

CHAPTER 3

ENVIRONMENTAL EFFECTS OF RIGHT-OF-WAY PREPARATION AND TRANSMISSION LINE CONSTRUCTION

Construction of the proposed 500 kV transmission line and Kathleen Substation will entail right-of-way and site clearing, and structure assembly, erection, and wire stringing. Requirements for the transmission line and structures were presented in Section 1.3.

Several distinct tasks will be required for construction of the proposed transmission line. These will include: surveying, clearing, foundation installation, tower erection, conductor and shield wire installation, and cleanup. The tasks will occur in sequence and will be separated, in time, by several days to several months.

3.1 LAND IMPACT

The proposed corridor contains approximately 9,730 acres (3,941 hectares), with an eventual right-of-way width estimated at 190 feet (58 meters). Preparation of the right-of-way will vary with existing vegetation and land use, that is, little treatment will be necessary in pasture and open areas, whereas clearing will be required in forested areas and citrus groves. Total land area affected, with a 190-foot right-of-way, will be approximately 1,025 acres (415 hectares).

A certain amount of additional acreage will be disturbed during construction by required equipment access roads to the right-of-way. Until a final centerline has been defined, the number and location of access roads needed cannot be determined. Nevertheless, such impact will occur, especially where the corridor does not parallel a public right-of-way, such as along SR 471. Most disturbance, however, will be restricted to the final right-of-way itself.

No explosives will be used during construction of the project. Military authorities will be consulted regarding the location and removal of possible live ordnance in the right-of-way if the final alignment enters the defined contaminated areas of the Withlacoochee State Forest.

3.1.1 Impact on Land Use

Land use patterns will not be significantly altered by construction of the proposed transmission line. Clearing of vegetation, including danger trees, will be required in forested areas, thus eliminating these areas from pulp and timber production. However, the cleared area will benefit some wildlife species (see Section 3.5), providing herbaceous and small shrub cover and creating an edge along the right-of-way.

Open areas and pasture will not be significantly affected by construction of the line, except for the small amount of land directly at the base of the structures. In areas of active cultivation, crop damage and loss during construction will be unavoidable. However, once operational, normal farming practices will be allowed to continue beneath the line. A small amount of land at the structure base will be removed from production for the life of the project. However, FPC will make every effort to locate structures in field corners, along field edges, and in fencerows, and to span cultivated fields so as to minimize impacts to the agricultural community.

Citrus trees in proximity to structure locations must be removed to allow for foundation construction and placement of the structures. The remainder of the grove will be left intact assuming grove owners maintain existing tree heights. Other agricultural uses (low-growing crops and grazing) would be permissible in the right-of-way.

Residences and other buildings within the proposed corridor are widely dispersed, permitting final centerline delineation to avoid dwellings where practicable. Impact to the human population will be minimal.

3.1.2 New Roads

New access and service road construction should be kept to a minimum, even though the southern half of the study area is approaching a semi-wilderness state. Because of the predominantly inaccessible areas to the south (the Green Swamp, and to a lesser degree, the Withlacoochee State Forest), FPC has established the proposed corridor parallel and immediately adjacent to State Route 471 (approximately 41 percent of the proposed corridor's length). Alignment along SR 471 will provide ready access to a right-of-way, and virtually

eliminate the need for access roads. This will minimize encroachment on wetland habitats, and, with the proposed span length between structures, virtually eliminate any disturbance to the Withlacoochee River, Gator Creek and other water crossings listed in Table 2-4.

As the proposed corridor traverses the northern boundary of the state forest, access appears to be highly restricted. However, upon closer examination of recent aerial photography, several state forest roads are readily available and offer limited access to the proposed corridor. Within the corridor itself, a well-maintained private road, apparently for logging vehicles, extends the entire east-west length of this corridor segment.

From the state forest north to the Central Florida Substation, several state and local roads cross the proposed corridor, providing access to the eventual right-of-way. Between SR 48 and SR 470, it again appears that access road construction will be necessary. However, large and active citrus groves are being maintained throughout much of the area. Improved farm lanes cross the proposed corridor at several intervals. Access should be readily available with little, if any, new road construction warranted.

North of the Sunshine State Parkway, an existing transmission line will provide access to the final route.

As a result, few new access roads, if any, will be required. Service roads will be situated in the final right-of-way. Those new access and service roads that are constructed will be approximately 12 feet (3.6 meters) in width and will not significantly change present patterns of water flow. No new bridges will be required, and, as pointed out in Section 2.2.7, natural surface drainage of the study area is not well developed, as the greatest percentage of water flow is through the groundwater system. Actual need for access roads and their locations cannot be determined until a final centerline is delineated.

3.1.3 Erosion

The potential for soil erosion will occur in areas where ground vegetation is removed during construction. This potential will continue until natural vegetation is reestablished.

Some soil compaction may occur during clearing, structure erection and stringing, and movement of heavy equipment, but it should be minimal. Compaction could increase if

construction practices continued as soil moisture content increased; soils are more sensitive to compaction as they approach their saturation point.

3.2 AIR IMPACTS

There will be no significant impacts to ambient air quality. Impact may occur in the form of dust or smoke. These impacts, if they occur, will be temporary and short-term in nature. Movement of construction vehicles along the right-of-way and on local roads may generate fugitive dust. Given the number of paved and maintained and improved unpaved roads and lanes, fugitive dust is not anticipated to be a problem.

3.3 IMPACTS ON WATER BODIES AND USES

The proposed transmission line may impact water resources through construction of culverts for access roads, dredging operations and placement of fill, though these activities are not anticipated to any great extent. There will be no need to utilize dewatering methods, alter water channels or place structures in a manner which would affect water levels. By utilizing existing roads for access, and crossing flowing streams at existing bridges, most of the potential for impact to water resources will be minimized, if not eliminated.

Some temporary increases in turbidity and silt deposition may occur during construction. During this same period, dissolved oxygen levels may decrease and nutrient concentrations may be disrupted. These effects will also be temporary.

Temporary diversion of surface drainage courses or construction of levees, or culverts can only be determined once a final centerline is selected.

Once a final centerline is delineated, and the number and location of access roads is determined (if any), FPC will complete a Joint Application, Department of Army/Florida Department of Environmental Regulation for Activities in Waters of the State of Florida, SAJ Form 983 (July 21, 1977) for waters of the State which are traversed.

3.4 SOLID WASTES

Solid wastes generated during construction of the proposed transmission line will consist of clearing residue and construction material debris. Vegetation, such as slash, will be disposed of by burning, removal from the site, mulching, or windrowing. Merchantable timber will be salvaged in a manner acceptable to the landowner/tenant.

Any remaining debris from construction materials will be removed from the right-of-way and disposed of at local landfills, or other approved disposal sites.

3.5 PERMANENT CHANGES TO VEGETATION, WILDLIFE AND AQUATIC LIFE

3.5.1 Vegetation

Depending on the vegetation type through which the transmission line is routed, various effects or changes are possible from construction. If an area is void of trees, then any change in species distribution will be relatively minor. Noticeable vegetation shifts would occur only if major soil disruptions resulted from construction activity.

A shift in species composition can be expected in areas where the tree canopy will be removed, such as along and in the Withlacoochee State Forest and south to the proposed Kathleen Substation site. The shift may be greatest in climax communities such as the southern mixed hardwoods (found primarily in the northern portions of the proposed corridor) because diversity is higher in these communities (Monk, 1967). It was also found that cypress domes (more apparent south of the state forest), as compared to the other major vegetation types, exhibited less diversity (Monk, 1968).

However, diversity cannot be the only consideration in final routing. Sandhills, according to Monk (1968), were far from being the most diverse, yet they contain many species of concern to the state and federal governments. Additionally, cypress domes and other wetlands are important hydrologically, while pine flatwoods are important for timber production.

A key mitigative measure in final line routing would be to parallel existing linear corridors (i.e., the existing 230 kV transmission line north of the Parkway, and SR 471). This would reduce the general amount of tree canopy loss to construction by eliminating the need to remove danger trees from one (or both) side(s) of the right-of-way. The proposed corridor alignment has been developed to offer such a routing option. Additionally, the corridor avoids major stands of southern mixed hardwoods and established sandhill communities.

Where a dense tree canopy will be removed, such as in the state forest, a general population shift will occur in the right-of-way. Shade tolerant species will be replaced by shade intolerant species. Population shifts, to some degree, can be expected to parallel effects documented by Moore and Terry (1980) for clearcutting operations. It was found that after clearcutting and chopping (a form of site preparation for the next crop), the amount of herbage increased by 34 percent, while two common woody understory components, common gallberry and saw palmetto, were reduced by 75 percent and 89 percent, respectively. Ball et al. (1979) found that grass was the major understory component in two-year old plantations, while shrubs were the major live biomass at ages five and ten years. (Plantation site disturbance can be expected to be similar, but more intensive, than along a cleared right-of-way.)

Other researchers, Conde et al. (1977), have reported an increase in species diversity as a result of intensive site preparation, such as along a transmission line right-of-way. However, it must be pointed out that species invading a cleared right-of-way may not be consistent with specific management goals of the landowner, such as in the state forest. FPC has been working with the Division of Forestry, and will continue to do so, with regards to appropriate management practices for the eventual right-of-way.

Right-of-way preparation and construction of the proposed transmission line can have adverse impacts to large woody vegetation. The decline and mortality of edge trees can be attributed to sunscald, scorch from burning, and/or mechanical damage to trunks and roots (Carvell and Johnston, 1978). Burning will be controlled on the right-of-way, and care and supervision of equipment movement during clearing, assembly and erection should mitigate problems resulting from mechanical damage. Sunscald will, in all likelihood, not be of consequence at this latitude as Carvell and Johnston cite several researchers who correlate sunscald with repeated and rapid freeze and thaw conditions.

Some rare plants, such as terrestrial orchids, will benefit from tree removal barring extensive soil disturbance or drainage disruptions (personal communication, K. Langdon, December 1980). Conde et al. (1977) located some of these rare plants while investigating reforestation activities. If a seed source is available, these rare plants will colonize the open transmission line right-of-way if other habitat requirements, such as soil, are acceptable.

A majority of the plants of concern to state and federal authorities (Table 2-5) can be avoided by selection of a final line route which bypasses the identified sandhill communities and hardwood hammocks. The proposed corridor offers the flexibility in final centerline delineation to avoid these features. Impact to aquatic plant species can be minimized by avoiding drainage modifications and permanent soil disturbance. Changes to the area's drainage system are not anticipated (see also Section 3.3) and disturbance to the soil structure can be reduced, if not eliminated, by well-planned construction scheduling and careful, restricted movement of construction equipment.

3.5.2 Wildlife and Aquatic Life

Environmental impacts imposed upon the local fauna from the construction activities associated with right-of-way clearing, structure assembly and erection, and stringing will vary in magnitude and duration. They will be influenced by the habitats crossed and the species present. Rare and endangered species, by their very nature, are more sensitive to these changes and activities within their habitats.

Construction activities will affect some wildlife and permanently remove some habitat, however, these losses will be small and they will not affect regional populations. The exception to this may be to the rare and endangered species, if present.

Due to their small size and their inability to move great distances rapidly, some reptiles and amphibians will be lost during construction activities. The reproductive rates of these animals should replace their losses in one or two reproductive cycles. Habitat destruction will be permanent in the southern portion of the proposed corridor where trees will have to be removed. Escaping animals will be able to overcome the effects of this impact by colonizing areas adjacent to the right-of-way. In the northern portion of the study area, the proposed corridor crosses more xeric conditions. Excavations at structure sites may destroy the

burrows of the gopher tortoise (*Gopherus polyphemus*) and its associated biota, most notably the tortoise itself, the gopher frog (*Rana arcolata aesopus*), and the eastern indigo snake (*Drymarchon corais*). These species will be able to withstand and replace such minimal losses.

Structures will be placed to avoid cypress domes where practicable. These biological islands support localized populations of species that have uneven distributions. Destruction of the dome may destroy the breeding population or breeding habitat of local species such as the striped newt (*Notophthalmus perstriatus*). Little is known about the short-tailed snake, which makes it difficult to assess the potential impact of construction activities on this species. However, as a result of conversations with local GFWFC biologists (Fickett and Chappell, 1981), the species is not expected to occur in the proposed corridor.

There will be no impact on the Suwannee cooter (*Chrysemys concinna suwannensis*), as the project area is on the far eastern edge of its range. By keeping construction equipment out of the watercourses as much as possible, little impact will be placed on their habitat.

Because of their mobility, birds as a group will experience far less negative impact than the herptiles. Generally, birds will leave the right-of-way during construction activities. Upon completion of construction, the birds will return to their old territories. In the northern portion of the proposed corridor, final line routing will attempt to disturb as little scrub oak habitat as possible. This will lessen any impact on the sedentary Florida scrub jay (*Aphelocoma coerulescens coerulescens*). Routing the line to avoid cypress domes, where practicable, and selecting river and wetlands crossings where structure placement can be made on high ground will ensure minimal disturbance to the feeding areas of the Florida sandhill crane (*Grus canadensis pratensis*) and the wood stork (*Mycteria americana*). No tree removal will take place in any known rookeries.

With most birds being somewhat arboreal, tree removal in the central and southern portion of the proposed corridor will impact nesting, perching, feeding, and roosting habitats. However, the amount removed is very small compared to the total available habitat. No red-cockaded woodpeckers (*Picoides borealis*) or cavity trees were observed in the study area or the proposed corridor. Only submarginal pines (young, or mixed with hardwoods) will be removed. Line placement will be such that the construction activities will not adversely

impact any known bald eagle (*Haliaeetus leucocephalus*) nesting trees, either active or inactive. With the available perching and nesting sites throughout the study area, the southeastern kestrel (*Falco sparverius paulus*) should experience no negative impacts to its nesting habitat and food source from construction activities. The ubiquitous bobwhite (*Colinus virginianus*) and the wild turkey (*Meleagris gallopavo*) will also be able to avoid the construction crews and return upon completion. In heavily forested areas, right-of-way clearing may provide some habitat improvement for these two game species.

A number of small mammals (i.e., rodents, shrews, etc.) will be lost during construction of the proposed project. However, their high reproductive rate should make up for these losses within one or two breeding cycles. The larger, more mobile species, such as the white-tailed deer, bobcat, raccoon, and Florida panther (*Felis concolor coryi*) (if present) will avoid the construction sites during daylight hours, but may use them for resting or feeding at night. Tree removal will impact the arboreal species such as the gray squirrel (*Sciurus carolinensis*) and Sherman's fox squirrel (*S. niger shermanii*), if present, as nesting and feeding habitat will be lost.

Right-of-way preparation in the more xeric areas will influence the habitat of the Florida mouse (*Peromyscus floridanus*). As its preferred habitat is similar to the gopher tortoise, it will be impacted much like the tortoise (which is discussed above). In addition, its reproductive rate will enable it to replace lost individuals, as the principal threat to the Florida mouse is habitat destruction. Upon completion of construction activities, the right-of-way will return to a near natural state, allowing the Florida mouse, gopher tortoise, gopher frog, and eastern indigo snake to reinhabit these areas.

Other impacts associated with the construction phase of the project will be reduced production of young if construction activities take place during the breeding seasons. Many of the wildlife species do have the ability to relocate, rebuild nests and produce second broods if the first is destroyed.

Care will be taken in final placement of the centerline so that right-of-way clearing will not create biogeographical islands too small for resident species. This will be especially important in the northern portions of the proposed corridor where most of the native habitat is restricted to small woodlots and fallow fields, and will also be a factor around cypress domes, which provide vital food, watering and breeding habitats for numerous species.

3.6 IMPACT ON LANDMARKS AND SENSITIVE AREAS

Construction impacts to sensitive features and areas (as described in Section 2.2.4) will be dependent, to a great degree, on the location of the final centerline and the structures. Some possible construction impacts have already been addressed, such as those to water bodies (Section 3.3) and vegetation and wildlife (Section 3.5).

The Green Swamp Area of Critical State Concern and SWFWMD landholdings will not be affected by construction of the proposed project. The Withlacoochee State Forest will be traversed by the eventual route. Vegetation removal will be required and changes in species composition will occur in and along the right-of-way (see Section 3.5.1).

The contaminated areas identified in the state forest are considered sensitive only in that they may very well be hazardous to proposed construction activities. If the final line route crosses these areas, additional decontamination work by the Army Corps of Engineers will ensure safety not only to the project but also to other forest users, thus producing a positive impact.

The one state-identified area of unique vegetation (the hardwood hammock) adjacent to the proposed corridor will not be adversely affected by construction, or operation, of the proposed project. Of particular concern is the Little Gator Creek rookery. It is anticipated that construction activities, which will be temporary and short-term in duration and which will occur east of SR 471 and the rookery, will not disrupt activity in the rookery. With the daily industrial activity and noise of the limerock surface mine approximately 600 feet (183 meters) to the south of the rookery, and the traffic of SR 471 even closer, the intermittent movement and sounds of construction along the eventual right-of-way should not cause any adverse impacts to the rookery and its inhabitants.

Known archeological sites and areas considered by the state to be potentially sensitive are addressed in Section 3.8.

None of the four recreation areas in the Withlacoochee State Forest will be physically impacted by construction activities, as their distances from the proposed corridor are approximately: Flag Ford, 0.75 mile (1.2 kilometers); South Grade Borrow Pit, 0.5 mile (0.8 kilometer); Megs Hole, 1.5 miles (2.4 kilometers); and Powder House, 0.5 mile.

At the South Grade Borrow Pit, there is a considerable amount of vegetation between the actual site and the proposed corridor. Therefore, there will not be direct visual impact, and the dense vegetation should also help to buffer noise impacts of construction. Even though the area offers some form of camping, picnicking, fishing, or hiking, construction noise should be less perceptible than that coming from heavy truck traffic along SR 471. Therefore, the only primary construction impact to this recreation area will be noise, and this should be minimal, especially since construction activities are temporary and short-term in nature.

Secondary impact to this facility will occur to the users as they travel to and from the campgrounds and encounter construction vehicles on public highways. However, this impact too will be very temporary and not unlike present truck traffic in the area.

3.6.1 Extent of Impact on Sensitive Areas

Seven miles (11.3 kilometers) of the proposed corridor are situated in the Withlacoochee State Forest with much of the total length being heavily forested and managed for timber production. The potential for visual impact of the proposed transmission line exists and was considered in the structure evaluation. FPC is proposing to construct the proposed facility on a low-profile structure with a horizontal configuration (Figures 1-2 and 1-3, and Section 1.3). In addition, existing vegetation not considered danger timber will remain, thus permitting the establishment of a set-back, or buffer zone, between the highway and the final right-of-way. This natural screening will help to visually hide much of the construction activity.

3.7 IMPACT ON HUMAN POPULATIONS

Population throughout the proposed corridor, as evidenced by the low level of development (Section 2.2.3), is sparse. Approximately 13 single-family residences are located within the corridor. These are situated north of the Withlacoochee State Forest, and are not concentrated in any one area. Another 50 dwelling units are within one-half mile of the proposed corridor.

As a result of these very low densities, impact to human populations will be slight. Center Hill, the closest population center to the proposed corridor, is approximately 1.3 miles (2.1

kilometers) to the west. Construction impacts resulting from equipment movement and attendant noise, dust, and congestion will be well away from most residences and human high use areas.

Only those people living close to the final centerline (as yet to be determined) will be affected by construction activities, and these impacts, in the form of noise, dust, and congestion, will be temporary and short-term in duration. In fact, there may be many days of inactivity between the various construction phases at any one location.

3.8 ARCHEOLOGICAL AND HISTORIC SITES

One known archeological site occurs within the proposed corridor (8 Sm 10). Also within this portion of the corridor is an existing 230 kV transmission line. In an attempt to minimize possible impacts to both natural and cultural systems, including this known site, FPC will consider a final centerline which parallels the existing transmission facility to the west. Such a routing would (1) follow the recommendations of the U.S. Departments of Agriculture and Interior (to parallel existing transmission lines when possible), (2) provide ready access for construction and maintenance, (3) reduce overall visual impact, and (4) avoid the archeological site 8 Sm 10. Therefore, no construction impacts to this cultural resource site will occur.

The proposed corridor crosses several areas identified by the Florida Department of State as having the potential to be archeologically significant. Construction of the proposed Central Florida-Kathleen 500 kV transmission line may produce adverse impacts to archeological resources if they exist within these sensitive zones (Figure 2-6).

Adverse impacts resulting from transmission line construction can occur in two forms, direct and indirect. Direct impacts are those which have an immediate effect on the integrity of archeological sites and include excavation for structure foundations as well as ground disturbance associated with vegetation clearing, movement of heavy equipment, and construction of access roads and labor facilities.

Indirect impacts are effects which are not an immediate and direct result of construction action, but which would probably not occur without it. Indirect impacts occur because of

the exposure of resources, either within or adjacent to the development, to such adverse effects as accelerated erosion, intensified agriculture, construction of private buildings, road-building, and increased vulnerability to vandalism and amateur collection.

If cultural resources do in fact exist in the proposed corridor and the eventual right-of-way, the major direct impact of the proposed construction may be the disturbance or destruction of archeological deposits in the upper soil layers. Movement of equipment and vegetation clearing may produce moderate to heavy disturbance to the upper 20-30 centimeters (cm) of the soil. This disturbance will result in soil displacement, churning and mixing, and compaction. It may produce the following adverse effects on cultural resources within this stratum (0-30 cm); (1) reduction of artifacts due to breakage and increased exposure to erosion, (2) partial or total destruction of subsurface features, and (3) partial or total destruction of artifact locational context. Additionally, augering for foundations may produce minor deposit damage to varying depths.

The major indirect impact can be the exposure of site surfaces to collection and erosion processes.

Approximately 5.1 linear miles (8.2 kilometers) of the proposed corridor (11.5 percent) contain portions of areas designated by the state as being potentially sensitive from an archeological perspective (Figure 2-6 A-M). Therefore, in order to determine the possible existence of cultural resources, FPC will secure the services of a qualified archeologist(s) to conduct a pedestrian survey of the final right-of-way prior to clearing, but only after Florida Power Corporation has complete control of the right-of-way.

If cultural resource sites are discovered in the right-of-way, and, after consultation with the Department of State, it is determined that they warrant preservation, several possible mitigative measures are available during construction: (1) the area of the find can be identified by markings or flagging, (2) clearing can be limited to hand clearing, (3) vehicles can be prohibited from traversing the site, and (4) the site can be illustrated on the engineering plan and profile drawings in order to avoid structure spotting in these sensitive areas.