

**Habitat Protection and Management Plan**  
for  
**Protected Species and their Habitat**  
At  
**The Preserve at Oak Hill**

**February 16, 2005**

**A. BASELINE DOCUMENTATION**

Environmental Impact studies conducted at The Preserve at Oak Hill site prior to development identified a number of listed/protected wildlife species on-site. This baseline information is documented in the **Preliminary Biologic Survey and Habitat Assessment** report dated March 5, 2004 and a Project Memorandum detailing the results of a follow-up survey for the presence of the Southeastern American Kestrel (SAK), dated October 28, 2004 by **MICHAEL G. CZERWINSKI, P.A., ENVIRONMENTAL CONSULTANTS**.

The listed wildlife species identified on site included the **gopher tortoise** (*Gopherus polyphemus*), the **Florida burrowing owl** (*Athene cunicularia floridana*), and the **Sherman's fox squirrel** (*Sciurus niger shermani*), state species of special concern (SSC), and the **Southeastern American kestrel** (*Falco sparverius paulus*), a state threatened (T) species. These species and their habitat are protected by the Florida Fish and Wildlife Conservation Commission (FWCC) under Chapter 68A-27.002-004, F.A.C which prohibits harm, injury or harassment (considered a "taking") to the individual, their nest or burrow<sup>1</sup>. As identified in the above referenced documentation, there is a high likelihood of other listed species to occur on site, particularly those associated with the gopher tortoise (burrow associates) and the upland habitats present on site.

Therefore, this habitat protection plan has been developed for The Preserve at Oak Hill in order to proceed with development and protect these species and a major portion of their habitat. The Developer, Land Associates IV, LLC, a Florida limited liability company, The Preserve at Oak Hill Community Association (POHCA) and individual lot owners, as pertinent, shall be responsible for complying with the pertinent portions of this plan. The Preserve at Oak Hill and its residents have a unique variety of listed species utilizing the site and as such, possess a unique opportunity to contribute to the persistence of these populations regionally and in the Sumter county area. Education of builders and residents regarding these species, the threats to their survival and their habitat requirements are vital to the habitat protection plan's success.

An essential portion of this HPP is the developer's agreement to preserve approximately 99.83 acres of prime Sandhill habitat located in the southern portion of the site (which contains the majority of the gopher tortoises as well as the Sherman's fox squirrel locations on site), and approximately 30.73 acres of pasture or other open areas- which will principally be in the form of passive walking and equestrian trails and which will provide a link of the remote areas of the site to the main Sandhill Preserve Area. Although the preserve's primary purpose will be as a habitat preserve for these listed species, the preserve will also be utilized for other activities including passive use by bird watchers, hikers and equestrians, and other passive recreational uses which are not in conflict with the primary purpose. This may include the creation of a single linear mulched trail (not to exceed 12' wide) within the preserve.

A conservation easement granted to the FWCC over the core preserve will provide compensation for impacts to the gopher tortoise and its habitat directly resulting from road construction and related improvements (drainage retention areas, utility installations, drainage easements / swales, etc.). This preserve shall be managed to maintain the habitat in a suitable condition for the long-term preservation of the gopher tortoise and the other listed species found on site. An incidental take permit (will be) issued by

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<sup>1</sup> "No person shall take, possess, transport, molest, harass or sell any"...." endangered, threatened, species or species of special concern"..."or parts thereof or their nests or eggs except as authorized by specific permit from the Executive Director, permits being issued only for scientific or conservation purposes and only upon a showing by the applicant that the permitted activity will not have a negative impact on the survival potential of the species".

the FFWCC upon approval of the Habitat Protection Plan (HPP), which will allow the development activities to occur, including any "incidental taking" of the species during initial development or future home site development.

The following sections provide details on the biology and habitat preferences of the individual listed species as well as a habitat management plan to be implemented over the life of the preserve.

### **Gopher Tortoise (GT)**

The Gopher Tortoise (*Gopherus polyphemus*) is listed by the State of Florida as a "species of special concern". Gopher tortoises live in dry, sandy habitats such as sandhill, pastures and old field habitat where they have sufficient low plant growth for food and can dig their burrows in the loose, well-drained sandy soils. Gopher tortoise burrows exhibit a distinctive half-moon shape, flat on the bottom and concave on the top, with a sandy apron of excavated sand at the entrance. These burrows extend 15-20 feet outward and 10-12 feet underground with multiple turns. Tortoises frequently use more than one burrow in an area, and particularly if such burrows are in close proximity.



Therefore, inactive burrows may be reactivated or re-colonized. It was determined at the time of the impact assessment that the Longleaf pine-Turkey oak (Sandhill) forest in the southern portions of The Preserve at Oak Hill supports a dense population of tortoises. The biological survey determined that gopher tortoises were present in this habitat at a density of approximately 1.3 tortoises per acre and it was estimated that the entire Sandhill area of 350 acres supported approximately 500 tortoises.

Gopher tortoises require habitat with well drained, sandy soils for easy burrowing, an abundance of **diverse** species of herbaceous ground cover, (an important indicator of habitat suitability), and a generally open canopy with sparse shrub cover, which will allow sunlight to reach the ground. The amount and diversity of herbaceous ground cover is directly related to the number of tortoises that can be sustained by a vegetative community. Maintenance of gopher tortoise populations generally requires active habitat management even on "protected" lands owned and managed by states or the federal government (McCoy and Mushinsky 1992b). Active management of upland habitats increases food abundance and nest site availability for gopher tortoises (Landers and Speak 1980). Prescribed burning is the preferred method (hydro axing and roller chopping are also utilized) for managing gopher tortoise habitats because it reduces excessive canopy cover and promotes a lush herbaceous ground cover. The goal should be to produce a mosaic of vegetation density by altering the frequency and timing of controlled burns (Diemer-Berish 1994). Optimal conditions include multi-aged forest, ranging from treeless areas with high diversities and abundances of grasses and herbaceous plants to areas with tree canopies that cover about 30-50% of the area. Spring and summer burning mimics the natural fire cycle, promotes flowering of annual herbaceous plants, and facilitates the production of seeds by many of the grasses. A highly overgrown site or one located near homes may be first burned during the winter months to reduce the risk of a very hot fire and to thin the canopy prior to implementing a cycle of summer burns which promote vegetative regrowth.

Although, the developer has provided compensation for impacts to the gopher tortoise and its habitat as part of the development agreement, direct impact to active and inactive burrows should be avoided and gopher tortoises should be relocated to other open areas outside of development (or home site) areas where avoidance is not possible. **If a gopher tortoise burrow can be avoided, a 20-25 foot protective buffer shall be established and maintained around the burrow during the construction period. The buffer shall be staked and flagged with caution flagging and may be removed after construction is completed.**

### **Sherman's Fox Squirrel (SFS)**

The **Sherman's fox squirrel** (*Sciurus niger shermani*) is listed by the State of Florida as a "species of special concern". Two (2) Sherman's fox squirrels were observed on site near the SE and SW corners of

the property (see results and features map) during the Biological Assessment. Sherman's fox squirrels are large, weighing more than 2 pounds, and reach a total length of 26 inches. Fox squirrels normally are reddish tan to buff gray with a black head and white ears and nose. Body color can vary from black to gray-white but the color pattern on the head almost always is the same. Although Sherman's fox squirrels are present in several conservation areas, their population have been tremendously reduced or eliminated from much of their former habitat as a result of development, fire suppression, and conversion of land to pine plantation and cropland. Fox squirrels are selective in their habitat needs and are typically found in areas that have open spaces, oak hammocks and longleaf pines, similar to the habitat requirements of gopher tortoises.



This species prefers the outer edges of woodland that abut open pastures (referred to as "edge" habitat), and thrives best in locations with a fairly open under story (maintained by moderate grazing or fire) and a variety of habitat types (such as Longleaf pine –Turkey Oak - wiregrass associations, with sporadic areas of Live Oak or other hardwood forest) which insure a more reliable variety of food and cover sources for this opportunistic feeder (Kantola and Humphrey 1990). Fox squirrels feed on pine buds, staminate cones, flowers, corms, bulbs, previous seasons' mast, fungi, insects, soft mast (berries of hollies, bays, wild grapes, and smilax). Acorns (Turkey oak, in particular) and hickory nuts may be supplemented by fungi and the seeds and drupes of other hardwoods. Longleaf pine cones are a crucial food source in that they are practically the only food available over the hot summer months, until the fall mast crop is available. Fox squirrels use a variety of shelters and research suggests that den sites (i.e. tree cavities) are preferred to leaf nests (usually in association with supporting grape vines), although both are used. Fox squirrels need three to four trees with grapevines per acre. Preferred cavities have entrance holes two to four inches in diameter that are 12 to 20 inches deep and are situated in the trunk or in a large limb of the tree. Limb cavities seem to be preferred over large hollow trees with large openings. Radio telemetry tracking has shown that up to nine different shelters may be used on average each year by one animal (DASNR). Fox squirrel breeding takes place in November and again in May or June and is followed by a 6-7 weeks gestation period typically producing 2-4 young.

The ideal fox squirrel habitat could be described as "park-like," with a high, open overstory and a low, grassy understory. The ideal fox squirrel vegetative assemblage includes:

- A tall, mature longleaf pine canopy for easy arboreal travel and nest sites;
- An open understory for safe, high-visibility ground travel, foraging, and nut caching;
- a variety of hardwoods (turkey oak, post oak, live oak) for both mast (acorn) variety and nesting;
- fruit providers (such as *Prunus* species, haws, blueberries, grapes etc.), and native or agricultural grains.

Fox squirrels are relatively solitary and an individual's range may cover 5 to 40 acres (Hoover et al 1999). Sherman's Fox squirrel populations are known to utilize residential subdivisions and golf courses in central Florida, particularly in those areas which provide large expanses of undeveloped greenways (as "horse trails," conservation easements, or parks) which function as wildlife corridors, and provide additional forage and nest options.

The major threat to fox squirrel populations in residential developments that provide adequate habitat is vehicular collision and predation by domestic pets (Spence & Ditgen, 1997). Placing conservation easements (preserves) away from the roads will go far to help minimize vehicular collisions. However, the southern roads do pass through sandhill habitat. **Therefore it is recommended that road speed be posted at no more than 25 mph through the sandhill portions of the site and "Wildlife Caution" or "Wildlife Crossing" signs be strategically placed along each road segment in the southern portion of the site. These signs should be of two styles: one with a tortoise and one with a fox squirrel.**

Fox squirrels generally do well in forested urban areas as well as golf course roughs. The large home range of the fox squirrel, its mobility, and the abundance of significant fox squirrel habitat on the site suggest that

reasonable guidelines for development of home sites in the sandhill (southern) portion of the site might include:

1. Preservation of the older, larger Long-leaf pine trees on site.
2. Preservation of as much native habitat (Longleaf pine-Turkey oak) as possible.
3. Domestic pets, especially dogs and cats should always be leashed or tethered and not allowed to roam free out of doors.
4. Inclusion and preservation of preferred native habitat types and native plant species in landscaped areas. Fox squirrels depend upon diversity of food resources to ensure that food is available throughout the year.
5. Nest boxes can be installed to maintain and even increase the population of fox squirrels and specifically in those areas / home sites where native vegetation is removed to accommodate the structure. Female fox squirrels have been shown to utilize nest boxes when anchored securely in the canopy of a tree with the limb above the box, and placed close to a field edge. Sub-adults of both sexes and adult males have been shown to use nest boxes when placed below the canopy and away from the forest edge. Nest boxes used for Southeastern American kestrels can be utilized for fox squirrels with the small modification of adding an extra entry hole to the box. Nest boxes should be placed at least 30 ft above the ground.

Consideration of these guidelines and a follow-up survey to identify target trees may make it possible to avoid impacting existing Sherman's Fox squirrel populations on site. It is recommended that road speed be posted at no more than 25 miles per hour (20 mph preferred) through the sandhill portions of the site and that "Caution Wildlife Crossing signs (equally ones with a tortoise image and one with a Sherman's Fox Squirrel image) be strategically placed along the roads in the southern portions of the site (see attached Map).

Finally, forest management that mimics natural disturbance regimes will benefit the SFS. Burning the habitat every 2-5 years (April-July if possible) controls the overgrowth of the hardwood understory, maximizes the regeneration and growth of groundcover, prepares a seedbed for longleaf pine and maintains a park like condition required by the SFS. If burning is not possible there are other methods (thinning, hydro axing, roller chopping) of maintaining the open conditions of the Sandhill habitat (See Following Section). **This is a critical component of the management for this species as well as the gopher tortoise.**

## **B. HABITAT MANAGEMENT PLAN FOR THE GOPHER TORTOISE AND THE SHERMAN'S FOX SQUIRREL**

Gopher tortoises and Sherman's fox squirrels have similar habitat requirements, both requiring a diverse variety of vegetation and preferring Sandhill areas with a relatively open understory. Therefore the following guidelines should be implemented within the 99.83 acre Sandhill Preserve to provide appropriate habitat and sustain long-term populations of these species on The Preserve at Oak Hill:

1. Prescribed fire: Prescribed fire is the preferred method of managing Sandhill habitats because many plants (i.e. wire grass and longleaf pine) in these communities are fire dependent and will only reproduce (flower, seed) after exposure to fire. Fire quickly releases nutrients bound in plant materials back into the soil. Due to the proximity to residences, **winter or summer burns should be conducted every 2-3 years, depending upon the vegetative overgrowth** of the Sandhill area. These fires burn more slowly, are more easily controlled, and may be able to be done in cooperation with the Division of Forestry burn mitigation team. If prescribed fire cannot be conducted due to safety or other issues, then mechanical means must be employed annually, during January or February,



utilizing either a bush hog or roller chopping. However, it should be denoted that mechanical methods cannot entirely duplicate the functions of prescribed fire, principally, seed regeneration.

2. Hydro axing /Roller chopping: These are effective techniques in reducing the canopy cover and do help preserve the open nature of the habitat, however these techniques do not allow fire dependent species to flower or seed and may reduce vegetative diversity over time if used as the only management techniques. These techniques may have undesirable consequences for tortoises and should only be used under special conditions (Cox, Inkley, Kautz. 1987).

a) Hydro axing- The Hydro-axing allows the operator to be precise in the areas and vegetation treated and reduces the possibility of damaging burrows, nest or killing hatchlings in shallow burrows.

b) Roller chopping- Should only be conducted during the winter months (December–February) to avoid injuring/killing hatchling and juvenile tortoise that have very shallow burrows.

At the recommendation of the FFWCC, an initial thinning of hardwoods shall be conducted in 2005, using mechanical or chemical (herbicide) means to reduce canopy closure to less than 30%. Vegetation surveys shall be conducted every 2-3 years thereafter by professional Foresters or Ecologists to monitor/assess the habitat quality of the preserve areas. If canopy closure exceeds 40%, mechanical or herbicide thinning shall be conducted within 12 months to reduce canopy closure to less than 30%.

#### **Southeastern American kestrel**

Three active kestrel snag trees were identified on-site and two other snag trees were found to occur in close proximity to the site. The once common kestrel, sparrow hawk, or "killy hawk" (named after its high-pitched alarm call of "killy-killy-killy") is now relatively uncommon in Florida. Preferred habitat includes open communities of Longleaf pine- Xeric Oak (Sandhill), pastures, grasslands, and open sites in residential and suburban areas such as golf courses, parks, or private residential yards that are managed to accommodate kestrel presence. Successful habitat areas like these offer open areas of short vegetation with scattered perch sites, adequate prey resources, and suitable nest sites that are all in close proximity to one another. Southeastern American kestrel (SAK) numbers may have decreased over 80% in the last 50 years due primarily to habitat loss from land management practices (primarily development, agricultural practices and fire suppression) which have degraded nesting and foraging habitat. Since the turn of the century, millions of acres SAK habitat has been altered into row crops, citrus groves, residential development, and timber production. With the rapid growth of Florida's human population, habitat loss is increasing. Preservation of foraging and nesting habitat is critical to the survival and maintenance of kestrel populations. Without effective programs to preserve and manage feeding and nesting areas, local extinctions could become more extensive. According to the Florida Fish and Wildlife Conservation Commission (FFWCC) kestrels are frequent residents of suburban areas and are somewhat tolerant of human activities if appropriate measures are taken to provide and maintain appropriate habitat for foraging and breeding.



The SAK forages for insects, mice and other small mammals, and small birds in low grassland, pasture and sandhill (long-leaf pine / turkey oak) type habitats. Kestrels typically nests in snag (dead standing) trees and sometimes the eaves of barns. Kestrels are also secondary cavity nesters and typically use cavities previously excavated by woodpeckers for raising their young. The subject site has an existing population of woodpeckers which include the Red-headed woodpecker (*Melanerpes erythrocephalus*), Red-bellied woodpecker (*Centurus carolinus*), Downy woodpecker (*Picoides pubescens*), Pileated woodpecker (*Dryocopus pileatus*), and the Northern Flicker (*Colaptes auratus*). Current regulations prevent the taking of

an active southeastern American kestrel nest or (snag) tree without obtaining a nest removal permit. In addition, disturbance of the nest site area during the nesting season (typically February through June) is not allowed.

A habitat protection area for SAK's is defined as the amount of *properly managed suitable habitat* required by a breeding pair of SAK's. Suitable kestrel habitat is composed of Type I habitat, Type II habitat, or a combination of the two habitats that contains natural or man-made nest structures and adequate perch sites. On-site preservation of the SAK and its habitat requires that a portion of the designated foraging area (greater than 75%) be maintained as Type I or Type II Habitat<sup>2</sup>. In high quality habitat, kestrel territory size is approximately 50 ha (124 acres), however, in areas of lower quality habitat (disturbed or cleared areas) breeding pairs may require up to 317 ha to successfully raise their young. The FFWCC recommends that a quality habitat protection area should include a 150m (450ft) radius buffer around any active nest sites and at least 50ha of suitable foraging habitat (Type I, Type II, or a combination). Nest boxes should be placed in the habitat protection area at a density of 1/10ha (25 acres), along with adequate perch sites that provide cover from predators, at a density of 1/2ha (5 acres).

**Several key management recommendations for the protection of Southeastern American Kestrels and their habitat have been suggested by the FFWCC and the University of Florida. These rather simple methods can be effectively utilized by private citizens with only a few acres or by large developments spanning several hundred acres and may help to minimize development impacts and aid in the persistence of this species; therefore, the education of the builders and residents regarding this threatened species, the threats to its survival and its habitat requirements is vital to the success of the habitat protection plan.**

Maintaining Natural Habitat: A short understory vegetation allows kestrels to see and catch their prey. Invading shrubs and trees are repressed naturally in longleaf pine sandhills by periodic fires. In areas where allowed and where safe, prescribed burning during the summer every three to four years will kill back invading shrubs and oaks. Fire permits from the Florida Division of Forestry are required before such a fire can be started. Mechanical methods, such as mowing, also may be used to maintain the open understory required by kestrels for feeding.

Snag Management: Snags and scattered live trees (especially pine trees) should be left in and near pastures and fields. These will provide current and future nesting sites and hunting perches for kestrels. Large numbers of snags (about 2/acre or 5/hectare) are necessary to support woodpecker populations that excavate the cavities kestrels use for nesting. The best way to provide snags for kestrels is to maintain enough live trees so that normal tree mortality will produce an adequate number of snags. Snags are a temporary resource, which must be continually replaced by reproduction, growth, and death of trees. Some snags only last a few years, while others remain standing much longer.

Nest Boxes: If adequate nesting sites are not available, nest boxes must be provided along with foraging habitat. Suitable locations for nest boxes are near stands of longleaf pine, in fields and pastures, and in open woodlands. Areas of known previous breeding are excellent sites for nest boxes. If permission is granted by the Department of Transportation or the appropriate utility company, highway roadsides and power line easements also provide excellent sites for kestrel nest boxes. These habitats should have abundant lizard or insect populations and areas where pesticide use may be high should be avoided. Nest boxes should be placed 20-25 ft above the ground, high enough to deter predators, but low enough so they can be reached for cleaning and repairing. Boxes should be cleaned between nesting seasons. Two inches of wood shavings or straw (not sawdust) should be placed in the bottom of the box each year. The opening should face south or east to allow warming in the morning but not overheating in the afternoon. This also will protect the nest box from adverse weather which typically arrives from the north. In prime habitats, nest boxes should be spaced at about 1/3mi (0.5 km) intervals. To reduce use of nest boxes by European

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<sup>2</sup> Type I habitat is composed of upland plant communities with less than 10% canopy cover and at least 60% herbaceous ground cover (i.e. pasture) that is less than 25cm tall. Type II habitat is composed of open woodlands with ground cover that is less than 25cm tall greater than 10% but less than 25% canopy cover, with at least 60% herbaceous ground cover that is less than 25cm tall (i.e. Sandhill community).

starlings, boxes should be placed at least 1/3mi (0.5 km) from farm buildings where starlings concentrate. Decreasing the amount of tree cover above the box and orienting the box to maximize internal light (generally southeast) may also deter starlings. Boxes also can be attached to dead (snag) or live trees, or utility poles. Branches should not obstruct the flight path to the box opening for those boxes attached to trees. Boxes on wooden poles can be protected from climbing predators such as raccoons and snakes by wrapping a 3ft (1m) wide strip of sheet metal around the pole. Active nest boxes should have a 450 ft protective buffer during nesting season to minimize disturbance and stress to the birds which will aid in reducing the possibility of the parent kestrels abandoning the nest and/or nestlings.

### **Southeastern American kestrel (SAK) Habitat Protection Plan**

The Developer will construct and provide 8 artificial nest boxes as potential “replacement” nests in close proximity to the current active snag trees located on site or near the site. Natural or artificial perch sites at a density of 1 per every 25 acres shall also be available (existing snags) or provided within the development<sup>3</sup>. Nest boxes and selected artificial perch sites will be established within designated common areas as shown on Exhibit A. Access to these sites shall be provided to allow for long-term maintenance access to the nest boxes. The perch site and box design and height shall be in accordance with FFWCC requirements.

On-site preservation of the SAK and its habitat requires a portion of the designated foraging area (greater than 75%) be maintained as Type I or Type II Habitat<sup>4</sup>. Due to the large lot size it is anticipated that the foraging pasture/habitat areas will be retained/maintained in the open undeveloped areas of each lot<sup>5</sup> as well as common areas (drainage retention and roadside swales) of the development. In order to preserve foraging habitat of the SAK, each individual lot owner shall not create “developed areas” **greater than 25%** of the total lot area of the smaller lots or ½ to ¾ acre (21,780-32,620 sq. feet) of developed area for each lot (large or small). For the purposes of this document “developed areas” shall be defined as and include residential lawns (St. Augustine), and impervious surfaces such as sidewalks, driveway, pool, structures or buildings. Developed areas shall not include bahia grass, undeveloped portions of the lot, native areas or native landscape areas that meet Type I or Type II Habitat requirements. Developed areas shall not include other common areas such as dry drainage retention areas, drainage easements or swales that meet Type I or Type II Habitat requirements. All other areas not meeting the definition of “Developed Areas” requirements shall be considered undeveloped areas. Therefore undeveloped areas of the Lots and Common Areas/trails and preserve will be considered part of the (foraging) habitat protection area of the SAK. Activities or practices such as pesticide use that would directly cause sickness, reduced reproductive ability, reduced amounts of prey are prohibited in the undeveloped areas (foraging habitat protection areas).

The following provisions must be adhered to:

1. Active Kestrel nest sites (snag trees with birds/nests) must not be disturbed during the breeding / nesting season (January-June) and must not be removed without a permit from the FFWCC or its successor agency.
2. After initial development, snag (dead standing) trees that are not being used by Kestrels for nesting shall not be removed by the community association, lot owners or others unless they endanger property or compromise public safety.
3. Dead standing (snag) trees that need to be removed for home site development shall be replaced by a kestrel nest box or artificial perch in an alternative location on the same lot, but only after approval by the community association or architectural review board.

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<sup>3</sup> It is estimated that the number of current snags, existing trees and perimeter fence and the estimated new features including barns, cupolas, fence posts, wind vanes, landscape trees etc. will provide a sufficient density of perch sites.

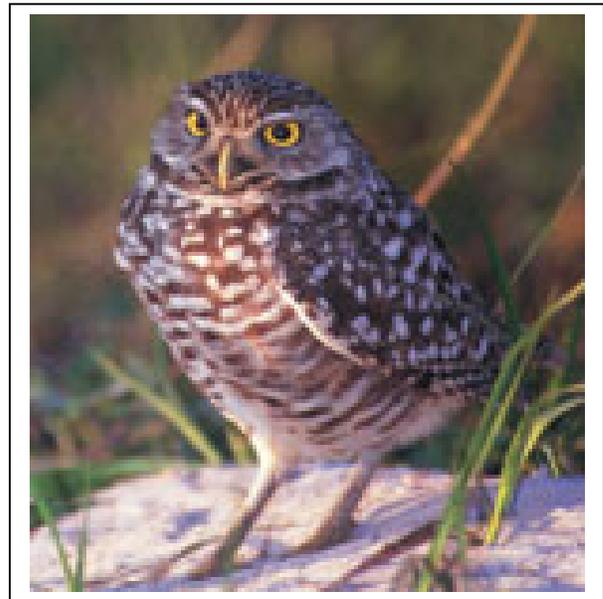
<sup>4</sup> **Type I Habitats** are upland plant communities (pasture or grasslands) with less than 10 % canopy cover and at least 60% herbaceous ground cover less than 25 cm. in height. The pasture areas of the site qualify as Type I Habitat. **Type II Habitat** is open woodlands with greater than 10% but less than 25% woody canopy cover and at least 60% herbaceous ground cover less than 25 cm. in height. Open sandhill such as that found in the southern portion of the site qualifies as Type II Habitat.

<sup>5</sup> Estimated average 6,000 square feet impervious surface per 2.5 acre average lot = approximately 5%. It should be noted that residential lawns (e.g. St. Augustine grass) are generally not considered part of the habitat protection area.

4. Maintenance and replacement of the nest boxes and perches shall be the responsibility of the developer or his successor, namely the Preserve at Oak Hill community association, or comparable entity.
5. Maintenance of the nest boxes shall include two routine maintenance checks per year, replacement of missing or damaged nest boxes, and removal of non-target species. One of the maintenance checks shall be performed just prior to the breeding season in December (Stys, 1993); the second shall occur during August.
6. Nest boxes shall be approximately 20-25 feet high, on poles, utility poles, snags or live trees and shall face in a southerly to easterly direction. If a live tree is used as a support structure, then there shall be approximately 15 feet between the nest box and the lowest branch on the tree (Stys, 1993).
7. Removal or relocation of a tree or nest box that has been used by kestrels requires a permit from the FFWCC.

### Florida Burrowing Owl

Four **Florida burrowing owl** (*Athene cunicularia floridana*) nests were identified within the pasture areas on site. The four nests are located on four separate proposed lots. The burrowing owl is a small ground dwelling owl that is active both day and night. Preferred habitats include dry, open, treeless, short grass pastures or prairies, golf courses, baseball fields, cemeteries, airports, vacant lots in residential areas, university campuses, and fairgrounds. While other species of burrowing owl are often associated with mammal burrows the Florida burrowing owl is the only sub-species that usually dig their own burrow, however, these owls will also re-activate and utilize inactive or abandoned gopher tortoise burrows. Burrowing owl burrows extend an average of 6-8 feet horizontally underground, in unpredictable directions. Similar in appearance to gopher tortoise burrows, burrowing owl burrows can often be distinguished by the presence of dung beetle shell fragments and pieces of dried cow manure at the burrow entrance. It is believed that the manure is used as a tool by the burrowing owl to lure their prey directly to the burrow entrance. Burrowing owls are opportunistic feeders and will eat a variety of insects as well as reptiles, amphibians, and occasionally small mammals and birds. Male and female burrowing owls are virtually indistinguishable by sight alone. Males may have a slightly lighter color during the nesting season, possibly due to sun bleaching, as he spends most of his time outside of the burrow, acting as a sentinel and foraging for the pair while the female sits the nest. Prior to egg laying the burrow and entrance is lined with various materials (e.g., grass clumps, palm fronds). Typically, egg laying (average of 4 eggs) takes place from February through late May, but has been observed as early as October. After the eggs are laid (and for reason's unknown), the entrance chamber is further adorned with more decorative and visible objects, such as paper scraps, plastics, tin foil, mirrors, graduation tassels, cigarette butts, and other non-natural materials (Florida Natural Areas Inventory, 2001). While a single brood per year is the norm, instances of double brooding have been documented. Studies indicate that multiple burrows are maintained as non-breeding nests that are used as escape burrows and as fledgling burrows as the young begin to venture from the nest. Research indicates that primary activity appears to be unequally centered around the burrow. Foraging territory has been estimated to between 12-16 acres and appears to occur in a variety of vegetative landscapes (i.e. tall grass fields, mowed grasses, etc.



The Florida burrowing owl is listed by the State of Florida as a Species of Special Concern and is also afforded protection by the FFWCC. This classification means that a species has a high vulnerability to factors that may lead to its becoming a threatened species in the absence of appropriate protection or management. FFWCC's policy is to issue permits to destroy burrowing owl nest burrows **only** as a last

resort; after all reasonable alternatives (such as realigning development to avoid the nest) have been shown to be impractical. **When such permits are issued, they apply only to inactive nests** (i.e., burrows containing no eggs or flightless young). Burrowing owl nests can typically be considered inactive from 10 July to 15 February, although some nesting occurs as early as October each year. **Between 15 February and 10 July, burrows attended by one or more burrowing owls are considered active nests.**

Burrowing owls often nest on vacant lots in rapidly developing suburban areas. In these areas, home construction is the primary cause of burrow destruction (road kills and domestic pets contribute as well). However, FFWCC studies in Cape Coral, Lee County, Florida have shown that if development is conducted in such a way that the area within 50-ft of the burrow is protected from disturbance, nesting is seldom interrupted. **No commission permit is required to build a home on a lot when at least a 50-ft radius circle can be provided around the burrow, but cautionary measures must be taken to protect the burrow from accidental damage or destruction. Ideally, a larger 150 ft buffer will decrease chances that the nest burrow will be negatively impacted (FFWCC, 2001).** It is recommended that the buffer be staked and roped off prior to the onset of construction. It is also recommended that a T-perch be placed near the burrow, not only as a perch for the burrowing owl but also to identify the burrow to prevent someone from accidentally stepping in the entrance.

The above recommendations are based on studies of burrowing owls in suburban/urban areas of Cape Coral where burrowing owls have become accustomed to human presence as the city has grown around them. There are no information or management guidelines available regarding burrowing owl populations in more rural settings where human presence is somewhat less intense and wildlife is not as de-sensitized to the close proximity of people. Therefore, ongoing studies to collect information gathered on the response of the burrowing owls to development in this setting would be invaluable to the development of a management plan for this species.

The following provisions must be adhered to:

1. Burrowing owl burrows shall not be disturbed during the breeding/nesting season (October - July).
2. All burrowing owl burrows shall be identified to prevent damage or destruction during development. No nest shall be destroyed without a permit from FFWCC. Only inactive nests can be issued permits for destruction.
3. No development shall take place within 50 feet of a burrowing owl burrow without either written coordination with or obtaining a permit from the FFWCC or its successor agency. Vegetation within the 50' buffer shall be maintained at 1/6 inches in height.
4. A **150 foot radius** protection buffer shall be established and maintained around each **active** burrow to protect the burrow from accidental damage/destruction or other negative impacts from heavy equipment vehicles. During any construction activity the buffer shall be staked and roped off with caution flagging for the duration of the construction. After development homeowners may make buffers "invisible", ornamental (landscape timbers, interior fence similar to those around trees in horse pastures, etc) or living (low vegetative hedges). Barriers must not limit the sight pattern or impede the activities of the owls in any way.
5. A **50 foot** protection buffer shall be established and maintained around each **inactive** burrow to protect the burrow from accidental damage/destruction or other negative impacts from heavy equipment vehicles. During any construction activity the buffer shall be staked and roped off with caution flagging for the duration of the construction. **Contractors may freely enter the protection zone without the use heavy equipment vehicles. If the burrow becomes active during the construction process, the buffer shall be extended to 150 feet and must not be entered.**
6. Homeowners with domestic pets must take measures (i.e. perimeter fencing, leashing, kept indoors, etc) to prevent any harm or harassment to the owls or their burrows. Mortality due to domestic pets (dogs and cats) is a leading cause of mortality for burrowing owls and other wildlife in residential areas; fledgling chicks are particularly vulnerable to predation.
7. Tee perches shall be placed next to each burrow.

8. Herbaceous ground cover within Tract G of the preserve shall be maintained between 3 and 6 inches in height.

**This document shall incorporate by reference the following documents:**

FFWCC 2001. *Available Options to Address the Presence of Gopher Tortoises on Lands Slated for Development*

FFWCC 2001. Burrowing Owl Nest Protection Guidelines and Procedures in Urban Areas.

FFWCC PERMIT APPLICATION FOR ON-SITE RELOCATION OF 5 OR FEWER GOPHER TORTOISES. [http://wildflorida.org/permits/apps/special\\_tortoise\\_relocation\\_application.pdf](http://wildflorida.org/permits/apps/special_tortoise_relocation_application.pdf)

Figure 13 Kestrel Nest Box Design. Page 30 in Stys, B. 1993 Ecology and Habitat Protection Needs of the Southeastern American kestrel (*Falco Sparverius Paulus*) on Large-Scale Development Sites in Florida. Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 13.

**The following reference documents can provide additional information:**

Cox, James, Douglas Inkley and Randy Kautz 1987. Ecology and Habitat Protection Needs of Gopher Tortoise Populations Found on Lands Slated for Large-scale Development in Florida. Florida Game & Fresh Water Fish Commission, Office of Environmental Services. Nongame Wildlife Program, Technical Report No. 4.

Diemer-Berish, J. E 1994. Status and Conservation of the gopher tortoise. Pages 24-28 in North American Conference proceedings, Mapimi Biosphere Preserve, Durango, Mexico. As referenced at [www.natureserve.org](http://www.natureserve.org).

Division of Agricultural Sciences and Natural Resources (DASNR), L-271 (No. 5) Wildlife Management Notes, Gray and Fox Squirrels.

Egbert, A.L., Ph.D. Executive Director FFWCC August 2001. *Guidelines for Gopher Tortoise Relocations*. [http://wildflorida.org/permits/policy/tortoise\\_relocation\\_guidelines.pdf](http://wildflorida.org/permits/policy/tortoise_relocation_guidelines.pdf)

FNAI (Florida Natural Areas Inventory), 2001. Field Guide to the Rare Animals of Florida. [www.FNAI.org](http://www.FNAI.org).

Haug E.E, Millsap B.A. and Martell M.S (1993). Burrowing Owl, The Birds of North America, No 61.

Landers and Speak 1980. Management need of sandhill reptiles in Southern Georgia. In Professional Annual Conference of the Southeastern Fish and Wildlife Agencies 34:515-529. As referenced at [www.natureserve.org](http://www.natureserve.org).

McCoy and Mushinsky, 1992b. Studying a Species in Decline: Changes in Populations of the Gopher tortoise on Federal Lands in Florida. Florida Scientist 55:116-125. As referenced at [www.natureserve.org](http://www.natureserve.org).

Stys, B. 1993 Ecology and Habitat Protection Needs of the Southeastern American kestrel (*Falco Sparverius Paulus*) on Large-Scale Development Sites in Florida. Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 13.