would be split into two components associated with a proposed 45-acre lake (see discussion of Lake 2, below). The theme of this OLC would be the French period of Texas history, trading, and Native American culture. The two components of this OLC would be connected by a foot trail and, if Lake 2 is constructed, by a canoe trail. Canoe livery and launch sites on both sides of the lake would be included in the zone of disturbance. Each component would also be individually accessed by secondary service roads and foot trails.

A 4,600 square-foot stockade and 2,500 square-foot trading post theme center would be located on the south shoreline of the proposed lake. A boat building and trapping area would be featured nearby. A restroom facility would be constructed to handle sanitation needs. Development of the Fort St. Louis component, primarily a day-use area, would impact about 12 acres of existing woodland.

A reconstructed Native American village, with a theme of Native American culture and skills, would be constructed on the north shore of the proposed lake. This area, containing Tonkawa-style thatched huts or teepees and a restroom/shower, would be the overnight camping zone for the Fort St. Louis OLC. About seven acres of woodland would be disturbed by this component.

#### ***3.1.4.6 Cities of Cibola Outdoor Learning Center***

The Cities of Cibola Outdoor Learning Center (Figure 5) would be located to the east of the proposed dam that would impound Lake 3 (see discussion of Lake 3, below). The theme of this OLC would be geology, gold and silver mining, and exploration.

The Cities of Cibola OLC would utilize the typical design. With its three camping pods, theme center, and restrooms, development would impact about 10 acres of forested cover. Access for hikers and service vehicles would be via a secondary service road along the edge of an existing pasture.

#### ***3.1.4.7 Anticipated Future Expansion of Outdoor Learning Centers***

Population in the 15-county area served by BSA/CAC is predicted to increase by 133 percent between 2000 and 2030 (Texas State Data Center 2000). Future expansion of amenities to meet the needs of an anticipated growth in Scout population during the life of the permit could require development of six additional Outdoor Learning Centers. These six new areas would accommodate an additional 612 Scouts and their leaders each week during the summer scouting season. Maximum capacity of Griffith League Ranch during the Scouting season would increase from 720 to approximately 1325 persons per week when the additional six OLC's came on line. Each additional OLC would require 10 to 14 acres for development, (between 60 to 84 acres for all six OLC's). Design

would be typical (Figure 6) and uses would be similar to those discussed above. Developed under an adaptive management strategy, specific locations for these six sites would be determined after consultation with Houston toad biologists and the Service and consideration of the most current information on the species.

### **3.1.5 Lakes**

Three lakes would be constructed on the tract (Figure 5, Palafox 1994). Vegetation would be cut, chained, or otherwise cleared from the lakebeds and dam sites prior to construction. Clearing and construction would occur during months that the Houston toad is believed to be less active (June through December) to minimize impacts of construction on the species. The lakes would be filled slowly during the period that the species is emergent (December through May). This would allow individual toads to move freely and escape rising water levels. While these lakes would impound runoff from their respective watersheds, it is likely that water levels behind the dams would fluctuate because of seepage and evaporation. To maintain water levels, wells would be drilled nearby to provide supplemental water for the lakes. All required permits would be obtained prior to construction of the dams or drilling of wells for supplemental water supply. And no groundwater withdrawal or well construction for use in the filling and maintenance of the proposed lakes will be commenced until the impact of such withdrawal has been evaluated. Further, the plans for the construction of Lakes 2 and 3 will incorporate the results of monitoring conducted on Lake 1.

Lake 1, largest of the proposed lakes and the first to be established, would impound about 187 acres behind a 2,100-foot dam in the western corner of the tract. This lake, with a maximum depth of about 40 feet, would flood about 17 acres of existing pasture and 170 acres of existing woodlands on an unnamed tributary of Piney Creek. Lake 1 would inundate drainage below the Finger Pond (Pond 12). This drainage has the only known source of spring-fed surface water on the property. Because this drainage is a permanent, year-round surface-water source, it could potentially serve as a Houston toad-breeding site, although no breeding there has been observed so far (Forstner 2000, 2001, 2002a). Prior to construction, surveys would be conducted to characterize the habitat and determine the extent of its use by the Houston toad. Post-construction, studies would be conducted to document the lake's impact on Houston toads and to determine whether or not the species can successfully use shallows along lake margins for breeding.

Construction of Lakes 2 and 3 would be postponed until research from Lake 1 has been analyzed. Lake 2 would be a 45-acre, 40-foot deep lake in the north central part of the tract. Its 900-foot dam would be constructed across an unnamed tributary of Alum Creek. Lake 3 would be a 55-foot deep, 90-acre lake in the south central part of the tract. A 1,900-foot dam across another unnamed tributary of Alum Creek would impound Lake 3. The design of Lakes 2 and 3, if and when constructed, would be modified to reflect the findings at Lake 1. The lakes would be stocked with fish. While preliminary results from Dr. Forstner's current research indicate that fish predation is not a serious threat to the species, further investigations on predation of Houston toad eggs and tadpoles by fish would be initiated to determine how best to manage the fishery in Houston toad habitat. Should such studies indicate that fish predation is a serious threat to the species,

appropriate lake designs would be constructed and maintained to reduce predation and encourage successful reproduction of the Houston toad. Fish would also be removed at specific breeding ponds if predation by fishes were determined to be detrimental to Houston toad survival. In addition, effects of pathogens from stocked fish, bait, or other introduced animals would be evaluated and assessed. Monitoring results would be used to alter and adapt current plans for the benefit of the toad.

### **3.1.6 Trails**

Current levels of planning preclude preparation of detailed trail maps. The major trail routes depicted in Figure 5 indicate corridors through which proposed trails would pass. Exact routes would be determined prior to construction and after consultation with Houston toad biologists. Approximately 20 miles of trail would be constructed in Phase 1 of the project. Routes, construction methods, and timing of construction would take into consideration potential impacts on the Houston toad. Avoidance and minimization of take would be emphasized in final trail design and construction. Calculation of the acreage required to mitigate take of Houston toad habitat resulting from trail construction would be based upon an eight-foot wide corridor of disturbance for foot trails and a 20-foot wide corridor for horse trails.

Secondary service roads, being only eight feet in width and having low vehicular traffic usage, would serve as hiking trails and pedestrian paths where feasible. Footpaths would be established to connect amenities within developed areas. New trails would be constructed to connect use areas and connect with other trail segments to form loop trails, where desirable. Trails would be cleared of vegetation and maintained for foot traffic. In most locations, foot trail widths would range between 18 and 48 inches, depending upon the purpose of the trail and the amount of use it would receive. In the more intensively used areas, trail treads would be surfaced with wood chips to prevent soil erosion or compaction.

An equestrian trail about 12 miles in length would be constructed roughly around the perimeter of the tract. This trail, built and maintained to horse-use standards, would utilize existing road traces and follow old logging skid paths, fence lines, and secondary roads where appropriate. A 3.5-mile horse trail would traverse existing pastures between the Chisholm Trail Outdoor Learning Center and the East Pasture near Alum Creek (Figure 5). During the initial phases of trail use, animal waste concentrations would be evaluated and, if deemed necessary in consultation with Houston toad biologists, a management plan would be implemented to minimize potential eutrophication of Houston toad breeding sites. No trail construction will be conducted on the Griffith League Ranch until a trail plan has been reviewed and approved by the Service. Further, these trails will be constructed based on minimization and mitigation strategies to reduce adverse impacts to the Houston toad

### **3.1.7 Native Texan Wild Game Preserve and Observation Area**

A native wild game preserve and observation area of about 650 acres would be established in the eastern part of the property (Figure 5). Animals such as bison, elk, and antelope would be stocked in the preserve. The reintroduction of such native species

would be based upon the advice and recommendations of wildlife specialists. Total numbers of animals would be kept minimal, the purpose being to provide Scouts an opportunity to observe wildlife native to Texas rather than propagation of a stable or viable population of each species.

Because total numbers of these animals would be low, they would be permitted to water at Alum Creek, at existing stock ponds within the wild game preserve and possibly on the shoreline of Lake 3. Should it be determined that watering at these locations adversely impacts the Houston toad, the animals would be excluded from these water sources and watered at above ground troughs, as are livestock. Depending upon how well they adapt to the range, these animals would either be left on the range year-round or brought to the ranch only for the summer months on a put-and-take basis.

Scouts and other visitors would have access to three observation towers near open areas or water tanks for viewing these animals. One tower would be located near the Cities of Cibola OLC, a second near Pond 17 and a third in the pasture east of Alum Creek. The footprint of each tower would be about 25 by 30 feet. The towers would all be placed in existing pastureland to minimize impacts on soils, vegetation, and Houston toad habitat. Keeping wildlife within the preserve would require replacing existing boundary fence with suitable wildlife fencing and construction of about two miles of new cross fence.

### **3.1.8 Caretaker Residence and Maintenance Area**

An existing ranch house, a ranch worker's house, a pole barn, and a horse barn are located near the center of the tract. These structures are either in existing pasture or disturbed woodland (Figure 3 and Figure 5). The existing houses would be refurbished for use as caretaker and staff residences. Sheds and barns would be utilized, if serviceable, for storage of equipment. Debris and junk that has accumulated in this area would be removed, and those structures no longer serviceable would be demolished.

A new 3,000 square-foot shop and equipment storage building would be constructed inside a fenced, five-acre compound on the north side of the main service road across from the existing horse barn. Activity and development in this compound would be kept away from Pond 8, a known Houston toad-breeding site. Contingency plans for managing spills and possible pollutants that might threaten Pond 8 would be prepared.

### **3.1.9 Circle D Volunteer Fire Department**

A ten-acre parcel near the south gate (Figure 5) would be provided for the Circle D Volunteer Fire Department (VFD). This local rural volunteer fire department would provide service to Griffith League Ranch as well as the local community. Under the partnership, the VFD would provide fire prevention and protection services, including assistance with prescribed fire, to BSA/CAC on Griffith League Ranch and Lost Pines Scout Camp.

The VFD would fence the plot and construct an office, engine shed, fire cache, related storage facilities, and parking. Clearing within the 10-acre compound would be limited to the amount of space required for operation of an efficient fire department in a safe

manner. BSA/CAC would assure that the VFD's use of the property was in compliance with the terms of the HCP.

### **3.1.10 Utilities**

The details of water, wastewater, electric, and telephone service are pending engineering design. Utility system structures and corridors have not been depicted on Figure 5 at this stage of planning. To mitigate for impacts on the Houston toad from construction and future maintenance of utility structures and corridors, BSA/CAC would set aside habitat within the conservation easement area at a 0.6:1 acre ratio based on the disturbance footprint after design of these features has been completed and before construction commenced.

A water distribution system would be constructed to service the Entrance and Conference Center/Base Camp Complex, Caretaker's Residence, and Maintenance Area. The water line would enter the property at the south gate and follow the current water line right-of-way along the roadway to the existing residences. The line would be extended to serve the proposed Circle D Volunteer Fire Department facility. A local provider would supply potable water. Water at outlying OLC's would be supplied by wells, ground transport, or buried waterlines, as appropriate. Well water would be used to maintain levels in the three proposed lakes.

Wastewater for the Entrance Complex and Conference Center/Base Camp Complex would be treated at an on-site wastewater treatment plant located in the development envelope of the conference center. Treated wastewater would be used to irrigate the golf course and landscaping around the Entrance and Conference Center/Base Camp complexes. Wastewater at the outlying OLC's and Caretaker's residence would be managed with individual septic systems. These septic systems are included in the development footprint for the OLCs and Caretaker residence complex on Table 1.

Electric and communication services would be distributed to the Entrance Complex, Conference Center and Caretaker's Residence/Maintenance Area. Where feasible, electric and communications services would follow the same corridors as water and wastewater. The OLC's would be solar powered.

Because trenches, pits, and holes could trap or injure individual toads, such hazards would be covered overnight. Erosion control devices would be used during construction to minimize sedimentation of nearby ponds and wetlands. These devices would remain in place until disturbed areas were fully revegetated. Utility rights-of-way and other disturbed areas would be replanted with native vegetation. Construction and maintenance of facilities having potential to disturb Houston toad habitat would be conducted during the time of year the toad is least active (June through December). BSA/CAC would educate construction and maintenance personnel about the Houston toad and measures to be implemented to avoid or minimize take of the species.

### **3.1.11 Road System**

The corridors of most existing ranch roads, some ranch road traces, and a few old logging traces would be utilized as entrance roads, main service roads, and secondary service

roads (Figure 5). Some existing road traces would be reopened and maintained as secondary service roads for occasional vehicle traffic and foot or horse use. Roadways would be maintained periodically to facilitate access and protect investments. Herbicides would be used in the road corridors only as a last resort and only according to a Service approved Integrated Pest Management Plan. BSA/CAC would mitigate impacts on Houston toad habitat in road corridors by setting aside habitat by conservation easement, as called for in the HCP.

The Boy Scouts of America, Engineering Services Division, has established construction and maintenance standards for entrance roads, main service roads and secondary service roads (Boy Scouts of America, undated). The road from the main entrance to the Conference Center/Base Camp area and a short segment of road between the South Gate and the Circle D Volunteer Fire Department compound would be upgraded to Entrance Road standards (Figure 5). Entrance roads would have two lanes, an 18-foot width with five-foot shoulders, a crushed rock base with graded or compacted gravel surface, and culverts and ditches to channel runoff.

Main service roads would be 10 feet wide with three-foot shoulders. They would be compacted or graded gravel with culverts or ditches to channel runoff. Main service roads would be used only where traffic load was heavy enough to justify the cost of construction. Secondary service roads would typically be unsurfaced, eight feet wide with no shoulders, and with only that drainage necessary to eliminate erosion problems. Secondary service roads would be as simple and unobtrusive as possible.

Some of the main and secondary service roads and a portion of the proposed horse trail would be routed through existing pasture to minimize impacts on prime Houston toad habitat. To further minimize impacts on the species, much of the road and trail system would follow pre-existing routes. Secondary service roads, foot trails and the equestrian trail would be minimally intrusive by design and require only minor landscape alterations. Slow speeds, light traffic loads and primarily daytime use would minimize the chances that accidental vehicle strikes would occur.

### **3.1.12 Fencing**

BSA/CAC has concerns over liability issues and trespass. The Preferred Alternative calls for stocking cattle and horses on the ranch during the summer and introducing certain native wildlife within a wild game preserve. Fencing adequate to prevent trespass and contain livestock and native animals would be constructed where needed. All fence lines would also serve as firebreaks for wildfire prevention, wildfire suppression, and prescribed fire activities. Fence lines could also be used as foot and horse trails.

Existing perimeter fence would be maintained on a routine basis or replaced as necessary. New fence would be constructed where needed and maintained on a routine basis (Figure 5). Existing fence corridor widths (approximately 20 feet) would be maintained and all new fencing would have a 20-foot corridor to facilitate construction and maintenance. All fencing would be installed so as to not interfere with dispersal of the Houston toad.

### **3.1.13 Vegetation Management Plan**

Before any manipulation of existing vegetation outside of construction footprints, BSA/CAC would prepare a Vegetation Management Plan (VMP) for Griffith League Ranch. This plan would be one of several management plans designed to guide management of the ranch's natural resources. Maintenance of biological diversity in the Lost Pines ecosystem would be emphasized. The VMP would contain basic vegetation descriptions and maps. It would promote application of the best available information and technology to vegetation management activities so as to avoid or minimize adverse impacts on the Houston toad and its habitat. The plan would include sections on landscaping and landscape management, forest management, revegetation and restoration of abandoned pastureland, disturbed sites and logged areas, fire management, control of non-native vegetation, and integrated pest management. Concurrence and approval of the VMP by the Service would be obtained prior to implementing the plan or any of its sections. In an annual review meeting, BSA/CAC and the Service would review any aspects of the plan or its sections that could impact the Houston toad. Modifications would be made, if needed.

#### ***3.1.13.1 Landscaping and Landscape Management***

A Landscape Management Plan would be a section of the VMP. It would specify that all developed areas be landscaped with trees, shrubs, grasses, and forbs native to the Lost Pines region. Vegetation in and around developed areas would be mowed and trimmed so as to fire-safe facilities and maintain an aesthetically pleasing view. This plan may allow use of prescribed fire as a vegetation management tool. To protect life, property, and infrastructure investment, vegetation would be managed more intensively near structures and roadways, grading into less intensive management that would blend into surrounding undisturbed cover away from structures. Native grasses and forbs would be maintained on the shooting ranges and the COPE course. Non-native turf would be used on the proposed golf course only where necessary.

#### ***3.1.13.2 Forest Management***

If any forest management or prescribed burning were anticipated, BSA/CAC would prepare a Forest Management Plan as a section of the VMP. Concurrence and approval of the Forest Management Plan by the Service would be obtained prior to implementing the plan. The objective of the plan would be to maintain a safe and healthy forest on the property. About 4,283 acres of loblolly pine-oak woodlands occur on Griffith League Ranch (Figure 10). Forest management would be used as a means of maintaining biodiversity in these forests located on the tract. Selective thinning of forested lands and removal of hazard trees would be emphasized. The plan would establish a schedule for forest management and detail reforestation projects to foster continued reproduction of loblolly pine over the long term. Studies would be conducted to determine the impacts of forest management on the Houston toad, and findings would be incorporated into adaptive management programs to avoid or minimize adverse impacts on the species. Overall, the main purpose for the Forest Management Plan would be to enhance the current ecosystem, creating a healthier forest. At the same time, knowledge can be

gained about the impacts of such activities on the Houston toad and incorporated into management plans.

### **3.1.13.3 *Revegetation and Restoration***

Prior to revegetation or restoration of the Griffith League Ranch, BSA/CAC would prepare a Revegetation and Restoration Plan as a section of the VMP. Concurrence and approval of the Revegetation and Restoration Plan by the Service would be obtained prior to implementing any projects. This plan would guide revegetation and restoration of disturbed sites to maximize biological diversity and enhance and restore Houston toad habitat on the property. It would include restoration of abandoned pastures, construction sites, and other sites disturbed by natural or human causes. The plan would specify that only plants native to the Lost Pines area would be used in revegetation and restoration projects.

### **3.1.13.4 *Fire Management***

Griffith League Ranch supports fire-adapted plant and animal communities. Prescribed burning is an important tool for restoring natural processes and avoiding catastrophic fires by removing the accumulation of duff and brush in the forest understory. Prior to conducting prescribed burns or a fire management program for the Griffith League Ranch, BSA/CAC would prepare a Fire Management Plan as a section of the VMP. Concurrence and approval of the Fire Management Plan by the Service would be obtained prior to implementing a fire management program. The Fire Management Plan would address prevention of wildland fire, pre-suppression and suppression activities, escaped fire, prescribed fire, and research burns. The plan would establish a fire prevention program and set standards of fire readiness and staff response to wildfires. The use of fire as a management tool to reduce the threat of damaging wildfire, achieve resource management goals, promote diversity in vegetation and wildlife communities, and establish a fire research program would be detailed in the plan. Results of research on optimal burn frequencies for loblolly pine forests would be incorporated into adaptive management programs to avoid or minimize adverse impacts on the Houston toad that could result from fire management activities.

### **3.1.13.5 *Non-native Plant Control***

Prior to engaging in any plant control projects, BSA/CAC would prepare a Non-native Plant Control Plan as a section of the VMP. The plan would call for an assessment of the extent and impact of existing non-native vegetation on native plant and animal communities. It would also call for an assessment of the impact of proposed vegetation control measures on the environment. The program would be designed to maximize the diversity of native plant communities while minimizing or avoiding adverse impacts on Houston toad habitat that could result from encroachment of non-native plants. Concurrence and approval of the Non-native Plant Control Plan by the Service would be obtained prior to implementing any plant control projects.

### **3.1.13.6 Integrated Pest Management**

Before action is taken to control pests on the Griffith League Ranch, BSA/CAC would prepare an Integrated Pest Management Plan (IPM) as a section of the VMP. Integrated pest management seeks to control pests without necessarily or exclusively targeting their elimination. The purpose of this plan would be prevention of adverse impacts on the Houston toad and other environmental components from exotic or invasive species within the context of an overall plan. General goals would include minimizing application of chemical pesticides, herbicides, and fertilizers and preventing hazardous materials spills. The plan would also address red imported fire ants (*Solenopsis invicta*) and other pest insects, potentially dangerous animals such as venomous snakes, invasive species such as the bullfrog (*Rana catesbeiana*), feral animals, weeds and other pest plants, and turf and pasture management. Management options, including physical removal or relocation of vertebrate species, consistent with the goal of minimizing impacts on the Houston toad would be detailed in the IPM Plan. For non-vertebrate species, alternative methods of pest control would be recommended in the plan. Chemical pesticides and herbicides would be used only when other methods failed to produce results. In such cases, those chemicals producing minimal adverse impacts on the environment would be selected for use. Application of chemicals would be carried out by certified pesticide/herbicide applicators following application procedures indicated on chemical labels. Concurrence and approval of the IPM by the Service would be obtained prior to implementing the plan. BSA/CAC and the Service would annually review, and modify if necessary, any elements of the IPM that could have adverse impacts on the Houston toad.

### **3.1.14 Wildlife Management Plan**

Before engaging in acts of wildlife population management, BSA/CAC would prepare a Wildlife Management Plan (WMP) for Griffith League Ranch. This plan would be designed to guide management of the tract's natural resources. Maintenance of healthy wildlife populations and biological diversity in the Lost Pines ecosystem would be emphasized. The WMP would address existing wildlife populations (both game and non-game species) and the introduction of other wildlife native to Texas (such as bison, elk, and antelope). Because the intent of introducing extirpated native wildlife is to afford Scouts the opportunity to observe those animals native to the state rather than long-term propagation of sustainable populations, the numbers of introduced natives would be limited to only a few individuals of each species. The WMP would also have sections on hunting and other wildlife population management methods and control of feral and pest animals such as dogs, cats, hogs, and raccoons.

Because livestock historically grazed the tract between the mid- to late-1800's and 1999, a livestock management plan would be prepared as a section of the WMP. It would address a small herd of Texas longhorns (about a dozen head), about 45 horses, and a variety of farm animals that would be kept on the property to meet educational program objectives. This plan would call for watering of livestock at above ground troughs away from Houston toad breeding ponds, fencing livestock out of Houston toad habitat, and composting manure and other biodegradable wastes to prevent pollution of Houston toad breeding sites.

Threatened and endangered species would also be addressed as a section of the WMP. The HCP (Chapter 6) would serve as the basis of a Houston Toad Management Plan for this purpose. In addition, BSA/CAC would include federally listed species of concern and state-listed threatened and endangered species that occur on the tract. This section of the WMP would guide the management of such species by BSA/CAC.

Concurrence and approval of the WMP by the Service would be obtained prior to implementing the plan or any of its sections. In an annual review meeting, BSA/CAC and the Service would review any aspects of the plan or its sections that could impact the Houston toad. Modifications would be made, if needed.

### **3.1.15 Restrictions on Ranch Operations**

Activities on Griffith League Ranch would be restricted in accordance with the provisions of Section 6.2.1.2. These restrictions, discussed in more detail in Chapter 6, would be designed to guide the management of natural resources on the ranch and protect the Houston toad. As detailed in Chapter 6, these restrictions would require that Scouts and Scout leaders be trained about the Houston toad and its presence on Griffith League Ranch. These restrictions emphasize low-impact activities such as hiking, camping, and backpacking and require that Scout leadership be trained in principles of low-impact use. Guided by ranch management plans and these restrictions, staff, camp users, and contractors would be provided protocols for working in or near Houston toad habitat. Activities adverse to the Houston toad would be restricted or prohibited both in time and location. The restrictions would require utilization of minimally intrusive improvements, particularly in areas away from proposed development. The consequences of failing to adhere to these restrictions or the terms of the permit would be detailed in a plan developed by BSA/CAC. Consistent with the Scout's adaptive management program, restrictions could be amended based upon the results of research.

### **3.1.16 Minimization and Mitigation**

Under the Preferred Alternative, 3,934 acres (81 percent) of the property would be subject to minimum development and low-impact uses. Disturbance levels for proposed activities have been evaluated based on their potential negative effect on habitat. BSA/CAC has been very conservative in its categorization of activities, erring in favor of the Houston toad. The activities have been categorized according to the timing of the activity, the proximity of the activity to breeding areas, the probability of encounter with the toad, the level of disturbance of habitat, the level of interference with access to habitat and the overall impact on the species. Based upon these criteria, the low impact uses have been determined to be those that are currently believed to have little impact on Houston toad populations because the activity does not eliminate habitat and does not affect the toad's access or use of an area. These low impact activities include "light-on-the-landscape" camping and day use, hiking, and orienteering, among others. Approved management techniques and practices would be permitted in the low impact zones.

To offset BSA/CAC activities on Griffith League Ranch that have a potential for high or moderate disturbance of Houston toad habitat, habitat would be set aside by long-term conservation easement on site, which will preclude any further development in the

easement area and provide for long term management for the Houston toad. High disturbance activities represent activities that permanently eliminate habitat, such as the creation of lakes or building complexes, or conversion of forest to pasture. In comparison, moderate disturbance activities are those that do not affect the toad's access or use of the area and the impacts are reversible, but the habitat may be modified or surface vegetation may be eliminated. Moderate disturbance activities include the creation of hiking and equestrian trails, camping pods, projectile ranges; and the maintenance of fire break corridors along the fence lines. The easement-protected habitat would compensate for complete or partial loss of habitat elsewhere on the tract. Acreage would be set aside as the need for mitigation arose, that is, at the time that a project that could result in take commences.

In establishing mitigation ratios, BSA/CAC considered the unique aspects of the Griffith League Ranch, including BSA/CAC's fifty-year commitment to a unique, active, long-term habitat conservation and management plan for the preservation of the Houston toad. Specifically, the Griffith League Ranch is a large tract of land that BSA/CAC proposes to manage on-site. This proposed habitat conservation plan represents a diversion from normal habitat conservation plans and is the only known project of its kind in Central Texas because of the size of the tract and the dedication of the BSA/CAC to prevent harm to an endangered species. Further, based upon current scientific research, BSA/CAC has carefully selected the locations for its facilities in areas that have the least number of known occurrences for the toad and would place them in areas where the toad has not been documented. In addition, BSA/CAC would restrict the development of many of its facilities and activities to the non-breeding and non-dispersal season. Although it is uncertain whether BSA/CAC's construction activities would actually result in take of the Houston toad, BSA/CAC would still commit to mitigate against the possibility of take in these areas. In addition, BSA/CAC would commit to the use of adaptive management techniques. For example, if studies on Griffith League Ranch indicate a decline in the toad population due to BSA/CAC activities, BSA/CAC would alter its proposed plan in order to prevent any further decline resulting from these activities. Further, BSA/CAC has committed to engage in and support ongoing scientific research on the Griffith League Ranch that would be used to adapt management plans for the benefit of the toad based upon the best biological data available at the time. Moreover, BSA/CAC would commit to enhancing the Houston toad's habitat by making many areas of the Griffith League Ranch more suitable for toad breeding populations. These characteristics of the BSA/CAC habitat conservation plan make it unique amongst other habitat conservation plans. Thus, the mitigation ratios for the Griffith League Ranch would not provide a template or set any precedent for future habitat conservation plans nor would they provide a new method or strategy for protecting the Houston toad. Due to the unique nature of BSA/CAC's efforts to protect the toad via research, light use, calculated placement of activities, adaptive management, and a long term conservation focus, mitigation has been established to offset take on the following basis:

- High Disturbance Activities—Acres set aside on a 1:1 basis.
- Moderate Disturbance Activities—Acres set aside on a 0.6:1 basis.

- Low Disturbance Activities—Education and facilitation of research activities by BSA/CAC would compensate for any impacts.

Habitat set aside for mitigation would be on portions of the ranch considered to be Houston toad habitat. A long-term conservation easement would be established first in the north corner of the property, and additional contiguous acres would be added as development occurs. The conservation easement configuration would be designed based on biological data, including known edge effects, that indicates the most suitable configuration, size and placement for the Houston toad. BSA/CAC would commit to preserving the habitat for the Houston toad through continued research and management of the easement. Low and limited moderate disturbance activities that would not be detrimental to the Houston toad population would be allowed in the conservation easement area, such as research, hiking, camping, horseback riding, mountain biking and jogging. Disturbance resulting from any of these activities would be mitigated by education and scientific studies or setting aside additional habitat as detailed in this EA/HCP. Activities such as forest management and controlled burns would only be permitted within the conservation easement to the degree that scientific research indicates that such practices would enhance or benefit toad habitat. If monitoring indicates a decrease in Houston toad populations attributable to BSA/CAC's activities, they would cease or be modified to remove the threat.

The HCP would stipulate that BSA/CAC manage Griffith League Ranch in a manner consistent with the continued presence of the Houston toad and its habitat. The HCP would address mitigation of impacts as well as positive actions to be taken for conservation and recovery of the Houston toad. It would stipulate that monitoring results be applied to management actions (development of adaptive management strategies). The HCP would promote development of a set of "best management practices" to be implemented on the ranch. Information gained through these measures would be shared with the community-at-large through education programs, and BSA/CAC would partner with others to help support the survival of the Houston toad across its range.

Most of the current knowledge about the Houston toad across its range comes from existing literature on the species. Current knowledge of the Houston toad on Griffith League Ranch is based on presence-absence surveys during the toad's breeding season from 2000 to 2002 and the initiation of a more thorough population study in 2002. Little is known about population density, breeding success, tadpole survival, recruitment, or toad activity outside the breeding season. Dr. Michael Forstner of Texas State University (formerly Southwest Texas University) began investigating these aspects of the toad's life history in 2002 using a three-year U. S. Fish and Wildlife Service Section 6 (Endangered Species Act) grant awarded to BSA/CAC by Texas Parks and Wildlife. BSA/CAC intends to continue to support a portion of grants such as this through matching contributions in the future. BSA/CAC has invested in numerous studies of the Houston toad by providing local universities, scientists and students access to the Griffith League Ranch, support, and partnership. These efforts by BSA/CAC have made significant contributions to the current state of knowledge of the Houston toad and its natural history. BSA/CAC would continue to support these efforts to learn more about the Houston toad.

In addition to mitigation, many actions by BSA/CAC will constitute restoration and improvement to toad habitat. BSA/CAC will also construct and manage breeding sites, facilitate research and pursue adaptive management practices designed to support a robust and healthy Houston toad population. Techniques for forest management, wildlife management, prescribed fire and recreation would be studied to determine which practices have the greatest benefit and least impact on the Houston toad. The findings of these studies would be applied to adaptive management programs. BSA/CAC would consult with the Service during preparation of ranch management plans, such as the Vegetation Management Plan and Wildlife Management Plan, to assure that proposed management activities would not adversely impact the Houston toad. These plans would emphasize avoidance and minimization of take.

BSA/CAC may establish a conservation bank on Griffith League Ranch. Credits in the conservation bank would be used to compensate for take of Houston toad habitat on Griffith League Ranch. Any credits remaining in the conservation bank, not used for mitigation by BSA/CAC, could be marketed to other entities for their take of the Houston toad elsewhere in its habitat, as approved by the Service.

### **3.2 ALTERNATIVE B - ALTERNATIVE SITE DESIGN**

Original concept plans for Griffith League Ranch Scout Camp called for considerable development of the property. As BSA/CAC became aware that portions of the tract include Houston toad habitat and that the species does, in fact, occur on the tract, the original concepts were modified. This Alternative Site Design, intermediate between the original concepts and the Preferred Alternative, is the result of scaling back original plans in an attempt to reduce impacts on the Houston toad. Because of the difficulty of implementation, higher costs and potentially greater adverse impacts on the Houston toad and its habitat, BSA/CAC rejected the Alternative Site Design in favor of the Preferred Alternative. Discussion of the Alternative Site Design highlights only those sections that deviate substantially from the Preferred Alternative. The level of use and goals of BSA/CAC program under this alternative would be the same as the Preferred Alternative.

#### **3.2.1 Camp Entrance Complex**

The Entrance Complex would be situated in the 50-acre extension on the northwest side of the property (Figure 7). Development would be the same as described for the Preferred Alternative, with exception of the following changes:

At about the mid-point of the 50-acre extension, a 4,000 square-foot administration building and a two-acre, 200-vehicle surfaced parking lot would be constructed (Figure 7). The administration building would provide office space for staff and serve as an information and check-in point for arriving and departing Scout groups. Restrooms, a small store, and exhibits related to the early ranching period, cattle drives, and Texas Rangers would be included in the administration building. Displays and literature related to the endangered Houston toad would be available in the check-in, store, and exhibit area. Scouts using the camp would leave their vehicles in the parking lot for the duration of their stay. They would proceed from the Administration Center on foot, or by other means of group conveyance, into the interior of the tract. Visitors other than Scouts

would bypass the administration building and proceed directly to the Conference Center Complex.

### **3.2.2 Conference Center/Base Camp Complex**

The Conference Center/Base Camp Complex would be the same as described for the Preferred Alternative, with the following exceptions (Figure 7):

The complex would include a smaller 3,500 square-foot (rather than 5,000 square-foot) conference center, a 2,000 square-foot (rather than 4,000 square-foot) museum and a larger 3,000 square-foot (rather than 2,000 square-foot) computer center. Southwest of the conference center and along the shoreline of Lake 1 would be a 3,000 square-foot dining hall, six 1,000 square-foot (rather than 2,000 square-foot) dormitories with a capacity of 16 persons per dorm and a 200-foot beach area for use by dorm residents (rather than two 400-foot beaches).

A standard three-hole golf course would be developed north of the conference center along the north side of the lake's northernmost finger (Figure 7). The course, occupying about 36 acres of existing pastureland, would be planted with standard golf course turf. This type of golf course would require more maintenance (mowing, fertilizer/chemical treatments, etc.) than those of the environmentally friendly design proposed in the Preferred Alternative. Although the location of the course in existing pasture would minimize impacts on surrounding Houston toad habitat, the establishment and maintenance of golf course turfs with an increased frequency of mowing and greater use of chemical pesticides and fertilizers could result in adverse effects on the Houston toad and biota of the adjacent Pond 4 and proposed Lake 1.

Developed in existing woodlands along the edge of Lake 1, the Base Camp would consist of six three-acre camping pods (rather than five).

### **3.2.3 Challenging Outdoor Personal Experience (COPE) Course**

A COPE Course would be developed on about 80 acres east of the Conference Center/Base Camp (Figure 7). This course would be similar in design to that described for the Preferred Alternative except that more acreage would be used in order to separate course elements. This design would require a more extensive internal trail system to connect course elements than would the COPE Course design described in the Preferred Alternative.

### **3.2.4 Outdoor Learning Centers (Program Areas)**

Six Outdoor Learning Centers would be constructed at various locations on the camp (Figure 7). The basic design and purpose of the OLC's would be similar to that described in the Preferred Alternative. In this alternative, greater distances than proposed in the Preferred Alternative would separate camping pods in order to distribute impacts over a broader area.

#### **3.2.4.1 *Chisholm Trail Outdoor Learning Center***

The basic design and theme for this OLC would be similar to that described for the Preferred Alternative, but the camping zone would be located north of the main entrance road and west of Pond 2 between Ponds 5A and the property boundary (Figure 7). New fence would be constructed to separate the camping area from the Native Animal Preserve to the north. A barn, livery, blacksmith shop, and corral would be located northeast of the Conference Center at the junction of the main entrance road and the Conference Center/Base Camp road (Figure 7). The corral and barn would serve as the trailhead for a cattle drive trail as well as an 11-mile horse trail that would wind through the camp. The cattle drive trail would terminate in a 73-acre pasture to be cleared on the northeast side of Lake 2. This new pasture, which would require the clearing of existing oak-pine woodland, would be fenced to contain livestock. A restroom/shower would be constructed along the pasture fence.

Existing pasture fences would be maintained and new fences would be constructed where needed around pastures along the cattle drive route. Pastures would remain in an improved coastal Bermuda grass (*Cynodon dactylon*) or equivalent.

#### **3.2.4.2 *Texan Outdoor Learning Center***

The Texan OLC, located east of Pond 12 (the Finger Pond), would be essentially as described in the Preferred Alternative. However, while the area would be of typical design (Figure 6), a total of about 20 acres would be utilized (Figure 7). With this expanded design, use would be spread over a wider area, reducing the concentration of impacts. The increased acreage would require a more extensive trail network to join the camp pods and theme center.

#### **3.2.4.3 *Republic of Texas Outdoor Learning Center***

The Republic of Texas OLC (Figure 7) would be essentially as described in the Preferred Alternative. However, while the area would be of typical design (Figure 6), a total of about 28 acres would be utilized. The increased acreage would require a more extensive trail system to join the camp pods and theme center, spreading impacts over a wider area.

#### **3.2.4.4 *Frontier Life Outdoor Learning Center***

The Frontier Life OLC (Figure 7) would be essentially as described in the Preferred Alternative. However, while the area would be of typical design, a total of about 20 acres would be utilized. With this expanded design, use would be spread over a wider area to reduce concentration of impacts. The increased acreage would require a more extensive trail network to join the camp pods and theme center.

#### **3.2.4.5 *Fort St. Louis Outdoor Learning Center***

Design and use of the Fort St. Louis OLC would be similar to that described in the Preferred Alternative except that the OLC would be located on either side of the proposed 90-acre Lake 3 instead of Lake 2 (Figure 7). The two elements of the OLC

would be connected by a canoe trail across Lake 3. Canoe livery and launch sites would be included in the zone of disturbance on both shores of the lake.

A stockade and trading post, boat building, trapping and spar pole component would be located on the eastern shoreline of Lake 3. This 38-acre element would serve as the overnight camping area for the OLC. A Native American village would be constructed on about 15 acres along the southwestern shore of the lake. In addition to a “village” of Tonkawa-style thatched huts, restroom facilities would be constructed to serve this day-use site.

The increase in acreage over that described in the Preferred Alternative for this OLC would require a more extensive trail system to join the camp pods and theme centers. New secondary service roads would be constructed through adjacent pasture and woodland to provide service access for the separated trading post-stockade and Native American components.

#### ***3.2.4.6 Cities of Cibola Outdoor Learning Center***

The Cities of Cibola OLC would be located on a ridge northeast of the proposed 45-acre Lake 2 (Figure 7). It would be developed on about 20 acres of existing woodland. The increased acreage would require a more extensive trail system to join the camp pods and theme center. Access for hikers and service vehicles would be via existing and proposed secondary service roads and trails. New fence would be constructed north of the camping pod between the boundary, Lake 2, and the main road to separate the OLC from the adjacent Native Animal Preserve.

#### ***3.2.4.7 Anticipated Future Expansion of Outdoor Learning Centers***

As described in the Preferred Alternative, BSA/CAC would plan to add six new OLC’s at a future date. Additional expansion to meet the needs of an increased scouting population is anticipated. These new OLC’s would be located on Griffith League Ranch in the future. Each of these additional OLC’s would require about 20 acres for development, a total of about 120 acres. Design would be typical (Figure 6) and uses would be similar to those discussed above. In order to avoid or minimize impacts on the Houston toad, specific locations for these new sites would be determined after consultation with Houston toad biologists and consideration of the most current information on the species.

### **3.2.5 Lakes**

Construction of three lakes would be the same as their description in the Preferred Alternative. Under the Alternative Site Design, however, a fourth lake would be constructed upstream of Lake 2 (Figure 7). Lake 4, the smallest of the proposed lakes, would flood only 10 acres just above Pond 7. Houston toads have been observed in Ponds 6 and 7 in 2000, 2001, and 2002 Houston toad surveys (Forstner 2000, 2001, 2002a). While the primary purpose of Lake 4 would be to provide water for wildlife in the Native Animal Preserve, it could also serve as a breeding pond for Houston toads in the area.

### **3.2.6 Trails**

The foot trail network would be similar to that described in the Preferred Alternative. Because the Alternative Site Design calls for larger plots for each OLC, the foot trail system would be more extensive to connect facilities and amenities that are spread more widely on the tract. The cattle trail route would deviate from existing pastures southeast of the Maintenance Area and follow an existing secondary service road into the proposed new pasture. The horse trail would be routed differently in several places, decreasing its total length to about 11 miles (Figure 7).

### **3.2.7 Native Texan Wild Game Preserve and Observation Area**

Under the Alternative Site Design, the Native Animal Preserve would include about 710 acres in the northern part of the tract (Figure 7). Existing boundary fence would be replaced with suitable wildlife fencing, and about two miles of new wildlife fence would be constructed through pine-oak woodlands to enclose the preserve along its southern perimeter.

The native wildlife would be watered at Lake 2 and Lake 4. They would also have access to Pond 6 and Pond 7. Both ponds are productive Houston toad breeding sites (Forstner 2000, 2001, 2002a), and the surrounding area has proven to be prime habitat for the species. Should watering native wildlife at these ponds be determined to adversely impact the Houston toad, wildlife would be excluded from the ponds. Fences would be constructed to isolate the ponds and wildlife would be watered at above ground troughs, as are livestock.

### **3.2.8 Caretaker Residence and Maintenance Area**

The existing buildings would be refurbished as in the Preferred Alternative, but the proposed maintenance area would be accessible over a surfaced entrance road. This road would extend from the junction of the Conference Center/Base Camp road, a distance of about one mile (Figure 7).

### **3.2.9 Circle D Volunteer Fire Department**

Development and use of a ten-acre parcel near the south gate (Figure 7) by the Circle D Volunteer Fire Department would be the same as described in the Preferred Alternative.

### **3.2.10 Utilities**

Development of utilities on the tract would be essentially the same as described in the Preferred Alternative.

### **3.2.11 Road System**

Road standards would be as described in the Preferred Alternative. However, under this alternative, the roadway between the main entrance and the south gate (about three miles) would be classed as “entrance road” and improved to that standard. Main service roads would feed to all outlying program areas and all other roads would be classed as secondary service roads (Figure 7).

### **3.2.12 Fencing**

Construction and maintenance of fencing would remain as described in the Preferred Alternative. A 20-foot fence corridor would be cleared around parts of the Animal Preserve, the corral pasture and the new pasture (Figure 7).

### **3.2.13 Vegetation Management Plan**

A Vegetation Management Plan would be prepared as described in the Preferred Alternative.

#### ***3.2.13.1 Landscaping and Landscape Management***

Landscaping and landscape management would be the same as described in the Preferred Alternative.

#### ***3.2.13.2 Forest Management***

Any Forest Management Plan would be prepared as described in the Preferred Alternative.

#### ***3.2.13.3 Reforestation and Revegetation***

Any Reforestation and Revegetation Plan would be prepared as described in the Preferred Alternative.

#### ***3.2.13.4 Fire Management***

Any Fire Management Plan would be prepared as described in the Preferred Alternative.

#### ***3.2.13.5 Non-native Plant Control***

Any Non-native Plant Control Plan would be prepared as described in the Preferred Alternative.

#### ***3.2.13.6 Integrated Pest Management***

An Integrated Pest Management Plan would be prepared as described in the Preferred Alternative.

### **3.2.14 Wildlife Management Plan**

A Wildlife Management Plan would be prepared prior to implementing any wildlife management programs as described for the Preferred Alternative. However, the livestock management section of the WMP would be expanded under this alternative. Cattle, horses and farm animals would be maintained on the property year-round. While some livestock would be utilized in educational programs related to the cattle drive and for equestrian activities, livestock management would be geared toward maximizing profit by operating a working ranch. Applying fertilizers and planting high-quality grasses in pastures would promote maximum productivity. Existing holding pens and internal fencing would be maintained. Ponds that were devoid of Houston toads when the tract

was acquired, such as Pond 1, Pond 9, and Pond 10, would continue to be used for watering livestock. Elsewhere, aboveground watering troughs would be installed to minimize impacts on ponds used by the Houston toad.

### **3.2.15 Restrictions on Ranch Operations**

Restrictions on ranch operations would be similar to those described in the Preferred Alternative.

### **3.2.16 Minimization and Mitigation**

The HCP would be similar to that prepared for the Preferred Alternative except that 3,611 acres of the property would be subject to only minimum development. Impacts on about 655 acres of “High Disturbance” acreage and 582 acres of “Moderate Disturbance” acreage would be mitigated by setting aside and managing acreage under a conservation easement according to Table 2. The Alternative Site Design was rejected because of greater impacts to the Houston toad.

## **3.3 ALTERNATIVE C - NO ACTION**

If the No Action Alternative were selected, BSA/CAC would not develop Griffith League Ranch as a high adventure Scout camp. The land would either be managed as agricultural property or used for low impact activities by the BSA/CAC. While “take” of Houston toads might not increase under this alternative, positive steps to enhance the habitat and promote recovery of the species would not be required of the BSA/CAC and may be much less likely to occur.

Agriculture at the scale practiced by the former owner would be unlikely to offset BSA/CAC’s current investments in the ranch. Revenues generated by traditional agriculture would not support the type of scouting program envisioned by the organization. Continued operation of the ranch in a traditional manner would be of little significance to the Scouting world. In the short term, the property would likely be leased for traditional agricultural uses in order to somewhat offset financial losses. While it is recognized that BSA/CAC may face other regulatory challenges to the use of the Griffith League Ranch for agricultural purposes, agricultural impacts on the Houston toad, such as pollution of ponds with chemical fertilizers, livestock feces and urine and trampling of pond-side vegetation by livestock, would likely recommence as they have in the past. Given the state of knowledge on the effects of agricultural use of the property and the known effects of the removal of cattle from the Griffith League Ranch, it would be difficult to return to an agricultural use of the property. Importantly, research has revealed that BSA/CAC’s removal of cattle from the Griffith League Ranch has resulted in a significant increase in use of ponds by the Houston toad. If the No Action Alternative were chosen, these potential negative impacts would likely result in a decrease in use of the ponds for breeding by the toad from current levels.

Unless the intensity of agricultural activity increased, it would not be cost effective for BSA/CAC to ranch or farm the property. Profitability would require improving pastures by planting and fertilizing forage grasses and hay, increasing the livestock capacity and

intensively managing the woodlands for timber. This would require actions such as tilling the soil, applying chemical pesticides and fertilizers, and producing marketable timber. Such large-scale practices at the level required to make ranching, farming and logging profitable would most likely be detrimental to the Houston toad and its habitat. These activities would also likely require a 10(a)(1)(B) incidental take permit.

Because continued agricultural use of Griffith League Ranch by BSA/CAC is not a realistic or viable option, the tract would probably be sold to recoup lost investment. Another alternative would be for BSA/CAC to retain the Griffith League Ranch and use it for low impact activities. Under these circumstances, BSA/CAC would be engaged in activities that are not likely to result in any take and no permit would be sought. However, whether the Griffith League Ranch is sold or used for low impact activities, scientific research and studies would terminate, as well as the monitoring of Houston toad habitat and its breeding population, and no habitat management or restoration would occur.

Under the Preferred Alternative and its companion Habitat Conservation Plan (Chapter 6), BSA/CAC would commit to mitigating adverse impacts on the Houston toad and would take positive steps leading toward recovery of the species. Similar commitments to long-term conservation of the Houston toad could be realized only if BSA/CAC were to sell its property to an entity similarly dedicated to the preservation of the Houston toad.

If the No Action Alternative were selected, BSA/CAC's plans for managing the property for the enhancement and benefit of the Houston toad would not be realized. Funds already expended by BSA/CAC for planning the Scout camp based upon the studies previously conducted on the Houston toad would be lost. BSA/CAC would lose an opportunity to work with community partners to conserve the area's natural resources and educate its citizens and leaders in the importance of natural resource conservation. Therefore, the No Action Alternative was rejected.

## **4 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

The environmental components and resources of Griffith League Ranch are described in this chapter. These descriptions provide baseline information on key physical, biological, economic, and social factors related to Griffith League Ranch. Each of these components could be affected by the actions under consideration by BSA/CAC.

### **4.1 GEOLOGY**

Underlying Griffith League Ranch are three Eocene epoch geologic formations (Procter, Brown and Waechter 1974, Figure 8). The deep billowy sands found on much of the tract generally cover geologic outcrops except in a few deep cuts in drainages and on exposed ridge tops.

The oldest geologic formation found on Griffith League Ranch is the Calvert Bluff Formation of the Wilcox Group. Occurring on the west side of the ranch, it underlies about 27 percent of the property. The formation has a total thickness of about 1,000 feet. The Calvert Bluff is a massive to thin-bedded mudstone, locally glauconitic in its upper

part, with varying amounts of sandstone, lignite, and ironstone concretions. The mudstone is silty with very fine laminae and weathers yellowish brown. The medium to fine-grained sandstone of the formation is moderately well sorted, cross-bedded and lenticular, with thin beds that may be locally burrowed. It weathers to various shades of brown. A brownish black lignite in the lower part of the formation occurs in seams one to 20 feet thick.

Overlying and to the east of the Calvert Bluff is the Carrizo Sand formation with a thickness of about 100 feet. It underlies over 59 percent of the property. The Carrizo Sand is a fine to coarse-grained, poorly sorted friable, non-calcareous, thickly bedded sandstone. In its upper part is a carbonaceous black clay and partings of silty clay. It weathers yellowish brown to dark reddish brown. Some beds of ironstone are dark brownish red.

The Reklaw Formation underlies about 14 percent of the easternmost part of the tract. This sand and clay formation, which forms a deep red soil, has a thickness of about 80 feet. The upper part of the Reklaw is a silty carbonaceous clay with lentils of glauconitic clay ironstone. It is brownish black to reddish brown and weathers light brown to light gray. The lower part of the formation is a fine to medium-grained, glauconitic, greenish-gray quartz sand and clay that weathers moderate brown and dark yellowish orange with some clay ironstone ledges and rubble.

Sands and coarse gravels are the most likely extractable minerals found on Griffith League Ranch. There is some potential for oil, gas, and lignite (Baker 1979). BSA/CAC owns one-half the mineral rights, and the estate of Mary Lavinia Griffith Sanders owns an undivided one-half. The United States reserves the rights to fissionable materials (uranium, etc.) on the tract (Paschall 2000). Because BSA/CAC is the sole owner of surface rights on Griffith League Ranch, development of mineral rights by other mineral rights owners would require the consent of BSA/CAC.

## **4.2 SOILS**

Patilo-Demona-Silstid Association soils cover 91 percent of the Griffith League Ranch. Most common on the tract are Patilo soils (63 percent), followed by Silstid (22 percent) and Demona soils (six percent). A small component (about seven percent) of Axtell-Tabor Association soils can be found in the eastern and western corners of the property, with a few patches occurring along the east-west axis and in the southern corner. Within any given mapping unit of these five soil series, smaller areas of the other four may be found, so that there is some intermixing among the series. Sayers Series soils (80 acres, or less than two percent) occur in the Alum Creek drainage on the eastern corner of the property. Five very small outcrops (42 acres, or less than one percent) of Jedd Series soils are scattered about the ranch (Figure 9).

Patilo Series soils are deep, gently to strongly sloping (one to eight percent, ranging to 12 percent), moderately well drained sandy soils. They formed in thick sandy and loamy material that appears to have been reworked by wind. The upper zone is a thin (five inch) layer of loose, billowy fine sand above a thicker layer (47 inches) of fine, loose sand. Below this is a thick layer (70 inches) of sandy clay loam. Permeability is moderately slow, runoff is slow, and available water capacity is low. Patilo soils can

have a perched water table at 48 to 72 inches after short periods of heavy rain. These soils are found mostly on upland ridge tops and side slopes. Erosion hazard for this soil is slight. Vegetation commonly associated with Patilo soils is wooded range with post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), and coarse bunchgrass. These soils are typically utilized for pasture, range, and wildlife habitat (Baker 1979).

Silstid soils are deep, gently sloping (one to five percent) well-drained sandy soils. They are found mostly on foot slopes and in drainages across uplands. These soils appear to have been formed from weathered sandy and loamy sediment interbedded with sandstone. The surface is a loose, loamy, fine sand about 10 inches thick. Below the surface layer is about 18 inches of loamy fine sand over a thicker layer (40 inches) of sandy clay loam. Below the sandy clay loam is a 70-inch thick layer of clay loam, 40 inches of sandy clay loam and 80 inches of a fine sandy loam. Permeability is moderate, runoff is slow, and available water capacity is medium. Erosion hazard is moderate. Silstid soils commonly support blackjack oak, post oak, and yaupon (*Ilex vomitoria*) with an understory of mid- and tall grasses. These soils are useful for recreation and wildlife habitat (Baker 1979).

Demona Series soils occur mostly on foot slopes and in drainages across uplands, but can also be found on ridge tops. These are deep, gently sloping (one to five percent) moderately well drained, sandy soils. The surface is typically a five-inch layer of loamy fine sand overlying a thicker layer (23 inches) of loamy fine sand. Permeability is slow, and runoff is slow to medium. After heavy rains, Demona sands can have a perched water table at 24 to 36 inches. Erosion hazard is moderate. Blackjack oak, post oak and bunchgrass are typically associated with Demona soils, providing range and wildlife habitat (Baker 1979).

Three Axtell series phases occur on the property: Axtell fine sandy loam (one to five percent slopes), Axtell fine sandy loam (two to five percent slopes), and Axtell-Tabor Complex (one to eight percent slopes). These well-drained to moderately well-drained soils occur on nearly level to strongly sloping side slopes, eroded ridge tops, and in drainages. A five to 14 inch surface layer of fine sandy to gravelly sandy loam characterizes Axtell soils. Lower layers are slowly permeable, runoff is slow to rapid, and available water capacity is high. Permeability, corrosivity, and shrink-swell potential limit development on Axtell soils. Erosion hazard is moderate to severe, and widely spaced gullies are typical. Axtell soils support post oak, blackjack oak, and bunchgrass. These soils are often associated with native grass pastures, crops and woodland range (Baker 1979).

Tabor fine sandy loams comprise only a small percentage (about two percent) of the soil found on the ranch. These deep, nearly level to sloping (one to three percent), moderately well drained, loamy soils occur on ridge tops, foot slopes, and in drainages. The surface is a six-inch layer of sandy loam over a nine-inch layer of fine sandy loam and a thicker layer (38 inches) of clay. Permeability is very slow, runoff is slow to medium, and available water capacity is high. Erosion hazard is moderate. Associated vegetation is post oak, blackjack oak, elm (*Ulmus sp.*), hackberry (*Celtis sp.*), and bunchgrasses. These soils are normally used for range and pasture (Baker 1979).

Sayers series soils are deep and nearly level (less than one percent slopes) excessively drained, sandy soils that occur on floodplains and bottomlands that are subjected to frequent flooding. They formed in recent sandy alluvium and can occur in areas 100 to 500 feet wide and several miles long. The surface is a fine sandy loam about 10 inches thick, with some areas having a surface layer of loam, loamy fine sand, or fine sand. Beneath the surface layer is up to 24 inches of slightly stratified, loamy fine sand and about 60 inches of fine sand. Permeability is rapid, runoff slow, and available water capacity is low. A perched water table can be found at 60 to 120 inches during spring and fall. Erosion hazard is slight. Native vegetation on Sayers soils includes tall grasses, elm, and cottonwood (*Populus deltoides*). These soils would support a few crops and are used as wooded and improved pasture, hayfields, native wildlife, livestock range, and wildlife habitat (Baker 1979).

Only five small areas (42 acres) of Jedd Series soils occur on the property. These are moderately deep, sloping to moderately steep (five to 20 percent), well-drained, stony, loamy soils found on small narrow ridge tops and short, hilly, side slopes in uplands. A four-inch surface layer ranges from a gravelly sandy loam to a gravelly loamy sand. This layer is composed of 30 to 70 percent small siliceous pebbles and as much as 35 percent platy sandstone cobbles and stones. It can contain about five to 10 percent sandstone outcrops. A gravelly sandy loam about eight inches thick with cemented sandstone fragments above clay and sandy clay is found below the surface layer. Permeability is moderately slow and available water capacity is medium. Erosion hazard is severe. Associated vegetation is typically post oak and blackjack oak with an understory of yaupon, mulberry (*Morus* sp.), and bunchgrasses supporting woodland and wildlife habitat (Baker 1979).

### 4.3 VEGETATION

Vegetation on Griffith League Ranch (Figure 10) is typical of the Lost Pines area of Bastrop County: a loblolly pine and mixed deciduous woodland interspersed with open, grassy areas. This loblolly pine woodland is disjunct from the “pineywoods” region of east Texas, separated geographically by over 100 miles. Although rainfall in the Bastrop area averages eight to 20 inches per year less than in the pine forests of east Texas, loblolly pines occur in Bastrop County because of high humidity; the timing and amount of rainfall; occurrence of deep, sandy, acid soils; and the ability of the species to efficiently utilize available water. The loblolly pine and several associated plant and animal species reach their westernmost range extensions in this area. This loblolly pine-post oak savannah ecosystem is an example of a fire-adapted, fire-climax community (Baker 1979, Gould 1962). It offers excellent opportunities for studies and discussions related to biogeography and plant and animal dispersal.

The dominant overstory on Griffith League Ranch is composed of loblolly pine, post oak, blackjack, and eastern red cedar (*Juniperus virginiana*). Some sandjack oak (*Q. incana*) can also be found. Typically the pines are found in drainages and the oaks on ridge tops. However, they are mixed in many locations on this particular tract. American elm (*Ulmus americana*), cedar elm (*U. crassifolia*), hackberry, and hickory (*Carya* sp.) are

found along drainages. Cottonwood occurs in wetter drainages such as Alum Creek and the unnamed tributary of Piney Creek on the west side of the property.

Understory vegetation contains yaupon, possumhaw (*I. decidua*), southern wax myrtle (*Myrica cerifera*), American beautyberry (*Callicarpa americana*), and farkleberry (*Vaccinium arboreum*). Grapevine (*Vitis* sp.), greenbrier (*Smilax* sp.), and poison ivy (*Rhus radicans*) are also common in the understory.

Coarse bunchgrasses such as little bluestem (*Schizachyrium scoparium*), broomsedge bluestem (*Andropogon virginicus*), pineywoods dropseed (*Sporobolus junceus*), hairyawn muhly (*Muhlenbergia capillaris*), Indiangrass (*Sorghastrum nutans*), purpletop (*Tridens flavus*), beaked panicum (*Panicum anceps*), switchgrass (*P. virgatum*), and curly threeawn (*Aristida desmantha*) are common ground cover. Other common ground covers include cactus (*Opuntia* sp.), yucca (*Yucca* sp.), and a variety of forbs, ferns, lichens and mosses, especially in openings of the woodland canopy.

Several sedges (*Carex* spp.) occur around permanent ponds and in wetter areas. Ponds not utilized heavily by livestock support a diverse aquatic flora. A charophycean alga (probably *Nitella* sp.) was noted in two small clear ponds in the pines. The American lotus (*Nelumbo lutea*) occurs in Pond 4 and Pond 12.

About 565 acres (12 percent) of the property have been cleared and planted with grasses, primarily coastal Bermuda. Livestock has historically grazed these pastures. Where not maintained, the pastures are being encroached upon by weedy species such as honey mesquite (*Prosopis glandulosa*), yankeeweed (*Eupatorium compositifolium*), and rattlebox (*Sesbania* sp.). Many of these historical pastures are also being actively colonized by volunteer loblolly pines and edge effect dispersal by native hardwoods.

Although loblolly pine savannah habitat is a fire-adapted sub climax vegetation association, there is no documented fire history for Griffith League Ranch, and little is known about historical fire occurrence in the loblolly pine woodlands of Central Texas. There is no data currently available on fire return interval, fire intensity, or seasonality of fire. Best available information indicates that loblolly pine forests require fire about every ten years to remain viable as a sub-climax vegetation community (Wahlenberg 1960, Schultz 1997). Due to the lack of long-term studies of controlled burning in loblolly pine forests in the Bastrop County area, the best scientific evidence available at the time would be used to create and adapt management plans for controlled burning in loblolly pine forests on Griffith League Ranch in order to maintain suitable habitat in Bastrop County for the Houston toad and prevent catastrophic fires.

#### **4.4 WILDLIFE**

Texas State University (TSU) scientists are currently conducting wildlife surveys on the ranch. Individuals familiar with the property have also made casual observations of wildlife.

Invertebrate fauna on the property have not been systematically inventoried. However, eight species of tiger beetle (*Cicindela* sp.) that are geographically separated from their east Texas pineywoods populations are known to occur in the vicinity (Bastrop County Environmental Network, undated). Numerous mounds of leaf-cutter ants (*Atta* sp.) have

been observed in wooded areas, and the red imported fire ant has been noted along roadways inside the property. No information is currently available for aquatic invertebrates or fishes in the ponds and Alum Creek.

Many migratory bird species common to the central flyway are found in the area. Birds observed on the tract include the black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*B. jamaicensis*), wild turkey (*Meleagris gallopavo*), barred owl (*Strix varia*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Poecile carolinensis*), northern mockingbird (*Mimus polyglottos*), and northern cardinal (*Cardinalis cardinalis*). Other common birds likely to occur include the eastern screech owl (*Otus asio*), ruby-throated hummingbird (*Archilochus colubris*), red-bellied woodpecker (*Melanerpes carolinus*), tufted titmouse (*Baeolophus bicolor*), Carolina wren (*Thyrothorus ludovicianus*), white-eyed vireo (*Vireo griseus*), northern parula (*Parula americana*), summer tanager (*Piranga rubra*), indigo bunting (*Passerina cyanea*), painted bunting (*P. ciris*), lark sparrow (*Chondestes grammacus*), and white-throated sparrow (*Zonotrichia albicollis*) (Freeman 1996, Scott 1987). The southwestern-most range of the pileated woodpecker (*Dryocopus pileatus*) and pine warbler (*Dendroica pinus*) and the western range extension of the Kentucky warbler (*Oporornis formosus*), hooded warbler (*Wilsonia citrina*), and Swainson's warbler (*Limnothlypis swainsonii*) occur in Bastrop County (Bastrop County Environmental Network, undated).

Mammals observed on Griffith League Ranch include the white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), ringtail cat (*Bassaricus astutus*), opossum (*Didelphus virginiana*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), and nine-banded armadillo (*Dasybus novemcinctus*). The red bat (*Lasiurus borealis*), eastern mole (*Scalopus aquaticus*), plains pocket gopher (*Geomys bursarius*), Attwater's pocket gopher (*G. attwateri*), hispid pocket mouse (*Perognathus hispidus*), white-footed mouse (*Peromyscus leucopus*), northern pygmy mouse (*Baiomys taylori*), hispid cotton rat (*Sigmodon hispidus*), and eastern woodrat (*Neotoma floridana*) are known to occur in the area and may occur on the tract. A disjunct population of short-tailed shrew (*Blarina* sp.), found in an area of sandy soils, new growth loblolly pine and old fallen logs within Bastrop State Park (Dixon et al. 1989, Dixon et al. 1990, Dixon 1987, Davis 1960), also occurs on Griffith League Ranch (Forstner 2002, SWTU, pers. comm.).

Amphibians documented on the property (Forstner 2000, 2001, 2002a) include the tiger salamander (*Ambystoma tigrinum*), southern leopard frog (*Rana sphenocephala*), bullfrog, cricket frog (*Acris crepitans*), gray treefrog (*Hyla versicolor*), green tree frog (*H. cinerea*), two narrowmouth toads (*Gastrophryne olivacea* and *G. carolinensis*), spadefoot toad (*Scaphiopus hurteri*), Gulf Coast toad (*Bufo valliceps*), Woodhouse's toad (*B. woodhousei*) and Houston toad. The Texas toad (*B. speciosus*), Rio Grande leopard frog (*Rana berlandieri*), and chorus frogs (*Pseudacris streckeri* and *P. clarki*) could also be found on the tract.

Reptiles observed include turtles, lizards, and snakes. Two turtles have been found on the ranch: the common snapping turtle (*Chelydra serpentina*) and the three-toed box turtle (*Terepene carolina*). Numerous lizards, including the ground skink (*Scincella lateralis*), the green anole (*Anolis carolinensis*), the Texas spiny lizard (*Sclerophorus olivaceus*), eastern fence lizard (*S. undulatus*), and six-lined racerunner (*Cnemidophorus sexlineatus*) have been observed. Snakes found on the site include the blind snake (*Leptotyphlops dulcius*), ground snake (*Storeria dekayi*), ribbon snake (*Thamnophis proximus*), blotched water snake (*Nerodia erythrogaster*), broadbanded water snake (*N. fasciata*), coachwhip (*Masticophis flagellum*), flat-headed snake (*Tantilla gracilis*), Eastern hognose (*Heterodon platirhinos*), Texas rat snake (*Elaphe obsoleta lindheimeri*), broad-banded copperhead (*Agkistodon contortrix*), western cottonmouth (*A. piscivorus leucostoma*), Texas coral snake (*Micrurus fulvius tenere*), and canebrake rattlesnake (*Crotalus horridus atricaudatus*) (Forstner 2002, TSU, pers. comm.). Other reptiles could include the mud turtles (*Kinosternon flavescens* and *K. subrubrum*), soft-shelled turtle (*Trionyx* sp.), large skinks (*Eumeces* sp.), glass lizard (*Ophisaurus attenuatus*), Texas horned lizard (*Phrynosoma cornutum*), Mediterranean gecko (*Hemidactylus turcicus*), Texas glossy snake (*Arizona elegans*), Eastern racer (*Coluber constrictor*), corn snake (*Elaphe guttata*), prairie kingsnake (*Lampropeltis calligaster*), speckled kingsnake (*L. getula*), Louisiana milksnake (*L. triangulum*), rough green snake (*Opheodrys aestivus*), Texas lined snake (*Tropidoclonion lineatum*), and rough earth snake (*Virginia striatula*) (Dixon et al. 1989, Dixon et al. 1990, Dixon 1987)

#### **4.5 THREATENED OR ENDANGERED SPECIES**

The Houston toad is currently the only species in Bastrop County on the federal endangered species list. The State of Texas (Texas Parks and Wildlife Department) also lists the species as endangered. The bald eagle (*Haliaeetus leucocephalus*) is listed as threatened both by the Service and the State of Texas. The Service considers the reddish egret (*Egretta rufescens*), white-faced ibis (*Plegadis chihi*), Audubon's oriole (*Icterus graduacauda audubonii*), loggerhead shrike (*Lanius ludovicianus*), and Texas horned lizard (*Phrynosoma cornutum*) to be "species of concern." Currently, available data do not support federal listing of any of these species. The State of Texas recognizes the reddish egret (*Egretta rufescens*), white-faced ibis (*Eudocimus albus*), Texas horned lizard, and the canebrake (timber) rattlesnake as threatened. Other than the Houston toad, the canebrake rattlesnake is the only state-listed species known to occur on Griffith League Ranch. In Bastrop County, it has been found only on Griffith League Ranch (Forstner, TSU, 2002, pers. comm.). No federal or state-listed plants are known to occur on Griffith League Ranch or in Bastrop County at the current time.

##### **4.5.1 Houston Toad**

The Houston toad is endemic to south-central Texas. John C. Wottring first noted the toad near Houston, Texas in the late 1940's, and in 1953 Ottys Sanders (Sanders 1953) described it as a distinct species. Ongoing habitat destruction and a severe drought in the 1950's raised concerns for the future of the species (Sanders 1953, Seal 1994). The Houston toad was first listed as endangered in 1970 under the Endangered Species Conservation Act of 1969 (35 FR 16047). The endangered classification was continued

with passage of the Endangered Species Act of 1973. The Service designated critical habitat for the Houston toad in Bastrop and Burleson counties in 1978 (43 FR 4022). The southern half of Griffith League Ranch lies within federally designated critical habitat (Figure 4).

The typical adult Houston toad is two to three inches long, females being larger and bulkier than males. Coloration is generally speckled, light brown varying to black, sometimes with green patches. Some individuals may appear to have a slightly reddish, yellowish or grayish hue. Small dark spots are often found on the pale undersides. There may be a variable white stripe down the back and irregular white streaks along the sides. Dark bands extend from each eye to the mouth and also occur on the legs. Males have a dark throat that appears bluish when distended. The species' mating call is a high-pitched, undulating trill lasting for four to eleven seconds (U.S. Fish and Wildlife Service 1984).

Life expectancy of the Houston toad is about four years (Price 1992). Males can reach sexual maturity in captivity at about one year, most females at two years (Quinn 1981). The toads are generally active between January 15 and June 1, but may emerge as early as late December and remain active until late June, depending upon environmental conditions. Rainfall and warm night time temperatures initiate breeding activity, usually in February and March (Hillis et al. 1984, Dixon 1982, Dixon et al. 1990, Price 1990b, Price and Yantis 1993), and dark phases of the moon influence night time activity (Price 1990b).

The species is currently known to occur in only nine Texas counties: Austin, Bastrop, Burleson, Colorado, Lavaca, Lee, Leon, Milam, and Robertson. Each of the nine counties has at least one population, but the Bastrop County population is the largest known and best studied. Although roadside and power line easement surveys have been conducted in Bastrop County (Price 1990b, Dixon 1990, U.S. Fish and Wildlife Service unpubl. data 1995, Bastrop County Environmental Network unpubl. data 1996-1997), there is little data on the size, extent, and trends of Houston toad populations range wide. The Houston toad has been extirpated from Fort Bend, Harris, and Liberty counties (Price 1990b). Primary threats to survival of the Houston toad include habitat destruction and degradation, fragmentation of habitat, predation, inter-specific competition and hybridization, contamination by chemical herbicides, pesticides and fertilizers, and prolonged drought.

Houston toad habitat is typically characterized as rolling uplands covered with pine and/or oak forests underlain by sandy soils. Tree species vary from one region to the next, but typically include loblolly pine, post oak, blackjack oak, and/or sandjack oak. Although Houston toads are associated with forests and sandy soils, they may breed in, and migrate across, sparsely wooded and cleared areas as well (U.S. Fish and Wildlife Service 1984, Dixon et al. 1990). Because the Houston toad is an ectotherm and its skin is highly vulnerable to desiccation, they become dormant during harsh weather conditions, such as cold (hibernation) and drought (aestivation). They seek protection during this time by burrowing into sand or hiding under rocks, leaf litter, logs, or in abandoned animal burrows (Texas Parks and Wildlife Department 1993).

There is a high correlation between the occurrence of the Houston toad and outcrops of the Eocene epoch Sparta Sand, Weches, Queen City Sand, Reklaw, and Carrizo Sand formations (Yantis 1991). A large area of eastern Bastrop County is underlain by these formations. The Carrizo Sand and Reklaw formations underlie the eastern 73 percent of the Griffith League Ranch. The Calvert Bluff formation of the Wilcox Group, which has not previously been noted to support Houston toad breeding (Forstner 2003), underlies 27 percent of the property on its western side (Procter et al. 1974, Figure 8). The Carrizo Sand and Reklaw formations give rise to deep sandy soils, while the Calvert Bluff gives rise to mudstone soils, although there is considerable overlap of the Carrizo soils onto the Calvert Bluff (Forstner 2003).

Houston toads are usually associated with deep, friable, sandy soils and woodlands. Ninety-eight percent of Griffith League Ranch is covered with Patilo-Demona-Silstid and Axtell-Tabor soils, both series being characterized by deep sands with relatively shallow perched water tables. Sayers soils, on another 2 percent of the tract, are a deep fine sandy loam (Baker 1979). On Griffith League Ranch, native loblolly pine-oak woodland savannah covers most (88 percent) of the tract. Native forbs and grasses provide shelter and insects for forage. The open ground cover allows the Houston toad easy travel in this vegetation type. Functioning as a “life zone” for many amphibians like the Houston toad, forests provide habitat needed for feeding, growing, maturation, and maintenance of juveniles and adults in populations (Semlitsch 1998) and can act as a refuge area in urban and agricultural landscapes (Knutson et al. 1999). Forests provide habitat partitioning needed to protect the Houston toad from competition with other toad species, cover to escape from predators and harsh climatic conditions, and food supplies. Forests also provide habitat continuity needed to maintain dispersal corridors between breeding and terrestrial habitats (Laan and Verboom 1990, Rudolph and Dickson 1990, Welsh 1990, DeMaynadier and Hunter 1998, Gibbs 1998, Knutson et al. 1999).

Houston toads breed from January to June with a peak in February and March. The Houston toad is an “explosive” breeder, appearing in large numbers at breeding ponds over a period of a few nights throughout the breeding season, beginning as early as January 18 (Dixon 1982). Breeding choruses at different sites are generally not synchronized, and it is not clear what triggers breeding, although rainfall, dark phases of the moon, cloud cover, high humidity (greater than 70 percent), air and water temperatures, and subsurface soil temperatures and moisture may play a part (Dixon 1982, Hillis et al. 1984, Dixon et al. 1990, Price 1990a 1993). Reported egg-laying dates in the field range from February 18 to June 26 (Kennedy 1962, Hillis et al. 1984, Dixon 1982). May 2 is the latest recorded date for finding a gravid Houston toad female in Bastrop County (Hillis et al. 1984, Forstner 2002a). In wet years, breeding may occur wherever sufficient standing water is present. The Houston toad has been known to breed in ephemeral rain pools, rain-filled ditches, natural or man-made pools, roadside ditches, flooded fields, prairie potholes, and permanent ponds (U.S. Fish and Wildlife Service 1984). It appears to prefer ephemeral pools to permanent ponds (Thomas 1975, Thomas and Potter 1975, Price 2000, pers. comm.) and needs shallow water for breeding. Permanent water is more likely to harbor predators such as turtles, fish, and bullfrogs (Quinn and Ferguson 1983, Dixon et al. 1990) and potential competitors such as the Gulf Coast toad.

Presence of water during and after breeding is required for egg laying, egg hatching, tadpole maturation, and emergence of toadlets. Following metamorphosis, water is necessary to prevent desiccation of post metamorphic individuals and for metabolic needs. For breeding and maturation of tadpoles, the species requires shallow, non-flowing ephemeral (lasting 30 to 60 days) pools, or permanent bodies of water with shallow, slow-flowing pools or eddies. Successful breeding and survival of tadpoles requires good water quality, availability of food, and protection from predators. Female toads lay 500 to 6,000 eggs (Kennedy 1962, Quinn and Mengden 1984, Quinn and Mays 1987). Less than one percent of the eggs survive to maturity (Quinn 1981, Price 1992, Forstner 2002a, 2003). Development rates vary, depending on temperature and other factors. Hillis et al. (1984) reported that hatching of eggs in Bastrop County occurred within seven days in water ranging from 46 to 63EF (8 to 17EC). Tadpoles metamorphosed within 60 to 61 days after eggs were deposited, with water temperatures between 52 to 88EF (11 to 31EC). Metamorphosis of tadpoles in a given pond generally occurs at the same time over a period of a few hours, resulting in post metamorphic aggregations of toadlets (Hillis et al. 1984, Dixon et al. 1990). Hillis et al. (1984) observed large numbers of toadlets moving over 330 feet (100 meters) from their natal ponds.

Houston toad activity has been observed on warm, wet, humid nights during both its breeding and non-breeding season. However, little is known about its life history during the non-breeding season. During the breeding season, adult Houston toads travel between different sites within and between years. A marked adult male traveled back and forth between two ponds 4,469 feet (1,375 meters) apart in a two-year period. Another marked individual in the same study covered 1,592 feet (490 meters) within a 24-hour period (Price 1992). Price (unpubl. data, 2001) has documented the same individually marked male and female Houston toads using different breeding ponds that are over one mile (1.6 kilometers) apart (straight-line distance) and in different watersheds. Individuals have been observed traveling up to 3,900 feet (300 meters) to breeding ponds through areas that included gravel roads, divided highways, and pastures (Dixon and Godwin 1990, Price 1990a, Yantis 1994). The species is known to seek protection under rocks, logs, leaf litter, refuse piles, and in small animal burrows during daytime hours. While preferring deep sandy soils and woodlands, the toad would also breed and travel in open areas and on non-sandy soils provided there were woodlands and sandy soils nearby.

Amphibian breeding populations naturally undergo wide fluctuations in number, which makes them especially vulnerable to environmental changes (Semlitsch 2000). Houston toad numbers in Bastrop State Park reflect such fluctuations from year to year and an overall negative trend (Price, TPWD, unpubl. data 2000). This negative trend may be due to natural fluctuations, drought, habitat degradation, invasion of permanent breeding ponds by predators, and/or other factors.

In 1993, Price (1993) documented Houston toads at three ponds on Griffith League Ranch. BSA/CAC began monitoring the Houston toad on Griffith League Ranch in January 2000. From February 7 to May 22, 2000, January 4 to April 15, 2001, and January 18 to April 9, 2002, Forstner (2000, 2001, 2002a) conducted audio surveys, mark-recapture studies, and breeding success studies for Houston toads on the ranch.

The first two years of the monitoring project (2000 and 2001) consisted of a habitat assessment and a simple presence/absence survey of the Houston toad in existing ponds. The objective of these initial studies was to determine whether the species was present on the tract and whether it was utilizing existing ponds for breeding. During 2001, permanent and temporary drift fence arrays were established to initiate studies on Houston toad movements, distribution and travel corridors. Forstner documented the species at 16 of 19 existing ponds. There appears to be an increase in both the number of individual male Houston toads heard and the number of chorus locations over the three years of study. This may be due, in part, to removal of livestock from the ranch and subsequent improvement in vegetative cover and water quality. The only ponds not used for breeding by Houston toads were Ponds 1, 4, and 17. Forstner theorizes that these ponds are not used because either the underlying soils are not suitable (Ponds 1 and 4), or the pond is isolated by more than 50 meters within cleared pasture (Pond 17). In herptofaunal arrays in place from March 12, 2001, to May 28, 2002, throughout the ranch, Forstner (2002a) trapped and marked 86 adult male Houston toads and only nine adult females. Although the data is preliminary, Forstner theorizes that the total population on the ranch is not orders of magnitude greater because toads are already being recaptured. He estimates the population density on the ranch is on the order of one adult Houston toad per 25 acres of habitat (Forstner 2003). Most Houston toads collected outside of the breeding season were juveniles, although adults may occasionally be active under suitable conditions. Despite placing almost half of the herptofaunal arrays in pastures, Houston toads were captured only within 50 meters (165 feet) of the forest edge, indicating that the toads do not use the pasture areas. An experimental pond array was also established near Ponds 5 and 5A to investigate breeding success, egg-tadpole survival, and recruitment parameters. BSA/CAC received a three-year Section 6 grant from the Service, through TPWD, in January 2002. Using funds from this grant, Forstner is continuing population studies of the Houston toad on Griffith League Ranch. Using mark/recapture methods, Forstner should be able to obtain more accurate population numbers, sex ratios, and trends than have been available heretofore. Under the same grant, Dr. John Baccus (also of TSU) is characterizing floral and faunal components of the Houston toad's habitat on the ranch.

Several reasons have been cited for increased extinction rates of plant and animal species, including decreased habitat size and quality, increased distance from similar habitats, the degree of difference in the intervening matrix, changes in biotic and abiotic properties of habitats, and ecosystem vulnerability to extrinsic disturbances (Harris 1984, Lord and Norton 1990, Reh and Seitz 1990, Soule, et al. 1992, Pechmann and Wilbur 1994, Vos and Chardon 1998). These elements can be especially critical for disjunct ecosystems such as the Lost Pines. The smaller the habitat remnant, the faster its biota would collapse; persistence time increases in proportion to population size of the biota (Soule et al. 1992). Providing several large tracts of high quality habitat, avoiding fragmentation, maintaining connectivity, buffering from negative effects, and instituting habitat management greatly influence the persistence of species (Shafer 1997).

Small, sedentary species such as the Houston toad, with restricted distributions, specialized habitat niches, and narrow climatic tolerances are particularly vulnerable (Welsh 1990, DeMaynadier and Hunter 1998). Population viability analyses for the

Houston toad indicate that risk of extinction increases with reduced migration, survivorship, reproductive success, and continued gradual but sustained reduction of available habitat. Maintaining several relatively large populations of equal sizes that are interconnected so as to allow dispersal and re-colonization can enhance population survival (Seal 1994).

Habitat loss and degradation, by altering essential ecological processes, increasing predation, and isolating small populations, are the primary causes for declines of many amphibian species. This also appears to be the major reason for the decline of Houston toad populations. Habitat can be lost, modified, and fragmented by a variety of means including, but not limited to, increased incursion of roadways, increased frequency of destructive fires (crown fires), increased acreage converted to agriculture, increased exploitation of forests by logging, increased incursion of urban areas into habitat, and increased mineral production within habitat. Habitat conversion, often being permanent, poses the most serious threat to the Houston toad. Woodlands inhabited by the species have been destroyed, degraded and made unsuitable by increased suburban sprawl, logging, and agricultural use.

The Houston toad, like many anurans, is primarily associated with woodlands. Although known to use breeding sites in open areas, these sites must be located near woodlands (Forstner 2002a, 2003). Clearing of overstory and understory vegetation results in inhospitable environmental conditions (Laan and Verboom 1990, Rudolph and Dickson 1990, Welsh 1990, Findlay and Houlahan 1997, DeMaynadier and Hunter 1998, Dodd and Cade 1998, Gibbs 1998, Semlitsch 1998, Knutson et al. 1999). The loss of woodland vegetation can result in increased temperature and drying of the surrounding environment. These changes would be accompanied by a concomitant shift in plant and animal communities, including an increase in non-native plant and animal species. Additionally, there can be increased potential for contamination because of increased run-off and sedimentation rates resulting from soil erosion. Under such conditions, the Houston toad is at risk of dehydration due to increased ambient temperatures and reduced moisture and humidity. Physiological constraints coupled with relatively poor dispersal capabilities and small home ranges cause many amphibian species to be especially sensitive to habitat loss and degradation (Welsh 1990, DeMaynadier and Hunter 1998).

Large habitat patches generally contain larger animal and plant populations, with lower extinction probabilities. Larger patches tend to be occupied more often than smaller ones (Soule et al. 1992). Habitat destruction and degradation can contribute to habitat fragmentation that result in smaller habitat patches with greater distances between them. Increased fragmentation isolates habitat and increases the Houston toad's vulnerability to adverse impacts, including predation, interspecific competition, and reduced food availability. Habitat fragmentation contributes to the genetic isolation of populations or population fragmentation. Population fragmentation can reduce genetic variation and viability. This, in turn, can increase the risk of extinction by reducing survival, reproduction, and dispersal. Isolation also precludes re-colonization should one or more populations be eliminated. When an inhospitable environment that imposes a high degree of threat on the remnant habitat surrounds isolated populations, these risks are compounded (Denton et al. 1997, Laan and Verboom 1990, Reh and Seitz 1990, Soule et al. 1992, Pechmann and Wilbur 1994, Shafer 1997, Gibbs 1998, Semlitsch 1998, Vos and

Chardon 1998). As numbers of populations are reduced and numbers of individuals in populations decline, the species also becomes vulnerable to catastrophic events such as severe and prolonged drought conditions. Droughts may reduce small populations to such low numbers that they are unable to recover (Soule et al. 1992, Pechmann and Wilbur 1994).

Even small amounts of habitat fragmentation, such as paved roads less than 10 feet wide, can prevent dispersal, effectively isolating populations of some invertebrates, small mammals (Mader 1984, Mader et al. 1990), and amphibians (Van Gelder 1973, Reh and Seitz 1990, Soule et al. 1992, Fahrig et al. 1995, Yanes et al. 1995, Findlay and Houlihan 1997, Gibbs 1998, Vos and Chardon 1998, Knutson et al. 1999). This barrier effect may be due to behavioral avoidance of roads or other edges, changes in microclimate conditions next to roads, vehicle emissions, environmental instability caused by cutting roadside vegetation or spraying it with fertilizers and pesticides, increased predation and competition along road edges, mortality from roadway traffic, and other associated factors.

Maintaining adequate sized areas of native vegetation with low perimeter to area ratio is essential to prevention of detrimental edge effects. Edge effect refers to changes in floral and faunal communities in the zone where different habitats, such as forest and pasture or meadow, forest and clear-cut, or forest and suburb, interface. Length and width of an edge, as well as the contrast between habitats along the edge, can contribute to impacts that can occur along the interface (Harris 1984, Smith 1990). Edge effects may include increases in solar radiation, changes in soil moisture due to elevated evapo-transpiration rates and wind buffeting (Ranny et al. 1981), changes in nutrient cycling, disruptions of the hydrological cycle (Saunders et al. 1990), and changes in the rate of leaf litter decomposition (Didham 1998). Other effects could include heating and drying of habitat along interface zones, shifts in species composition and abundance, increased predation and competition along the interface, and invasion of the zone by non-native species. Such edge effects can cause disruptions in native plant communities, which in turn can impact associated animal species. The effects of edge on animal communities generally are greater than the effects on plant communities (Wilcove et al. 1986).

The greater the edge exposure on a habitat fragment or patch, the larger the patch should be to protect the core area from the deleterious edge effects (Ranny et al. 1981, Lovejoy, et al. 1986, Yahner 1988, Laurance 1991, Laurance and Yensen 1991, Kelly and Rotenberry 1993, Holmes et al. 1994, Turner 1996, Reed et al. 1996, Suarez et al. 1998). Edge effects can be minimized in preserve design by keeping the edge/area ratio low. This is done by increasing the patch size (Holmes et al. 1994) and using optimal preserve shapes. Circular preserves or preserves that are connected with other preserves are preferable (Diamond 1975, Wilcove et al. 1986, Kelly and Rotenberry 1993, Wigley and Roberts 1997, Kindvall 1999). A preserve with a circular configuration would have less edge than an equal-sized preserve with any other configuration.

Edge effects in plant communities have been documented to extend between 52 and 449 feet inward from their margins (Jiquan et al. 1992, Stefan and Fairweather 1997, Meiners and Steward 1999). These edge effects include decreased density, elevated tree mortality, increased growth rates and recruitment of dominant species (Jiquan et al.

1992), increased proportions of exotic species, decreased proportions of native species (Stefan and Fairweather 1997), and changes in species richness and percentage of cover (Meiners and Steward 1999).

Reported edge effects on animal communities are typically 164 to 328 feet or greater (Lovejoy et al. 1986, Wilcove, et al. 1986, Laurance 1991, Laurance and Yensen 1991, Kapos et al. 1993, Andren 1995, Reed et al. 1996, Burke and Nol 1998, Didham 1998, Suarez et al. 1998). Suarez et al. (1998) found that densities of the Argentine ant, an exotic species that has a life history similar to the fire ant, are greatest within 328 feet of an urban edge but are rare or absent within 656 feet of the edge. Native ant communities tend to be more abundant in native vegetation and less abundant in areas with exotic vegetation. Edges and their associated effects often result in just enough habitat disruption that invasive species can gain a foot-hold, whereas native vegetation had previously prevented their spread (Saunders et al. 1990, Kotanen et al. 1998, Suarez et al. 1998, Meiners and Steward 1999). Invasion of an area by the imported, non-native fire ant is aided by “any disturbance that clears a site of heavy vegetation and disrupts the native ant community” (Porter et al. 1988). Thus, maintaining large, undisturbed woodland areas can help sustain native ant communities while helping to combat the fire ant threat (Porter et al. 1988, Porter et al. 1991).

Detrimental edge effects increase as the size of a habitat patch decreases. Populations in small isolated patches are more vulnerable to extinction than populations within large contiguous patches (Diamond 1975, May 1975, Wilcove et al. 1986, Soule et al. 1992, Denton et al. 1997, Gibbs 1998). Local populations on small habitat patches have higher probabilities of extinction than those on larger patches because those on small patches lose more emigrants than are compensated for by immigration. Immigration can reduce the risk of local extinctions through a “rescue” effect: colonizations compensate for local extinctions. The ability for individuals to move between preferred habitat patches is essential for colonization and population viability (Fahrig and Merriam 1994, Kattan et al. 1994, Eber and Brandl 1996, Hill et al. 1996, Kozlov 1996, Kuussaari et al. 1996, Turner 1996, Kindvall 1999). Some studies have shown that emigration increases as patch size decreases, while immigration tends to increase as patch size increases (Kuussaari et al. 1996, Kindvall 1999). Large circular or square patches tend to have less emigration than narrow elongated patches because the probability of encountering a patch boundary decreases with increasing patch size and decreasing edge/patch size ratios. Likewise, large patches have a higher probability of colonization than small patches. Patch shapes with connections to a greater number of neighboring patches increase the likelihood that a neighboring patch would be occupied (Fahrig and Merriam 1994, Kuussaari et al. 1996, Tiebout and Anderson 1997, Kindvall 1999). If a population is isolated and movement between populations is restricted, the habitat patch must be large enough to ensure that the population can survive on its own at that patch size and configuration (Fahrig and Merriam 1994).

Small wetlands are crucial to the survival of many amphibians, other vertebrates, and invertebrate species. Water is an important factor in the survival of the Houston toad since reproduction cannot occur without adequate water in breeding pools. Houston toads typically prefer to breed in small, temporary pools that may be destroyed or degraded by modern agricultural practices, logging operations, and urbanization. Run-

off, erosion, and application of pesticides and fertilizers may contaminate breeding sites. Since Houston toads require shallow areas for breeding activities, deepening ponds or pools could effectively eliminate breeding and attract predators (Dodd and Charest 1988, Yantis 1989, Denton et al. 1997, Hecnar and M'Closkey 1997, Kupferberg 1997, Knutson et al. 1999, Semlitsch 2000) and competitors. Creation of stock ponds, recreational fishing ponds, or other permanent water bodies also provides avenues for invading species such as the bullfrog. Bullfrogs are known to have detrimental effects on native amphibians and reptiles through predation and competition (Kupferberg 1997). Bullfrogs were first reported in Bastrop State Park in 2000 (Price 2001 pers. comm.) and have been documented on Griffith League Ranch (Forstner 2000, 2001, 2002a).

Wetland loss also increases the distance between neighboring wetlands and the probability that populations will be rescued from extinction by nearby source populations (Semlitsch 2000). Small, isolated populations are much more vulnerable to extinction than populations within large, contiguous patches (Diamond 1975, May 1975, Wilcove et al. 1986, Soulé et al. 1992, Denton et al. 1997, Gibbs 1998) because of the greater chance that a random, catastrophic event will wipe out a population in a fragment that cannot be recolonized.

Stocking of predatory fishes in ponds, tanks or other potential breeding sites likely alters assemblages of amphibian species and reduces community diversity on a geographic scale. Predatory fish can reduce the abundance of amphibians, eliminate subpopulations and cause local extinctions. Lack of defense mechanisms may explain why temporary pond species such as the Houston toad may not be able to coexist well with introduced fish in permanent water (Hecnar and M'Closkey 1997). Predatory fish could affect the Houston toad directly by preying on its eggs and tadpoles. They could affect the species indirectly by introducing pathogens, including viruses, bacteria, and fungi. The fungus is a worldwide pathogen of fishes that attacks eggs, larvae, and adult fishes. It is especially prevalent in hatchery-reared fish (Blaustein et al. 1994). *Saprolegnia* has also been shown to infect the eggs, tadpoles, and adults of anurans, including *Bufo* species. This fungus is one of the factors recently attributed to the disappearance of frogs and toads from breeding ponds in the wild (Blaustein et al. 1994). Voris and Bacon (1966) found that tadpoles of the American toad (*B. americanus*), a species related to the Houston toad, are relatively free from fish predation. However, research has also shown that, although the American toad and Woodhouse's toad appear to be unpalatable to largemouth bass, the bass would prey on these species when other food is scarce or unavailable (Kruse and Stone 1984).

Protecting woodland habitat adjacent to breeding sites is also essential to conserving breeding habitat. Woodlands provide the habitat continuity needed to allow for movement between ponds and re-colonization of local population extinctions (Laan and Verboom 1990, Rudolph and Dickson 1990, Welsh 1990, DeMaynadier and Hunter 1998, Gibbs 1998, Knutson et al. 1999). Loss of woodlands, which supports the terrestrial phase of the Houston toad's life, would most likely reduce recruitment of juveniles into the breeding population, adult survival, and the persistence of the population (Laan and Verboom 1990, Pechmann and Wilbur 1994, Findlay and Houlahan 1997, Dodd and Cade 1998, Gibbs 1998, Semlitsch 1998).

The Houston toad's range overlaps with only three other *Bufo* species: Woodhouse's toad, the Texas toad, and the Gulf Coast toad. Forests are the natural habitat of Houston toads, and there are selective forces that prevent Houston toads from exploiting non-forested breeding sites. In particular, when Houston toads attempt to breed outside of the borders of forested habitat, they frequently breed in mixed toad breeding choruses with Woodhouse's toads. In these circumstances, hybridization among species occurs, and Houston toads essentially fail to reproduce. Woodhouse's toads do not ordinarily breed in forested breeding ponds, so Houston toads are protected against the hybridization threat to persistence when adequate forest habitat is provided. For many anurans associated with forests, the clearing of overstory and understory vegetation results in inhospitable environmental conditions (Laan and Verboom 1990, Rudolph and Dickson 1990, Welsh 1990, Findlay and Houlihan 1997, DeMaynadier and Hunter 1998, Dodd and Cade 1998, Gibbs 1998, Semlitsch 1998, Knutson et al. 1999, Semlitsch 2000). Woodhouse's toad occurs in a variety of habitats. It is the most widespread toad in North America. The Houston toad appears to be a poor competitor that has retreated and adapted to an environment where, under natural conditions, few interspecific interactions occur (Yantis 1989). The presence of woodlands provides an important separation between Houston toad and Woodhouse's and Texas toad habitats. Although the breeding seasons of the Houston toad and Woodhouse's toad are similar, different habitat requirements tend to keep the two species separated. Likewise the same habitat differences are in place between Houston toads and Texas toads, but the breeding seasons are even further displaced in time. In Bastrop County, the Houston toad occurs throughout the pine forest while Woodhouse's toad populations surround the forest. Since Woodhouse's toads are generally found in more open habitats, land-clearing practices can quickly diminish numbers of Houston toads in favor of Woodhouse's toads. Hybridization between these two species occurs primarily along habitat edges where the forest has been cleared and permanent ponds have replaced ephemeral pools (U.S. Fish and Wildlife Service 1984).

The Gulf Coast toad is primarily a lowland species. Its range extends from Louisiana and Texas south to Costa Rica. The primary isolating mechanism between the Houston toad and the Gulf Coast toad is the separation of their breeding seasons. The Gulf Coast toad tends to breed later in the year than the Houston toad. However, there is some overlap in breeding seasons, particularly when the Houston toad's breeding is delayed by cold weather. Also, the Gulf Coast toad tends to prefer permanent breeding ponds rather than the temporary rain pools used by the Houston toad, so some degree of habitat partitioning does occur between these two species. Elimination or modification of temporary rain pools, or their conversion to permanent ponds, forces Houston toads to use permanent ponds where they may be outnumbered by Gulf Coast toads (U.S. Fish and Wildlife Service 1984).

Differences in species densities may also be an important factor contributing to interspecific competition and hybridization (Brown 1971). Woodhouse's or Gulf Coast toads, in areas where these species are more abundant, soon replace the Houston toad. An abundance of Woodhouse's or Gulf Coast toads is an indication that Houston toads may be absent (Yantis 1991). Brown (1971) documented a location near Bastrop State Park where Woodhouse's toads rapidly invaded a Houston toad-breeding pond following

land clearing. Hybridization was reported shortly after the area had been cleared (Brown 1971). The Houston toad later disappeared from this site. However, the Houston toad appears to have a competitive advantage at sites where it outnumbers Woodhouse's and Gulf Coast toads, namely in woodland habitat with ephemeral ponds.

While both of the preceding species have been demonstrated to hybridize with the Houston toad (Hillis et al. 1984), the third sympatric species, the Texas toad, has never been confirmed to do so. Interestingly, the Texas toad is also reportedly in serious decline as a result of pesticide and herbicide use in Texas agricultural operations (Dixon 2000). This species is not reported in microhabitat sympatry with Houston toads in the literature, although it does occur in several Houston toad counties in Texas. Much like Woodhouse's toad, the Texas toad prefers open shrubland often characterized by mesquite and other thornscrub species patches. Yet, it is also an inhabitant of sandy soils as an active burrower. Its breeding season extends through the summer months and thus is partially isolated from the Houston toad. At this time, no Texas toads have been located on the Griffith League Ranch but they are known to occur in Bastrop County (Dixon 2000).

Native predators of the Houston toad include birds, mammals, snakes, and turtles. Introduction of domestic pets, particularly house cats and dogs, and an increase in some native mammals, such as raccoons and opossums, generally accompanies human settlements. These predators can have impacts on amphibian and other vertebrate populations (Soule et al. 1992).

The imported, non-native fire ant is an aggressive predator. Where fire ant infestations occur, they impact the Houston toad directly and indirectly through predation and competition. The species has been observed preying on newly metamorphosed Houston toads (less than 10 days old) as they emerged from the water (Freed and Newman 1988). Current evidence shows that this species has devastating and long-lasting impacts on native ant populations and other invertebrate communities (Vinson and Sorensen 1986, Porter and Savignano 1990), which provide food for the Houston toad. The red imported fire ant appears to benefit from destruction of woodland habitat and the presence of humans (Tschinkel 1988; Porter et al. 1988, 1991). Research indicates that the fire ant is associated with open habitats disturbed by human activity, such as old fields, lawns, roadsides, ponds, and other open, sunny habitats. However, it is absent or rare in late succession or climax communities such as mature forest (Tschinkel 1988). Although this association is not apparent in all areas, especially in central Texas (Porter et al. 1988 and 1991), maintaining native vegetation communities may help sustain native ant populations and further deter imported, non-native fire ant infestations. This species can be introduced into an area via nursery stock and soil. Any disturbance that clears a site of heavy vegetation and disrupts the native ant community can also result in the introduction of the species into an area.

Traffic mortality has a significant negative effect on local population densities of some invertebrates, small mammals (Mader 1984, Mader et al. 1990), and amphibians (Van Gelder 1973, Reh and Seitz 1990, Soule et al. 1992, Fahrig et al. 1995, Yanes et al. 1995, Findlay and Houlahan 1997, Gibbs 1998, Vos and Chardon 1998, Knutson et al. 1999). Slow-moving, ground-dwelling amphibians are especially vulnerable to roadway

mortality (Vos and Chardon 1998). Roadways, which eliminate and fragment habitat and result in mortality from vehicle strikes, present a serious threat to survivorship and dispersal (Reh and Seitz 1990, Fahrig et al. 1995, Findlay and Houlahan 1997, Vos and Chardon 1998). Roadways can have serious demographic consequences. They contribute to adult mortality, reduce connectivity between habitat patches, and interfere with migration among remnant habitat patches (Reh and Seitz 1990, Fahrig et al. 1995, Findlay and Houlahan 1997, Vos and Chardon 1998).

The proportion of mortality from vehicle strikes increases with increasing roadway density and traffic (Fahrig et al. 1995, Vos and Chardon 1998). Reh and Seitz (1990) found that common frogs (*Rana temporaria*) are particularly vulnerable to increasing traffic density and that roadways represent a significant barrier to its dispersal. Surveys conducted in 1990 along a five-mile section of Highway 21 in Bastrop County documented a 67 percent mortality rate for the Houston toads observed (Dixon et al. 1990, Price 1990, Texas Department of Transportation 1993). Van Gelder (1973) found that about 30 percent of female European toads (*Bufo bufo*) crossing a 13-foot wide asphalt road with a traffic density of about 10 cars per hour were run over. Later studies concluded that a traffic frequency of 24 to 40 cars per hour killed 50 percent to 100 percent of amphibians crossing the roads (Fahrig et al. 1995, Vos and Chardon 1998).

The presence of forest cover generally has a positive effect on toad densities (Fahrig et al. 1995). The removal of forests associated with road construction can pose significant risks to wetland biodiversity (Findlay and Houlahan 1997) and isolation of breeding ponds (Vos and Chardon 1998). Vos and Chardon (1998) suggest that the distribution of suitable terrestrial habitat may be a limiting factor because of high mortality in the terrestrial phase of the amphibians' life cycle and that dispersal may be more effective in landscapes with large proportions of suitable habitat. Other road-related factors such as pollutants in road run-off, exhaust emissions, vibrations, and noise may also affect toad densities either by causing direct mortality or interrupting behavior (Fahrig et al. 1995).

Pesticides and other chemicals may impact Houston toads directly, particularly during the aquatic phase of its life cycle. These substances may directly or indirectly lower the abundance and diversity of the toad's food supply. Research indicates that amphibians, particularly their eggs and larvae, are sensitive to pollutants (particularly cyclodienes, such as endosulfan, endrin, toxaphene, and dieldrin), nitrites, salts, certain organophosphates (such as parathion and malathion), and petroleum hydrocarbons (Harfenist et al. 1989, Little et al. 2002, SAIC 2003). Because of the semi-permeability of the Houston toad's skin, the development of their eggs and larvae in water and their position in the food web, these amphibians can be exposed to waterborne and airborne pollutants (Bishop and Pettit 1992). Pesticides can change the quality and quantity of amphibian food and habitat (Bishop and Pettit 1992). The amount and quality of food and shelter may be reduced when insecticides and herbicides contaminate wetland ecosystems. Pesticides can change or reduce macrophyte, algal, and invertebrate populations, resulting in a loss of food and cover for adult and young Houston toads and tadpoles.

Pesticides may enter the Houston toad's habitat through direct application, drift from sprays, and agricultural and urban run-off. Herbicides applied along highways and other

roads, as well as roadway run-off, may be harmful to the Houston toad. The commonly used herbicide atrazine has been shown by Hazelwood (1970) to seriously affect frog eggs and is now known to be an endocrine disrupter to amphibians. Many common pesticides used by area residents are likely to adversely impact Houston toads. Heavy metals and petroleum hydrocarbons deposited by automobiles along highways may accumulate to the point of becoming toxic to the Houston toad. Toxic effects to amphibians from pollutants may be either lethal or sub-lethal, include morphological and developmental aberrations, lower reproduction success and survival rates, and change behavior and biochemical processes.

Agricultural activities can contribute to loss of habitat through conversion of woodlands to pasture or cropland. Clear-cut timber harvesting can remove overstory vegetation and result in significant and detrimental changes to Houston toad habitat. Agricultural practices can result in soil compaction or disturbances that can increase the mortality of, or disturb, aestivating Houston toads (Knutson et al. 1999). Wetlands important for Houston toad reproduction can be drained, filled, or deepened. Fertilizer and pesticide application can be harmful to amphibians, including the Houston toad. Conversion of woodlands and savannah to non-native sod-forming grasses such as Bermuda grass or other cover types can increase threats of competition by providing habitat for the Woodhouse's, Texas, and Gulf Coast toads; increase Houston toad exposure to predators; and hinder Houston toad mobility and dispersal capabilities. Habitat conversion can also encourage invasion and establishment of the imported, non-native fire ant.

A study conducted by Knutson et al. (1999) concluded that there is a consistent negative association between the presence of urban land and its effects on all anuran guilds. The building of roads, homesites and similar structures, and commercial or industrial areas creates inhospitable habitats for anurans, including the Houston toad. The establishment of exotic turf grasses; increased vulnerability to predators and competitors; loss or degradation of breeding ponds; application of pesticides, herbicides, and fertilizers; and presence of fire ants are harmful. These factors work synergistically with the detrimental effects of habitat fragmentation to decrease the numbers and distribution of toad populations. Ultimately such conditions may lead to local toad extinctions.

The adverse effects of residential and commercial development on Houston toad demography are most likely due to a combination of factors. Construction of buildings and associated infrastructure can result in permanent loss, degradation and fragmentation of native habitat. Adverse impacts can result from the conversion of native woodlands to sod-forming turf grass lawns; introduction of non-native vegetation and imported topsoils; soil compaction; increased application of pesticides, herbicides, and fertilizers; and the erection of privacy fencing that impedes the passage of the Houston toad. Direct mortality of toads may occur during site clearing, preparation, and construction. Expansion of the road network increases the likelihood of mortality from motor vehicle strikes because of increased traffic density. Changes in the native habitat can inhibit Houston toad mobility and its dispersal. Access to, and the availability of, food and breeding sites, protection from predators and competitors, and genetic exchange may be limited, restricted, and reduced by habitat alteration. The availability of shelter, including sandy soils, leaf litter, and animal burrows, that enables the Houston toad to escape predators and adverse weather conditions (cold, heat, and drought) can be

seriously impacted or eliminated by development. Development can also result in the destruction or degradation of breeding ponds to the point that reproduction declines or ceases. Since the Houston toad requires shallow areas for breeding, deepening existing ponds or constructing new ponds could eliminate breeding sites and increase competition with other species. Predation on eggs and tadpoles by fish stocked in ponds could adversely impact survival and recruitment.

Habitat changes and edge effects could increase the Houston toad's exposure to competitors, such as Woodhouse's, Texas, and the Gulf Coast toads, and predators. Predators can include other amphibians, such as the bullfrog, domestic pets such as dogs and cats, native mammals such as raccoons and opossums, and imported, non-native fire ants. Predatory native mammals, often attracted to predictable food sources such as trash cans and pet food dispensers in areas occupied by humans, could increase in number to the point of being a serious threat to the Houston toad. Fire ants may be introduced through imported topsoils and nursery plants. They could increase in distribution and density as a result of land clearing and development. A higher density of humans and their activities could also increase the chances of human-toad interactions. Toads could be pursued, trapped, captured, injured, or killed, either accidentally or intentionally. Intentional killing of other toad species has been documented in some residential areas. These factors could work together to decrease the numbers and distribution of toads and result in the species becoming even more vulnerable.

Fragmentation of habitat by suburban development increases the rate of local extinctions beyond that expected from habitat loss alone. As Houston toads are forced into smaller habitat patches, they are exposed to greater pressures from predation and competition. As habitat patches decrease in size, it becomes more difficult for Houston toads to escape predators and compete with congeners. Additionally, because individuals must travel greater distances to find suitable habitat, they become more vulnerable to death from depredation and vehicle strike. Fragmented patches of marginal habitat may act as biological sinks in which mortality exceeds reproduction and the population becomes unable to survive on its own.

Loss of the Houston toad from the vicinity of Houston, Texas, demonstrates that the species is vulnerable to urbanization. Without ecosystem stability and population viability requirements, the continued pressures associated with suburban development would accelerate declining trends. However, protecting large blocks of woodlands that support core source populations could enhance survival of the species. Such source populations could be used for re-colonization should local populations be eliminated. Spacing source populations in proximity to allow for dispersal and maintaining suitable habitat between them while minimizing threats to the species could enhance population viability.

Protecting the ecosystem upon which the Houston toad depends requires the careful planned conservation of a representative portion of the native Lost Pines plant and animal community. The conserved habitat area (patch size and configuration), quality, arrangement, and connectivity must be sufficient to maintain the integrity and persistence of native plant and animal communities, allow for dispersal of native fauna, preserve populations to allow for re-colonization, and ensure adequate gene flow. Increases in the

mortality rates of native fauna from predation, competition, roads, and urbanization need to be avoided, minimized, and managed, as should any introduction or increase in non-native predators, competitors, and aggressive plant species. Maintaining optimal habitat also requires protecting it from detrimental edge effects such as heating, drying, invasion of non-native species, and shifts in species composition and abundance. Adequate buffer area for Houston toad habitat patches should be provided. By connecting habitat patches, plant and animal communities on which the Houston toad depends can be conserved and population sizes maximized to allow for dispersal and re-colonization.

#### **4.5.2 Bald Eagle**

The bald eagle was listed as endangered in 1978 (*Federal Register*, March 11, 1967, and February 14, 1978). The species neared extinction because of contamination by pesticides (DDT) and predator control activities. Less than 500 pairs of bald eagles were known to occur in the lower 48 states in 1963. As the result of an aggressive protection and conservation program, a ten-fold increase in population has been recorded. The species was reclassified from endangered to threatened in 1995 (*Federal Register*, July 12, 1995) and is currently proposed for de-listing (64 FR 36453). The current status of the bald eagle is the result of an aggressive recovery plan designed to protect the species and its habitat and to reduce the use of harmful pesticides.

The bald eagle is rare in Bastrop County (Freeman 1996). When present, this winter resident can be found feeding, nesting and roosting along the Colorado River. Adult bald eagles have a distinctly white head and tail with a dark brown body. Juveniles are a chocolate brown, often with white mottling on the undersides. This large raptor feeds on fish and would take birds and small mammals, both live and as carrion. Adults can measure three feet from head to tail, have a seven-foot wingspan, and weigh up to 12 pounds.

Although some four to seven miles from the Colorado River, it is conceivable that bald eagles could roost or nest in the larger trees on Griffith League Ranch. However, no sightings of the species have been documented. The construction of three lakes, as proposed in the Preferred Alternative, could increase the potential that the species might utilize the property.

#### **4.5.3 Species of Concern**

Species of concern are species for which there are indications of vulnerability, but for which there is insufficient information to support their listing as threatened or endangered. Species in this category receive no protection under the Endangered Species Act of 1973. Of the species of concern noted for Bastrop County, the Audubon's oriole is an uncommon tropical resident in south Texas. It is not likely to occur on the Griffith League Ranch. Neither the reddish egret (except as a transient) nor the white-faced ibis are likely to occur on the tract as suitable habitat is lacking. Suitable habitat does exist for the loggerhead shrike, and it is possible that this species could be recorded on the property in the future. The Texas horned lizard is not known to occur on Griffith League Ranch. Given its association with sandy soils, however, it could potentially occur on the tract.

#### **4.5.4 State Listed Species**

The canebrake rattlesnake, listed as threatened by the State of Texas, is the only state-listed species other than the Houston toad that occurs on Griffith League Ranch. In Bastrop County, it has been found only on Griffith League Ranch (Forstner 2002 pers. comm.). This seldom-seen snake occupies moist lowland and hilly pine and mixed hardwood forest. It is normally found less than a mile from permanent water sources (Werler and Dixon 2000). State law prohibits take (injury, killing, capturing), possession, transportation, or sale of any state-listed species. Texas law does not protect habitat of state-listed threatened and endangered species.

#### **4.6 CRITICAL HABITAT**

Approximately 2,712 acres (56 percent) of Griffith League Ranch are included in federally designated critical habitat for the Houston toad. The Service designated critical habitat for the species in Bastrop and Burleson counties in 1978 (43 FR 4022). Critical habitat in Bastrop County is delineated on the west by State Highway 95 and on the south by the Colorado River. The eastern limit, 97 degrees 7 minutes 30 seconds west longitude, is over four miles from the eastern corner of Griffith League Ranch. The northern limit, latitude 30 degrees 12 minutes 00 seconds north, bisects Griffith League Ranch so that its northern half is excluded from critical habitat while the southern half is within federally designated critical habitat (Figure 4).

Determination of critical habitat for the Houston toad pre-dates the Service's 1984 regulations and procedures for designating critical habitat. The federal designation of critical habitat for the Houston toad, conducted in 1978, was done without prior research into the best areas in the range for the toad. Today, many areas designated as critical habitat do not contain the requisite primary constituent elements. Primary constituent elements are those elements within the defined area of critical habitat that are essential to the conservation of the species (50CFR17.94). Research regarding soils relative to the presence of the toad has demonstrated that the Houston toad does not inhabit large portions of designated critical habitat (Forstner 2000, 2001, 2002a,). For this reason, the proposed activities have been placed in areas where on-site surveys indicate (1) the toads are least likely to be located due to localized soil and geology; (2) the toads have not been chorusing; and (3) the least number of known occurrences on the ranch have been noted, whether the areas are located in critical habitat or not. This site-specific analysis was conducted independent of the designation as critical habitat.

In the absence of detailed studies and research, the primary constituent elements of the species' habitat were not detailed at the time critical habitat was listed. As currently understood, primary elements of critical habitat for the Houston toad would likely include: shallow, non-flowing ephemeral pools or permanent water bodies with slow flowing pools or eddies for breeding and development of tadpoles; good water quality; cover of native grasses and forbs that provide for availability of food and protection from predators; deep, friable, sandy soils for burrowing, aestivation or hibernation; and native woodlands (Seal 1994, U.S. Fish and Wildlife Service 1995). There is also a high correlation between occurrence of the Houston toad and outcrops of the Eocene Reklaw and Carrizo Sand formations (Dixon and Godwin 1990). These elements are present in

many, but not all, areas of Griffith League Ranch, both within and outside the designated critical habitat.

No federal critical habitat has been designated for the bald eagle in Bastrop County. Texas law does not provide for protected habitat for state-listed species.

#### **4.7 WETLANDS**

Nineteen ponds are known to occur on Griffith League Ranch. Thirteen ponds and the headwaters of one creek are noted on the 1993 National Wetlands Inventory maps (U.S. Fish and Wildlife Service 1993a, 1993b). One of the 13 ponds, classified as palustrine, open water and permanently flooded, was not located. It appears that this site was either mapped in error or has been lost due to changes of a meandering stream channel. The head of the unnamed creek that flows directly into Lake Bastrop from the southern corner of the tract is designated as riverine, intermittent streambed and seasonally flooded. The portion of this drainage on the Griffith League Ranch does not meet the National Wetlands Inventory criteria for an intermittent, seasonally flooded stream and probably should have a different classification.

Four of the 13 listed ponds are classified as palustrine, open water and permanently flooded. Three of these are one acre or less in size, the fourth is approximately three acres. Seven of the 13 ponds are classed as palustrine, open water, permanently flooded, and diked. Of these seven, one is about three acres in size, another about two acres and the other five are one acre or less. Two ponds of one acre or less are listed as palustrine, emergent, persistent, temporarily flooded, and diked. All 13 ponds mapped as wetlands appear to be constructed stock ponds, possibly natural depressions that were scooped out to enlarge them. It was not possible to determine if any of the ponds are related to naturally occurring seeps or springs.

Two streams that are not listed on the National Wetlands Inventory map occur on the Griffith League Ranch. Alum Creek, in the eastern corner of the tract, has year-round water flowing along its length within the property boundaries. This stretch of Alum Creek is impacted by livestock activity upstream of the ranch. The area where Alum Creek flows off the property is a low-lying, marshy area. The streambed downstream of the Finger Pond (Pond 12) also appears to meet wetland criteria as it has permanent pools along more than a mile of its reach toward the northwestern boundary of the property. The water source for this stream appears to be one or more natural seeps or small springs. Some of the pools along its run contain persistent, perennial aquatic and semi-aquatic vegetation (Forstner 2000, Figure 3).

During the wet winter of 2002, it was noted that almost all of the drainages on the ranch flow for some time after periods of heavy or extended rainfall. Also, shallow depressions in uplands appear to hold water after heavy or extended rainfall. Shallow pools along the intermittent drainages and the upland depressions, while not considered wetlands, could serve as breeding sites for the Houston toad provided that steep banks do not present a barrier for the species or the pools do not dry too fast.

#### **4.8 WATER RESOURCES AND WATER QUALITY**

A north-south trending ridge with elevations of 600 to 650 feet divides Griffith League Ranch hydrologically (Figure 3). The Griffith League Ranch is situated at the headwaters of three creeks. The western and northwestern portions of the ranch are drained by intermittent tributaries of Piney Creek, which empties into the Colorado River upstream of Bastrop. Spicer Creek and an unnamed creek drain the southwestern portion of the property. These two creeks are intermittent, arise on the property, and drain into Lake Bastrop about 1.5 miles to the southwest. Spicer Creek continues below the dam on Lake Bastrop and empties into Piney Creek. Alum Creek, a short segment of which passes through the easternmost corner of the tract, is the major drainage east of Griffith League Ranch. Several unnamed, intermittent branches of Alum Creek arise on the property, as does Price Creek, the only named tributary on the tract's east side. Alum Creek empties into the Colorado River below Bastrop. Water flows year-round in this stretch of Alum Creek. While its quality has not been determined, it appeared eutrophic in 2000, probably due to livestock grazing on and upstream of the tract.

Of the 19 known ponds on the ranch, most appear to hold water year-round. Pond 6 and Pond 13, both shallow ponds, have dried for periods between 2000 and the present. Most of the ponds appear to be diked ponds, probably constructed to provide water for livestock. Judging from the size of pine trees growing in the dikes, most of the ponds appear to be old construction. In 2000, those ponds having heavy livestock use were eutrophic, devoid of vegetation on their perimeters, and had little evidence of diverse aquatic life. Water quality in the ponds ranged from excellent to poor during the 2000 season, depending on the amount of stock use each received. With heavier rainfall and removal of livestock starting during the 2001 season, water quality in all the ponds improved, and vegetation covered their banks. In addition to the ponds, several dry upland depressions were noted in 2000. Vegetation associated with these dry depressions indicated that they might hold water for some time after precipitation events, particularly during wet periods. This was, in fact, observed during the winter of 2001. At least one of these depressions served as a breeding site for the Houston toad. However, it dried before the tadpoles emerged (Forstner 2001).

Griffith League Ranch is underlain by two major aquifers of the region: the Wilcox Group and the Carrizo Sand. Only one well, State Well No. 58-55-402, has been recorded on the property. This well, drilled in 1952 for domestic and stock use, taps the Wilcox Group. Water from this well, which was apparently never used, was described as "soft" by the driller. Quality of the water from this well is unknown (Palafax 1994). Several other wells, probably used to water livestock, are known to exist on the tract but no information related to them has been located. A hand-dug, stone-lined well was reported by a Boy Scout Troop in January 2000. Its exact location is unknown and quality and quantity of its water is undetermined.

An environmental site assessment was conducted in 1994 (Palafax 1994) that surveyed the Griffith League Ranch for contaminants and concluded that the site was "generally uncontaminated by hazardous materials." Therefore water quality is considered to be good.

## 4.9 LAND USE

The present Griffith League Ranch was originally granted to Jacob Large by the Board of Land Commissioners, Sabine County, Republic of Texas, in 1838. Jacob Large, upon being certified as “a married man...and the head of a family” and “being a resident citizen of Texas at the date of the Declaration of Independence” was granted “one league and labour of land in said Republic” (one league equals 4,428.4 acres, one labour equals 174.1 acres). Survey notes, dated June 28, 1838, describe the property as “containing eight labours of temporal land and eighteen labours of pasture land” (Board of Land Commissioners, Republic of Texas, 1838).

In 1846, Jacob Large sold the tract to Alfred Griffith, a “native of the state of Maryland” (Bastrop County, Deed Record E, 1846). Additional adjacent acreage may have been purchased, and some of the ranch was evidently sold and later reclaimed in the early 1900’s. The ranch passed to Mary Lavinia Griffith Sanders, a direct descendent of Alfred Griffith, in 1950. At about the same time that Mrs. Sanders received title to the ranch, she purchased an additional 50.5 acres from Mrs. Ella Fleming of Travis County. This 50-acre addition provided access to Griffith League Ranch from Oak Hill Cemetery Road. Knox’s 1950 survey recorded the ranch at “4,847.5 acres, more or less” (Knox 1950). The Griffith family owned the property until 1993 when Mrs. Sanders bequeathed it to BSA/CAC.

Griffith League Ranch remained predominantly vacant and undeveloped since the time of the original grant to Jacob Large in 1838. Aerial photographs, dated 1974, 1981, 1991 and 1999, show little change on the property. Topographic maps indicate that the tract has been heavily wooded for at least the past 50 years (Palafox 1994, Texas Natural Resource Information System 2000). Approximately 565 acres (about 12 percent) were in improved pastureland in 1999, and at least 17 constructed stock ponds were associated with these pastures. The pastures and adjacent woodlands were used for grazing cattle through 2000. Small areas of the ranch could have been farmed in past years. Fire scars on trees indicate that at least one widespread wildfire occurred on the ranch at some time in the past. A small sawmill operated in the southern corner of the property during the 1960’s. Several unimproved roads, skidder trails and the remains of the sawmill evidence past logging activity on much of the ranch (Palafox 1994, Texas Natural Resource Information System 2000).

During World War II and the Korean War (prior to 1955), the U.S. Army utilized most of the land between Elgin and State Highway 21 in Bastrop County as a military training camp, Camp Swift. The eastern portion of Griffith League Ranch was used as an artillery range impact zone. Knox noted military roads in his 1950 survey of the ranch (Knox 1950). Some of the old military roads now provide access to various sections of the ranch. Archeologists surveying the tract have found evidence of military activities on the tract (Parkhill 2000). The two existing ranch houses were moved from Camp Swift to the ranch’s central pasture in the late 1950’s (Palafox 1994). The larger main residence was refinished with a stone facade and the smaller was used as a ranch worker’s residence. Several outbuildings and sheds were built adjacent to the houses.

Adjacent lands to the north of Griffith League Ranch are heavily wooded. Land to the east and northeast and to the west and northwest appear to be used for agricultural

purposes at the present time. To the southeast, south, and southwest, lands are platted for residential development and are rapidly being converted to that use.

#### **4.10 CULTURAL RESOURCES**

Because no archeological surveys had been conducted on Griffith League Ranch in the past, no records of cultural resources were found in Texas Historical Commission (THC) or Texas Archeological Research Laboratory (TARL) files. However, archeological sites are commonly associated with the heads of, and along, drainages. Archeological sites have been documented in similar environments on Camp Swift and near Lake Bastrop, an indication that similar sites are likely to occur on Griffith League Ranch as well (Martin, THC, 2000, pers. comm.). Being within a short distance of one of the early Spanish Colonial-era routes that traversed the area, the ranch could produce evidence of that period. The discovery of a hand-dug well by Boy Scouts in early 2000 may indicate unrecorded past uses of the property that need documentation. Utilization of the tract as a military training camp during World War II and the Korean War may have historical significance. In the event that valuable prehistoric sites are discovered on the Griffith League Ranch, BSA/CAC would revise development plans and consider new placement for any activities that were previously planned for areas that have proven archeological significance.

Knowledge of the history and pre-history related to the present Griffith League Ranch would aid BSA/CAC in fulfilling Lavinia Griffith Sanders' vision for her property. Such information would also aid BSA/CAC in achieving its mission. Therefore, BSA/CAC initiated a preliminary archeological survey during 2002. The survey included areas of the ranch that could be disturbed if Phase One of the Preferred Alternative were implemented. This preliminary archeological survey was conducted by a volunteer group of avocational and professional archeologists affiliated with the Texas Archeological Society and the THC's Texas Archeological Steward Network. Their preliminary investigation was limited to a pedestrian inspection of areas that could be disturbed by proposed development on the ranch. Archeological and historical sites are being documented and recorded. Prior to land disturbance, more detailed investigation would be done, along with mitigation, if needed. The group recorded two historical sites with THC. Although a few stone flakes and scattered worked stone were observed, no archeological sites have yet been found or recorded (Parkhill 2000).

As development of the ranch and the archeological survey proceed, archeologists would be present during any ground disturbances associated with implementation of the Preferred Alternative. All sites that would be disturbed by development would be more thoroughly investigated and documented by professional archeologists. Their field reports would be submitted to THC for a "determination of significance" under the National Historic Preservation Act (NHPA). BSA/CAC would forward a copy of THC's "determination of significance" to the Service. Should a site require mitigation under NHPA, BSA/CAC would consult with the Service to assure that impacts to the Houston toad would be avoided or mitigated.

#### **4.11 AIR QUALITY**

Bastrop County is part of the Austin regional airshed. There are no air quality monitoring stations in Bastrop County. The Texas Council on Environmental Quality (TSEQ) and the U.S. Environmental Protection Agency currently consider the Austin air shed as a “full attainment area” for all air quality criteria pollutants measured. However, changes in air quality standards or an increase in regional air shed pollution levels could affect future attainment status of the area (Wells, TCEQ, 2000 per. comm.).

#### **4.12 SOCIOECONOMIC CONDITIONS**

Bastrop County has experienced rapid growth since 1990. This change seems to be catalyzed by growth in the Austin area, 30 miles to the west, and the opening of Austin-Bergstrom International Airport just 23 miles from Bastrop (Bastrop Chamber of Commerce 1999). The county’s 1990 population of 38,282 increased almost 51 percent to 57,733 in 2000. It is projected to climb another 166 percent, to 153,392, by 2040. Population composition by race-ethnicity for Bastrop County in 2000 was: Anglo (66 percent), Hispanic (24 percent), Black (nine percent) and Other (one percent). By 2040, these percentages are expected to change to: Anglo (46 percent), Hispanic (47 percent), Black (six percent) and Other (one percent) (Texas State Data Center 2001).

Population over the 15-county area serviced by BSA/CAC was 1,429,276 in 2000. By 2040, it is expected to reach 2,825,739, an increase of almost 98 percent. Population composition by race-ethnicity for the 15-county area in 2000 was: Anglo (63 percent), Hispanic (25 percent), Black (eight percent) and Other (four percent). By 2040, population composition by race-ethnicity over the area is projected to be: Anglo (46 percent), Hispanic (42 percent), Black (six percent), and Other (six percent) (Texas State Data Center 2001).

BSA/CAC currently serves over 22,000 boys (ages seven to 21) and girls (ages 14 to 21) in the Council’s 15-county area. The demand for scouting is growing along with the communities it serves. Between 1990 and 2000, BSA/CAC increased its membership by about 80 percent, from 12,423 to 22,311 members. During this same period, outreach programs for inner city youth grew about 474 percent, from 673 to 3,866. The Council anticipates that both general membership and inner city youth membership would grow another 34 percent by 2005. BSA/CAC’s membership application does not request information on an applicant’s race, ethnicity, or disability status, and the Council does not maintain membership records by these criteria. Because membership is open to all youth in the 15-county area served by the Council, BSA/CAC anticipates that it is serving all youth in about the same percentage as the race, ethnicity or disability composition of the schools in each of the district’s counties. Griffith League Ranch Scout Camp would serve the Council’s youth in about these same proportions. BSA/CAC provides scholarships for disadvantaged youth to enable them to participate in the camp experience. The camp would be designed to accommodate persons with disabilities. It is anticipated that Griffith League Ranch Scout Camp would employ minorities in about the same ratio as the population composition of Bastrop County. (Boy Scouts of America, Capitol Area Council 2002).

Bastrop is a regional retail center for a 25-mile radius, serving some 40,000 people. However, an estimated 50 to 60 percent of the area's residents work in, and commute to, Austin while preferring to reside in the small town, rural atmosphere of Bastrop County (Newman 2000). The goal of the Bastrop Economic Development Corporation is to "bring in new jobs so people already living in Bastrop won't have to commute" (Magee 2000). The demand for retail services and housing is expected to increase as the Bastrop area grows (Bastrop Chamber of Commerce 1999). Bastrop Independent School District is currently the area's largest employer. Other major employers include government offices and services, retail sales, commercial services, and light manufacturing (Bastrop Chamber of Commerce 2002). Agricultural resources of the county include beef, livestock, pecans, peaches, watermelons, cotton, oats, hay, sorghum, and pine timbers. Coal, gravel, and oil are its major mineral resources (Bastrop Economic Development Corporation 2000). Additionally, about 500,000 tourists visit Bastrop each year to take advantage of the area's climate, scenery, recreational venues, and history (Magee 1999).

In 2001, retail sales were \$543,483,900 and Bastrop County's sales tax rebate increased 7.78 percent over 2000 (Magee 2002). Per capita income was \$18,530 and property values (1997) were calculated at \$1,791,338,674 (Ramos 1999). The county's average unemployment rate for 2001 was 3.8 percent. Unemployment dropped from a high of 4.7 percent in 1990, but was up from a low of 2.3 percent in 2000 (Magee 2000, 2002). Agriculture market value for Bastrop County (1997) was \$27,899,000, while agricultural net returns were minus \$2,140,000 (Ramos 1999).

## **5 ENVIRONMENTAL CONSEQUENCES**

Each of the three alternative development plans for Griffith League Ranch (the Preferred Alternative, an Alternative Site Design, and a No Action Alternative) that was considered by BSA/CAC was presented in Chapter 3. Twelve environmental elements, including natural, cultural and socioeconomic resources, on or related to Griffith League Ranch were described in Chapter 4. In this chapter, the effects that each of the three alternatives could have on each resource element are analyzed. A Habitat Conservation Plan (HCP), presented in Chapter 6, identifies and discusses measures that BSA/CAC would undertake to avoid or mitigate incidental take of the endangered Houston toad should the Preferred Alternative be implemented.

The direct, indirect, and cumulative impacts that each alternative could have on each environmental element are identified and analyzed below. Figure 11 and Table 1 analyze the spatial extent and intensity of disturbances that could result from selection of the Preferred Alternative. Figure 12 and Table 2 analyze the spatial extent and intensity of disturbances that could result from selecting the Alternative Site Design.

### **5.1 EFFECTS ON GEOLOGY**

Geologic (mineral) resources on Griffith League Ranch could include sand, gravel, lignite, oil, gas, and fissionable (radioactive) minerals. If either the Preferred Alternative or the Alternative Site Design were selected, the effects on geologic resources would be negligible. Under both of these options, mineral resources would remain undeveloped.

If the No Action alternative were selected, short-term effects would be negligible so long as mineral resources remained undeveloped. However, if mineral resources were developed, substantial long-term adverse environmental effects could occur.

### **5.1.1 Alternative A -- Preferred Alternative**

#### **5.1.1.1 *Direct and Indirect Effects***

If the Preferred Alternative were selected, impoundment of the proposed lakes would inundate rock outcrops in drainage ways. Mineral resources flooded by the proposed lakes and around building sites would become inaccessible or difficult and costly to extract. Shallow trenching for utilities and foundations could cut into the mineral resources of underlying geologic formations. A few geologic outcrops at proposed development sites could be exposed by excavation and grading or buried by filling and contouring of land surfaces.

#### **5.1.1.2 *Cumulative Effects***

Mineral resources would not be developed, thus conserving the region's geologic resources. Conservation of mineral resources could have a minor influence on local market conditions and economic growth by reducing availability of locally produced mineral products. This could result in slight cost increases for such materials.

### **5.1.2 Alternative B -- Alternative Site Design**

#### **5.1.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, the direct and indirect effects on geologic resources would be substantially the same as described for the Preferred Alternative.

#### **5.1.2.2 *Cumulative Effects***

If the Alternative Site Design were selected, the cumulative effects on geologic resources would be substantially the same as described for the Preferred Alternative.

### **5.1.3 Alternative C – No Action**

#### **5.1.3.1 *Direct and Indirect Effects***

If the No Action Alternative were selected, there would be no immediate direct or indirect effects on geologic resources.

#### **5.1.3.2 *Cumulative Effects***

If the No Action Alternative were selected and mineral rights remained undeveloped, the conservation of geologic resources on Griffith League Ranch would augment the conservation of mineral resources in the region.

## **5.2 EFFECTS ON SOILS**

Effects on soils would be minimized if either the Preferred Alternative or the Alternative Site Design were selected. The Preferred Alternative includes activities that would disturb soils on about 10 percent of the property and moderately disturb another nine percent. Soils on about 81 percent of the tract would remain essentially undisturbed. If the Alternative Site Design were implemented, about 14 percent of the soils would be disturbed and 12 percent would be moderately disturbed. Soils on about 74 percent of the tract would remain essentially undisturbed.

### **5.2.1 Alternative A -- Preferred Alternative**

#### **5.2.1.1 *Direct and Indirect Effects***

If the Preferred Alternative were selected, its effects on soil would be negligible on about 3,934 acres (81 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 5 and 11, Table 1). Activities in this zone would be limited to light-on-the-landscape and low-impact uses such as hiking, “no-trace” camping, orienteering, and nature studies. After careful evaluation, the effects of hiking, backpacking, overnight camping, and orienteering have been deemed low-impact activities because of BSA/CAC’s supervised program of use and commitment to minimization. Further, all activities will be supervised and controlled, thereby preventing Scouts from disturbing areas off the trail. And the effects of these low-impact activities will be monitored and adjustments to design, placement, and intensity of use of these areas will be made based on the results of such monitoring. Finally, low-impact activities would not be expected to substantially affect soils on the property.

About 416 acres of soil would be moderately impacted (Figures 5 and 11, Table 1). Digging or scraping during construction and maintenance would minimally impact soil along foot trails, fence lines and lake perimeters and at the COPE course. Some compaction and erosion from light foot traffic could occur. Moderate impact mountain biking and horseback riding will take place on preexisting trails where possible. These activities will take place on single-track trails to minimize any soil compaction or erosion, and new trails will be created in low erosion areas. Moreover, the impact of all trails will be mitigated in accordance with the mitigation measures described in subchapter 3.1.16. Additionally, trail design for these activities must be approved by the Service. The more intense use patterns in more heavily used areas could cause minor compaction or soil erosion. However, most of these impacts would be short-lived. They would be minimized by design and construction techniques, proper use of erosion control devices, restoration, and revegetation.

Soil on some 498 acres would suffer a high degree of disturbance (Figures 5 and 11, Table 1). During construction of small buildings, shooting range backstops, and service roads, soil would be subject to high disturbance by excavation, leveling, contouring, compaction, and stockpiling. Soil in the footprints of buildings, parking lots, entrance roads and main service roads, septic fields, dam sites, and lakebeds would be graded, spread, removed, compacted, covered with impervious materials, or flooded. Of the 498 acres, dam construction and subsequent flooding of three proposed lakes would impact

about 360 acres of soil. The other 138 acres would be impacted by building, road construction, and intensive use. Soil management strategies applied by BSA/CAC would be used to promote and instill land and resource stewardship values in Scouts and other visitors to Griffith League Ranch. The extent of impact would depend upon site design, engineering specifications, and planned uses.

#### **5.2.1.2 *Cumulative Effects***

Under the Preferred Alternative, the effects on soil would be negligible on about 3,934 acres. Impacts would be moderate on about 416 acres. These impacts would be mitigated through use of proper design and construction methods, erosion control devices and restoration or revegetation. Long-lasting cumulative soil impacts would be unlikely. Lakes, intensive use zones, and development would cover approximately 498 acres of soil, which would add to the amount of soil being covered by urban development elsewhere in the region. These impacts would likely be long lasting.

### **5.2.2 Alternative B -- Alternative Site Design**

#### **5.2.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, its effects on soil would be negligible on about 3,611 acres (about 74 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 7 and 12, Table 2). Activities would be similar to those of Alternative A. About 582 acres of soil would be moderately impacted (Figures 7 and 12, Table 2). Soil on some 655 acres would suffer a high degree of disturbance (Figures 7 and 12, Table 2). Of the 655 acres, dam construction and subsequent flooding of four proposed lakes would impact about 373 acres of soil. The other 282 acres would be disturbed by building, road construction, and intensive use.

#### **5.2.2.2 *Cumulative Effects***

Under the Alternative Site Design, the effects on soil would be negligible on about 3,611 acres. Impacts would be moderate on about 582 acres. These impacts would be mitigated through use of proper design and construction methods, erosion control devices and restoration or revegetation. Long-lasting cumulative impacts would be unlikely. Lakes intensive use zones, and development would cover approximately 655 acres of soil, which would add to the amount of soil being covered by urban development elsewhere in the region. These impacts would likely be long lasting.

### **5.2.3 Alternative C – No Action**

#### **5.2.3.1 *Direct and Indirect Effects***

There would be no immediate direct or indirect impacts on soils of the Griffith League Ranch if the No Action Alternative were selected.

### **5.2.3.2 Cumulative Effects**

If the No Action Alternative was selected and Griffith League Ranch remained undeveloped, there would be no cumulative effects on soils.

## **5.3 EFFECTS ON VEGETATION**

Effects on vegetation would be minimized if either the Preferred Alternative or the Alternative Site Design were selected. The Preferred Alternative includes activities that would remove vegetation on about 10 percent of the property and moderately disturb another nine percent. Vegetation on about 81 percent of the tract would remain essentially undisturbed. If the Alternative Site Design were implemented, vegetation on about 14 percent of the tract would be removed, and 12 percent would be moderately disturbed. Vegetation on about 74 percent of the tract would remain essentially undisturbed. With either of these alternatives, BSA/CAC would prepare a comprehensive Vegetation Management Plan. This plan would address landscaping with native plants, restoration and revegetation of disturbed areas, forest management, fire management, control of non-native plants, use of chemical fertilizers and herbicides and handling of hazardous materials.

Although short-term effects might be negligible, the long-term risks of selecting the No Action alternative could be substantial. Grazing would likely be reinstated, and BSA/CAC would not prepare a Vegetation Management Plan for the tract if this option were selected.

### **5.3.1 Alternative A -- Preferred Alternative**

#### **5.3.1.1 Direct and Indirect Effects**

If the Preferred Alternative were selected, its effects on vegetation would be negligible on about 3,934 acres (81 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 5 and 11, Table 1). Activities in this zone would be limited to light-on-the-landscape and low-impact uses such as hiking, backpacking, “no-trace” camping, orienteering and nature studies. There would be no commercial logging, and the forest would be managed to conserve and restore the natural ecosystem. Fire and forest management on this portion of Griffith League Ranch would be addressed in a Vegetation Management Plan. Timber would be harvested on the Griffith League Ranch for the use of the Scout camp only, and would not be conducted until the vegetation and timber harvest management plans have been reviewed and approved by the Service. Further, all management plans will take into account current adaptive management strategies. Management activities would be designed to produce long-term beneficial effects for Lost Pines habitat. Restrictions on ranch operations, as detailed in Section 6.2.1.2 include measures to avoid or minimize adverse effects resulting from scout camp activities. Therefore, effects in the low impact zone should be negligible or may even improve the health of the woodland.

About 416 acres (nine percent) of vegetation on the property would be moderately impacted: 338 acres of woodland (eight percent of the total woodland) and 78 acres of pasture (Figures 5 and 11, Table 1). Vegetation within trail and utility corridors,

roadways, fence lines, the COPE course, campsite pods, and shooting ranges could be cut, trimmed, or mowed. The purposes of vegetation treatment would be to allow safe access for users and maintenance crews, provide firebreaks, and maintain aesthetic and ecological integrity. Vegetation in campsites and along trails would be trampled and locally destroyed. Prescribed fire would be used as a vegetation management tool in both this zone and the low disturbance zone to improve the health of the pine woodland ecosystem. Effects on vegetation would be minimal and reversible.

Vegetation on some 498 acres (10 percent) on the property would suffer a high degree of disturbance: 422 acres of woodland (ten percent of the total woodland) and 76 acres of pasture (Figures 5 and 11, Table 1). Effects would be long term. Complete removal of vegetation would occur at major development sites such as the entrance and conference center complexes, outdoor learning centers, maintenance area, dams and lakes, and fire station. These actions would be necessary to prepare construction sites, construct buildings and infrastructure, and develop lakes. Of the total 498 acres, about 322 acres of woodland would be permanently flooded by impoundment of the three proposed lakes. The other 176 acres would be cleared for construction of dams, structures, and infrastructure. Domestic agricultural plants in the orchard and garden proposed for the Republic of Texas Outdoor Learning Center would replace about three acres of native vegetation.

In areas where existing vegetation is manipulated or removed, habitat would be exposed to more sunlight and air circulation. Edge effects thus created could result in warming and drying of exposed habitat. However, most of the woodland that would be disturbed would be replaced by the lakes that could add humidity and soil moisture to the immediate area and moderate temperatures. Development of the OLCs would require only selective removal of vegetation, and most trees would be left standing. Disturbed sites on the tract could be susceptible to encroachment by invasive non-native plants. Existing forested areas on the tract could become warmer and drier due to edge effects related to opening the forest canopy near development sites. However, these areas would be minimized by placement of as much development as possible in existing pasture.

The reintroduction of Texas native large mammals such as bison, antelope, and elk into a 610-acre fenced preserve could have a negative impact on the vegetation depending on the stocking rate, and about two miles of existing vegetation would be removed to construct a new wildlife fence. BSA/CAC would consult with wildlife specialists to minimize the impact.

BSA/CAC's active management of the Lost Pines plant community on the 90 percent of the property, which would be used only for low and moderate impact activities, would offset the permanent loss of about 10 percent of the vegetation from Griffith League Ranch. Vegetation management strategies applied by BSA/CAC would be used to promote and instill land and resource stewardship values in scouts and other visitors to Griffith League Ranch.

Before any active manipulation of the vegetation is conducted, a Vegetation Management Plan would be prepared to guide the long-term management of vegetation resources. Vegetation management activities on the property would include removal of vegetation for landscaping, restoration and revegetation projects, forest management, fire

management, control of non-native vegetation, and application of chemical herbicides and fertilizers. The plan may call for salvage of native plants from areas disturbed by construction and the use of native plants for restoration of high-use areas and disturbed sites such as construction zones, dam sites, utility and road corridors, and abandoned pasturelands. It would also address forest management, reforestation, prescribed fire, and the application of chemical fertilizers and herbicides. The objective of the vegetation management program would be the perpetuation of a biologically diverse plant community that would be safe for scouts to use.

#### **5.3.1.2 *Cumulative Effects***

The Preferred Alternative would add cumulatively to the loss of native vegetation elsewhere in the surrounding area.

Management of vegetation guided by a well-designed Vegetation Management Plan would likely benefit native plant communities on Griffith League Ranch. The preparation and implementation of such a plan could serve as a model for other landowners and land managers in the Lost Pines region. Sensitive vegetation management in the Lost Pines ecosystem could be an aid to conserving this unique plant community.

### **5.3.2 Alternative B -- Alternative Site Design**

#### **5.3.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, its effects on vegetation would be negligible on about 3,611 acres (74 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 7 and 12, Table 2). About 582 acres (12 percent) of vegetation on the property would be moderately impacted: 478 acres of woodland (11 percent of the total woodland) and 104 acres of pasture (Figures 7 and 12, Table 2). Vegetation on some 655 acres (14 percent) on the property would suffer a high degree of disturbance: 514 acres of woodland (13 percent of the total woodland) and 81 acres of pasture (Figures 7 and 12, Table 2). Impacts would be the same as Alternative A only greater in extent.

#### **5.3.2.2 *Cumulative Effects***

About 655 acres of vegetation would be lost to the construction of structures, infrastructure and lakes. This loss of vegetation would add cumulatively to the loss of native vegetation elsewhere in the surrounding area.

Management of vegetation guided by a well-designed Vegetation Management Plan would likely benefit native plant communities on Griffith League Ranch. The preparation and implementation of such a plan could serve as a model for other landowners and land managers in the Lost Pines region. Sensitive vegetation management in the Lost Pines ecosystem could be an aid to conserving this unique plant community.

### **5.3.3 Alternative C – No Action**

#### **5.3.3.1 Direct and Indirect Effects**

There would be no immediate direct or indirect impact on vegetation if the No Action Alternative were selected and Griffith League Ranch remained undeveloped, except that grazing would likely resume, which would affect the vegetation species composition.

#### **5.3.3.2 Cumulative Effects**

Since there would be no immediate development or change in the current vegetation as a result of this alternative, there would be no cumulative effects on vegetation.

### **5.4 EFFECTS ON WILDLIFE**

The Preferred Alternative includes activities that would permanently disturb wildlife habitat on about 10 percent of the property and moderately disturb another nine percent. Wildlife habitat on about 3,934 acres (81 percent) of the tract would remain essentially undisturbed. If the Alternative Site Design were implemented, wildlife habitat on about 14 percent of the tract would be permanently disturbed, and 12 percent would be moderately disturbed. Wildlife habitat on about 74 percent of the tract would remain essentially undisturbed. With either of these alternatives, BSA/CAC would prepare a comprehensive Wildlife Management Plan. This plan would address game and non-game species, reintroduced native species, threatened and endangered species, and non-native and feral domesticated animals. The objective of the wildlife management program would be to perpetuate a diverse, healthy wildlife component on the property.

Although short-term effects might be negligible, the long-term risks to wildlife of selecting the No Action alternative could be substantial. BSA/CAC would not prepare a Wildlife Management Plan for the tract if this option were selected.

#### **5.4.1 Alternative A -- Preferred Alternative**

##### **5.4.1.1 Direct and Indirect Effects**

If the Preferred Alternative were selected, some species might be negatively impacted by loss of habitat, habitat fragmentation, habitat modification, and the presence of human activity. Other species could be positively impacted by the creation of new habitat niches and changes in wildlife population dynamics and community structure. If the Preferred Alternative were selected, its effects on wildlife would be negligible on about 3,934 acres (81 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 5 and 11, Table 1). Activities in this zone would be limited to light-on-the-landscape and low-impact uses such as hiking, backpacking, “no-trace” camping, orienteering and nature studies. Light development and low-impact activities would not be expected to substantially affect wildlife or wildlife habitat on the property. Wildlife would be exposed only occasionally to human activities in this zone. Fire and forest management activities proposed for this portion of the property would be designed to promote long-term beneficial effects for wildlife while avoiding or minimizing adverse effects. Hunting for white-tailed deer, turkey, and other native game species would be

used as a wildlife management tool. A Wildlife Management Plan (WMP) would be prepared to guide hunting practices on the ranch. The restocking of Texas native large mammals such as bison, antelope, and elk, depending on the stocking rate, could displace and degrade the habitat for species that already exist on that portion of the ranch and could introduce diseases and parasites.

About 416 acres (nine percent) of habitat on the property would be moderately impacted: 338 acres of woodland (eight percent of the total woodland) and 78 acres of pasture (Figures 5 and 11, Table 1). Vegetation management on the property could reduce the amount of available cover and nesting habitat for some species. Other species could take advantage of a reduction in cover and expand into these more open zones. Service roads and trails could increase human activities in areas that previously have been relatively isolated from human presence. While these roads and trails could result in increased human-wildlife interactions, these same routes could be used by some species as travel corridors. Although some habitat modification could occur within these 416 acres, no habitat would be permanently lost, and no major habitat changes would likely occur.

Wildlife habitat on 498 acres (10 percent) on the property would suffer a high degree of disturbance: 422 acres of woodland (10 percent of the total woodland) and 76 acres of pasture (Figures 5 and 11, Table 1). Wildlife using this area would be displaced, resulting in potentially higher death rates and loss of breeding potential. Of these 498 acres, about 322 acres would be permanently flooded by impoundment of the three proposed lakes, which would likely be stocked with sport fish.

Species that prefer habitat associated with human activities would find new niches to occupy in developed areas and could expand into them. Negative edge effects on wildlife populations would be greatest around developed areas.

The lakes could become habitat for aquatic species and others that are dependent upon small bodies of water. Birds not now found on the tract could be attracted to the lakes. Fish, amphibian, and reptilian species could also be expected to take advantage of new lacustrine and wetland habitats. Bullfrogs, water snakes, turtles, fish, and the Gulf Coast, Texas, and Woodhouse's toads, species that are competitive with or threatening to the Houston toad, could be attracted to these new sites. At the same time, shallow quiet pools along shorelines could provide new breeding habitat for the Houston toad and other amphibians. These new lakes would provide a dependable, long-term water supply for all wildlife on the property.

Fencing for the Native Texan Wild Game Preserve would inhibit free movement of all but the smaller mammals currently on the ranch. The WMP would cover management of game and non-game species, reintroduced native species, threatened and endangered species and non-native and feral domesticated animals. Such management guided by a comprehensive plan would be expected to be a long-term benefit to wildlife on the tract. BSA/CAC's management of 90 percent of Griffith League Ranch for conservation of native wildlife in Lost Pines habitat would offset the alteration of about 10 percent of the wildlife habitat. Wildlife management strategies applied by BSA/CAC would be used to promote and instill land and resource stewardship values in Scouts and other visitors to Griffith League Ranch.

#### **5.4.1.2 *Cumulative Effects***

This loss of wildlife habitat would add cumulatively to the loss of wildlife habitat elsewhere in the surrounding area. Reduction in wildlife populations because of habitat loss would add cumulatively to the loss of wildlife due to habitat loss elsewhere in the region. Increases and changes in wildlife populations due to the creation of new lacustrine and wetland habitat could cumulatively increase the numbers of those species in the region. Because the development of the Griffin League Ranch as a scout camp is unique in the region and more akin to the development of Bastrop and Buescher State Parks, the cumulative effects would be relatively minor, and the ranch could become a wildlife haven as the area becomes more urbanized.

Management of wildlife, guided by a well-designed Wildlife Management Plan, would likely benefit wildlife communities on Griffith League Ranch. The preparation and implementation of such a plan could serve as a model for other landowners and land managers in the Lost Pines region. To the extent that this occurs, there could be an area-wide reduction in adverse impacts on wildlife due to improper management decisions and actions. Sensitive wildlife management in the Lost Pines ecosystem could be an aid to conserving native wildlife populations.

### **5.4.2 Alternative B -- Alternative Site Design**

#### **5.4.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, its effects on wildlife would be similar to the effects of the Preferred Alternative. Approximately 3,611 acres (74 percent) of the tract would have low impacts and about 582 acres (12 percent) of vegetation on the property would be moderately impacted: 478 acres of woodland (11 percent of the total woodland) and 104 acres of pasture (Figures 7 and 11, Table 2). Wildlife habitat on 655 acres (14 percent) on the property would suffer a high degree of disturbance: 574 acres of woodland (13 percent of the total woodland) and 81 acres of pasture (Figures 7 and 11, Table 2). Of these 655 acres, about 373 acres would be permanently flooded by impoundment of the three proposed lakes. About 204 acres would be cleared for construction of structures and infrastructure. Seventy-three acres would be cleared for a new cattle pasture. Although the proposed lakes would eliminate about 373 acres of mostly forested wildlife habitat, the lakes could become habitat for aquatic species and others that are dependent upon small bodies of water.

#### **5.4.2.2 *Cumulative Effects***

The cumulative effects of the Alternative Site Design would be similar to those of the Preferred Alternative.

### **5.4.3 Alternative C – No Action**

#### **5.4.3.1 *Direct and Indirect Effects***

There would be no immediate direct or indirect impacts on wildlife if the No Action Alternative were selected and Griffith League Ranch remained undeveloped. If it is not

sold, BSA/CAC would likely continue to use the property for agricultural purposes, such as livestock, hay and timber production, in order to offset expenses. Free-ranging livestock could continue to impact wildlife populations in woodlands, around stock ponds, and in pastures. Pastures could be improved to promote maximum yield of forage for cattle, and timber could be cut when it became commercially marketable rather than managing these resources for wildlife. Unmanaged harvest of white-tailed deer and turkey could continue. BSA/CAC would not prepare a Wildlife Management Plan under this alternative.

#### **5.4.3.2 Cumulative Effects**

If the No Action Alternative was selected and Griffith League Ranch remained undeveloped, there would be no cumulative effects on wildlife.

### **5.5 EFFECTS ON THREATENED OR ENDANGERED SPECIES**

The Preferred Alternative includes activities that would eliminate habitat of the endangered Houston toad on about 10 percent of Griffith League Ranch and moderately disturb another nine percent. Houston toad habitat on about 81 percent of the tract would remain essentially undisturbed, and few effects of consequence would be expected on this portion of the property. If the Alternative Site Design were implemented, Houston toad habitat on about 14 percent of the tract would be highly disturbed and 12 percent would be moderately disturbed. About 74 percent of the species' habitat would remain essentially undisturbed under the Alternative Site Design.

With either Preferred Alternative or Alternative Site Design options, BSA/CAC would prepare a Habitat Conservation Plan (HCP) for the Houston toad as required by Section 10 of the Endangered Species Act. The HCP would address management of the Houston toad, avoidance or mitigation of impacts on the species, monitoring, research, adaptive management, and education.

If the No Action Alternative were selected, short-term effects on threatened or endangered species would likely be minimal. BSA/CAC would not prepare a Habitat Conservation Plan for the Houston toad if this option were selected.

The threatened bald eagle is not known to use any portion of Griffith League Ranch. No take of this species would be anticipated under any of the three alternatives. Regardless of the alternative selected, no impacts would be expected on any of the species of concern.

#### **5.5.1 Alternative A -- Preferred Alternative**

##### **5.5.1.1 *The Houston Toad: Effects of the Preferred Alternative***

If the Preferred Alternative were selected, its effects on the Houston toad would be minimized on about 3,934 acres (81 percent) of Griffith League Ranch, the "Low Disturbance Zone" (Figures 5 and 11, Table 1). Only light-on-the-landscape amenities designed for low-impact uses would be permitted in this zone. Amenities, such as foot trails and primitive campsites, and activities, such as hiking, backpacking, "no-trace"

camping, orienteering, and nature studies, would not be expected to substantially affect the Houston toad or its habitat. Management activities such as fire and forest management would be designed to promote long-term beneficial effects on the Houston toad habitat while avoiding adverse effects. This level of development, use, and management would be compatible with the continued presence of the Houston toad. Most activities in this zone would occur during the summer and fall when the species is least active. Activities during other parts of the year would be carefully managed and supervised to avoid or minimize impacts on the Houston toad.

About 416 acres (nine percent) of the tract would be moderately developed. Development and activity levels in this “Moderate Disturbance Zone” (Figures 5 and 11, Table 1) would cause some landscape and habitat alterations, although no known breeding ponds would be disturbed. However, neither the planned development nor intensity of use would preclude the utilization of moderately disturbed habitat by the Houston toad. The habitat disturbance would be reversible, and the disturbance would be avoided or minimized as much as possible. Most activities in this zone would occur during the summer and fall when the toad is least active. Activities during other parts of the year would be carefully supervised to avoid or minimize impacts on the species. Take caused by development and use in this zone would be mitigated by setting aside habitat as agreed upon in the HCP.

The “High Disturbance Zone” would include about 498 acres (Figures 5 and 11, Table 1). Development and use in this area would result in long-term loss of Houston toad habitat. It is expected that the Houston toad would be unable to utilize these areas once they were developed as proposed in the Preferred Alternative. However, under the Preferred Alternative, about 154 acres of the 498 acres of high disturbance would be concentrated in existing pasture where Houston toads have not been documented in order to minimize impacts on the species (Figures 5 and 11, Table 1). No breeding ponds would be impacted.

Critical Habitat. About 2,712 acres of Griffith League Ranch (56 percent) are within federally designated critical habitat (Figure 4). Selection of the Preferred Alternative would leave almost 2,355 acres (almost 87 percent) of the critical habitat on the tract undisturbed or with only minimal impacts resulting from light-on-the-landscape, low-impact activities. About 134 acres of critical habitat (about five percent) would be moderately disturbed. The only high impact development that will occur in designated critical habitat is the construction of Lake 3, a portion of Lake 1, and four activity areas, totaling approximately 223 acres. This constitutes eight percent of the critical habitat on site and 0.2 percent of the critical habitat designated in Bastrop County.

#### ***5.5.1.2 Direct and Indirect Effects -- The Low Disturbance Zone***

If the Preferred Alternative were selected, about 3,934 acres would be minimally impacted. Improvements proposed for this zone, such as foot trails, primitive backcountry campsites, and a native animal preserve, and low-impact activities, such as hiking, backpacking, “no-trace” camping, wilderness orienteering, and nature studies would have little effect on Houston toad because little habitat disturbance would occur (Figures 5 and 11, Table 1). Most of these activities would occur during daylight hours

between mid-June and July, during the period when the Houston toad is least active. Education programs for BSA/CAC staff, adult leaders and camp users would raise awareness of the Houston toad. Using the Houston toad as a symbol for natural resources conservation, these programs would direct user behavior toward a “leave-no-trace” ethic for backcountry use. Camp staff and adult leaders would closely supervise activities in the low disturbance zone.

Negative impacts could include the possible, but unlikely (given the low density of Houston toads on the ranch), trampling of aestivating toads and harassment in the vicinity of the campsites; introduction of exotic plants, animals, parasites, and diseases; and local habitat degradation. No breeding ponds would be disturbed and no activities except research and education would be conducted at or near the ponds during the breeding/dispersal season.

Management actions, such as fire and forest management, proposed for this portion of the property would be designed to promote long-term beneficial effects on habitat for the toad. Accidental or prescribed fires could result in direct mortality of individual toads, and catastrophic fires or too frequent fires could result in destruction of portions of the woodland. However, prescribed fire could provide a net benefit by removing excess duff and debris on the forest floor and overgrown understory that does not provide good Houston toad habitat. Any logging would be part of a woodland management strategy designed to maintain a healthy habitat for the overall benefit of the Houston toad, although it is possible that some individual toads could be harmed in the process. The introduction of native Texas game animals could result in degradation of portions of Alum Creek and could trample toads. However, since the stocking rate would be low and management of the animals would be adjusted to avoid impacts to the Houston toad, the impacts should be minimal. Monitoring would be conducted to determine the effects of fire, forest management, and recreation on habitat and the species. Conclusions from these investigations would be incorporated into adaptive management strategies and management plans. The BSA/CAC would implement new adaptive management techniques after incorporation into management plans approved by the Service.

Critical Habitat. Negative impacts on critical habitat would be minimal or none in the Low Impact Zone. No habitat would be adversely modified. Many actions by BSA/CAC would constitute restoration and improvement to toad habitat.

### ***5.5.1.3 Direct and Indirect Effects -- The Moderate Disturbance Zone***

Under the Preferred Alternative, it is anticipated that disturbances ranging from minimal to moderate would occur on about 416 acres (nine percent) on the property: 338 acres of woodland (eight percent of the total woodland) and 78 acres of pasture (Figures 5 and 11, Table 1). Development and intensity of use in this zone would cause more habitat disturbance than that described for the low disturbance zone but less than described for the high disturbance zone. No known breeding ponds would be affected. Habitat would be set aside and managed in perpetuity to compensate for impacts as called for in the HCP.

Most habitat disturbance in the moderate disturbance areas would be related to camp management and maintenance. Vegetation in 20-foot corridors along up to 17 miles of

internal and external fence lines would be deforested, cut, and trimmed periodically to allow for construction and maintenance of fences and firebreaks. The only internal fencelines would enclose the Native Wild Game Preserve and existing pastures. Holes would be dug in these corridors to set fence posts. Periodic patrol and maintenance of fence corridors on foot would be conducted by horseback or all-terrain vehicle. Although the fenceline corridors would not be barriers to Houston toad movement, the corridors could become inhospitable to toads because of the removal of trees and the increase in temperature and reduction of moisture in the soils. Toads could also be subject to increased risk of predation in these areas.

In the proposed COPE area, vegetation would be cut and trimmed to permit installation of course elements, promote safe use of the course and provide access to the area. Holes would be dug to set support poles. Except in trail treads and immediately around course elements, use of the COPE course would be low-intensity with less vegetation trampling and soil compaction. Vegetation within most of the COPE area would remain undisturbed in order to physically separate course elements. A Houston toad could be subject to trampling if it burrowed in the course area, but this would be an unlikely event given the current population density. Some change in the vegetation could occur, but so long as the canopy is relatively undisturbed and the vegetation does not present a barrier to toad movements, the impacts to the Houston toad population should be minimal.

A corridor of about 20 feet around each lake would be subject to fluctuating water levels. While flooding might alter vegetation in this corridor, this vegetation could also provide cover for the Houston toad. Shallow shoreline stretches could provide additional breeding sites for the species. Negative effects should be minimal or none.

Although existing ranch roads would be used as much as possible, where new service roads or trails would have to be constructed or existing roads or trails widened, moderate impacts from construction, use, and maintenance would be expected (Table 1). Trimming, cutting, and grubbing of vegetation would open eight-foot wide foot trails and 20-foot wide horse trail corridors. This clearing would permit the safe passage of hikers, mountain bikers, and horseback riders. Up to eight miles of foot trails and up to 15 miles of horse trails would be developed. The narrow hiking and mountain biking trails should have the least impact on the Houston toad because the forest canopy would remain intact, although there is a chance that a toad could be trampled, and heavy use could cause soil compaction and erosion that could present a barrier to toad movements if not repaired. The horse trails could open the canopy, resulting in increased soil temperatures and decreased moisture. A Houston toad could be trampled, and soil disturbance and erosion could be a barrier to toad movements.

Service roadways would be graded and drainage improved where necessary to prevent erosion or flooding of road surfaces. This would require periodic scraping and digging of soil within the road tread and along its edges. Vegetation in road corridors would be trimmed to the extent necessary to permit safe passage of vehicles, maintain the right-of-way, and maintain road corridors as fire breaks.

Opening the canopy and disturbing the existing vegetation could facilitate the colonization by Woodhouse toads, which could then interbreed with the Houston toads. Burrowing toads could be harmed by trampling or killed by mechanical equipment. The

construction of new service roads and the upgrading of existing ranch roads could create a barrier to normal toad migration and dispersal and increase the risk of predation by increasing the toads' exposure to predators. An increase in vehicular traffic could increase the chances of accidental vehicle strikes on individual toads. Individual Houston toads could be at risk from strikes by mowing and maintenance equipment. The reduction in vegetative cover along these linear intrusions into Houston toad habitat could provide easy access by predators and subject toads to increased risk of predation.

Linear utility lines to the OLCs would temporarily disturb up to 25 acres of woodland habitat and individual Houston toads could be disturbed or killed during the digging of trenches. However, the disturbance would be temporary, the activities would be scheduled from June to December when the toads are less active, and trenches would be covered overnight to prevent inadvertent entrapment.

An increase in human activity could increase the risk of take by trampling vegetation, compacting soils, and physically disturbing active toads. These increased risks would be minimized through education programs to inform staff, Scouts, contractors, and other visitors about the Houston toad, its habitat requirements, and appropriate activities and precautions in Houston toad habitat. The proposed outdoor learning centers and designated camping pods would concentrate human activities within the immediate area to prevent unnecessary encroachment into Houston toad habitat.

Human activities could reduce cover and forage for the species and disrupt its activity patterns. Overnight and night time use would be concentrated at the conference center, base camp and outdoor learning centers, away from breeding areas. The majority of use by Boy Scout groups would occur during June and July, outside the normal Houston toad breeding/dispersal season from January to June. During this time there would be less likelihood of interaction between the toad and users of the property. Non-scout use on the tract during fall and winter months would be concentrated at the conference center complex and in areas away from breeding ponds where impacts on the toad would be unlikely. During the Houston toad's breeding/dispersal season, trained camp counselors would carefully supervise weekend and night time activities to minimize and avoid user impacts on the species. Access to Houston toad breeding sites would be extremely limited and also closely supervised during this period. Education programs and close supervision would be the primary means of reducing risks of take and preventing conflicts between the toad and visitors. These programs would become an integral part of a visit to the property by all visitors.

In proposed camping pods, wooded overstory would be left undisturbed, but understory vegetation and ground cover would be impacted by cutting and clearing for initial construction and routine maintenance. Vegetation in camping pods would be subject to trampling. Former burrowing and feeding habitat could become unsuitable because of soil compaction and destruction of vegetation. The extent to which the campsite habitats could be used by the toad during the time that they are not being used by the scouts is unknown. While some soil compaction could occur and vegetative cover might be reduced within each pod, undisturbed vegetation and soil between the pods would provide suitable habitat and travel corridors for the Houston toad. BSA/CAC would rotate the use of camping pods on an annual basis to reduce impacts on soil and

vegetation. If the rotation is not an effective conservation method, then BSA/CAC will adapt its plans so that camping pods would contain two instead of three pods. Heaviest use of camping areas would occur during a six-week period between mid-June and July, outside the normal period of activity for the Houston toad, thereby minimizing impacts.

In the shooting ranges and chapel area, forest, understory, and ground cover vegetation would be cut and mowed during the summer use period. These areas would receive light use and maintenance during the camp's off-season. The opening of the canopy in these areas could result in an increase in soil temperatures and a decrease in soil moisture that would reduce the habitat value for the Houston toad. Vegetation trampling and soil compaction would likely occur in the chapel area, but the area would primarily be used during the summer months. Lead could be introduced into the habitat on the shooting range if the lead recycling program is not effective. However, there are no known routes of contaminants that would likely affect the toad at the level of use expected. Lead bullets, but no lead shot would be used. Mowing could result in toad mortalities if any are in the area and active.

Critical Habitat. The base camp and four OLC camping areas would be located in the designated critical habitat, along with a portion of the horse trail, cross-fencing for the Native Texas Wild Game preserve, and service roads. These developments should have minimal impact on the habitat because only small numbers of trees would be removed, the canopy would remain relatively intact, and no permanent structures would be constructed. Approximately 250 acres within critical habitat (less than 10 percent) would be moderately impacted, most of which would be in the camping pods that would be managed to minimize impacts.

#### ***5.5.1.4 Direct and Indirect Effects -- The High Disturbance Zone***

Construction of facilities and intensive use would subject about 498 acres (10 percent) of the property to a high degree of disturbance: 422 acres of woodland (10 percent of the total woodland) and 76 acres of pasture (Figures 5 and 11, Table 1). Because Forstner (2002a, 2003) found Houston toads only in woodland or pasture within 500 feet (150 meters) of woodland, as many facilities as possible would be placed in pastures to minimize impacts on the species: the proposed main entrance gateway, ranger residence, golf course, conference center complex, corral and horse stable area of the Chisholm Trail Outdoor Learning Center, the maintenance yard, observation towers, and entrance road would be located on 76 acres of existing pasture. As further described in the HCP, BSA/CAC would mitigate impacts to the Houston toad even in the pasture areas where take of Houston toads would not be likely by setting aside habitat for the benefit of the toad. Wherever possible, impacts on the Houston toad would be avoided or minimized. No known breeding ponds would be impacted.

Water and sewer lines, septic systems, and building foundations would require trenching and digging, resulting in soil and vegetation disturbance within the development footprint. In up to 28 acres (less than one percent) of woodland, individual aestivating Houston toads could be disturbed or killed by heavy equipment. None of these areas will be in drainages or near breeding ponds, and covering trenches overnight, revegetating disturbed areas, and scheduling such activities between June and December when toads

are less active would minimize any take. The high-impact OLC facilities and utilities would be constructed on about 35 acres (less than one percent) of the potential Houston toad woodland habitat. In the garden and orchard plots (three acres), vegetation would be cut, and soils would be tilled. Existing native plants would be replaced with agricultural plants of various kinds. The removal of trees would open the canopy, and the construction of the OLCs along with their attendant service roads and utilities would fragment the existing habitat. Any toads within the construction footprint could be killed, and the habitat would become unusable for the Houston toad. Vegetation and soils in construction zones would be trampled and compacted by foot and vehicle traffic. The soil disturbance could make these areas attractive to imported, non-native fire ants, which prey on toads, toadlets, and their food base.

However, to minimize impacts to Houston toads during construction, erosion control devices would be used to prevent soil loss and downstream sedimentation that could impact the Houston toad. Exposed soils in disturbed sites would be revegetated with native plants or stabilized when construction is finished. Also, application of organic and inorganic fertilizers, pesticides, and herbicides would be managed under guidelines documented in an Integrated Pest Management Plan, a subsection of the Vegetation Management Plan for Griffith League Ranch, to minimize impacts to the Houston toad. This plan would also address hazardous materials spills at the maintenance yard, Circle D Volunteer Fire Department facility, and other locations on the property. Habitat to mitigate for impacts on the fire department parcel would be set aside for the benefit of the toad.

Pond 8, near the caretaker's residence and proposed maintenance area and Pond 16, near the proposed south gate fire station, are known Houston toad breeding sites, although no tadpoles or toadlets have yet been observed to emerge from there. Disturbances near these areas would include grading and contouring of soil surfaces, digging and overlaying areas of heavy use with impervious materials. Prudent methods of erosion control would be used to prevent sediment from entering Ponds 8 or 16. Any areas of disturbance near the ponds would be revegetated with native plants, potentially improving habitat for the toad. These areas could present a risk for incidental take resulting from chemical spills, even though only small quantities of such materials would be stored nearby. A hazardous materials spill response plan would be included in the Integrated Pest Management Plan. In the event of a hazardous material spill, the response plan would be activated to prevent serious impact on Houston toad habitat.

Increased use of motor vehicles and heavy construction and maintenance equipment could result in injury or death of individual toads from vehicle strikes. Risks of take would be reduced by imposing low speed limits, keeping traffic loads low, and limiting night time use during the toad's breeding/dispersal season. Roadways, trails, lakes, and activity areas would introduce human activity into portions of the habitat that previously have been relatively isolated.

Constructing the three proposed lakes would permanently flood about 335 acres of known Houston toad habitat. No known breeding ponds would be inundated. Lake 1 would inundate a perennial free-flowing stream downstream of Pond 12. Houston toads are known to occur in the vicinity of Pond 12 but none have yet been documented

utilizing the perennial stream for breeding. Similarly, Pond 4 would be inundated but no Houston toad breeding has been observed there. All vegetation on the proposed lake sites would be cleared prior to construction of the dams and subsequent flooding. Soils at the proposed lakes would be disturbed during site preparation and construction by heavy equipment such as bulldozers and earth moving equipment. Material for dam construction would be hauled to the sites. Access routes to each dam would be impacted by removal of vegetation, grading of roadbeds, and compaction of soils. Soils brought to the site for construction could introduce or provide habitat for the aggressive non-native fire ant and a variety of non-native plants. Any Houston toads utilizing the areas proposed for impoundment would be subject to take. Individual toads, if any, in the lakebed and dam areas would be permanently displaced or killed.

Establishment of the lakes could create new breeding sites along shallow shorelines. Although predation by fish, snakes, turtles, and mammals could impact the toad at these potential breeding sites, Forstner (2000, 2001, 2002a) documented that the Houston toad successfully utilizes the margins of larger ponds despite the presence of predators. An experimental pond array was established in February 2002 on Griffith League Ranch by Forstner to examine predation on Houston toad eggs, tadpoles, and toadlets. Preliminary results from these studies indicate that fish predation may not be a serious threat to the species (Forstner 2002a). Depending upon the final results of these studies, appropriate pond designs can be constructed and maintained to mitigate predation and encourage successful reproduction of the Houston toad. Fish would also be removed at specific ponds if predation by fishes were determined to be detrimental to Houston toad survival. Effects of pathogens, stocked fish, bait, or other introduced animals would also be evaluated and assessed. A general prohibition on the use of off-site minnows for use in fishing would be established. BSA/CAC would continue to monitor the effects of the proposed lakes and the stocking fish on the Houston toad, and would adapt management plans and activities in order to minimize harm to the toad. In the event that the lakes or the stocking of fish in these lakes results in a significant negative effect on Houston toad populations, BSA/CAC will change the design, placement or installation of these lakes.

Critical Habitat. The only high impact development that will occur in designated critical habitat is the construction of Lake 3, a portion of Lake 1, the fire station, and four activity areas, totaling approximately 233 acres. This constitutes eight percent of the critical habitat on site and 0.2 percent of the critical habitat designated in Bastrop County. The development will not negatively affect breeding ponds, and the lakes and activity areas were planned for the areas least likely to support Houston toads. The intent of the BSA/CAC is to manage the Griffith League Ranch in a manner that will not degrade the habitat and will likely improve the habitat for the Houston toad.

#### **5.5.1.5 Cumulative Effects**

The Houston toad is primarily restricted to large blocks of habitat where urban disturbance is minimal. Approximately 65,520 acres of relatively unaltered woodland remain in Bastrop County, but only about 15,000 acres are found in large habitat blocks. Griffith League Ranch is within one of the last remaining large patches (approximately

8,700 acres) of contiguous Houston toad habitat. There are two other large patches centered around Bastrop State Park and Buescher State Park, respectively. However, most of the pine forest surrounding Buescher State Park has been removed, and only about 2,000 acres remain in a contiguous block. Subdivisions, roads, and timber and agricultural activities fragment the remaining habitat. Throughout Bastrop County, approximately 60,500 acres of Houston toad habitat have been platted for single-family housing or degraded by agricultural uses, timber harvest, commercial development, and roadways. Urban and agricultural development can result in habitat fragmentation, leaving small isolated woodlands that are partially or completely surrounded by roads, homes, and human activities. Although a low density residential area adjacent to Griffith League Ranch is known to support breeding choruses of Houston toads (Forstner 2002b), urban development increases the exposure and vulnerability of the Houston toad to development-related impacts such as construction activities, cars, pets, inter-specific competition, and predation.

The Preferred Alternative would directly reduce the amount of available habitat and contribute to on-going habitat fragmentation within the county. When considered along with other endangered species permits that have been, or would be, issued by the Service, implementation of this alternative would contribute to the total take of the Houston toad and the destruction or degradation of its habitat in Bastrop County. However, the Service believes that conservation measures included in BSA/CAC's HCP could be instrumental in conserving this large contiguous block of habitat for the long-term survival and recovery of the Houston toad.

Houston toad habitat on 3,934 acres would remain essentially undisturbed. While impacting the species to some degree, moderate disturbance on 310 acres would not be expected to interfere substantially with the Houston toad's continued use of the area. Thus, approximately 50 percent of the 8,700-acre habitat block would be relatively undisturbed and managed to avoid or minimize any negative impacts to the toad, while research studies and conservation actions would benefit the toad.

About 498 acres of Houston toad habitat (approximately six percent of the 8,700-acre habitat block and less than one percent of the estimated 65,520 acres of remaining woodland habitat in Bastrop County) would be lost to development. To date, within the same block of habitat, the Service has issued one permit covering ten acres, and no others are pending. Cumulatively, the Service has issued 208 total permits for a total of 1,067 acres (less than two percent of the remaining woodland habitat). In addition to the BSA/CAC application, 11 permit applications covering 184 acres are pending.

To mitigate the permanent loss of 498 acres and impacts on 416 acres of Houston toad habitat on Griffith League Ranch, BSA/CAC would set aside by conservation easement a portion of the tract having prime Houston toad habitat as a long-term conservation area for the Houston toad that would add cumulatively to other lands being set aside or available for this purpose in Bastrop County: Bastrop State Park (5,745 acres), Buescher State Park (1,017 acres). Bastrop County is currently developing a 10a(1)(B) permit, the goal of which is to conserve habitat for the Houston toad while allowing development to proceed.

BSA/CAC would place restrictions on ranch operations, and develop educational programs for Griffith League Ranch designed to improve the environmental quality of the tract and conserve its unique Lost Pines biological community. Educational programs would teach users and land managers about Houston toads and appropriate land stewardship practices. Management plans and education programs would be made available to camp visitors, other landowners, land managers, and the general public. The natural resources management plans could become models for others, leading to development and implementation of a set of “best management practices.” A cumulative area-wide improvement in natural resources management and a cumulative reduction in adverse impacts on the Houston toad could result from these actions. Educational programs could raise the community’s awareness of the Houston toad and the issues, needs, and goals of effective endangered species management programs. Such educational programs could result in a cumulative improvement in public attitudes related to the Houston toad and endangered species management.

BSA/CAC would continue to foster and support research on the Houston toad and other environmental components of the Griffith League Ranch. Research results and monitoring would be used to modify management plans and actions (adaptive management) to better support recovery of the species. BSA/CAC would continue to partner with other entities to conduct studies related to the Houston toad and share research results with the community. These studies could cumulatively add to the knowledge base of the Houston toad and the surrounding Lost Pines ecosystem, leading to its eventual recovery.

#### **5.5.1.6 *Assessment of Take***

At this point in time, it is not possible to accurately determine the anticipated take of individual Houston toads that would result from implementing the Preferred Alternative. Because the Houston toad population on Griffith League Ranch is not well documented, predictions of take of individuals would be speculative. Take is better determined by predicting potential habitat loss and the extent of adverse habitat modification that could occur as the result of implementing the various alternatives. The 4,848-acre Griffith League Ranch contains about 4,283 acres (88 percent) of good Houston toad habitat and 565 acres of marginal habitat (pastureland, 12 percent). If the Preferred Alternative were selected, Houston toads that occur on 498 acres (10 percent of the tract) of the habitat (422 acres of woodland (10 percent of the total woodland) and 76 acres of pasture) would likely be taken, and the habitat would become unsuitable for use by the toads. There would likely be some take of Houston toads on 416 acres (nine percent of the tract, 338 acres of woodland (eight percent of the total woodland) and 78 acres of pasture), but it is expected that some toads will continue to occupy the area. Impacts on the species on the remaining 3,934 acres (81 percent) would be expected to be minimal because of the low density of Houston toads, the removal of cattle, and the avoidance of activities near breeding ponds. While there could be take of a small number of individual toads, no decrease in the overall population due to BSA/CAC’s activities is expected because of the protection of the breeding ponds and the overall active adaptive management for the Houston toad.

## **5.5.2 Alternative B -- Alternative Site Design**

### ***5.5.2.1 The Houston Toad: Effects of the Alternative Site Design***

If the Alternative Site Design were selected, its effects on the Houston toad would be minimized on about 3,611 acres (about 74 percent) of Griffith League Ranch. This “Low Disturbance Zone” would be minimally impacted. About 582 acres (12 percent) of the tract would be moderately developed. Development and activity levels in this “Moderate Disturbance Zone” would cause some landscape and habitat alterations. The “High Disturbance Zone” would include about 655 acres (14 percent). Under the Alternative Site Design, about 185 acres of existing pasture would be utilized for development in order to minimize impacts on the species (Figures 7 and 12, Table 2).

If the Alternative Site Design were implemented, about 3,611 acres (about 74 percent) of the critical habitat would be left relatively undisturbed. Approximately 582 acres (12 percent) would be moderately disturbed and 655 acres (14 percent) would be highly disturbed. About 134 acres of critical habitat (about five percent) would be moderately disturbed and 223 acres (eight percent) would be permanently disturbed, similar in type to the Preferred Alternative, but more significant.

### ***5.5.2.2 Direct and Indirect Effects -- The Low Disturbance Zone***

If the Alternative Site Design were selected, about 3,611 acres would be minimally developed. Impacts would be similar to those described for the Preferred Alternative.

### ***5.5.2.3 Direct and Indirect Effects -- The Moderate Disturbance Zone***

Under the Alternative Site Design, it is anticipated that disturbances ranging from minimal to moderate would occur on about 582 acres (12 percent) on the property: 478 acres of woodland (11 percent of the total woodland) and 104 acres of pasture (Figures 7 and 12, Table 2). Impacts would be similar to those described for the Preferred Alternative, but greater in extent. Camping pods would be more widely distributed across the ranch, which would introduce human disturbance throughout a larger area of habitat.

### ***5.5.2.4 Direct and Indirect Effects -- The High Disturbance Zone***

Construction of facilities and intensive use would subject about 655 acres (14 percent) on the property (574 acres of woodland (13 percent of the total woodland) and 81 acres of pasture) to a high degree of disturbance (Figures 7 and 12, Table 2). Impacts would be similar to those described for the Preferred Alternative, but greater in extent. Additional areas within the existing woodland would be cleared for pasture and another lake, increasing the fragmentation of the habitat. The additional lake could result in eliminating Pond 7, a known Houston toad breeding pond.

### ***5.5.2.5 Cumulative Effects***

Cumulative impacts to the Houston toad would be similar to those of the Preferred Alternative except about 655 acres of Houston toad habitat (approximately eight percent

of the 8,700-acre habitat block and less than one percent of the estimated 65,520 acres of remaining woodland habitat) would be lost to development. To date, within the same block of habitat, the Service has issued one permit covering 10 acres, and no others are pending. Cumulatively, the Service has issued 208 total permits issued to date for a total of 1,067 acres (less than two percent of the remaining woodland habitat). In addition to the BSA/CAC application, 11 permit applications covering 184 acres are pending.

#### **5.5.2.6 *Assessment of Take***

At this point in time, it is not possible to accurately determine the anticipated take of individual Houston toads that would result from implementing the Alternative Site Design. Because the Houston toad population on Griffith League Ranch is not well documented, predictions of take of individuals would be speculative. Take is better determined by predicting potential habitat loss and the extent of adverse habitat modification that could occur as the result of implementing the various alternatives. The 4,848-acre Griffith League Ranch contains about 4,283 acres (88 percent) of good Houston toad habitat and 565 acres of marginal habitat (pastureland, 12 percent). If the Alternative Site Design were selected, no known breeding ponds would be affected, but Houston toads that occur on 655 acres (14 percent of the tract) of the habitat (574 acres of woodland (13 percent of the total woodland) and 81 acres of pasture) would likely be taken. There would likely be some take of Houston toads on 582 acres (12 percent of the tract): 478 acres of woodland (11 percent of the total woodland) and 104 acres of pasture, but it is expected that some toads will continue to occupy the area. Impacts on the species on the remaining 3,611 acres (74 percent) would be expected to be minimal. As in the Preferred Alternative, the impacts would be minimized by the protection of breeding ponds and adaptive management for the Houston toad. However, elimination of one breeding pond would be expected.

### **5.5.3 *Alternative C – No Action***

#### **5.5.3.1 *Houston Toad Direct and Indirect Effects***

There would be no immediate direct or indirect impacts on the Houston toad if the No Action Alternative were to be selected and Griffith League Ranch remained undeveloped. However, BSA/CAC would likely sell the property in order to recover investment costs, raise funds for the purchase of land elsewhere, and support Scouting programs.

Under the No Action Alternative, if BSA/CAC retained ownership of the property or if the Griffith League Ranch were sold, BSA/CAC would not prepare an HCP or prepare and conduct educational programs nor would the organization support research on the Houston toad or undertake habitat improvements. If the ranch were not sold, BSA/CAC would likely continue to use the property for agricultural purposes (livestock, hay, and timber production) in order to offset expenses. Free-ranging livestock could again impact the Houston toad in woodlands and around stock ponds. Vegetation in woodlands and around ponds could be trampled and cover reduced. Pond eutrophication could again degrade Houston toad breeding ponds. Pastures could be improved to promote maximum yield of forage for cattle. Fertilizers and herbicides applied to pastures could further

pollute ponds, potentially jeopardizing breeding sites and interfering with normal maturation of eggs and tadpoles. Timber could be harvested when it became commercially marketable. Timber harvest could cause warming and drying of forested habitat, making it less suitable for Houston toads. With no plan for wildfire prevention it is likely that wildfire could, at some point in time, drastically alter vegetative cover and adversely impact toad habitat. The severity of such impacts on the Houston toad would be related to the level of care with which BSA/CAC managed Griffith League Ranch.

Because of the existence of the endangered Houston toad and federally designated critical habitat on the tract, harvest of timber or development of the property would require a Section 10(a)(1)(B) incidental take permit from the Service to authorize take of the Houston toad before initiating any projects.

#### **5.5.3.2 *Cumulative Effects***

If the No Action Alternative was selected and Griffith League Ranch remained undeveloped, there would be no additional negative cumulative effects on the Houston toad. However, the toad habitat on the Ranch would not be managed for the benefit of the toad and given the current development pressures in the area, the future of the tract and a significant block of Houston toad habitat would be uncertain.

#### **5.5.3.3 *Assessment of Take***

There would be no take of the Houston toad if the tract remained in its current state. Any future development or other activities resulting in habitat destruction or take of the toad would require authorization under a 10(a)(1)(B) incidental take permit.

### **5.6 EFFECTS ON WETLANDS**

Effects on wetlands would be minimized if either the Preferred Alternative or the Alternative Site Design were selected. Under the Preferred Alternative, about 81 percent of Griffith League Ranch would remain relatively undisturbed. The creeks, drainages, springs, and other wetland areas within this portion of the tract would also remain relatively undisturbed. Under both alternatives, the springs and seeps in the drainage below Pond 12 would be permanently flooded. Some scattered wet season pools, (intermittent, temporary pools in natural or man-made depressions), near proposed development could be impacted by development. Existing stock ponds and other wetlands would be improved by removing livestock from the vicinity of the ponds. Restoration of impacted ponds and limitations on activities on or near these bodies of water could improve their wetland characteristics over time. New wetlands would be created along the shorelines of the proposed lakes. If the No Action Alternative were selected, the impacts to wetlands would likely be negative because of the return of cattle grazing.

## **5.6.1 Alternative A – Preferred Alternative**

### **5.6.1.1 *Direct and Indirect Effects***

If the Preferred Alternative were selected, effects on wetlands would be minimal on at least 3,934 acres (about 81 percent) of the tract. This portion of Griffith League Ranch would be minimally developed (Figures 5 and 11, Table 1). Isolated wetlands at various locations on the tract include small areas of wetland-type vegetation associated with creeks, drainages, springs, seeps and constructed earthen stock tanks (Figure 3). A number of inconspicuous and un-mapped upland depressions appear to have potential to serve as seasonal breeding pools for the Houston toad. While light development and low-impact activities would not be expected to substantially affect wetlands, a few of the un-mapped natural depressions, which are not known to support Houston toads, could be adversely impacted in and around activity centers.

Scattered, infrequent wetland habitat on about 914 acres of the tract could be moderately to highly impacted by development (Figures 5 and 11, Table 1). Since proposed structures would generally be located in upland areas, the construction and maintenance of these facilities would not be expected to directly impact drainages, creeks, springs, and seeps. Erosion control measures would be taken to prevent sedimentation in drainages and ponds. Some of the inconspicuous upland depressions could be eliminated by construction activities. Roads and trails would be designed and constructed so as to not impede water flow in drainages, impact wetlands downstream, or degrade potential Houston toad breeding sites.

The southern drainage of Pond 12 (Finger Pond) contains wetland habitat fed by perennial water flowing from seeps. Construction of Lake 1 would permanently flood this drainage and inundate wetlands associated with it. The construction of Lakes 2 and 3 would flood portions of two other drainages. The U.S. Army Corps of Engineers would be contacted and permits, if needed, would be obtained prior to work being done within these wetland areas. BSA/CAC would refrain from building Lakes 2 and 3 until results of studies on the impacts of Lake 1 were available. Conclusions of investigations on Lake 1 would be considered in deciding whether or not to proceed with construction of the other two lakes. The construction of Lake 1 and the two other lakes would be expected to create additional wetland habitat on Griffith League Ranch. In addition to creating lake-associated wetlands, BSA/CAC may construct other shallow, ephemeral Houston toad breeding sites at select locations. Some of these would be associated with the existing upland depressions. These ponds would increase the amount of wetland habitat on the ranch.

### **5.6.1.2 *Cumulative Effects***

If the Preferred Alternative were implemented, wetlands on about 3,934 acres would remain relatively undisturbed. BSA/CAC would avoid or minimize actions that would adversely impact wetlands in this zone. Some small, ephemeral wetlands occurring on about 914 acres could be lost to construction or degraded by user activities. These impacts to wetlands would add cumulatively to the degradation and loss of wetlands elsewhere in Bastrop County.

Shallow areas along the shorelines of the three proposed lakes could add cumulatively to the amount of available wetland habitat in the region. These wetlands would be available for all wildlife, including the Houston toad.

## **5.6.2 Alternative B – Alternative Site Design**

### **5.6.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, effects on wetlands would be similar to those of the Preferred Alternative except that approximately 3,611 acres (about 74 percent) of the tract would be minimally developed (Figures 7 12, Table 2). Some small, ephemeral wetlands on about 1,237 acres of the tract could be moderately to highly impacted by development (Figures 7, 12 and Table 2). Construction of the dam for Lake 4 could result in eliminating Pond 7.

### **5.6.2.2 *Cumulative Effects***

These impacts to wetlands would add cumulatively to the degradation and loss of wetlands elsewhere in Bastrop County, and the creation of new wetland habitat along the shores of the lakes would add cumulatively to other wetlands in Bastrop County.

## **5.6.3 Alternative C – No Action**

### **5.6.3.1 *Direct and Indirect Effects***

There would be no immediate direct or indirect impacts on wetlands of the Griffith League Ranch if the No Action Alternative were selected. However, BSA/CAC would not provide management to promote the health of the overall ecosystem including wetlands, which could be negatively impacted by cattle and feral hogs. For so long as market conditions remained unfavorable for selling or if the tract was sold to an entity having no intent to develop it and cattle grazing were not resumed, the effects on wetlands would be negligible.

### **5.6.3.2 *Cumulative Effects***

If the No Action alternative was selected and Griffith League Ranch remained undeveloped, there would be no immediate cumulative effects on wetlands. Assuming the appropriate permits were obtained, agricultural use of the Griffith League Ranch would adversely affect wetlands. If managed intensively for agricultural purposes, existing loblolly pine-oak woodland savannah would be converted from minimally productive to highly productive agricultural lands. Wetlands on the tract could be adversely impacted by intensive agricultural practices, thus reducing the amount of relatively undisturbed wetland habitat in the region. Such loss and degradation of wetlands on Griffith League Ranch would add cumulatively to the loss and degradation of wetlands elsewhere in Bastrop County.

## **5.7 EFFECTS ON WATER RESOURCES AND WATER QUALITY**

Effects on water resources and water quality would be minimized if either the Preferred Alternative or the Alternative Site Design were selected. Under the Preferred Alternative, about 81 percent of Griffith League Ranch would remain relatively undisturbed. The creeks, drainages, springs, and the aquifer within this portion of the tract would also remain relatively undisturbed. About nine percent of the property would be moderately disturbed and only 10 percent highly disturbed. If the Alternative Site Design were implemented, about 14 percent of the tract would be highly disturbed, 12 percent would be moderately disturbed, and 74 percent would remain essentially undisturbed.

If the No Action Alternative were selected, short-term consequences for water resources and water quality would be negligible. However, commercial grazing on the Ranch could continue to degrade water quality in the ponds and streams.

### **5.7.1 Alternative A – Preferred Alternative**

#### **5.7.1.1 *Direct and Indirect Effects***

If the Preferred Alternative were selected, the effects on water resources and water quality would be minimal. About 3,934 acres (about 81 percent) of the watershed on Griffith League Ranch would remain relatively undeveloped, thereby protecting the quality of surface waters on the tract and on downstream properties. BSA/CAC use on 416 acres would be expected to have only minimal on water resources and water quality. While there would be some vegetation or soil disturbance on a small proportion of the area in this zone, no impervious covers would be utilized. On the 498 acres to be more heavily developed and disturbed, significant disturbances to soil and vegetation would occur (Figures 5 and 11, Table 1). Development in this zone could affect water quality more than activities in the other zones. BSA/CAC would take steps to prevent and limit water pollution. These measures would include the use of erosion control devices, placement of sedimentation ponds, wastewater treatment, and restrictions on the use of fertilizers, herbicides and pesticides on the tract.

A wastewater treatment plant would be constructed on the property to serve the entrance complex, conference center complex, and the base camp area. Treated wastewater would be used to irrigate the golf course and other landscaped areas. Excess wastewater would be filtered through a constructed wetland near the treatment plant. Outlying program areas would use septic systems to manage wastewater in these isolated areas.

Potable water would be purchased from local water utilities. To minimize use of potable water, BSA/CAC might opt to restore one or more of the existing shallow wells on the tract. These wells would provide non-potable water for program livestock and irrigation.

Three dams would be constructed across drainages to impound water for recreational lakes (Figures 5 and 11, Table 1). Lake 1, draining about 1,800 acres, would flood two tributaries of Piney Creek. The free-flowing water issuing from the perennial, springs or seeps in the south branch below Pond 12 would be permanently flooded. Lakes 2 and 3 in drainages that drain about 600 and 470 acres, respectively, would impound water on

tributaries of Alum Creek. Water quality in all three lakes would be expected to be high as the lakes would be near the tops of their respective watersheds and development around the lakes would be minimal. The dams constructed in these drainages would capture rainfall runoff. This would lessen total potential runoff into Piney and Alum Creeks. Water would flow downstream of the dams only during wet periods when maximum lake levels were exceeded and water flowed over the spillways. The amount of water normally reaching the Colorado River from the headwaters of these drainages would be reduced by the amount retained behind the dams.

To offset loss of water from the three proposed lakes due to high soil permeability and evaporation, BSA/CAC would drill one or more wells near the lakes. These wells would supply water to keep the lakes at or near capacity and maintain constant water levels. Use of water from the aquifer to maintain constant lake levels would not be expected to significantly draw down the Wilcox-Carrizo Aquifer (per Aqua Water Supply Corporation). Prior to installation of the wells, BSA/CAC would obtain all necessary permits from the Lost Pines Water District.

BSA/CAC would permanently eliminate free-ranging livestock from the tract so that wetlands associated with creeks, drainages, ponds, and upland depressions would be protected from further impact. Livestock trample vegetation and compact and erode soils on pond margins and in natural depressions. Eutrophication caused by livestock urine and feces can degrade water quality, and it reduces the likelihood that the Houston toad or other wetland-dependent species can use ponds and other wetland areas successfully. Cattle and horses kept on the property for program activities would be watered from aboveground reservoirs located away from existing ponds and wetlands to avoid contamination of surface water resources. Manure and other livestock waste materials would be collected and recycled as compost for use on the Scout property. Therefore, it is expected that water quality would continue to improve in wetlands on Griffith League Ranch.

#### **5.7.1.2 *Cumulative Effects***

This alternative would not add significantly to other impacts on water quality. It could add to other diversions of water that would otherwise flow to the Colorado River.

### **5.7.2 Alternative B – Alternative Site Design**

#### **5.7.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, the effects on water resources and water quality would be similar to those of the Preferred Alternative, except that about 3,611 acres (74 percent) of the watershed on Griffith League Ranch would remain relatively undeveloped (Figures 7, 12 and Table 2). Development and use on 582 acres would be expected to have minimum to moderate impact on water resources and water quality. Development on the 655 acres to be more heavily developed and disturbed could affect water quality and quantity. Four dams would be constructed across drainages to impound water for recreational lakes (Figures 7, 12 and Table 2). In addition to Lakes 1, 2, and 3, Lake 4, a 10-acre lake just above Pond 7 (Figure 7), would be constructed and would

serve as a dependable, constant-level water source for native wildlife in the proposed animal preserve. Wells to maintain water levels would be drilled as in Alternative A, and cattle would also be removed.

#### **5.7.2.2 *Cumulative Effects***

This alternative would not add significantly to other impacts on water quality. It could add to other diversions of water that would otherwise flow to the Colorado River.

### **5.7.3 Alternative C – No Action**

#### **5.7.3.1 *Direct and Indirect Effects***

There would be no direct or indirect impacts on current water quality or water resources of the Griffith League Ranch if the No Action Alternative were selected. However, BSA/CAC would likely sell the property to recover investment costs, raise funds for the purchase of land elsewhere and support Scouting programs. For so long as market conditions remained unfavorable for selling and if BSA/CAC resumed grazing on the ranch, the effects on water quality and water resources would be negative. No improvements to ponds would occur, and pollution from trampling and manure would resume.

#### **5.7.3.2 *Cumulative Effects***

This alternative would add to other negative impacts on water quality and water resources in Bastrop County.

## **5.8 EFFECTS ON LAND USE**

Use of the Griffith League Ranch would be converted from commercial cattle grazing to recreational use under the Preferred Alternative or the Alternative Site Design alternative. Under these two options, future use of the tract would be for low-impact educational and recreational activities. If the No Action Alternative were selected, there would be no change in land use.

### **5.8.1 Alternative A – Preferred Alternative**

#### **5.8.1.1 *Direct and Indirect Effects***

About 3,934 acres (almost 81 percent) of the tract would remain relatively undeveloped. Activities in this zone would be limited to light-on-the-landscape development and low-impact uses such as hiking, “no-trace” camping, orienteering, and nature studies. About 416 acres (nine percent) of the property would be developed for uses such as camping areas, foot and horse trails, outdoor recreational facilities, and secondary roadways. Approximately 13 acres would be devoted to the Conference Center Complex.

Under the Preferred Alternative, livestock would be kept on the property only as needed to meet educational and recreational goals rather than as a commercial venture. Forest management would occur on a sustainable basis so as to promote a safe and healthy

forest ecosystem. The previous owner used Griffith League Ranch as a hunting preserve. BSA/CAC would continue hunting activity on the tract.

#### **5.8.1.2 *Cumulative Effects***

Selection of the Preferred Alternative would cumulatively reduce the total amount of land in the region available for commercial agricultural use or development of residential and commercial neighborhoods. More intense development on about 138 acres would add cumulatively to other lands in the area being intensively developed.

### **5.8.2 Alternative B – Alternative Site Design**

#### **5.8.2.1 *Direct and Indirect Effects***

Effects of the Alternative Site Design would be similar to those of the Preferred Alternative.

#### **5.8.2.2 *Cumulative Effects***

Cumulative effects would be similar to the Preferred Alternative.

### **5.8.3 Alternative C – No Action**

#### **5.8.3.1 *Direct and Indirect Effects***

There would be no direct or indirect impacts on land use if the No Action alternative were selected and Griffith League Ranch remained undeveloped.

#### **5.8.3.2 *Cumulative Effects***

There would be no cumulative effects on land use if the No Action alternative were selected and Griffith League Ranch remained undeveloped.

## **5.9 EFFECTS ON CULTURAL RESOURCES**

If either the Preferred Alternative or Alternative Site Design were implemented, the effect on cultural resources would be positive. Under either alternative, cultural resource surveys would be conducted on Griffith League Ranch for the first time. Those areas proposed for development would have highest priority for survey. Lowest priority for survey would be those areas in which no ground disturbance was anticipated. Significant cultural sites in areas proposed for development would be documented and protected or mitigated. Information obtained from these surveys would be added to the regional cultural resource database. BSA/CAC would prepare cultural resource educational programs based on resources found on the tract. BSA/CAC's management of Griffith League Ranch would offer additional protection for any undocumented cultural sites not in the proposed developed areas. That protection would include limiting access to the property, preparing and presenting cultural resources education programs for Scouts, and supporting universities or other scientific entities that would like to continue archeological studies on the tract.

If the No Action alternative was selected and the ranch remained undeveloped, impacts on cultural resources would be expected to be minimal.

## **5.9.1 Alternative A – Preferred Alternative**

### **5.9.1.1 *Direct and Indirect Effects***

Griffith League Ranch has never been surveyed for cultural or archeological properties. Therefore, the direct and indirect effects on cultural resources as a result of implementing the Preferred Alternative cannot be fully determined at this time. The size of the tract and cost of conducting surveys precludes an immediate 100 percent cultural resource survey. In developing Griffith League Ranch as a high adventure Scout camp, BSA/CAC would partner with the Service and the THC to protect and document significant cultural resource sites on the property. BSA/CAC initiated cultural resources surveys on the ranch during January 2000. As of April 2000, two sites had been documented and recorded with THC (Parkhill, 2002).

Full build-out of the Scout camp as proposed in the Preferred Alternative would be phased over a period of years. Cultural resource surveys would be scheduled to precede specific phases of the project. BSA/CAC would ensure that archeological surveys were conducted at all sites where soil disturbance would occur. Areas to be surveyed would include all building sites, lakes and dams, roads, trails, fence lines, and intensive use areas such as the conference center, base camp complexes, and program areas. Cultural resource surveys would be completed prior to initiating any soil disturbing activity. All cultural sites found during these surveys would be documented. Survey reports would be forwarded to the THC for a determination of significance. BSA/CAC would provide copies THC's findings to the Service. Significant cultural sites would be properly documented and protected or mitigated as required by federal and state law.

The overall impact of implementing the Preferred Alternative would be positive in that cultural resource surveys would be conducted on at least those portions of the tract proposed for development. Significant sites would be documented and protected or mitigated. General knowledge gained from cultural resource surveys would be included in educational programs for Scouts. An archeological record for the tract would be established.

### **5.9.1.2 *Cumulative Effects***

Griffith League Ranch and much of the area around it have never been surveyed for archeological sites or historic properties. If the Preferred Alternative were selected, cultural resource surveys would be conducted on at least those portions of this 4,848-acre tract proposed for development. Data collected during these surveys would augment knowledge of archeological and historical sites in this area of Bastrop County. There would be a cumulative increase in what is known of the pre-history and history of this area. General information gained from the surveys would be made available as educational programs, cumulatively adding to public understanding and appreciation of the history and pre-history of the Lost Pines region.

## **5.9.2 Alternative B – Alternative Site Design**

### **5.9.2.1 *Direct and Indirect Effects***

The effects on cultural resources from selecting the Alternative Site Design would be similar to those described for the Preferred Alternative.

### **5.9.2.2 *Cumulative Effects***

The cumulative effects on cultural resources as a result of selecting the Alternative Site Design would be substantially the same as described for the Preferred Alternative.

## **5.9.3 Alternative C – No Action**

### **5.9.3.1 *Direct and Indirect Effects***

There would be no additional direct or indirect impacts on cultural resources if the No Action Alternative were selected and Griffith League Ranch remained undeveloped. Archeological and historical sites could continue to be subjected to destruction by erosion or to disturbance by artifact hunters and amateur collectors.

### **5.9.3.2 *Cumulative Effects***

Regardless of cause, if surveys were not conducted the loss of cultural sites would add cumulatively to the on-going loss of information on the history and pre-history of the area.

## **5.10 EFFECTS ON AIR QUALITY**

No substantial effects on air quality would be expected if Griffith League Ranch under any of the alternatives.

### **5.10.1 Alternative A – Preferred Alternative**

#### **5.10.1.1 *Direct and Indirect Effects***

About 3,934 acres (about 81 percent) of the Griffith League Ranch would remain relatively undeveloped. Likewise, moderate development and use limited to light-on-the-landscape development and low-impact uses on about 416 acres would be expected to have little impact on air quality. On the 498 acres to be more heavily developed and disturbed, there could be slight temporary degradation of air quality during construction phases. Dust could be raised by construction activities such as land clearing, earth moving and road building. Exhaust from mechanized equipment and construction vehicles would contribute a minor amount to local air pollution. These contributions of air pollutants would be eliminated when construction was completed. Exhaust emissions from service vehicles and visitor's vehicles would contribute minor amounts of pollutants to the regional air shed during operational phases of the camp. However, it would be anticipated that many of the vehicles accessing the tract would be carrying multiple occupants. Car-pooling of groups visiting the camp would minimize vehicle emissions.

#### **5.10.1.2 Cumulative Effects**

As Scout Camp visitors travel to and from Griffith League Ranch, automobile exhaust emissions would contribute incrementally and cumulatively to regional air pollution.

### **5.10.2 Alternative B – Alternative Site Design**

#### **5.10.2.1 Direct and Indirect Effects**

Direct and indirect effects on air quality resulting from selection of the Alternative Site Design would be similar to those described for the Preferred Alternative.

#### **5.10.2.2 Cumulative Effects**

Cumulative effects on air quality resulting from selection of the Alternative Site Design would be similar to those described for the Preferred Alternative.

### **5.10.3 Alternative C – No Action**

#### **5.10.3.1 Direct and Indirect Effects**

There would be no direct or indirect effects on ambient air quality at Griffith League Ranch if the No Action Alternative were selected and the tract remained undeveloped.

#### **5.10.3.2 Cumulative Effects**

If the No Action Alternative was selected and Griffith League Ranch remained undeveloped, no significant cumulative effects in air quality would be expected. As currently managed, activities on Griffith League Ranch would not be expected to contribute to any decline in ambient air quality. Rather, current management practices would contribute cumulatively to maintaining the status of regional ambient air quality since few emissions could be attributed to activities on the property.

## **5.11 EFFECTS ON SOCIOECONOMIC CONDITIONS**

Under either the Preferred Alternative or the Alternative Site Design, development of Griffith League Ranch as a Scout camp would not displace, disadvantage or adversely impact any minority or ethnic group. BSA/CAC does not maintain records of financial status or ethnic group for their members. However, since BSA/CAC does not discriminate based upon ethnicity or financial status, either of these options would provide Scouting opportunities for boys and girls from all sectors of society. Positive educational opportunities would be provided to all participating youth in the 15-county district served by BSA/CAC. The same opportunities could be provided to other youth from outside of BSA/CAC's district, as well. Because BSA/CAC is a tax-exempt, not-for-profit organization, there would be a loss of property tax base for as long as the property was owned by BSA/CAC. BSA/CAC's operating expenditures and the personal expenditures by visitors to the Scout camp would contribute to sales tax base and the local economy. Employment opportunities would be created at the camp.

Under the No Action Alternative, no changes in socioeconomic conditions would be expected.

### **5.11.1 Alternative A – Preferred Alternative**

#### **5.11.1.1 *Direct and Indirect Effects***

Griffith League Ranch is located in a sparsely populated rural area of Bastrop County. Between 1846 and 1993, the same family owned the tract. Development of the Scout camp as proposed in the Preferred Alternative would not displace, disadvantage, or otherwise adversely impact any minority or ethnic group. Rather, it would offer increased Scouting opportunities to over 22,000 boys and girls in a 15-county district under the jurisdiction of BSA/CAC. Many of the young people taking advantage of educational programs and opportunities for personal growth would be members of ethnic or minority groups from within the area served by BSA/CAC. It is anticipated that in the future, Scouts from outside the Capitol Area Council would also have opportunities to participate in activities at the camp.

Over the course of a year, an estimated 9,000 visitors would spend about 62,540 user days and 35,120 user nights on Griffith League Ranch. Of this total, some 4,320 Scouts would account for about 30,240 user days and 25,920 user nights during the six-week peak operating season in June and July. Weekday and weekend seminars and outings would be offered during the off-season. About 4,600 Scouts and other visitors taking advantage of these opportunities would spend another 32,300 user-days and 9,200 user-nights on Griffith League Ranch. Each year an estimated 6,000 to 7,000 young adults would receive training and experiences in citizenship, civic responsibility, leadership, and physical fitness. They would also be exposed to conservation and land stewardship training, including education on endangered species management, while visiting the camp. About 2,300 adults would also be exposed to the same educational opportunities annually while visiting Griffith League Ranch.

If the Preferred Alternative were selected, property taxes would be lost from the county tax base because BSA/CAC is a not-for-profit organization and holds tax-exempt status. However, about six new permanent jobs and 40 seasonal jobs would be created at the camp. Camp payroll, plus operational expenditures of about \$500,000 annually for food, supplies, materials, and services would flow into the local economy. Visitors to the camp would spend for fuel, food, and miscellaneous items while in the Bastrop area en route to and from Griffith League Ranch. Such personal expenditures would support the local economy and increase community sales tax revenue.

#### **5.11.1.2 *Cumulative Effects***

Under the Preferred Alternative, approximately 9,000 individuals of all races, ethnicity and economic class would be exposed to recreational and educational opportunities on Griffith League Ranch. Included in the camp's agenda would be education on land stewardship, conservation, endangered species management, and management of the endangered Houston toad. Expenditures and revenues generated by the camp and its visitors would be a cumulative addition to the tourist economy in the region. New

permanent and seasonal jobs created at the camp would add cumulatively to job availability in Bastrop County.

### **5.11.2 Alternative B – Alternative Site Design**

#### **5.11.2.1 *Direct and Indirect Effects***

If the Alternative Site Design were selected, the direct and indirect effects on socioeconomic conditions in the Bastrop community would be similar to those described for the Preferred Alternative.

#### **5.11.2.2 *Cumulative Effects***

Cumulative effects of selecting the Alternative Site Design would be similar to those described for the Preferred Alternative.

### **5.11.3 Alternative C – No Action**

#### **5.11.3.1 *Direct and Indirect Effects***

There would be no direct or indirect effects on socioeconomic conditions if the No Action Alternative were selected and Griffith League Ranch remained undeveloped.

#### **5.11.3.2 *Cumulative Effects***

There would be no cumulative effects as a result of the No Action Alternative.

## **6 HABITAT CONSERVATION PLAN**

The purpose of the Boy Scouts of America (BSA) is “to provide an educational program for boys and young adults, to build character, to train in the responsibilities of participating citizenship, and to develop personal fitness.” The Scouting Conservation Program is one element of the Boy Scouts of America’s education and participating citizenship programs. Scouting conservation “is designated to incorporate... an awareness and understanding of conservation as the wise and intelligent management of natural resources.” The program emphasizes commitment to improving the environment and conserving natural resources through first-hand experiences and “learning by doing.” It endeavors to make all those individuals active in Scouting — youth, adult members, and their families — aware of their responsibility to the future and the fact that their action or inaction can affect the quality of life throughout the nation and the world (Boy Scouts of America 2001).

With this background and guidance, BSA/CAC is committed to environmental stewardship, including the conservation of federally listed threatened or endangered species. BSA/CAC would educate its Scouts, Scout leaders and staff, contractors, and visitors to Griffith League Ranch about conservation of the endangered Houston toad. Research, management plans, and education would be used as tools in working toward the survival, and perhaps eventual recovery, of the species. Techniques such as “leave-no-trace” camping, hands-on involvement with resources management and research

projects and educational programs would assure that Scouts would continue to be ingrained with a sound conservation ethic and participate in conservation of the Houston toad.

This chapter contains BSA/CAC's specific conservation proposals for the proposed project, and specifies the following:

- 1) Measures that BSA/CAC would undertake to monitor, minimize, and mitigate impacts on the Houston toad;
- 2) Funding that would be made available to undertake these measures;
- 3) Procedures for dealing with changed and unforeseen circumstances; and
- 4) Long-term protection of Houston toad habitat on Griffith League Ranch through a conservation easement.

Mitigation measures that would offset the adverse effects (take) on the Houston toad caused by implementing the Preferred Alternative are detailed below in this HCP. At a minimum, these mitigation measures are intended to promote stability in the Houston toad population on Griffith League Ranch. To mitigate loss and degradation of habitat resulting from development, Houston toad habitat would be set aside through a binding conservation easement.

An on-going monitoring program will evaluate the status of the Houston toad over time, analyze the effects of management actions on the species, and measure the effectiveness of mitigation actions. A monitoring program will also ensure compliance with the terms of this HCP. The monitoring program will provide timely feedback that would enable managers to refine goals and objectives and modify management strategies, management actions, and mitigation measures.

The purpose of this HCP is to protect and conserve the Houston toad on Griffith League Ranch. This HCP sets forth the guidelines, terms, and conditions for developing and managing Griffith League Ranch in a manner consistent with the survival and continued presence of the Houston toad. This HCP allows for management flexibility based upon an on-going monitoring program, acquisition of new knowledge through research, and application of new knowledge to research-based adaptive management strategies.

## **6.1 GOALS AND OBJECTIVES**

The following goals and objectives are intended to guide Houston toad management on Griffith League Ranch for the 50-year term of the incidental take permit. Because it is difficult to project 50 years into the future, these goals and objectives may require modification over time. Changes and updates of goals and objectives may be made during reviews of this HCP. Reviews will validate the currency of goals and objectives and assure that programs related to management of the Houston toad remain on track. Achievement of goals and completion of objectives can be used to measure the success of this HCP. During the annual planning cycle, objectives will be further reduced to specific tasks, or conservation measures, to facilitate budget planning and project definition. Such tasks become the steps necessary for completing objectives and accomplishing goals.

**Goal 1: Maintain a stable population of Houston toads on Griffith League Ranch while fulfilling the mission and purpose of the Boy Scouts.**

*Objective 1: Determine the status of the Houston toads annually and assess the impact of BSA/CAC activities on Griffith League Ranch so that the ranch can be used and managed adaptively with minimal impact on the toads.*

*Objective 2: Support and cooperate with researchers to increase knowledge of Houston toad biology and threats to its survival.*

**Goal 2: Maintain a healthy ecosystem within which the Houston toad can thrive.**

*Objective 1: Restrict the use of designated lands within Griffith League Ranch by conservation easement to mitigate for the effects of BSA/CAC's use and development of Houston toad habitat.*

*Objective 2: Manage the remaining habitat on the ranch in a manner that will protect and conserve the Houston toad.*

**Goal 3: Educate the Boy Scouts and other visitors about biology and plight of the Houston toad, and become a model of best management practices for the general Bastrop area.**

*Objective 1: Create an education program that will instill a conservation ethic and awareness of the Houston toad and the steps needed to protect it for visitors to Griffith League Ranch.*

*Objective 2: Make available the lessons learned to other potential preserve managers.*

**6.2 HABITAT CONSERVATION PLAN**

In order to meet the goals and satisfy the objectives outlined above, BSA/CAC shall:

- 1) Minimize and mitigate incidental take of the Houston toad and its habitat on Griffith League Ranch,
- 2) Monitor the status of the Houston toad on Griffith League Ranch,
- 3) Utilize adaptive management strategies with respect to the management and operation of Griffith League Ranch as set forth below, and
- 4) Assure that funding is available to accomplish these goals pursuant to Section 6.3 below.

**6.2.1 Minimization and Mitigation**

Development and use of Griffith League Ranch as proposed in the Preferred Alternative would result in incidental take of the Houston toad. The development of Griffith League Ranch will proceed in phases, at a pace and scale contingent upon available sources of funding. The first phase of the development will include trails, entrance facilities, road

construction, and fencing. Immediate use of Griffith League Ranch will include hiking, camping, backpacking, and COPE training. Later phases will include the construction of lakes and conference facilities.

#### **6.2.1.1 *Initial Activities Permitted on Griffith League Ranch***

Initial activities on Griffith League Ranch will include low-impact activities, such as hiking, camping, backpacking, nature studies, and the moderate-impact COPE training, horseback riding, and mountain biking. Such activities will be conducted in accordance with the principles of minimizing environmental impacts. Scouts and scout leaders participating in low-impact activities on Griffith League Ranch will receive training in low-impact use. Low impact use of wildlands is based upon the following concepts:

- Always camp on durable surfaces;
- Dispose of waste by utilizing “pack in” and “pack out” techniques;
- Minimize disturbance of natural objects and avoid introducing permanent structures;
- Minimize campfire impacts by using established fire rings, fire pans, or mound fires; burning all wood and coals to ash; extinguishing campfires completely; and properly disposing of campfire residues;
- Utilize established trails when available;
- For mountain biking, use only single-track trails created in low erosion areas in daylight hours; and

Supervise all low-impact activities to avoid any off-trail or off-site disturbance.

#### **6.2.1.2 *Restrictions on Ranch Operations***

The Preferred Alternative is the result of careful analysis and several revisions of BSA/CAC’s original development concept for Griffith League Ranch. In arriving at the Preferred Alternative, Scout planners were mindful of potential adverse impacts on the endangered Houston toad. They were also cognizant of their legal obligations under the Endangered Species Act and their responsibilities as leaders in conservation and youth education. The Preferred Alternative is, itself, the result of serious and sincere efforts to mitigate and minimize impacts on the Houston toad. To further mitigate or minimize impacts on the species on Griffith League Ranch, BSA/CAC shall do the following:

- 1) Consistent with the scope of the permit, limit off-trail activities in undeveloped areas of Griffith League Ranch to low impact activities such as hiking, camping, nature studies, jogging, and orienteering. These activities will be supervised and controlled by trained leaders or camp staff.
- 2) Provide for the instruction of staff and camp users on Service specified procedures to follow, should any living, trapped, injured, dead, or diseased Houston toads be found or encountered on Griffith League Ranch.
- 3) Restrict or limit programs, uses and activities within 100 feet of maximum pool height of a documented, known, and active Houston toad breeding pond except for areas for which the development and use has been previously mitigated through preservation by conservation easement of other land on Griffith League Ranch. For example, appropriate restrictions will be placed on the size of groups

allowed near known breeding ponds, programs will be restricted to educational and research oriented activities, and specified restrictions will limit the time of day and the time of year in which these activities can take place. Specifically, one type of activity in these areas will consist of a Scout nature hike for the purpose of observation of the species and a lecture emphasizing the importance of species diversity. Restrictions and limitations will be in effect during the Houston toad's breeding/dispersal season, which shall be determined annually with the Service's concurrence for each breeding site based on survey results and expert opinion.

- 4) Limit the number of cattle, horses, and other farm animals on Griffith League Ranch to the minimum number deemed necessary for program use.
- 5) Prohibit commercial and open-range grazing.
- 6) Require aboveground troughs to water livestock or other alternatives that do not impact known Houston toad breeding sites or attract Houston toads. Spillage and overflow from troughs shall be kept to a minimum to avoid attracting Houston toads to livestock watering sites.
- 7) Restrict grazing by livestock to pastures segregated from breeding sites and woodland areas.
- 8) Require that excess manure and other livestock waste material from corrals and stables be composted away from drainages, creeks, ponds, and wetlands to minimize eutrophication of water sources and breeding sites.
- 9) Require inspection of any imported soils or the source of such soils, fill materials, and nursery stock for the non-native imported fire ant and its eggs, and should the pest be detected, treatment of these materials using methods selected based upon input from experts including the Service.
- 10) Impose restrictions on construction of improvements including:
  - a) Construction activities, including for example board walk and observation decks for providing access for research and education, within 100 feet of maximum pool height of known breeding ponds shall only be scheduled during the Houston toad non-breeding/dispersal season. These activities will be extremely rare events in the overall management scheme and will be designed to enhance the pond or provide appropriate access for research and educational purposes.
  - b) Because trenches, pits, and holes could trap or injure individual toads, all open construction trenches and excavations shall be covered overnight or suitable barriers erected to prevent entry by the Houston toad at all construction sites, including utilities, on a year-round basis.
  - c) Construction sites shall be inspected for the presence of Houston toads prior to beginning each workday and prior to backfilling open pits or trenches.
  - d) Instruction shall be provided for contractors on proper procedures to be followed should any living, trapped, injured, dead or diseased Houston toads be found or encountered on Griffith League Ranch. BSA/CAC shall advise contractors, BSA/CAC staff, and volunteers engaged in construction and maintenance projects on Griffith League Ranch about the requirements of the incidental take permit regarding such activities and the

measures to be implemented to avoid or minimize take of the Houston toad.

- e) All construction areas shall be demarcated on site so that soil and vegetation disturbances are confined to construction areas only. As necessary to control soil erosion, exposed soils in disturbed sites shall be revegetated with native plants or stabilized when construction is finished.
  - f) Best management practices shall be implemented to prevent soil erosion during construction phases and to prevent runoff and sedimentation from contaminating nearby ponds, creeks, or breeding sites.
  - g) Only materials resistant to termite damage, such as pretreated lumber, stone, or concrete, shall be utilized for construction of foundation members in order to minimize any future need for application of potentially harmful pesticides.
  - h) Only those plants native to the Lost Pines will be used for landscaping, restoration, and revegetation.
- 11) Require additional ranch management plans as developed (such as a Vegetation Management Plan, a Fire Management Plan, Trails Plan, and a Wildlife Management Plan) to be submitted to the Service for its review and approval with respect to impacts to the Houston toad, and, as necessary, obtain comments from outside experts on specific issues related to the Houston toad prior to implementation. Plans describing activities affecting the toad not covered by the HCP or other plans specified therein, consistent with the concepts of adaptive management, shall be submitted to the Service for review and approval before implementation.
- 12) Require the golf course be designed to environmentally friendly standards, which would require less maintenance (mowing, fertilizer/chemical treatments) than those of standard golf course design.
- 13) Require that skeet, trap and sporting clay ranges utilize steel shot.
- 14) Require that access to breeding sites be supervised during the Houston toad's breeding/dispersal season and require that programs, uses, and activities relating to such access be designed to prevent adverse impacts on the Houston toad.
- 15) Require that lake construction practices be designed to minimize adverse impacts on the Houston toad. No groundwater withdrawal or well construction for use in the filling and maintenance of the proposed lakes will be commenced until the impact of such withdrawal has been evaluated. Clearing and construction shall occur during months that the Houston toad is believed to be less active (June through December) to minimize impacts of construction on the species. The lakes shall be filled slowly during the period that the species is emergent (December through May). Prior to construction, surveys shall be conducted to characterize the habitat and determine the extent of its use by the Houston toad. Post-construction studies shall be conducted to document the lake's impact on Houston toads and to determine whether or not the species can successfully use shallows along lake margins for breeding.
- 16) Where practicable, require that the equestrian trail follow old logging skid paths, fence lines, and secondary roads. Placement of hitching posts and corrals will be outside of creeks and drainages.

- 17) Restrict or limit activity and development near the Caretaker Residence and Maintenance Area and require that contingency plans for managing spills and possible pollutants that might threaten Pond 8 are prepared. In the event of a hazardous material spill, the response plan will be activated to prevent serious impact on the Houston toad habitat.
- 18) Impose restrictions on traffic beyond the main road of the Griffith League Ranch as follows:
  - a) Restrict speed limits.
  - b) While night time driving is not a normal activity on the ranch, restrict night time driving to authorized vehicles for purposes of emergency or maintenance.
  - c) Restrict daytime access to areas outside of the main complex to authorized vehicles.
- 19) Should wild hogs threaten the integrity of the Breeding Sites, implement a plan to remove such animals and remediate their impacts.

#### **6.2.1.3 Education**

Education programs will be a primary means of reducing risks of take of the Houston toad. A primary mission of BSA is to educate and train young people in responsible citizenship. Responsible citizenship includes an awareness of, and sensitivity to, the conservation of natural and cultural resources. The organization has a strong record and long history of youth education in conservation and land stewardship. Further, the Houston toads' existence on the Griffith League Ranch presents a unique opportunity to educate youth and demonstrate the successful coexistence of the species with the BSA/CAC. To participate in education related to the Houston toad, BSA/CAC shall:

- 1) Design a program demonstrating the unique, rare, and privileged opportunities and consequent responsibilities that BSA/CAC has implemented in their participation in managing habitat of the endangered Texas endemic Houston toad.
- 2) Incorporate information about the Endangered Species Act, protection of the Houston toad, and conservation of its habitat into the program. This program and the incorporated information will become an integral part of the Griffith League Ranch experience.
- 3) In designing the program, work with the Service to develop age-appropriate educational materials specific to the Houston toad, including information on the sensitivity of the species to human activities, legal protection of the species, reporting requirements, conservation measures designed to reduce impacts on the species, and what to do and who to contact if the species is encountered during activities.

#### **6.2.1.4 Mitigation Measures**

- 1) In establishing mitigation ratios, BSA/CAC considered the following unique aspects of the Griffith League Ranch, including BSA/CAC's 50-year commitment to a unique, active, long-term habitat conservation and management plan for the preservation of the Houston toad. Specifically, the Griffith League Ranch is a large tract of land that BSA/CAC proposes to manage on-site. This represents a

diversion from normal habitat conservation plans, and is, in fact, the only known project of its kind in Central Texas because of the size of the tract and the dedication of BSA/CAC to prevent harm to an endangered species. Further, based upon current scientific research, BSA/CAC has carefully selected the locations for its facilities in areas that have the least number of known occurrences for the toad and in areas where the toad has not been documented. In addition, BSA/CAC shall restrict the development of many of its facilities and activities to the non-breeding and non-dispersal season. Although it is uncertain whether BSA/CAC's activities will actually result in take of the Houston toad, BSA/CAC has still committed to mitigate against the possibility of take in these areas. In addition, BSA/CAC has committed to the use of adaptive management techniques. For example, if monitoring on Griffith League Ranch indicates a decline in the toad population due to BSA/CAC activities, BSA/CAC will use adaptive management to alter its proposed plan in order to prevent any further decline resulting from these activities. Further, BSA/CAC has committed to engage in and support ongoing scientific research on the Griffith League Ranch that will be used to adapt management plans for the benefit of the toad based upon the best biological data available at the time. Moreover, BSA/CAC is committed to enhancing the Houston toad's habitat by making many areas of the Griffith League Ranch more suitable for toad breeding populations. These characteristics of the BSA/CAC habitat conservation plan make it unique amongst other habitat conservation plans. Thus, the mitigation ratios for the Griffith League Ranch do not provide a template or set any precedent for future habitat conservation plans nor do they provide a new method or strategy for protecting the Houston toad.

Due to the unique nature of BSA/CAC's efforts to protect the toad via research, light use, calculated placement of activities, adaptive management, anticipated low level of take, and a long term conservation focus, the BSA/CAC shall mitigate for any impacts by the following: prior to each development project, BSA/CAC shall restrict by conservation easement and commit to manage, as approved by the Service, one acre of impacted Houston toad habitat for one acre of "High Disturbance" habitat (1:1 ratio) and six-tenths of an acre of habitat for one acre of impacted "Moderate Disturbance" habitat (0.6:1 ratio) as described in Table 1 for each such project. The "impacted habitat" shall be calculated based on the final design of the improvement or use area, which may be greater (subject to subchapter 6.5 hereof) or less than the estimated acreages set forth on Table 1, but shall include the footprint of the development and areas of indirect effects.

- 2) The conservation easement will commence in the north corner of the property and will move out from that location. With the possible exception of intervening trails, roads, and utility lines, land added to the conservation bank will be contiguous to land under the conservation easement. The area occupied by trails, roads, and utility lines will not be counted as mitigation acres, but may be included in the conservation easement area.
- 3) Activities within the conservation area shall be restricted to low-impact and Service-approved, moderate-impact activities. Such low-impact use shall be limited to upkeep, research, hiking, camping, and jogging. Horseback riding and mountain biking shall be restricted to maintained trails that have been approved

by the Service and mitigated according to subchapter 6.2.1.4(2). These activities will be supervised and controlled by camp staff.

- 4) Habitat conserved for the needs of the Houston toad shall be in a contiguous block. Service roads, trails, new roads, and utility lines will not be a factor in the determination of contiguity. The Service must give approval prior to construction of any new service road, utility line or trail within the conservation easement and proposed for use in connection with activities other than the Low Impact activities.
- 5) As an alternative to a simple conservation easement, BSA/CAC may choose to mitigate through a Conservation Bank on Griffith League Ranch for the conservation of Houston toad habitat. The Conservation Bank would be established by entering into a formal Conservation Bank Agreement with the Service and dedicating property to be restricted under the same conditions as described in subchapters 6.2.1.4 (1, 2, 3 & 4). The Conservation Bank provides an opportunity for BSA/CAC to place land into the conservation easement in addition to the land BSA/CAC is required to place under the easement for purposes of mitigation. The agreement establishing such bank would provide for the granting of a conservation easement on land deposited in the bank and establish Houston toad conservation credits on a one-acre for one-credit basis. With respect to the development and use of Griffith League Ranch, the use of such conservation credits for mitigation would be based upon the High Disturbance and Moderate Disturbance ratios noted above. BSA/CAC may deposit Griffith League Ranch land in the conservation bank as the need for mitigation on other Scout property arises, or if credits are to be sold to others. The mitigation ratios established for the Griffith League Ranch will not affect the mitigation ratios for mitigation on other Scout properties or for third party mitigation. The mitigation ratios contained in this EA/HCP are unique to the Griffith League Ranch and are associated with the specific nature of management and use of the ranch by the BSA/CAC.

## **6.2.2 Monitoring**

BSA/CAC shall establish an on-going monitoring program that will document the status of the Houston toad over time, evaluate the effectiveness of management actions and mitigation measures, refine adaptive management strategies, and document BSA/CAC's compliance with this HCP.

### **6.2.2.1 *Houston Toad Monitoring***

Within one year from issuance of the incidental take permit, BSA/CAC will develop and implement an on-going monitoring program of the Houston toad on Griffith League Ranch to:

- 1) Estimate population trends over time, and
- 2) Assess the impacts of BSA/CAC activities on Houston toad mortality and breeding success through the findings noted above.

At minimum, the BSA/CAC shall monitor and report to the Service:

- 1) Houston toad breeding activity at all ponds, including the timing of breeding activity and numbers of adult males and females, presence of egg strings and tadpoles, and emergence of toadlets;
- 2) Environmental conditions at the ponds, including night time temperatures and water levels during the breeding season;
- 3) The presence of predators, such as turtles, snakes, fish, and mammals, in or near the ponds, coincident with the breeding season;
- 4) The presence of imported, non-native fire ants in or near the ponds, coincident with the breeding season;
- 5) Observations of mortality of Houston toads due to roads, construction activities, or other accidental incidents; and
- 6) The presence and numbers of Gulf Coast and Woodhouse's toads, or their hybrids, encountered in breeding ponds, coincident with the breeding season.

#### **6.2.2.2 *Monitoring Reports***

BSA/CAC will prepare an annual report of all monitoring activities on Griffith League Ranch conducted during the preceding year. The annual report will be submitted to the Service by December 1 each year and include the period between October 1 and September 30. The annual report will include the following:

- 1) Houston toad surveys completed for the period and a description and map of the locations at which the species was observed. The report will include any updated distribution and abundance information.
- 2) An analysis of population trends and an assessment of road mortality.
- 3) A discussion of the effectiveness of mitigation measures taken to avoid, minimize, or rectify impacts on the Houston toad.
- 4) A report for any locations that might be associated with development at which red imported fire ants were observed.
- 5) A map and description of activities that have been implemented as per this HCP and its associated management plans, including new development, resource manipulation, user activities, and user statistics.
- 6) An assessment of habitat conditions, including a discussion of any signs of habitat degradation, and notable presence or absence of Houston toads.
- 7) Anticipated management actions for the upcoming year.
- 8) A report of any minor amendments requested or any refinements to this HCP or its related management plans.
- 9) Any suggested refinement of adaptive management strategies based upon the past year's observations and research activity.
- 10) Documentation of BSA/CAC's compliance with the terms of this HCP.

### **6.2.3 Adaptive Management**

This HCP allows for management flexibility based upon an on-going monitoring program, acquisition of new knowledge through research, and application of new knowledge to adaptive management strategies. The HCP was prepared using the best available information on the Houston toad and was specifically structured based on research data from the Griffith League Ranch for its Houston toad population. In the analysis of effects on the species (Chapter 5), it became obvious that little is known and much remains to be learned about the Houston toad, its biology, life cycle, habitat requirements, and ecological role. Since much remains to be learned about the Houston toad, management strategies adopted early during implementation of the Preferred Alternative may require modification as new, credible information concerning the Houston toad and its habitat is gained through research and monitoring. For example, if monitoring reveals, incident to BSA/CAC activity, unexpected road mortality, despite the significant restrictions placed on traffic, BSA will install a drift fence to prevent further mortality. Similarly, if studies indicate that fish predation or the stocking of fish in the lakes is a serious threat to the Houston toad, BSA/CAC will construct and maintain appropriate designs to reduce or eliminate predation. Thus, when it appears that a localized effect on the toad is the result of BSA activities, BSA will adapt its plans to prevent harm to the Houston toad. Specifically, to this end, BSA/CAC shall:

- 1) When feasible and not inconsistent with the safe and prudent operation of a Scout ranch, modify its management strategies and management techniques whenever monitoring or research data indicate that doing so would reduce or eliminate adverse impacts on the Houston toad and promote its survival on Griffith League Ranch.
- 2) During preparation and implementation of ranch management plans (such as a Vegetation Management Plan or Wildlife Management Plan) for Griffith League Ranch, address and minimize, to the maximum extent practicable consistent with the scope of the permitted activities, the impacts of implementing such plans on the Houston toad.
- 3) Periodically review and update each resource management plan to incorporate the most current information about the Houston toad and refine management techniques. Submit the various ranch management plans to the Service for review and comment to confirm that such plans are consistent with this HCP.
- 4) If imported, non-native fire ants are detected in or near a breeding pond, and their occurrence is a result of BSA/CAC activity, treat the area for fire ants using the safest methods for the Houston toad according to current Service recommendations. BSA/CAC will implement a program to avoid introducing the imported, non-native fire ant through importation of soil or infected nursery stock. Infestations of the fire ant in or near known breeding ponds on Griffith League Ranch will be controlled using integrated pest management strategies and following recommendations of experts, including those from the Texas Department of Agriculture and from the Service. This program will be detailed in the Integrated Pest Management Plan for Griffith League Ranch.
- 5) Postpone construction of Lakes 2 and 3 until research from Lake 1 has been interpreted. No groundwater withdrawal or well construction for use in the filling

- and maintenance of the proposed lakes will be commenced until the impact of such withdrawal has been evaluated. Post-construction, studies shall be conducted to document the lake's impact on Houston toads and to determine whether or not the species can successfully use shallows along lake margins for breeding. In the event that the lakes result in a strong negative effect on the toad, BSA/CAC will change the design, placement or installation of Lakes 2 and 3.
- 6) Should studies indicate that fish predation or the stocking of fish in the lakes is a serious threat to the species, construct and maintain appropriate designs to reduce or eliminate predation and encourage successful reproduction of the Houston toad. Fish would also be removed at specific ponds if predation by fishes were determined to be detrimental to Houston toad survival. In addition, effects of pathogens from stocked fish, bait, or other introduced animals would be evaluated and assessed. Monitoring results would be used to alter and adapt current plans for the benefit of the toad.
  - 7) During the initial phases of trail use, evaluate animal waste concentrations, and if deemed necessary in consultation with Houston toad biologists, implement a management plan to minimize potential eutrophication of Houston toad breeding sites.
  - 8) If monitoring on Griffith League Ranch indicates a decline in the toad population due to BSA/CAC activities, alter its proposed plan in order to prevent any further decline resulting from these activities.

#### **6.2.4 Joint Annual Review and Submission of Report**

The purpose of the annual reviews is to compile, analyze, and interpret the best available scientific information and technical data on topics fundamental to the preparation and direction of this HCP. BSA/CAC shall consult with the Service no later than December 1 of each year to review the annual report and discuss any recommendations of the Service for modification of existing management strategies on Griffith League Ranch and any necessary process for evaluating adaptive management techniques. To the extent not inconsistent with the safe and prudent operation of a Scout ranch and not inconsistent with the monetary obligations set forth in this HCP, BSA/CAC shall discuss and implement the Service's recommendations. The review of the annual report may be less frequent than annually following the first five years.

### **6.3 FUNDING**

BSA/CAC will provide funds on an annual basis to manage the Houston toad on Griffith League Ranch and implement this HCP. As part of its yearly budget cycle, BSA/CAC will estimate the costs for projects and programs called for in the HCP. Funding allocations will be based on estimated costs of activities to be implemented in the coming year. BSA/CAC estimates that its annual budget (the BSA/CAC Annual Obligation) for compliance with this HCP will be \$20,000 (adjusted annually for inflation based upon changes in the applicable reported Consumer Price Index for Austin, Texas). The BSA/CAC Annual Obligation includes costs associated with recurring elements such as monitoring, reporting, and consultation with the Service (Specific HCP Compliance Costs). Some obligations of this HCP that are completed in the overall management of

Griffith League Ranch and the cost of which would be difficult to separate from the costs associated with such management will be funded as part of the routine management of Griffith League Ranch (Nonspecific HCP Compliance Costs). For example, that portion of the cost of such general ranch management and program elements as fencing, trespass control, education, trail design, erosion control, fire management, and wildlife management incurred as a result of the presence of the Houston toad would be considered Nonspecific HCP Compliance Costs. Costs for changes resulting from adaptive management will also be considered Nonspecific HCP Compliance Costs.

Although BSA/CAC may expend additional funds to support program elements in addition to the requirements of this HCP, the BSA/CAC Annual Obligation represents the maximum annual amount that BSA/CAC shall expend in compliance with the terms of this HCP with respect to Specific HCP Compliance Costs.

The BSA/CAC Annual Obligation will be paid from the dedicated annual revenue from the Scott and Wooten Trusts (“Trusts”), which is available for use by BSA/CAC. BSA/CAC will provide the Service with a commitment letter stating that sufficient funds are available from the Trusts for distribution to meet the BSA/CAC Annual Obligation.

In the event this HCP is terminated, pursuant to the terms of the Conservation Easement, the Service and BSA/CAC (or its successor in ownership of the easement area) shall, in consultation with the Service, ensure the continued implementation of a management plan for the easement area. Such management plan shall provide for the implementation of management measures and tasks consistent with the terms of this HCP applicable to the easement area. In connection with the transfer of fee simple ownership to any of the easement area, the Service may require, in its sole discretion, that the transferee deposit or provide reasonable security for such transferee's obligations under the Conservation Easement.

#### **6.4 NO SURPRISES**

BSA/CAC prepared this HCP, and upon issuance of an incidental take permit by the Service, intends to implement it according to its terms and conditions. The Service, in accordance with the Department of the Interior’s “No Surprises” assurances rule, shall not seek any additional mitigation from BSA/CAC other than that described in this HCP so long as BSA/CAC is fully implementing the terms and conditions of the HCP in good faith. If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the Service may require additional measures of BSA/CAC where the conservation plan is being properly implemented, but 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 Houston toad and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures will not involve the commitment of additional land, water or financial compensation or restrictions on the use of land, water, or financial compensation or restrictions on the use of land, water (including quantity and timing of delivery), or other natural resources otherwise available for development or use under the original terms of this HCP without the consent of BSA/CAC.

In the event that any judicial decision or determination, including without limitation the decision from the District Court for the District of Columbia in *Spirit of the Sage, et al. v. Norton et al.*, 98-CV-1873 (D.D.C. 2003), may hold that the Department of Interior's "No Surprises" assurances rule (or similar successive rule) is vacated, unenforceable or enjoined for any reason to any extent, the HCP shall be enforceable only to the degree allowed by any such decision or determination; provided that the remainder of the HCP shall remain in full force and effect to the maximum extent permitted by law. In the event that the "No Surprises" assurances rule may be vacated, unenforceable or enjoined by such decision or determined but is later reinstated, this section of the HCP likewise be automatically reinstated and apply to the entire term of this HCP. If, in response to any such judicial decision or determination, the "No Surprises" assurances rule is revised, the HCP shall be automatically amended in a manner consistent with the revised rule so as to afford the maximum protection to the Applicant consistent with the revised rule.

#### **6.4.1 Changed Circumstances**

"Changed circumstances" are defined by the Service as those circumstances that "...are not uncommon during the course of an HCP and can reasonably be anticipated and planned for." In managing for unforeseen changed circumstances, the Service will neither require BSA/CAC to exceed the amount of the BSA/CAC Annual Obligation nor modify the terms of the conservation easement, unless BSA/CAC concurs with such changes. During the course of this 50-year incidental take permit, BSA/CAC may find need to modify its development and use plan to meet changing needs and goals or respond to new adaptive management strategies. Should such changes be anticipated, BSA/CAC will notify the Service of their intent to make changes. Procedures for amending this HCP and incidental take permit, as discussed below, will be followed.

##### **6.4.1.1 Wildfire**

Wildland fire is likely to occur on Griffith League Ranch as a result of lightning, accidental ignition, arson, or escaped fire from outside the property. Loblolly pine /oak forest habitat is a fire-adapted subclimax vegetation association. Because the Houston toad is adapted to this habitat, it is most likely adapted to the occurrence of wildland fire. There is no documented fire history for Griffith League Ranch. Little is known about historical fire occurrence in the loblolly pine woodlands of Central Texas. No data is currently available on fire return interval, fire intensity, or seasonality of fire as regards the Houston toad. Therefore, without additional investigation it is difficult to determine the effect of fire on the Houston toad. Due to the lack of long-term studies of controlled burning in loblolly pine forests in the Bastrop County area, the best scientific evidence available at the time will be used to create and adapt management plans for controlled burning in loblolly pine forests on Griffith League Ranch in order to maintain suitable habitat in Bastrop County for the Houston toad and prevent catastrophic fires.

BSA/CAC shall use reasonable efforts to assure that all wildfires are suppressed to the extent feasible until such time as a Fire Management Plan is to be prepared for the Griffith League Ranch, which shall address the Houston toad in order to avoid or minimize adverse impacts on the species.

A catastrophic fire is one that occurs under extreme fire weather conditions during a period of severe drought in vegetation that has not burned in the past ten years. Such fires are potentially landscape-changing fires. Extreme fire behavior could alter vegetative cover on the landscape over the long term. Should a substantial wildland fire occur on Griffith League Ranch, BSA/CAC shall cooperate with the Service in implementing remedial action in the manner provided in this HCP to the extent of the BSA/CAC Annual Obligation.

#### **6.4.1.2 Drought**

The drought of record for the State of Texas is the 1950's drought. It began in central Texas in 1950 and lasted until 1957 (Votteler 2001). The 1950's drought is thought to have seriously impacted Houston toads (U. S. Fish and Wildlife Service 1984, Seal 1994). Drought is generally defined as an extended period of time during which evaporation exceeds precipitation to the point that wildlife and vegetation are adversely affected. Drought conditions can prevail for as few as three to six months but can continue for a period of years. A record drought could occur every 50 to 100 years. Historically, droughts have lasted for decades in the areas of the southwestern United States. Drought is a relatively normal event in Texas. Global weather patterns such as the positioning of the Bermuda High and "el nino-la nina" weather patterns are causal agents of drought in Texas (Votteler, 2001).

BSA/CAC will monitor the Houston toad during drought conditions in the normal course of its annual monitoring program and advise the Service of their findings in the annual report. Provided that a reasonably accessible and economically feasible water source is available and the action is approved by the Service, BSA/CAC will consider supplementing the water levels at breeding sites during the critical breeding season. Should extreme drought continue for more than four years and the Houston toad show a serious decline in population, BSA/CAC shall cooperate with the Service in implementing remedial action in the manner provided in this HCP to the extent of the BSA/CAC Annual Obligation.

#### **6.4.1.3 Pine Beetle Infestation**

One or more engraver beetles, (*Ips* spp.) are known to exist on or near Griffith League Ranch. These beetles infest timber or logging debris and can weaken living trees. *Ips* beetles do not normally kill enough living trees to be considered pests and rarely infest healthy forests. Trees weakened by stress such as drought are subject to infestation by the engraver beetles. Under such conditions, engraver beetles can kill significant numbers of trees (Pase 1999 and 2000). Should drought conditions result in increased engraver beetle activity to the point that large numbers of trees or trees in Houston toad habitat are killed, BSA/CAC will follow recommended procedures for controlling the spread of the beetles. Accepted practices call for cutting and removing infested trees.

The southern pine beetle (*Dendroctonus frontalis*) is not known to occur in the central Texas Pine forest near Bastrop, Texas (Pase 2002). The southern pine beetle is the most serious insect pest in southern pine forests. It is capable of killing large numbers of trees. A single infestation can impact hundreds of acres of loblolly pine, including healthy trees

(Pase 1999). A serious infestation of this insect could alter vegetative cover significantly, possibly to the detriment of the Houston toad. BSA/CAC will also consult with the Texas Forest Service, and to the extent practicable, take steps to stop the spread of this species on Griffith League Ranch. Should substantial damage to the forest on Griffith League Ranch occur from southern pine beetle infestation, BSA/CAC shall cooperate with the Service in implementing remedial action in the manner provided in this HCP to the extent of the BSA/CAC Annual Obligation.

#### **6.4.1.4 *Unforeseen Circumstances***

BSA/CAC shall consult with the Service to determine what actions, if any, will be taken to avoid or minimize impacts to the Houston toad in the manner provided in this HCP to the extent of the BSA/CAC Annual Obligation.

### **6.5 AMENDMENTS**

Both this HCP and the Incidental Take Permit may require amendment from time to time as circumstances change and new information is acquired. BSA/CAC will make all requests for amendment in writing.

#### **6.5.1 Minor Amendments**

Minor amendments include routine administrative revisions or insignificant changes in development plans or operating programs. The development plan for the Preferred Alternative is conceptual. Precise acreages and locations of proposed disturbances have not yet been determined. Therefore, minor amendments include, but are not limited to, changes in the size of a development on Griffith League Ranch where the proposed change does not increase the covered disturbance by more than a total of (a) 20 percent of the area affected by the proposed activity (“disturbance footprint”) with respect to “Moderate Disturbance” activities, and (b) 10 percent of the area affected by the proposed activity (“disturbance footprint”) with respect to “High Disturbance” activities and changes in the specific location of a covered activity. For example, if plans were altered to enlarge the size of Lake 2 from 45 acres to 48 acres (or a six percent increase in the disturbance footprint), the amendment would be a minor amendment because the activity is a high disturbance activity where the proposed change does not increase the covered disturbance by more than 10 percent. However, if the plans required an increase from 45 acres to 50 acres (or a 11 percent increase in the disturbance footprint), then this would be considered a major amendment requiring formal amendment. In both cases, such changes will be considered as minor amendments only if the proposed change (in size or location) will not result in a significant increase of impacts on the Houston toad, diminish the level of required mitigation or alter the terms of the incidental take permit. BSA/CAC will make written request to the Service to initiate minor amendments. The Service may authorize minor amendments if it is determined that such amendments neither conflict with the primary purpose of this HCP nor materially increase the level of take authorized by the incidental take permit.

### **6.5.2 Major Amendments**

Substantial changes to the development plans or proposed uses of Griffith League Ranch, as described in the Preferred Alternative, require formal amendment. Such changes may result in additional significant impacts on the Houston toad and its habitat, require additional mitigation, and require modification of the terms of the incidental take permit. BSA/CAC will make written request to the Service to initiate major amendments. Major amendments are subject to all the procedural requirements of federal law and regulation. Major amendments may necessitate changes in this HCP and changes in mitigation measures. A supplemental environmental assessment and public review of the proposed action(s) may be required before the Service can approve major amendments.

### **6.6 DURATION OF THE HABITAT CONSERVATION PLAN**

This HCP is written in anticipation that the Service will issue a 50-year, renewable incidental take permit. The term of the incidental take permit shall be effective upon the date of the last signature on the permit. Recognizing that the development of Griffith League Ranch is a long-term multi-year project, BSA/CAC will conduct periodic reviews to assess the status of the Houston toad on Griffith League Ranch, consider adaptive management alternatives, and assure BSA/CAC's compliance with the terms of this HCP. Such review shall be based upon BSA/CAC's submission of reports to the Service, or by means of a joint meeting, or both, as is mutually acceptable.

## **7 CONSULTATION AND COORDINATION**

The following entities and individuals contributed their time, advice and information to aid in the preparation of this Environmental Assessment/Habitat Conservation Plan.

### **7.1 PRIVATE SECTOR**

#### **Boy Scouts of America, Capitol Area Council, Austin, Texas**

Ray Smith, former Scout Executive  
Martin Payne, Program Director  
W. Philip Koepp, Environmental Advisor

#### **Boy Scouts of America, Capitol Area Council, Houston Toad Committee, Austin, Texas**

Jack Holford, Chair  
Jack Martin  
James Morriss, III  
Trey Garrison  
Thomas Graham  
Robert Cullick

#### **Boy Scouts of America, National Office, Irving, Texas**

Robby Reid, R.A.

#### **Boy Scouts of America, Philmont Scout Ranch, Cimarron, New Mexico**

Doug Palmer

#### **Holford Development Group, Austin, Texas**

Jack Holford

Jim Latson  
Ed Barnhart, Ph.D.  
Anthony Martinez  
Deborah Martin

**Thompson & Knight, L.L.P., Austin, Texas**

James Morriss, III  
Andrew Ingram  
Sherri L. Eastley

**Colovista Properties, Bastrop, Texas**

Les Appelt

**Lower Colorado River Authority, Austin, Texas**

Jeff Singleton

**Volunteer Archeological Stewards**

David Parkhill, Austin, Texas  
Nick Morgan, Cedar Creek, Texas

**7.2 UNIVERSITIES**

**Texas State University, San Marcos, Texas**

Michael R. J. Forstner, Ph.D.

**Texas A & M University, College Station, Texas**

James Dixon, Ph.D.

**7.3 GOVERNMENT – FEDERAL**

**U.S. Fish and Wildlife Service, Ecological Services, Austin, Texas**

Renne Lohofener  
David Frederick  
Robert Pine  
Dawn Whitehead  
Scott Rowin  
Lisa O'Donnell  
Sybil Vosler

**U. S. Fish and Wildlife Service, Region 2, Albuquerque, New Mexico**

Geoffrey Haskett  
Bryan Arroyo  
Steve Chambers  
Sarah Rinkevich

**U. S. Fish and Wildlife Service, Washington, D.C.**

Gary Frazer  
Michelle Morgan

**U.S. Natural Resource Conservation Service, Bastrop, Texas**

Bill McPherson

**7.4 GOVERNMENT – STATE OF TEXAS**

**Texas Forest Service, La Grange, Texas**

Daniel Lewis

**Texas Historical Commission, Austin, Texas**

William Martin

Dan Potter

**Texas Commission on Environmental Quality (formerly] Texas Natural Resources Conservation Commission), Austin, Texas**

Ron Wells

**Texas Natural Resources Information System, Austin, Texas**

Carol McElroy

Sean Moran

**Texas Parks and Wildlife Department, Austin, Texas**

Mike Herring

Andrew Price, Ph.D.

Danny Mask

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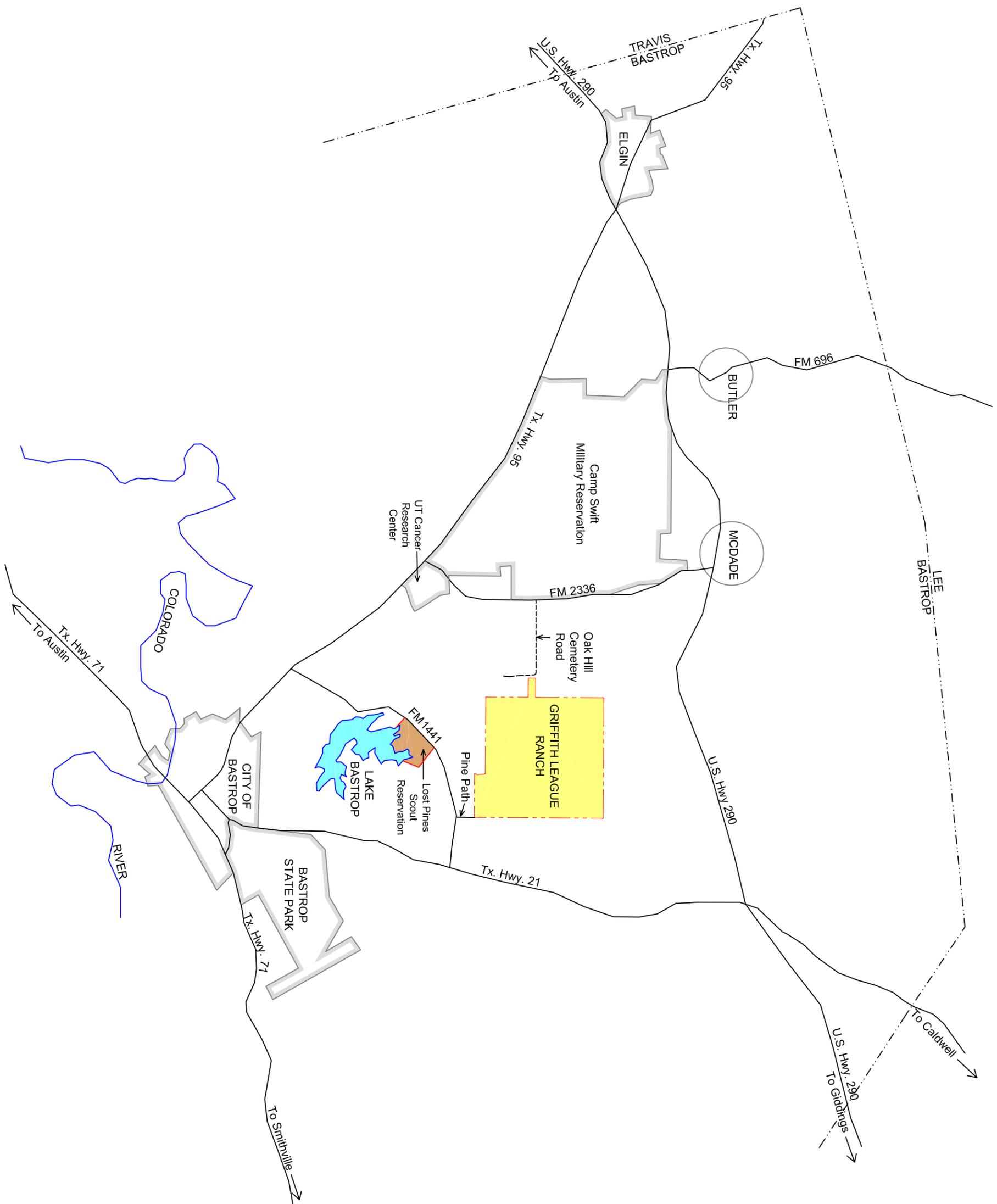
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- Yantis, J. H. 1991. Houston toad distribution and habitat status. Performance report, Job No. 76. Texas Parks and Wildlife Department. Austin, Texas.

Figure 1



LEGEND	
PROPERTY BOUNDARY	— — — — —
COUNTY LINE	- - - - -
PAVED HIGHWAY	— — — — —
UNPAVED ROAD	- - - - -
RIVER	— — — — —
LAKE	— — — — —
GRIFFITH LEAGUE RANCH: 4848 ACRES	
LOST PINES SCOUT RESERVATION: 541 ACRES	



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 DRAWING NO. 2011-001-001

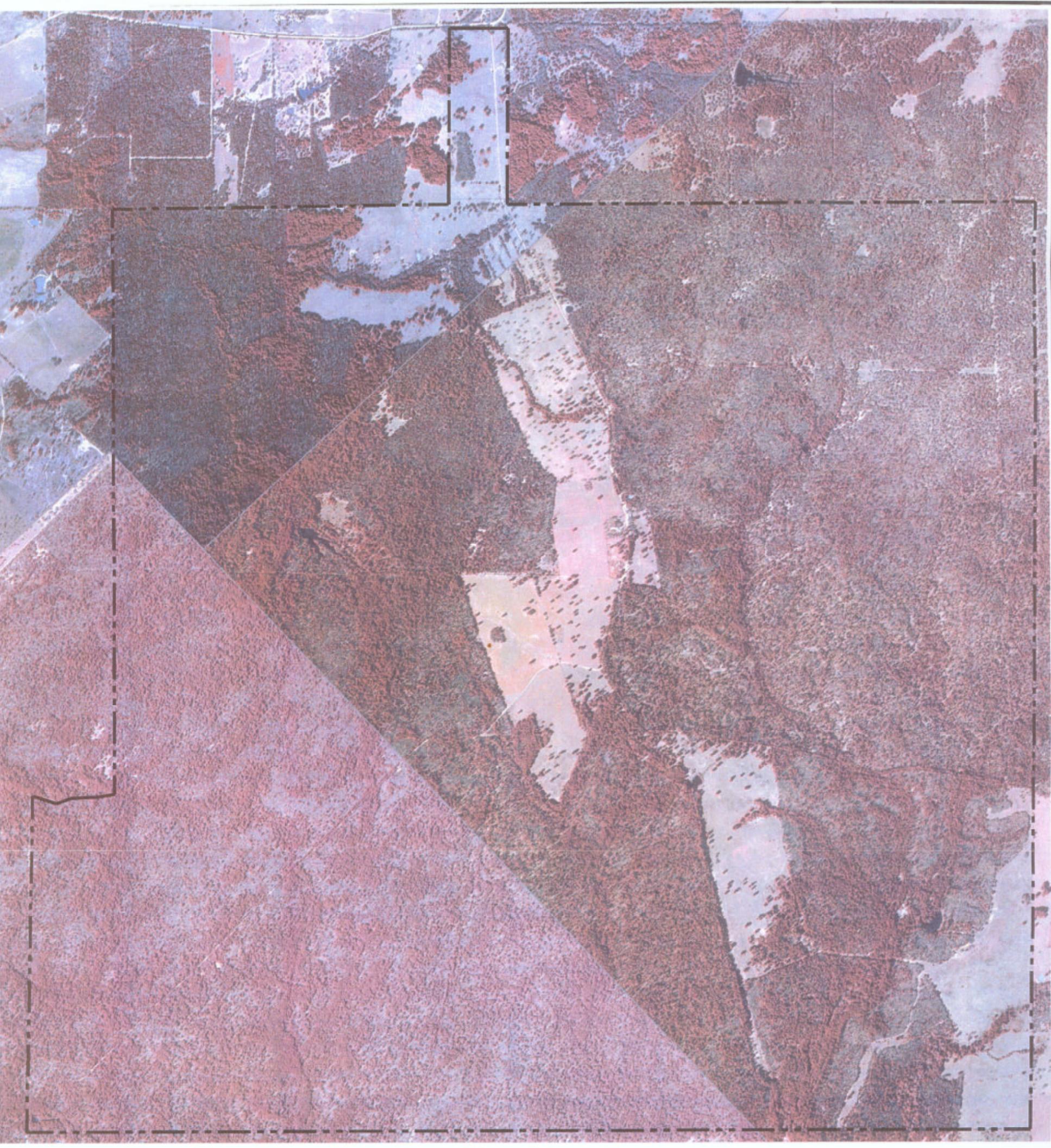
ORIGINATOR: R.R.  
 DRAWN: R.L.C.

Source: TxDOT and Roads of Texas Maps Knox Survey, 1950.

Date: 9-4-03

**LOCATION MAP**  
**GRIFFITH LEAGUE RANCH**  
 CAPITOL AREA COUNCIL, BOY SCOUTS OF AMERICA  
 AUSTIN, TEXAS

Figure 2



LEGEND	
APPROXIMATE PROPERTY BOUNDARY	---



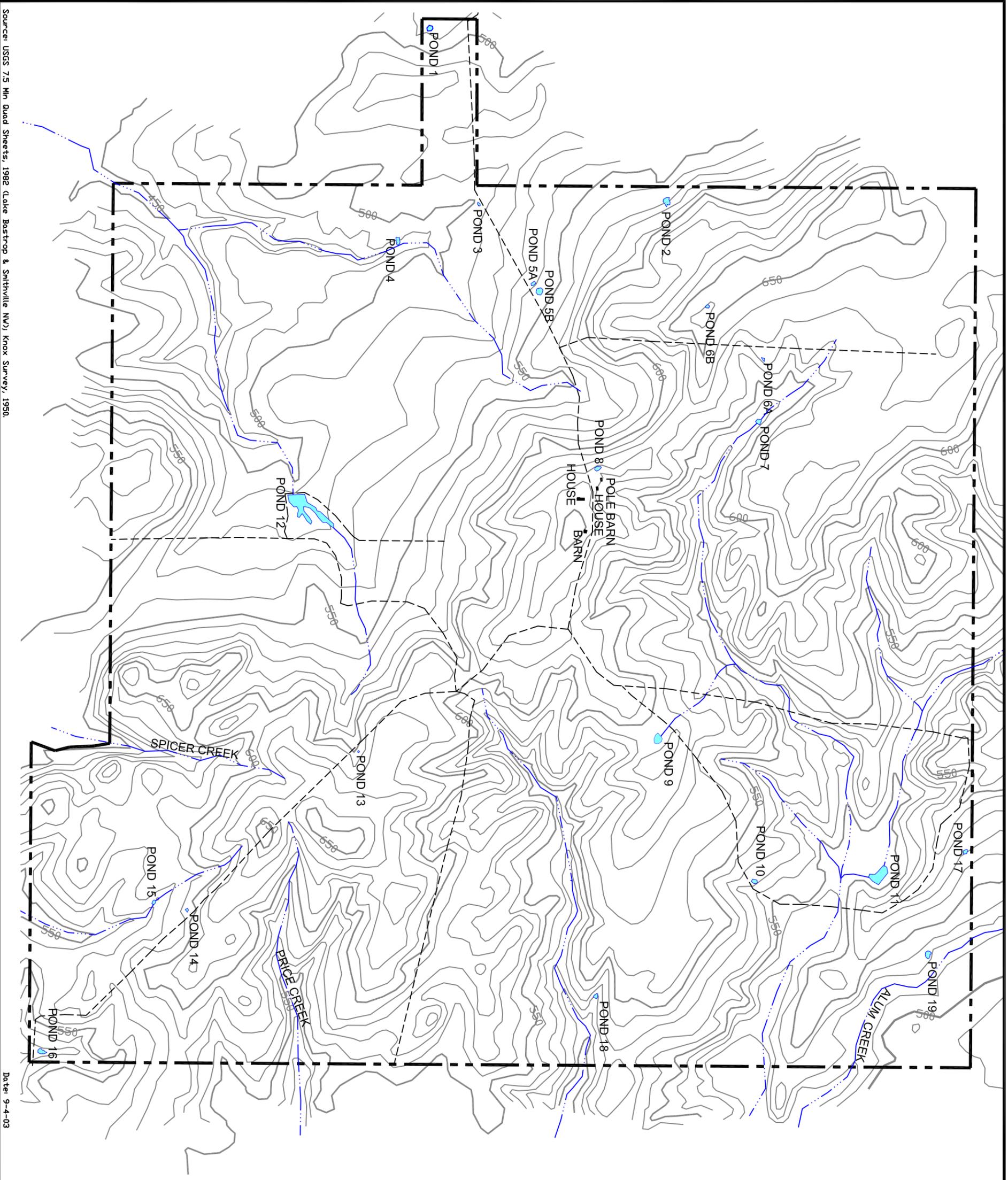
**AERIAL PHOTOGRAPHY**  
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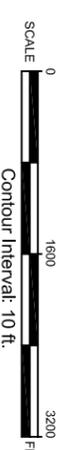
Source: USGS 7.5 Min Quad Sheets, 1982 and TNRS Digital Orthophoto Quads, 2000 Lake Bastrop & Smithville NW2, Knox Survey, 1950.

Date: 7/5/02

Figure 3



LEGEND	
PROPERTY BOUNDARY	--- (dashed line)
ROAD - SECONDARY	— (solid line)
50 FT CONTOUR	— (solid line with '500')
10 FT CONTOUR	— (solid line with '600')
INTERMITTENT STREAM	- · - · - (dashed-dotted line)
POND	■ (light blue filled square)
EXISTING STRUCTURES	■ (black filled square)



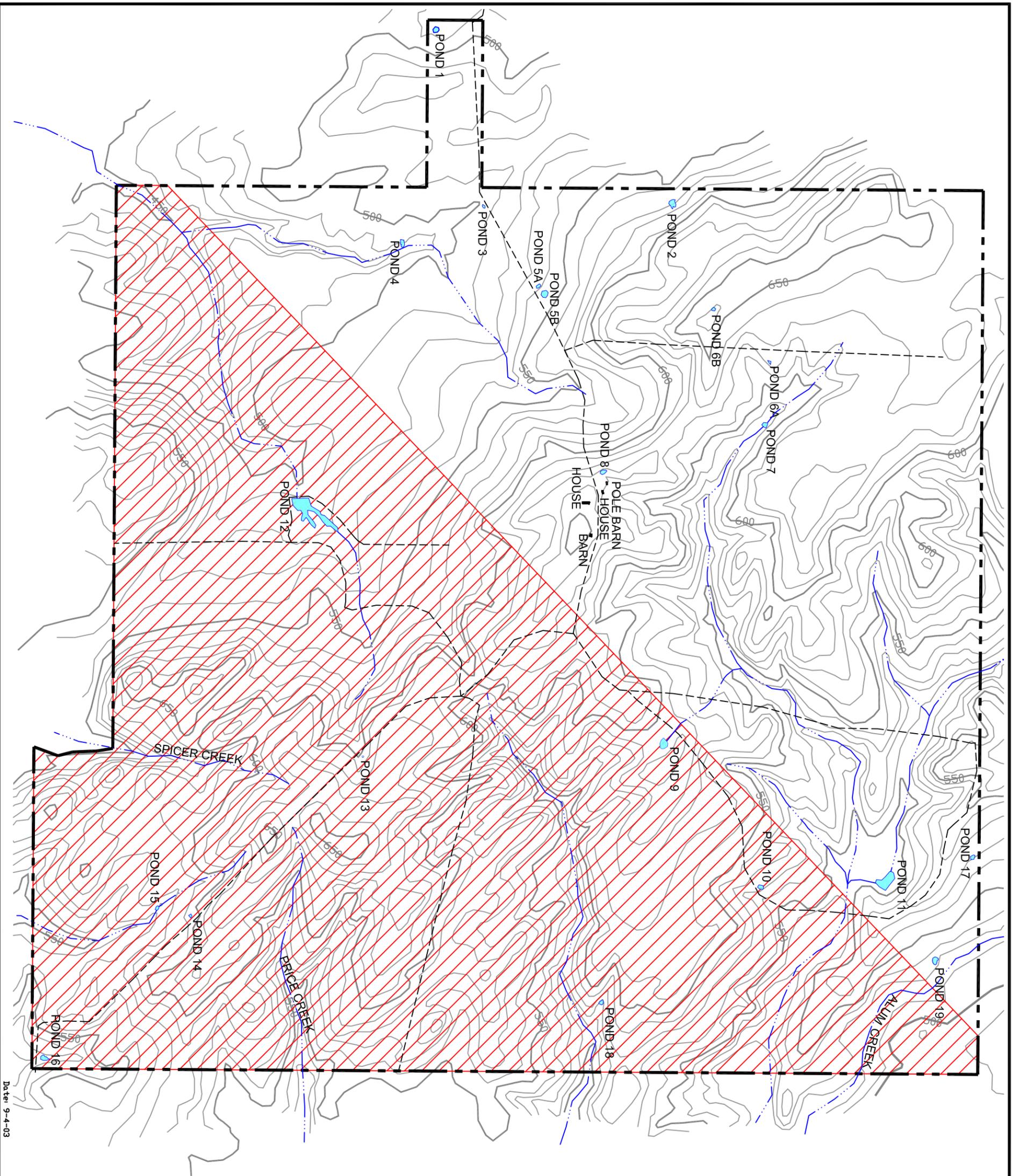
**TOPOGRAPHY**  
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 AUSTIN, TX 78703

ORIGINATOR: RRR  
 DRAWN: RLC

Figure 4



LEGEND	
PROPERTY BOUNDARY	— — — — —
ROAD - SECONDARY	— — — — —
50 FT CONTOUR	— — — — —
10 FT CONTOUR	— — — — —
INTERMITTENT STREAM	— · — · — ·
POND	■
EXISTING STRUCTURES	■
CRITICAL HABITAT (2,712 ACRES)	▨



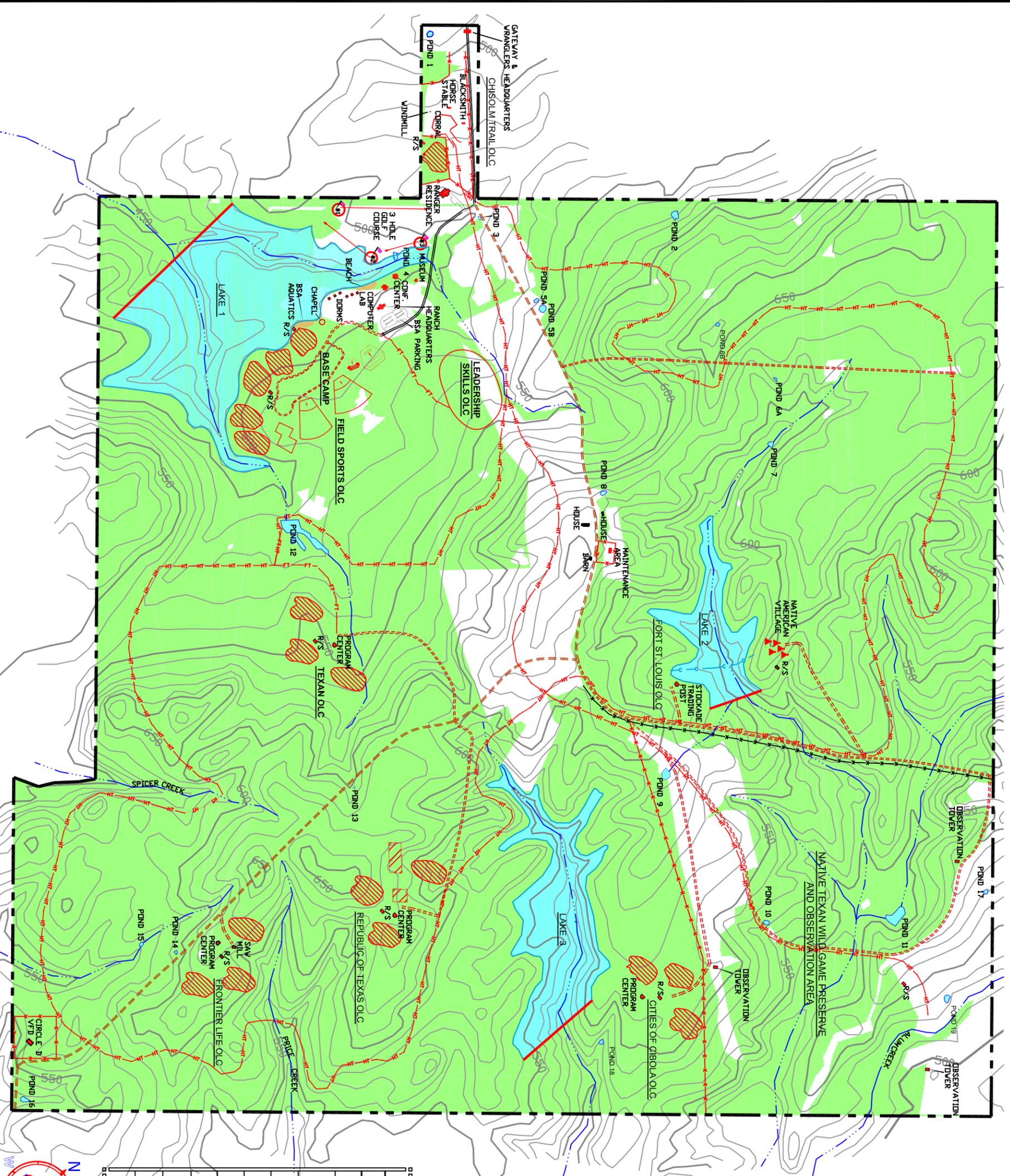
CRITICAL HABITAT  
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 IRVING, TX 75039-2909

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Figure 5



LEGEND	
— — — — —	PROPERTY BOUNDARY
=====	ENTRANCE ROAD
-----	MAIN SERVICE ROAD
-----	SECONDARY SERVICE ROAD
— — — — —	FOOTPATH
— — — — —	HORSE TRAIL
— — — — —	CANOE TRAIL
— — — — —	EXISTING FENCE
— — — — —	PROPOSED FENCE
— — — — —	50 FT CONTOUR
— — — — —	10 FT CONTOUR
— — — — —	FORESTED AREA
— — — — —	INTERMITTENT STREAM
— — — — —	LAKE / POND
— — — — —	STRUCTURES: EXISTING
— — — — —	PROPOSED
— — — — —	RESTROOM / SHOWER
— — — — —	CAMPsites
— — — — —	RIFLE AND PISTOL RANGE
— — — — —	ARCHERY
— — — — —	SHOTGUN
— — — — —	ORCHARD / GARDEN
— — — — —	CHAPEL

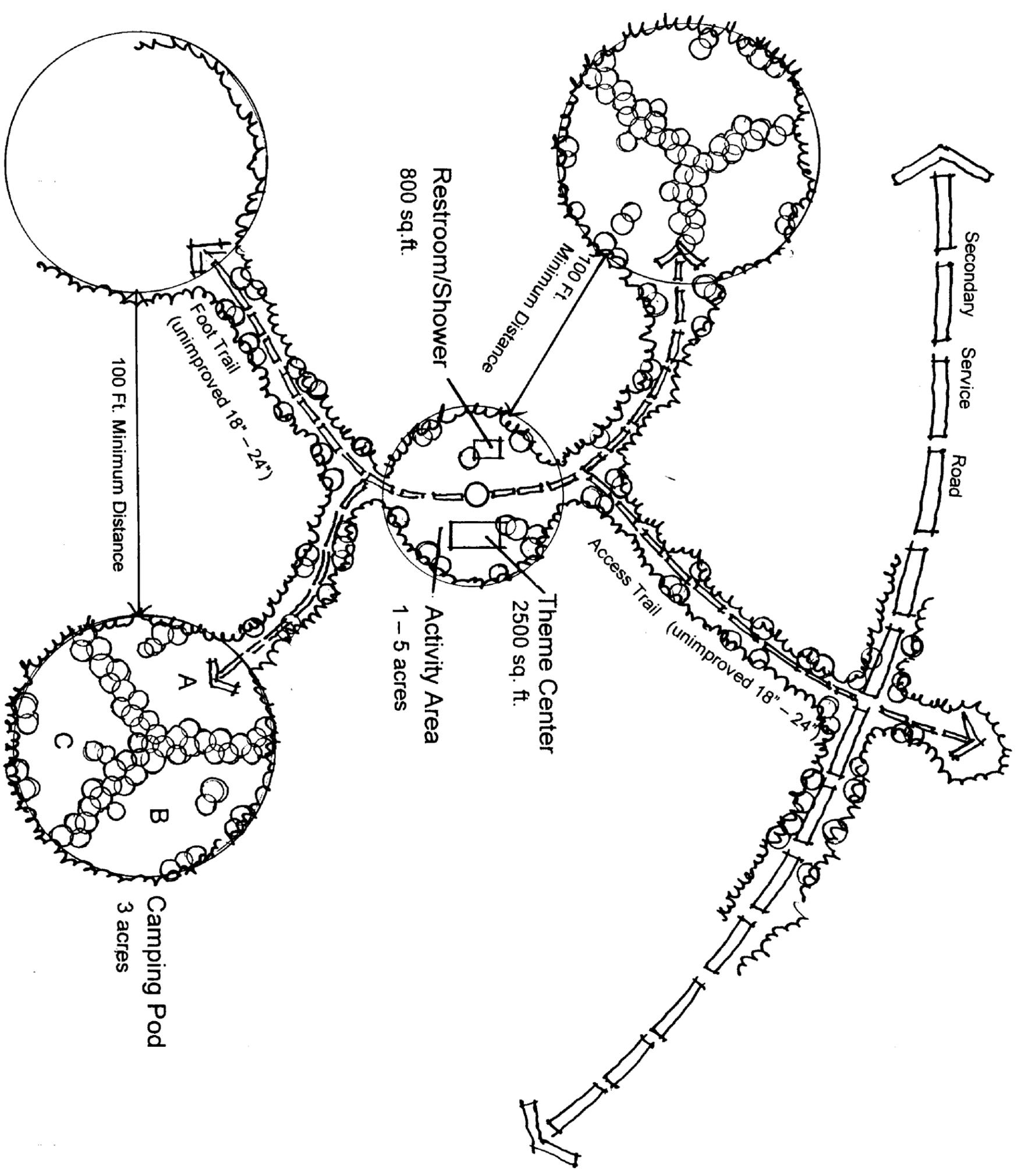
OUTDOOR LEARNING CENTER ACTIVITIES	
OLC	ACTIVITY
CHISHOLM TRAIL	HORSES, CATTLE, ROPING, BRANDING, CHUCKWAGON, TEXAS RANGERS
TEXAN	ADOBE MAKING, POTTERY, WEAVING / BASKETRY, SUBSISTENCE RANCHING / FARMING, ANIMAL HUSBANDRY
REPUBLIC OF TEXAS	LEATHERWORK, VEGETABLE GARDENING, ORCHARD, FISHING, SMOKEHOUSE, DUTCH OVEN COOKING
FRONTIER LIFE	SAWMILL, WOODWORKING, WOODCARVING, FURNITURE MAKING
PORT ST. LOUIS	STOCKADE, TRADING POST, TRAPPING, SPAR POLES, BOAT BUILDING
NATIVE AMERICAN VILLAGE	CANOE TRAIL, HEAD DRESS/MOCCASIN MAKING, TOOL MAKING, BEAD WORK, TOMAHAWK THROWING
CITIES OF GIBOLA	GEOLOGY, MISSIONS, GOLD/SILVER MINING, EXPLORATION
LEADERSHIP SKILLS	C.O.P.E. COURSE (ROPES COURSE), CLIMBING/RAPPPELLING
FIELD SPORTS	RIFLE/PISTOL RANGE, SHOTGUN/SKEET/TRAP RANGES, ACTION ARCHERY RANGE



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**SITE PLAN**  
 GRIFFITH LEAGUE RANCH  
 CAPITOL AREA COUNCIL, BOY SCOUTS OF AMERICA  
 AUSTIN, TEXAS

Figure 6



**TYPICAL PROGRAM AREA**

CONTAINS:

- A) AN ACTIVITY AREA OF 1-5 ACRES.
- B) 3 CAMPING PODS, 3 ACRES EACH.
- C) 3 CAMPING SITES ON WHICH USE WILL BE ROTATED ANNUALLY.

NOTE: EACH CAMPING POD CONTAINS 3 CAMPING SITES ON WHICH USE WILL BE ROTATED ANNUALLY.



NOT TO SCALE

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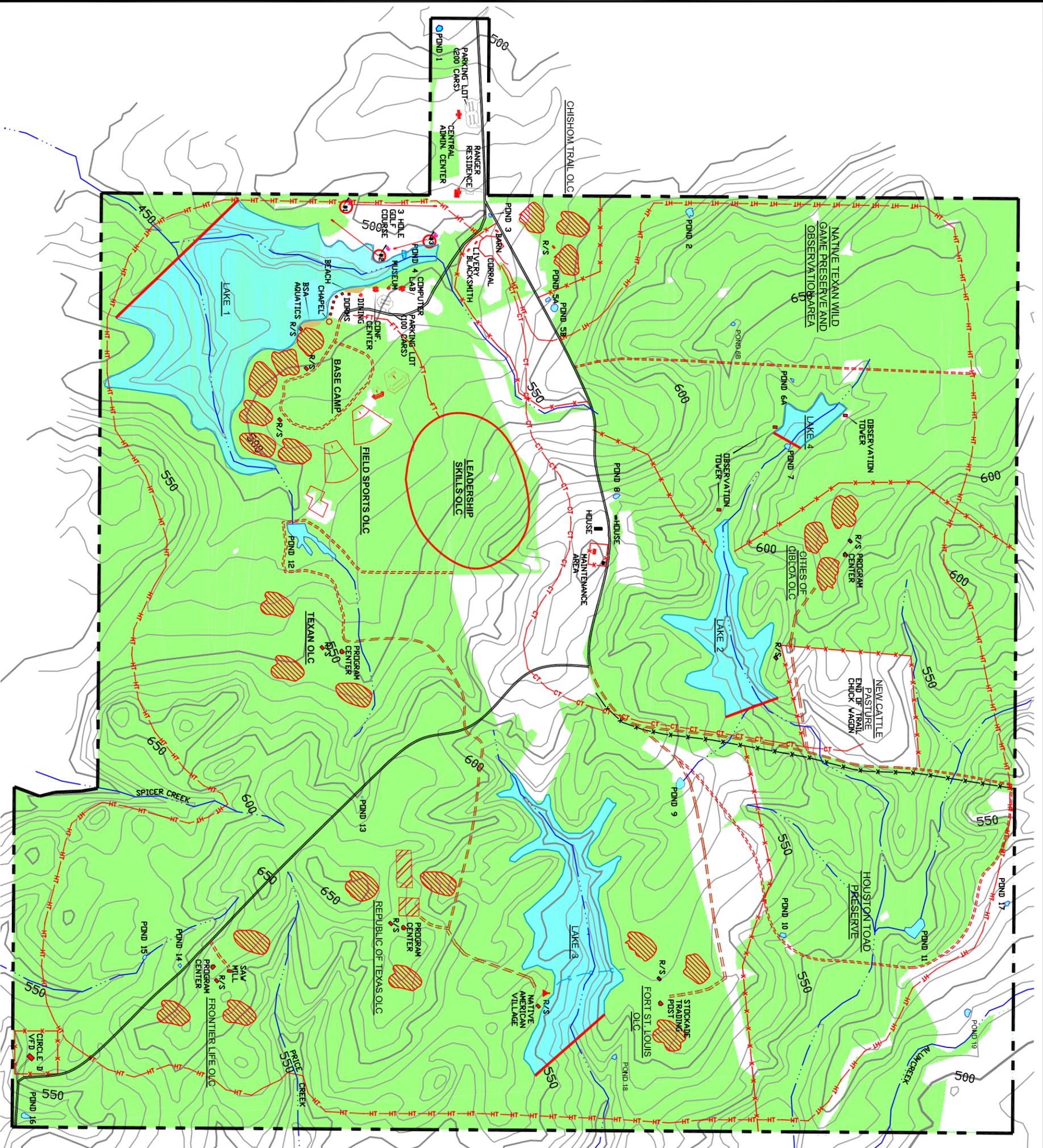
ENGINEERING  
 SERVICE  
 BOY SCOUTS OF AMERICA  
 1225 W. WANDER HILL LN  
 RAINES, TX 78075-2079

ORIGINATOR: RHR  
 DRAWN: RLC

TYPICAL PROGRAM AREA  
 GRIFFITH LEAGUE RANCH  
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 AUSTIN, TEXAS

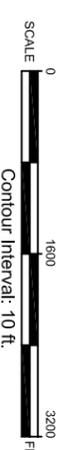
Date: 9-4-03

Figure 7



LEGEND	
— — — — —	PROPERTY BOUNDARY
=====	ENTRANCE ROAD
-----	MAIN SERVICE ROAD
-----	SECONDARY SERVICE ROAD
— FT — FT — FT — FT — FT —	FOOTPATH
— HT — HT — HT — HT — HT —	HORSE TRAIL
— CT — CT — CT — CT — CT —	CANOE TRAIL
— C — C — C — C — C —	EXISTING FENCE
- - - - -	PROPOSED FENCE
50 FT CONTOUR	50 FT CONTOUR
10 FT CONTOUR	10 FT CONTOUR
FORESTED AREA	FORESTED AREA
INTERMITTENT STREAM	INTERMITTENT STREAM
LAKE / POND	LAKE / POND
STRUCTURES: EXISTING	STRUCTURES: EXISTING
PROPOSED	PROPOSED
RESTROOM / SHOWER	RESTROOM / SHOWER
CAMPsites	CAMPsites
RIFLE AND PISTOL RANGE	RIFLE AND PISTOL RANGE
ARCHERY	ARCHERY
SHOTGUN	SHOTGUN
ORCHARD / GARDEN	ORCHARD / GARDEN
CHAPEL	CHAPEL

OUTDOOR LEARNING CENTER ACTIVITIES	
O.L.C.	ACTIVITY
CHISHOLM TRAIL	HORSES, CATTLE ROPING, BRANDING, CHUCKWAGON, TEXAS RANGERS
TEXAN	ADobe MAKING, WEAVING / BASKETRY, SUBSISTENCE RANCHING / FARMING, ANIMAL HUSBANDRY
REPUBLIC OF TEXAS	LEATHERWORK, VEGETABLE GARDENING, ORCHARD, FISHING, SMOKEHOUSE, DUTCH OVEN COOKING
FRONTIER LIFE	SAWMILL, WOODWORKING, WOODCARVING, FURNITURE MAKING
FORT ST. LOUIS	STOCKRADE, TRADING POST, TRAPPING, SPAR POLES, BOAT BUILDING
NATIVE AMERICAN VILLAGE	CANOE TRAIL, HEAD DRESS/MOCCASIN MAKING, TOOL MAKING, BEAD WORK, TOMAHAWK THROWING
CITIES OF COBOLA	GEOLOGY, MISSIONS, GOLDSILVER MINING, EXPLORATION
LEADERSHIP SKILLS	C.O.P.E. COURSE (ROPES COURSE), CLIMBING/RAPPPELLING
FIELD SPORTS	RIFLE/PISTOL RANGE, SHOTGUN/SKEET/TRAP RANGES, ACTION ARCHERY RANGE



Date: 9-4-03

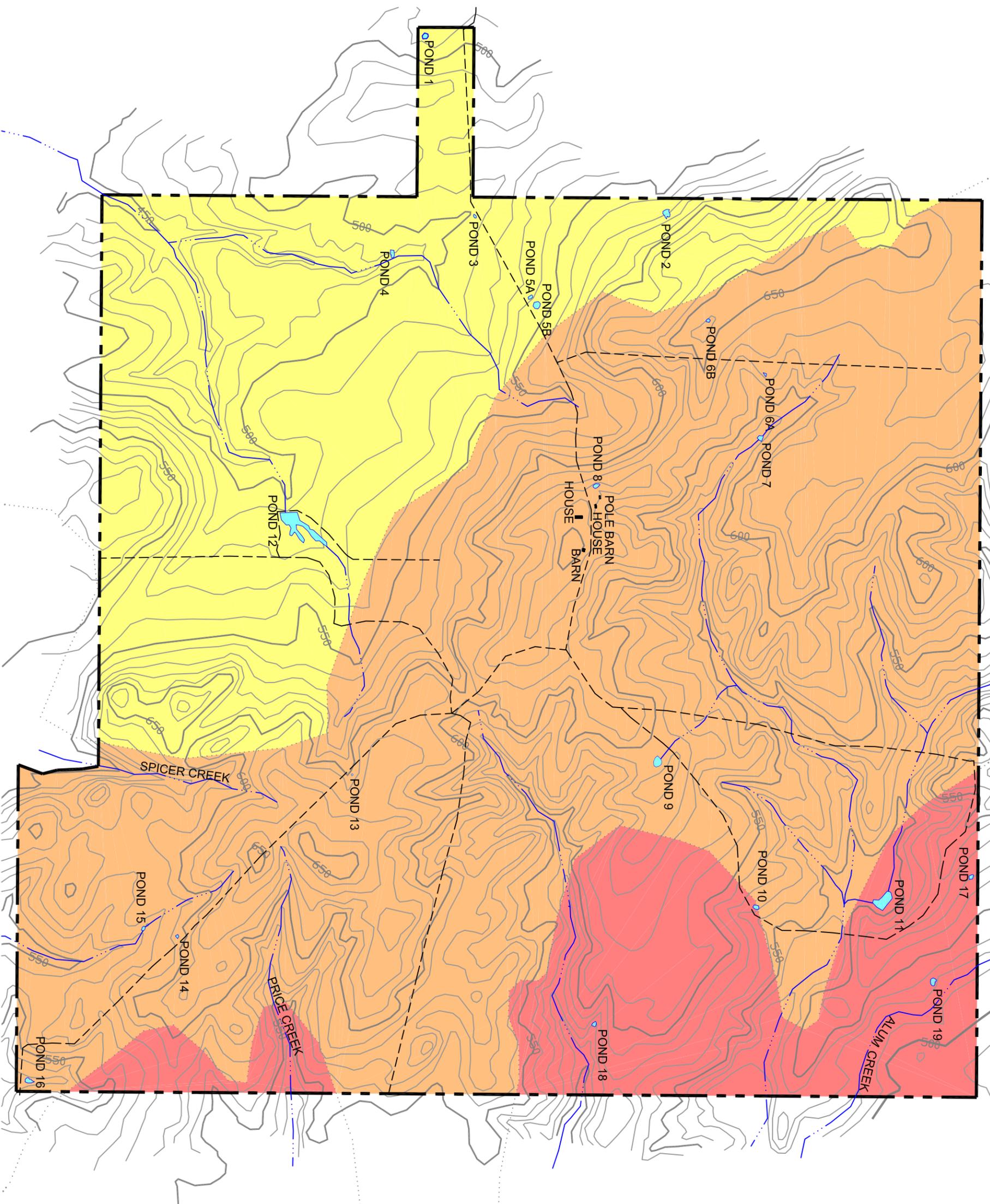
Source: USGS 7.5 Min Quad Sheets, 1982 (Lake Bastrop & Smithville NW) Knox Survey, 1950.

**ALTERNATIVE SITE PLAN**  
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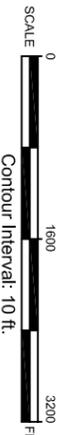
**ENGINEERING SERVICE**  
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 1800 N. BRUNNEN  
 AUSTIN, TEXAS 78701

Figure 8



**LEGEND**

- CALVERT BLUFF FORMATION (1323ac.)
- CARRIZO SAND (2867 ac.)
- REKLAW FORMATION (658 ac.)
- PROPERTY BOUNDARY
- - - ROAD - SECONDARY
- 50 FT CONTOUR
- 10 FT CONTOUR
- INTERMITTENT STREAM
- LAKE/POND
- EXISTING STRUCTURES

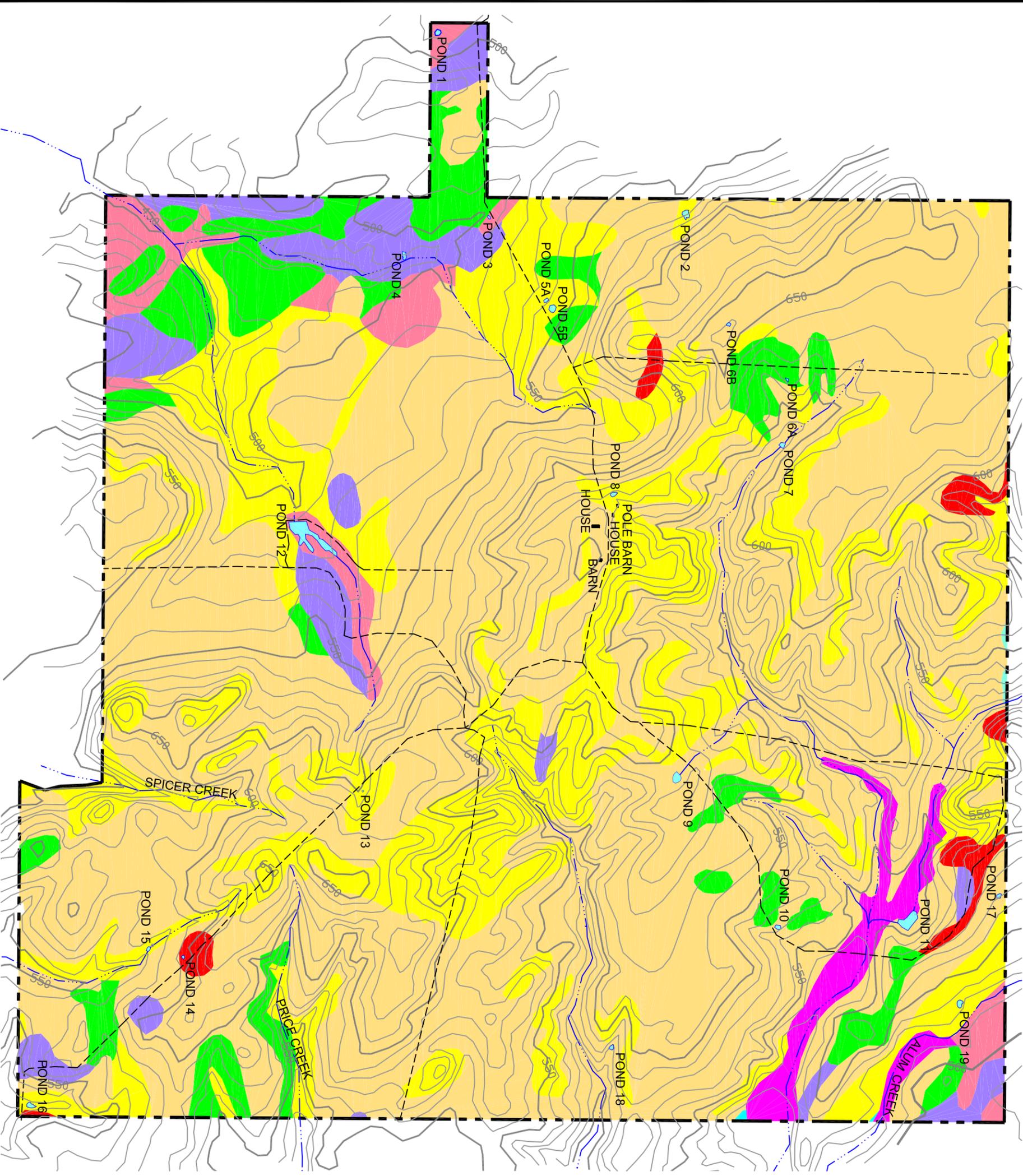


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 NATIONAL HEADQUARTERS  
 1300 N. MEADE AVE.  
 AUSTIN, TX 78705

**GEOLOGY**  
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Figure 9



LEGEND	
PATILO - DEMONA - SILSTID ASSOCIATION	
	PATILO SERIES (3076 ac.)
	DEMONA SERIES (297 ac.)
	SILSTID SERIES (1042 ac.)
AXTELL - TABOR ASSOCIATION	
	AXTELL SERIES (190 ac.)
	TABOR SERIES (121 ac.)
	SAVERS SERIES (80 ac.)
	JEDD SERIES (42 ac.)
PROPERTY BOUNDARY	
	ROAD - SECONDARY
	50 FT CONTOUR
	10 FT CONTOUR
	INTERMITTENT STREAM
	POND
	EXISTING STRUCTURES

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 15200 N. 29th Street  
 Irving, TX 75039

**SOILS**

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 AUSTIN, TEXAS

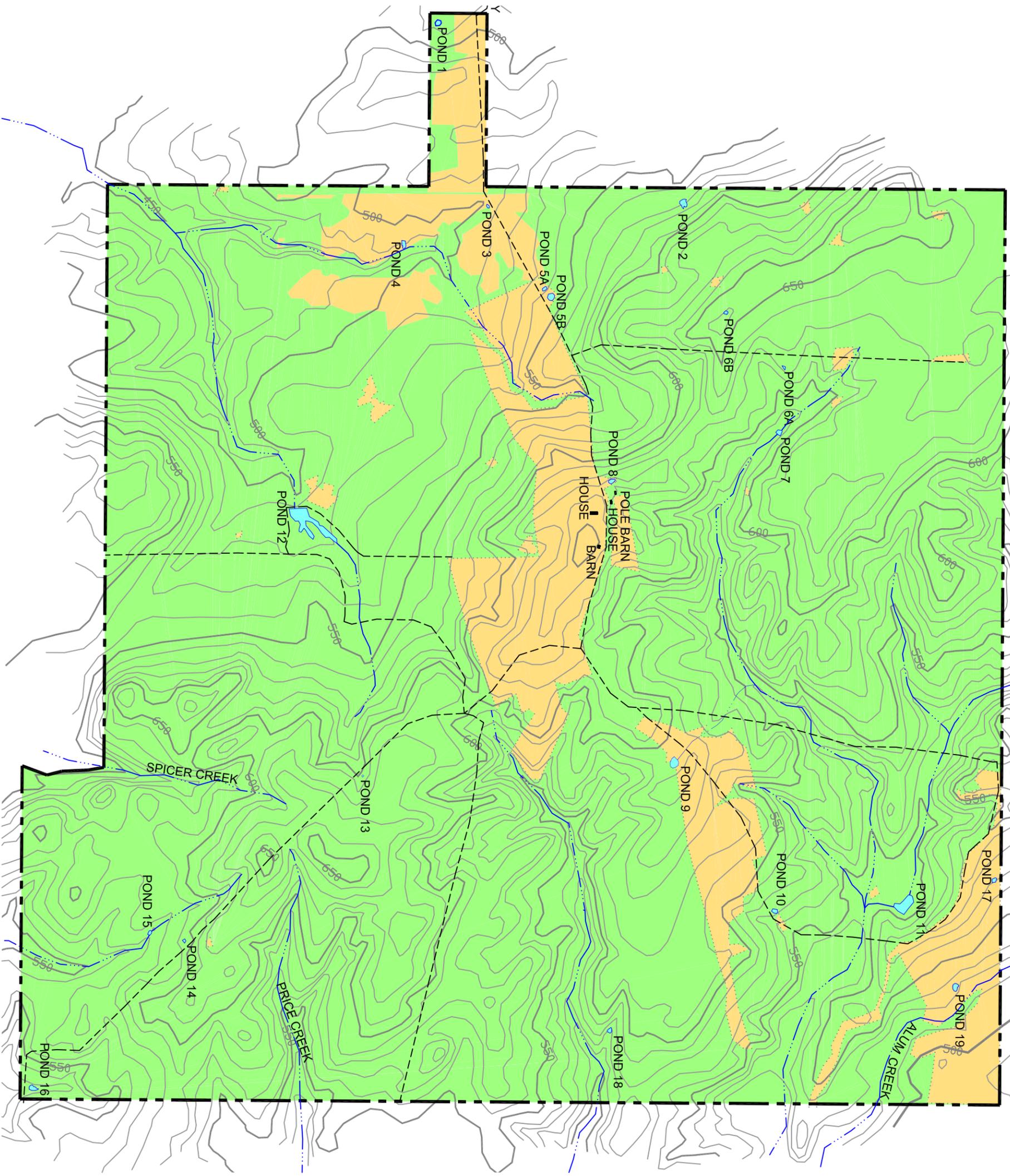
Source: USGS 7.5 Min Quad Sheets, 1982 and National Wetlands Inventory, 1993 (Lake Bastrop & Smithville NW); Soils Survey, Bastrop County, Texas, 1979; Knox Survey, 1950.

Date: 9-4-03

Figure 10

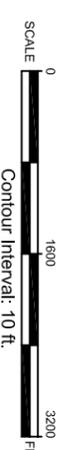
**LEGEND**

- FORESTED (4271 ac.)
- PASTURE AREA (577 ac.)
- PROPERTY BOUNDARY
- ROAD - SECONDARY
- 50 FT CONTOUR
- 10 FT CONTOUR
- INTERMITTENT STREAM
- LAKE/POND
- EXISTING STRUCTURES



Source: USGS 7.5 Min Quad Sheets, 1982, National Wetlands Inventory, 1993 and TNRIS Digital Orthophoto Quads, 2000 (Lake Bastrop & Smithville NW), Knox Survey, 1950.

Date: 9-4-03



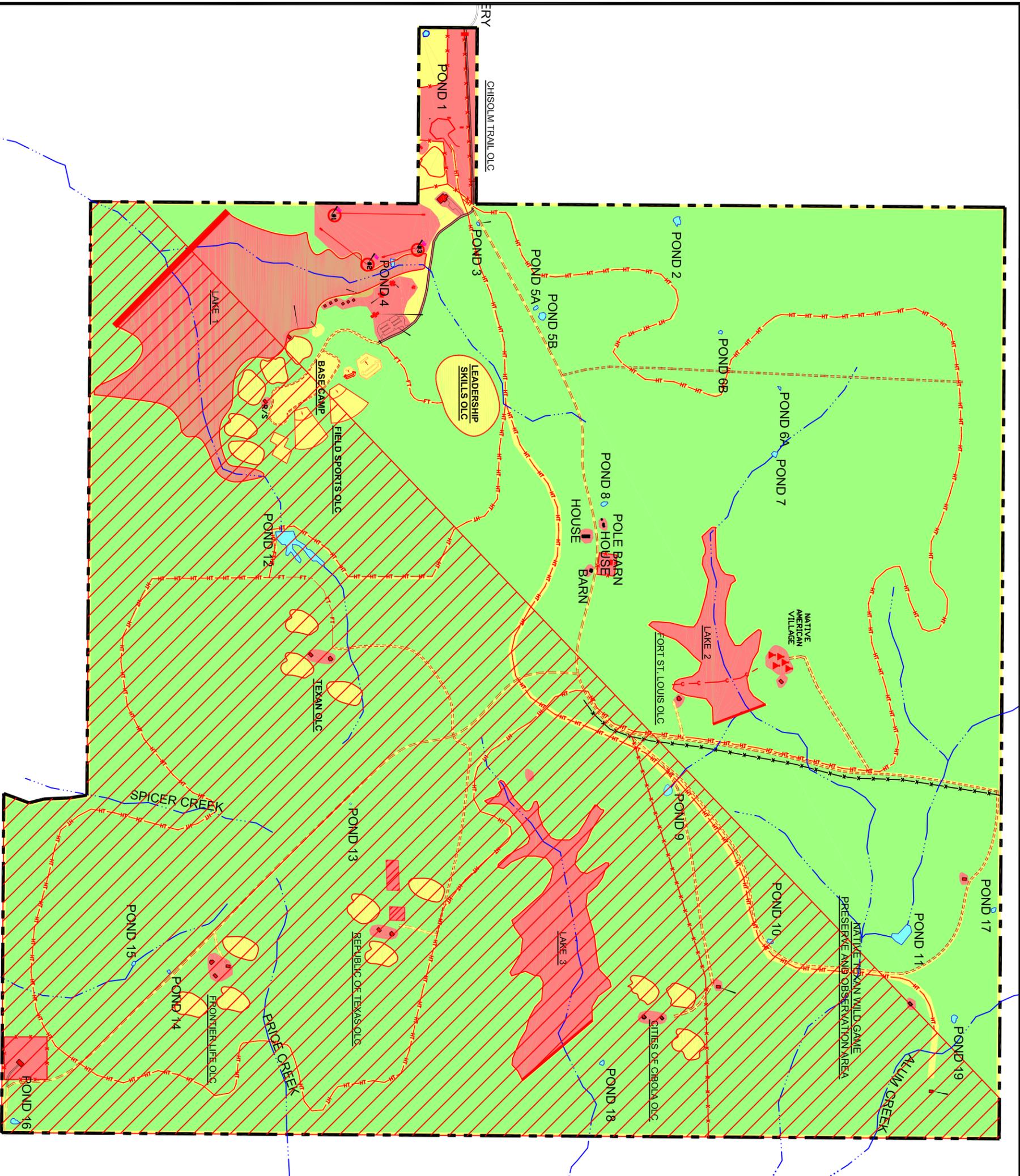
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**ENGINEERING SERVICE**  
 BOY SCOUTS OF AMERICA  
 1800 N. WINDY HILLS  
 AUSTIN, TX 78759

ORIGINATOR: RRR  
 DRAWN: RLG

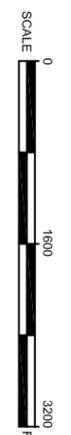
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Figure 11



**LEGEND**

- LOW DISTURBANCE
- MODERATE DISTURBANCE
- HIGH DISTURBANCE
- PROPERTY BOUNDARY
- ENTRANCE ROAD
- MAIN SERVICE ROAD
- SECONDARY SERVICE ROAD
- FOOTPATH
- HORSE TRAIL
- CANOE TRAIL
- EXISTING FENCE
- PROPOSED FENCE
- 50 FT CONTOUR
- 10 FT CONTOUR
- INTERMITTENT STREAM
- LAKE / POND
- CRITICAL HABITAT
- STRUCTURES: EXISTING
- PROPOSED
- RESTROOM / SHOWER
- CAMPsites
- RIFLE AND PISTOL RANGE
- ARCHERY
- SHOTGUN
- CHAPEL



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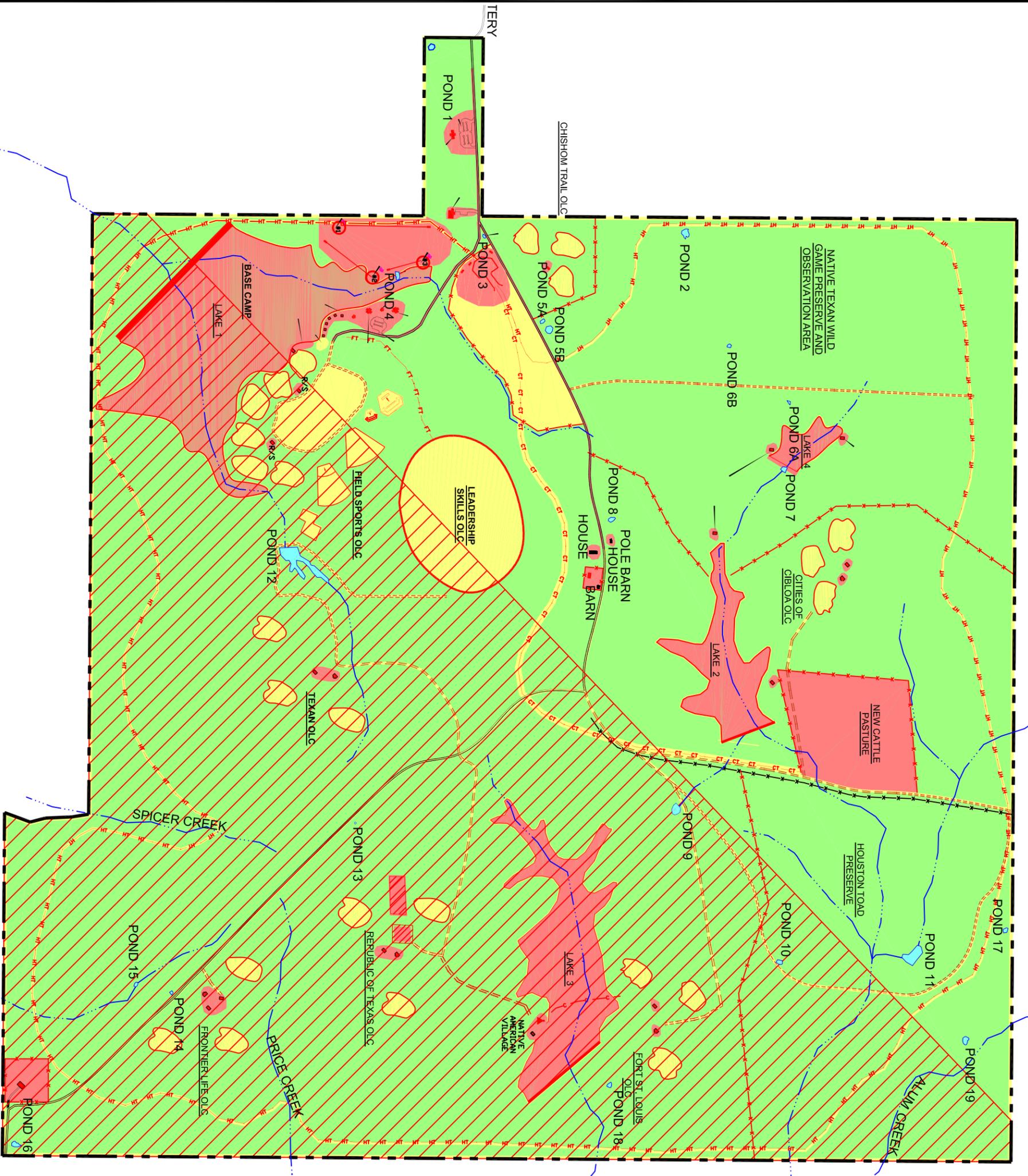
ENGINEERING SERVICE  
 BOY SCOUTS OF AMERICA  
 1325 W. WALNUT HILL LN  
 RICHMOND, TX 75283-2879

ORIGINATOR: RR  
 DRAWN: RLC

Source: USGS 7.5 Min Quad Sheets, 1982 (Lake Bastrop & Smithville NW) Knox Survey, 1950. Date: 9-4-03

**DISTURBANCE ZONES: PREFERRED ACTION**  
**GRIFFITH LEAGUE RANCH**  
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Figure 12



LEGEND	
[Green Box]	LOW DISTURBANCE
[Yellow Box]	MODERATE DISTURBANCE
[Red Box]	HIGH DISTURBANCE
[Solid Black Line]	PROPERTY BOUNDARY
[Dashed Black Line]	MAIN SERVICE ROAD
[Dotted Black Line]	SECONDARY SERVICE ROAD
[Dash-Dot Black Line]	ENTRANCE ROAD
[Dashed Red Line]	FOOTPATH
[Dashed Blue Line]	HORSE TRAIL
[Dashed Green Line]	CATTLE TRAIL
[Dashed Yellow Line]	CANOE TRAIL
[Solid Red Line]	EXISTING FENCE
[Dashed Red Line]	PROPOSED FENCE
[Solid Red Line]	50 FT CONTOUR
[Dashed Red Line]	10 FT CONTOUR
[Blue Dotted Line]	INTERMITTENT STREAM
[Blue Polygon]	LAKE / POND
[Red Hatched Polygon]	CRITICAL HABITAT
[Black Polygon]	STRUCTURES: EXISTING
[Red Polygon]	STRUCTURES: PROPOSED
[Red Polygon]	RESTROOM / SHOWER
[Red Polygon]	CAMPsites
[Red Polygon]	RIFLE AND PISTOL RANGE
[Red Polygon]	ARCHERY
[Red Polygon]	SHOTGUN
[Red Polygon]	CHAPEL

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 BOY SCOUTS OF AMERICA  
 1800 N. WINDY HILL BLVD  
 AUSTIN, TEXAS 78759

SCALE: 0 1600 3200 FEET

ORIGINATOR: RRR  
 DRAWING: RLJ

**DISTURBANCE ZONES: ALTERNATIVE DESIGN**  
**GRIFFITH LEAGUE RANCH**  
 CAPITOL AREA COUNCIL / BOY SCOUTS OF AMERICA  
 AUSTIN, TEXAS

Source: USGS 7.5 Min Quad Sheets, 1982 (Lake Bastrop & Smithville NW) Knox Survey, 1950.

Date: 9-4-03