Kevin L. Erwin Consulting Ecologist, Inc.
Alternative Species Survey Method

THREATENED AND ENDANGERED SPECIES RATIONALE

STEP ONE:

Rationale

The initial mapping of the property is an extremely important step in the survey methodology. This should be done only by qualified personnel in order to ensure accuracy. Ground truthing is imperative. It is also important that the delineation be conducted to at least FLUCCS Level III. Existing development areas, FLUCCS codes 100 (Urban and Built-up) and 800 (Transportation, Communication and Utilities), should be mapped to Level I or Level II. The acreage of each individual FLUCCS mapping unit should be calculated and presented on the vegetation map so that separate areas of similar habitat type can be referenced. Cumulative totals for each FLUCCS code should be calculated and provided so that the quantity of the various habitats onsite can be easily reviewed by County staff.

STEP TWO:

Rationale

The process of reviewing the Lee County Protected Species List will ensure that the personnel conducting the survey are aware of all of the Lee County Listed Species which may potentially occur onsite. This will also document the knowledge of the species status by the personnel.

STEP THREE:

Rationale

The use of overlapping belt transects covering 100 percent of the suitable habitat and the ecotones virtually insures that any evidence (sighting, sign, etc.) of Lee County Listed Species will be found. It is absolutely imperative that only qualified personnel conduct the survey. The results of any survey will only be as accurate and reliable as the expertise of the personnel performing it.

STEP FOUR

Rationale

The use of these two methods for calculating species density and abundance will provide the maximum usable information for the effort and money expended. The size and distribution of a population of a species occurring in small areas can be best quantified by locating and counting all the individuals of the species. For populations which occur over greater areas intensively subsampling a smaller unit of the habitat is often appropriate.

STEP FIVE:

Rationale

In order to characterize the population of certain species further information is required. For example, the existence of 25 gopher tortoise burrows does not necessarily indicate that 25 tortoises are found onsite. Because the burrow occupancy rate may be quite low (<0.5 tortoise per burrow) the calculation of a site specific burrow occupancy correction factor should be calculated. This can be accomplished by stick trapping. Early morning and late afternoon surveys should be conducted to determine the activity status of red-cockaded woodpecker cavity trees. Forage range and clan size should also be determined.

STEP SIX:

Rationale

The submittal of this information will provide the County with a reliable estimate of Lee County Listed Species populations occurring onsite. The information can then be utilized by the County to evaluate the potential impact on Lee County Listed Species by the development of the subject property.

FIGURE 1. FLUCFCS, Levels III and IV Vegetation Map.

ACREAGE AND PERCENT OF TOTAL PROPERTY FOR EACH FLUCFCS MAPPING UNIT

FLUCFCS, LEVEL III & IV		ACRES	PERCENT
321	Palmetto Prairie	6.35	15.27%
411	Pine Flatwoods	21.00	50.52%
424	Melaleuca	0.49	1.17%
4119	Pine Flatwoods/Invaded by Exotics	9.45	22.73%
* 621	Cypress	1.90	4.57%
* 624	Cypress – Pine	0.21	0.50%
* 6219	Cypress Invaded by Exotics	0.92	2.21%
* 6249	Cypress – Pine Invaded by Exotics	1.24	2.98%
TOTAL		**41.56**	**100%**
* TOTAL WETLAND		4.27	10.27%
TOTAL UPLAND		37.29	89.73%
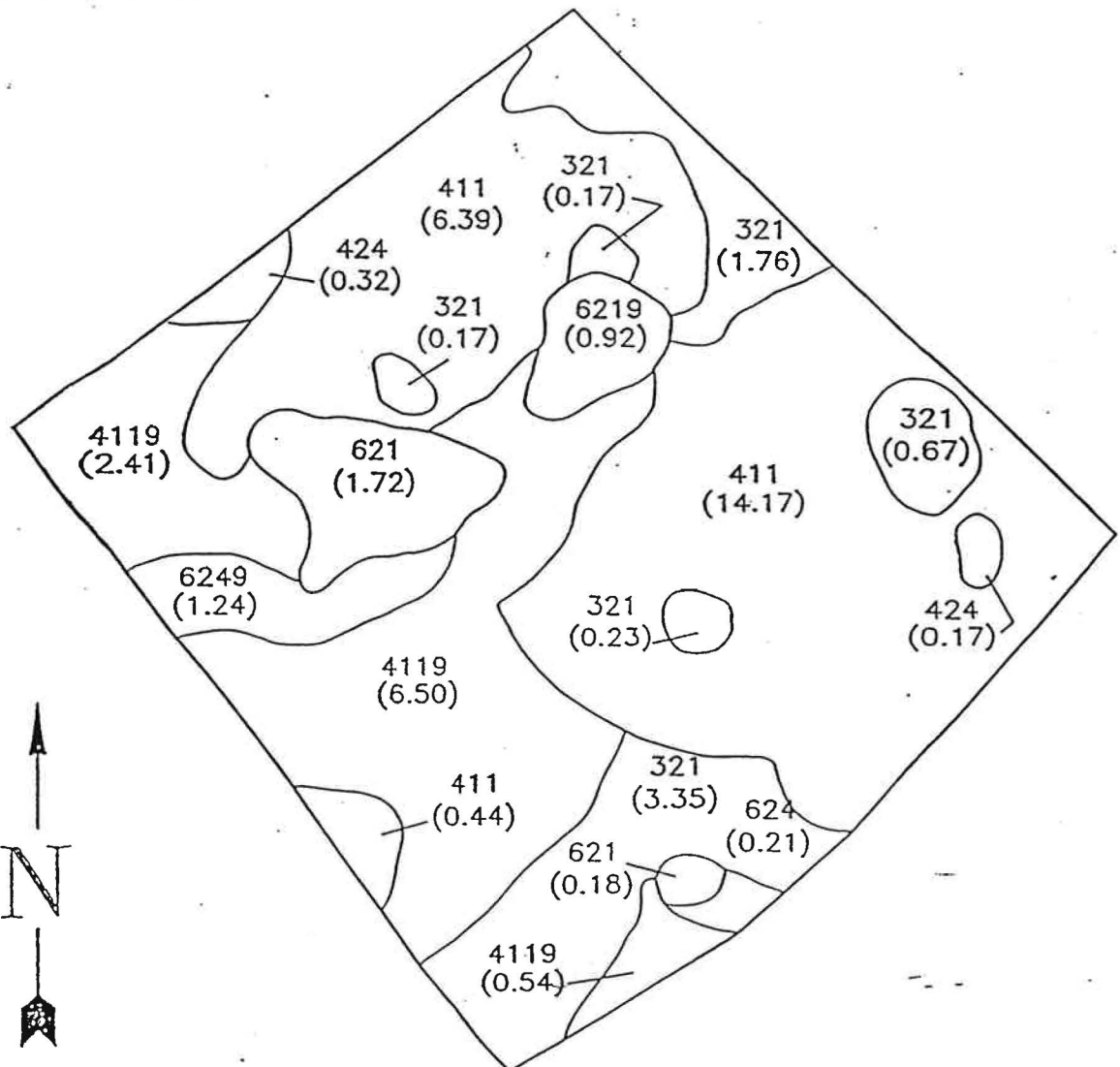
THREATENED AND ENDANGERED SPECIES SURVEY METHODOLOGY

Lee County Ordinance No. 89-34 requires a survey to identify and locate animal and plant species on the Lee County Protected Species List prior to development. This ordinance specifies a methodology to be utilized to conduct the survey but also allows the use of an alternate method, subject to County approval. The methodology described below has been utilized extensively throughout southern Florida, including Lee, Collier, and Charlotte Counties. This methodology has been utilized in the preparation of Environmental Impact Statements (EIS), Developments of Regional Impact (DRI), rezone applications, real estate evaluation reports, and wildlife surveys for the GFC and USFWS.

The following methodology has been drafted based on the experience and expertise of and for the primary use of Kevin L. Erwin Consulting Ecologist, Inc. Therefore, it is strongly recommended that this alternative methodology only be utilized by personnel with similar levels of experience and familiarity with the flora and fauna of southwest Florida. The proposed alternative methodology is presented below. This methodology is to be utilized on projects of 40.0 acres or greater total size.

STEP ONE:

Alternative

All major upland and wetland vegetation associations onsite are delineated on recent 1"= <400' aerial photography by a qualified ecologist or field biologist. Those habitats are mapped utilizing the Florida Land Use, Cover, and Forms Classification System (FLUCCS), Level III or Level IV. Extensive ground truthing is performed to ensure the accuracy and completeness of the mapping effort. The acreage of each individual FLUCCS mapping unit is calculated and depicted on the vegetation map (Figure 1). A cumulative acreage total for each FLUCCS is provided as Table 1 (Table 1 may be included on the vegetation map).

STEP TWO:

Alternative

The list of FLUCCS, Level III or IV codes compiled during Step One are compared to the FLUCCS codes presented in the Lee County Protected Species List.

STEP THREE:

Alternative

For each FLUCCS mapping unit suitable for Lee County Listed Species an intensive pedestrian survey is conducted. The pedestrian survey consists of a sufficient number of parallel, over lapping belt transects through all of the suitable habitat to insure that 100 percent visual coverage of ground and flora is attained. The number of transects through each FLUCCS is recorded. This includes thorough coverage of all edges or ecotones between differing habitat types. The spacing between adjacent belt transects is dependent on the type of habitat and the density of the vegetation. Pedestrian surveys will be conducted by a minimum of two (2) qualified ecologists or field biologists, as approved by the County Administrator. The approximate location of all Lee County Listed Species (sightings and signs) are identified on the aerial or vegetation map. This methodology will be utilized by only those persons with an educational equivalent to a Bachelor of Science (B.S.) in ecological science and two (2) years ecological consulting/government experience.

STEP FOUR

Alternative

The number of individuals of each Lee County Listed Species found onsite is calculated using one or two methods. The selection of the appropriate method is guided by the approximate densities and habitat sizes tabulated in Steps 1 and 3. Method 1, which consists of counting all individuals onsite will be utilized for all surveys. Following the completion of Method 1, if it is determined that the species occurs over large areas (75.0 acres) the area will be intensively subsampled as described in Method 2. The results of the abundance and density calculations utilizing both Methods 1 and 2 will be reported. When utilized, the results of Method 2 will be assumed to be the most accurate.

Method 1: This method is appropriate to calculate abundance and density for use with all species which are found to occur onsite within small areas (<5.0 acres of total suitable habitat). The location and number of all individuals is recorded for each FLUCCS habitat. The abundance and density calculated as follows:

$$\text{Abundance} = \text{sum of } n_i$$
$$\text{Density} = (\text{sum of } n_i)/A$$

Where n_i is the number of individuals observed in belt transect i, and A is the acreage of the FLUCCS habitat.

<u>Method 2</u>: This method is appropriate to calculate abundance and density for use with species which are found to occur onsite within large areas (>5.0 acres of total suitable habitat). The number of individuals within belt transects of a standard width and a known variable length are recorded. A sufficient number of linear feet of transect is sampled to insure that 10 - 20 percent of the habitat is sampled. The location of these sampling transects are indicated on the vegetation map. The density and abundance is calculated as follows:

$$\text{Abundance} = \{(\text{sum of } n_i)/[(t_L \times t_w)/43560]\} \times A$$
$$\text{Density} = (\text{sum of } n_i)/[(t_L \times t_w)/43560]$$

Where n_i is the number of individuals recorded on transect i, t_L is the total length of all transects, t_w is the transect width, and A is the acreage of the FLUCCS habitat. The abundance and density calculated in this step will be compiled by species in Table 3.

In cases where evidence is by sighting or sign that does not provide abundance and density information, such as gopher tortoise burrows or red-cockaded cavity trees, a further characterization of activity/inactivity will be pursued as outlined in Step Five Alternative.

STEP FIVE:

Alternative

The identification of the presence of certain Lee County Listed Species onsite requires addition population characterization. Subsequent to the documentation of red-cockaded woodpeckers (<u>Picoides</u> <u>borealis</u>) or gopher tortoises (<u>Gopherus</u> <u>polyphemus</u>) onsite further sampling is performed to accurately assess population size.

Gopher tortoise

 a) Active and inactive gopher tortoise burrows identified in each FLUCCS code are subdivided into categories based on FLUCCS code.

 b) Approximately 25% (5 minimum and 30 maximum) of all active and inactive burrows are stick trapped for a period of four consecutive days (daytime high temperature must equal or exceed 70°F on each day).

 c) Daily and mean gopher tortoise occupancy correction factors are calculated for each FLUCCS code category as follows:

1. Daily correction factor = sum of active burrows/ numbers of burrows sampled.

2. Mean correction factor = sum of daily correction factors/4.

d) The density of gopher tortoises is calculated for each FLUCCS code category as follows:

1. Density = mean correction factor x number of burrows per acre.

e) The abundance of gopher tortoises is calculated for each FLUCCS code category as follows:

1. Abundance = density x acreage of FLUCCS code category.

Red-cockaded Woodpecker

a) All active and inactive cavity hole and start hole trees are identified and located on the aerial.

b) A series of no less than four (4) early morning or late afternoon stake outs are conducted to determine the activity status of each cavity tree.

c) On no less than four mornings the red-cockaded woodpeckers are followed from the time they emerge from the cavity trees in order to estimate clan size and foraging range.

Site specific circumstances may require that differing methodologies be utilized to accurately characterize the abundance and density of Lee County Listed Species onsite. Approval of the County Administrator will be obtained prior to the utilization of an alternative sampling methodology. These population characterizations will be performed by qualified ecologists or field biologists utilizing methodologies consistent with Florida Game and Fresh Water Fish Commission (FGFWFC) guidelines or other recognized professional standards and will be submitted to the County for approval.

STEP SIX:

Alternative

The completed survey would include:

1. Vegetation map or aerial depicting the location, configuration, and acreage of all FLUCCS mapping units; and

2. Table 1 - an acreage summary and percent of total site for each FLUCCS code; and

3. Table 2 - the abundance and density of observed Lee County Listed Species presented by species; and

4. — The calculations utilized to produce the abundance and density figures; and

5. The name(s) of personel who conducted the survey, the survey date(s) and the survey time(s); and

6. Proposed methodology for additional field work (if required).

Table 1.   ACREAGE AND PERCENT OF TOTAL PROPERTY FOR EACH FLUCCS MAPPING UNIT

FLUCCS, LEVEL III AND IV	ACRES	PERCENT
321 Palmetto Prairie	6.35	15.27
411 Pine Flatwoods	21.00	50.52
4119 Pine Flatwoods/Invaded by Exotics	9.45	22.73
424 Melaleuca	0.49	1.17
621 Cypress	1.90	4.57
6219 Cypress/Invaded by Exotics	0.92	2.21
624 Cypress - Pine	0.21	0.50
6249 Cypress - Pine/Invaded by Exotics	1.24	2.98
TOTAL	41.56	100.00

Table 2.   ABUNDANCE AND DENSITY CALCULATIONS FOR LEE COUNTY LISTED SPECIES OBSERVED ONSITE

Species	FLUCCS	Transects Through FLUCCS	Present/ Absent	METHOD 1		METHOD 2		Comments:
				Abundance	Density	Abundance	Density	
Gopher Tortoise	321 (3.35 ac.)	7	P	9	2.7	-	-	burrow occupancy correction factor = 0.31
	321 (1.76 ac.)	4	P	3	1.7	-	-	burrow occupancy correction factor = 0.42
	321 (0.17 ac.)	1	A	-	-	-	-	
	321 (0.67 ac.)	3	A	-	-	-	-	
	411 (14.17 ac.)	21	P	10	0.7	12	0.8	burrow occupancy correction factor = 0.38
	411 (6.39 ac.)	11	A	-	-	-	-	
	411 (0.44 ac.)	2	A	-	-	-	-	