APPENDIX B

Southwest Florida Pre-Development Vegetation Map

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SOUTHWEST FLORIDA PRE-DEVELOPMENT VEGETATION MAP

Development of a natural system hydrologic model (NSM) will be based on the distribution of pre-development southwest Florida plant communities, whose classification is directly related to the hydrologic regime of the sites where each community is located (Table 1). Pre-development is defined as the condition of the landscape prior to the arrival of Europeans in southwest Florida, when hydrology and fire regimes were the primary determinants of plant community distributions.

The Natural Systems Group (NSG) of the Southwest Florida Feasibility Study (SWFFS) Team began work on the Pre-Development Vegetation Map (PDVP) in September 2001. At our first meeting we reviewed the known maps that were available to see if something might already exist that could meet our needs. The most important features of an appropriate map would be that it described the pre-development vegetation on a scale comparable to the mesh (cell size) of the proposed NSM, that the plant community classification be clearly related to their hydrologic regimes, and that it be available in electronic format because of time constraints. At this meeting, it was agreed that the University of Florida Center for Wetlands 1900 maps for Collier, Hendry, and Lee Counties, and for South Florida by Lehman (no date), DeBellevue (no date), Brown (no date), and Browder et al. (no date), respectively, which were published in the late 1970s, would be the best choice, if the digitized versions of the maps could be located. After several months of searching, the two known copies of the digitized maps were presumed lost.

At subsequent meetings in October and November, we considered several other maps in case we were unable to locate the Center for Wetlands digitized maps. One was based on the Florida Gap Analysis conducted by the Florida Game and Freshwater Fish Commission (Cox et al. 1994). This was a detailed digitized map created from 1985-89 Landsat Satellite Thematic Mapper data. While the map proved useful in describing current plant communities, the vegetation in many areas had been so altered that it would have been a major task, that was beyond our time constraints, to correct these back to their pre-development condition. The 30 m pixel size was also much more detailed than the approximate 20 ac size of the NSM cell mesh. While this level of detail might be desirable, it was beyond the needs of our project, particularly considering the amount of work and the uncertainty that would have been involved in converting the map to pre-development conditions. We also looked at several other maps that were even less suitable for our needs.

In October we had looked at the Natural Soils Landscape Positions (NSLP) map that had recently been created by the South Florida Water Management District (Zahina et al. 2001). However, its plant community classification, which was developed to apply to the whole area of the District, contained only ten natural plant community classes and these classes were not related to specific hydrologic regimes. This did not provide enough detail to adequately sort out the communities in southwest Florida in a way that was relevant to hydrology, so we decided not to use this map. However, later discussions among the PDVM subteam of the NSG led us to reevaluate this map because of the relationship between plant communities and the detailed soil unit coverage that was also included in the NSLP. Between November and January, the PDVM subteam met periodically, and reclassified the NSLP soil types into hydrology-related plant community maps, using best professional judgment and the information in the most recent soil surveys for each of five southwest Florida counties, including Charlotte (Henderson 1984a), Collier (Liudahl et al. 1998), Glades (Carter et al. 2000), Hendry (Belz et al. 1990), and Lee (Henderson 1984b) (Table 2).

While the NSLP does include tidal and barrier island plant communities along the coast, the NSM does not adequately deal with tidal water flows, which are a major component of the hydrologic regime in these coastal areas. Portions of the NSM mesh do extend into tidal areas, but the primary reason for this is to have the peripheral NSM cells beyond the area where we can expect the model to make reasonably accurate hydrologic predictions. Cells along model boundaries are characteristically less accurate in their predictions, largely because of the lack of an appropriate representation of flows across their edges. In situations where there are tidal boundaries, daily flow reversals rather than generally one-way downstream flows, greatly increase the complexity of modeling hydrology. This in combination with the convoluted flow paths through a maze of islands, shallowly submerged bars, and as sheetflow across broad areas requires vast amounts of site specific data, that are generally not available, if we are going to accurately represent water flows within the coastal portion of a southwest Florida hydrologic model.

The Big Cypress National Preserve (BCNP) and the adjacent Everglades National Park (ENP) lands were not included in the NSLP coverage. However, a recent plant community classification and vegetation map of these areas was available (Doren et al. 1999, Madden et al. 1999, Welch et al. 1999), and was reclassified into the same plant community classes as was done for the five county areas (Table 3). We felt this was a reasonable approximation, since only small portions of BCNP have been altered from their pre-development condition. In a few areas, we utilized McPherson's (1973) map of the eastern Big Cypress and Leighty et al.'s (1954) Collier County soil map to help bridge the gap between the National Park Service's (NPS) current plant community classification boundaries and those we ultimately used in our PDVM.

After the soil units (counties) or plant communities (NPS lands) were reclassified according to our hydrology-related plant community classification, I printed them as separate ARCVIEW maps for each county, the BCNP, and the ENP. The PDVM subteam then reviewed them and made suggestions concerning how and where their accuracy might be improved. General types of changes that applied throughout the area are described below and are listed in Table 4. Descriptions of detailed changes for each of the seven land units are found in Attachment.

The most obvious needed changes were to convert areas where the substrates had been sufficiently disturbed at the time the county soil surveys were done so that information on the pre-development soil characteristics was not available. Examples included canals, excavations, filled wetlands, dredge spoil, and developments where the landscape had been severely recontoured. We needed to map the original plant communities on these sites and reconnect them across the boundaries of these disturbances as best we could. In some locations there were documents, primarily those developed in the process of permitting site alterations, which assisted us in deciding how to map the original plant communities. There was an early soil survey in Collier County (Leighty et al. (1954) (Table 5), which was very helpful in mapping the original plant communities in developed portions of the county. Where this information was not available, but the sites were small or elongate, it was not difficult to reconnect plant communities. As they increased in size, unless I had historical information, I attempted to recreate plant community distribution patterns that matched those in nearby areas. In very large disturbed areas, such as Cape Coral and Fort Myers, we had little useful information on pre-development vegetation patterns, so I simply tried to recreate vegetation patterns that resembled those in the region and that made sense given their location on the landscape.

Less obvious needed changes were based primarily on the knowledge of individuals with long term experience in southwest Florida, a 1940s soil survey of Collier County (Leighty et al. 1954), 1940s and early 1950s aerial photography, and aerial photos contained in the county soil surveys. The subteam's original county-wide estimate of the plant communities present on certain soil types did not always agree with what communities we felt were likely to have been present prior to development on these soil types at specific sites we were familiar with in the area. In yet other cases, a certain soil type was known to support one plant community on some sites and another on other sites within a county. Sometimes two very different communities were found on two sides of a canal or road, particularly in the Big Cypress National Preserve. These were more than simply differences in successional status associated with fire. They often involved significant differences in hydrologic regime, which needed to be rectified if we were going to be able to convert the PDVM to a Pre-Development Hydrologic Map that would form the basis for the NSM.

When we had completed all of the corrections to the individual five county and two NPS lands maps, we had to merge them so that the plant community distributions were seamless along the borders of the seven land units. For the county boundaries, the polygons had already been aligned in the NSLP project (Zahina 2001). Unfortunately, there were often large differences in the soil classifications when they were compared between most of the counties (Table 6). Only Lee and Charlotte counties had essentially the same soil classifications, since they were done by the same person and were published simultaneously. Comparisons among the other counties indicated that they invariably had less than half of their soil types in common and normally had less than a third in common, even where the counties were adjacent to one another. As a result, there were sometimes major differences in soil characteristics, and thus in our estimated plant communities, in polygons that extended across these boundaries. I generally used aerial photos in the county soil surveys and my professional knowledge of some areas to help me make decisions about how to correct these discrepancies.

The boundaries between the BCNP and ENP lands matched very well since they were done simultaneously by the same group (Doren et al. 1999, Madden et al. 1999, Welch et al. 1999). However, the boundaries between the soil-based polygons in the adjacent counties and the current vegetation polygons in the NPS lands, required major adjustments immediately along these boundaries and to some extent further into the adjacent county or NPS lands. These decisions were again based on aerial photos in the county soil surveys and my professional knowledge of some areas. There is an obvious difference in the grain between the county and NPS lands portions of the map, which was impossible to adjust for, without taking what I felt would be excessive liberties in the manipulation of the maps.

The model mesh for the SWFFS area extended into small areas of southern DeSoto, northwestern Palm Beach, and western Broward counties. We had comparable NSLP data for DeSoto County, which merged easily with the adjacent Charlotte County coverage. However, we had only a very coarse 1948 soils coverage for the other two areas (Jones et al. 1948). We reclassed the Palm Beach County area as Marsh because most of the adjacent Hendry County lands were Marsh, and this small area was even closer to the vast Everglades marshes. The Broward coverage was more problematical because both the adjacent Hendry soil-based polygons and particularly the adjacent BCNP vegetation-based polygons had a much finer resolution of plant communities than did the old Broward County soils data. It was impossible to resolve all of the discrepancies across these boundaries, so I just tried to make the dominant plant community types as compatible as possible. I used the Hendry County and BCNP coverage to make adjustments across the boundary with Broward County because their data were both more recent and detailed.

Southwest Florida Plant Communities

We have classified the pre-development plant communities in southwest Florida into 15 major types, based on characteristics relevant to their relationship to hydrology of the region. All "disturbed areas" on our original plant community maps, which were within or close to the area to be included within the SWFFS hydrologic model, have been reclassified to what represents our best estimate of the pre-disturbance communities on these sites. The highest level of the pre-development classification hierarchy was whether a community was tidal or non-tidal, since the hydrologic models we will be using in the Southwest Florida Feasibility Study do not apply to tidal areas. The second level divides the communities on the basis of their hydrologic regimes, in terms of hydroperiod, average wet season water depth, and minimum dry season water depth during an average year and during a 10-year drought. Lastly, we divide them according to their successional stage in terms of whether they are predominantly an early successional herbaceous wetland community or pine flatwoods community or a later successional community dominated by cypress and/or hardwoods. The hydrologic significance of distinguishing successional stages is that herbaceous communities have different rooting depths, leaf areas, and roughness coefficients based on their structural characteristics, which factors are important to defining model parameters for these communities. The shrub stages of these successional sequences were not included in our classification. They were considered to be transitional communities, which could be included with earlier or later successional stages depending on their degree of development. We characterized each major pre-development plant community according to its topographic setting and soils, dominant vegetation, hydrology, and fire regime (Tables 7 and 8).

Upland areas are dominated by a pine flatwoods complex with numerous small-to-large wetland depressions and flowways. Pine flatwoods are most extensive on the higher elevation, more northern portions of southwest Florida. Xeric pinelands are typically found on the most well-drained sites, which are usually located on deep sands. These types of sites are typically found on the highest topographic elevations in an area, or close to the Gulf coast and along streams where there are relatively steep slopes. They rarely have water standing above ground, and then only for very short periods. At the other extreme, hydric pinelands are more common in the southern portions of southwest Florida in poorly-drained areas with little relief, where they can be shallowly inundated for several months each year. Mesic flatwoods occur on sites with moderate drainage, where the water table is located close to the ground surface for much of the summer wet season, but is only above ground for short periods during most years. Mesic and hydric flatwoods can occur on a variety of soil types, including sand, marl, and rock.

Flatwoods can best be described as low-relief savannas that burn frequently. They are typically dominated by an open canopy of slash pine (Pinus elliottii var. densa) over a low open cover of scrub oak (Quercus spp.) on the driest sites, palmetto (Serenoa repens) on moist sites, and a dense and very diverse herbaceous community on the wettest sites (Table 1). With a reduced fire frequency, shrubs gradually increase their dominance on mesic and hydric sites, until the more slowly invading trees overtop them and establish either a mesic or hydric hammock forest of mixed hardwoods with a reduced, shade-tolerant groundcover. On the driest sites, the scrub oaks merely increase in size and density until they develop into a low xeric hammock forest, again with a reduced, shade-tolerant groundcover.

Herbaceous wetlands in southwest Florida vary greatly in size, from small shallow depressions on the order of only 30 ft across up to some as large as hundreds or thousands of acres. We have divided them into two major types, those with and without organic soils (Table 1), although both types can be present in larger wetlands where organic soils develop in the deeper parts of mineral soil depressions. Mineral soil herbaceous wetlands, which we call wet prairies, typically are a very diverse plant community, and can be found on sand, marl, or rock substrates. Structurally, the vegetation is relatively short and open, so that sunlight reaches the water surface over much of the wetland. Light reaching the water surface results in the development of a substantial submerged aquatic vegetation and algal periphyton community, the latter growing on the many surfaces present in the shallow water, including live plant stems, litter, logs, and the ground surface. Wet prairies typically have shorter hydroperiods, are more shallowly inundated during the wet season, and have a greater annual water table fluctuation than do organic soil marshes. While marshes support a less diverse community, they are more structurally developed. The vegetation is typically taller and denser, so that little sunlight gets to the water surface, resulting in little submerged vegetation or periphyton. They have longer hydroperiods, are inundated more deeply during the wet season, and do not have as great an annual water table fluctuation as wet prairies. In the absence of fire, woody shrubs invade herbaceous wetlands with wax myrtle (Myrica cerifera) dominating in wet prairies and willow (Salix caroliniana) in marshes. Eventually trees will colonize these sites, with pine flatwoods dominating in drier areas and cypress forests in wetter areas. The shade produced by the forest canopy typically results in a reduced ground cover with a very different species composition from that present in the herbaceous wetlands.

Dwarf cypress communities are dominated by cypress (Taxodium distichum), but are functionally more similar to wet prairies. They typically occur on marl soils with a very shallow depth to bedrock. As a result, the cypress are stunted because of limited root development and low nutrient availability on the rock substrate. The hydrology is more characteristic of a wet prairie, whose fire regime is normally too frequent for cypress. However, the low productivity of this community results in little fuel accumulation in the form of either vegetation or litter, and a fire frequency and severity more similar to that of cypress.

Forested wetlands are dominated by cypress and/or mixed hardwoods. They occur in topographic depressions or on stream floodplains where there are long hydroperiods and moderate annual water table fluctuations (Table 1). Cypress dominate on sites that burn relatively frequently, while mixed hardwood swamps, usually with a significant cypress component in the pre-development landscape, dominate sites that burn infrequently. Those on stream floodplains usually have a somewhat flashier range of water level fluctuation associated with major rainfall events and the subsequent rapid watershed runoff.

In southwest Florida, water as a habitat is most common in the form of small, shallow depressions located in wetlands. They are typically no more than about an acre in size and about 3 - 5 ft in depth during the wet season, and support either floating or submerged vegetation (Table 1). All surface water is lost from even the deepest of these water bodies on an average of about once every ten years during severe droughts. They typically have sand, organic or sometimes rock substrates. Some of those with organic soils have even been created by fire during particularly severe droughts. The largest bodies of open water in southwest Florida include Lake Okeechobee, Lake Trafford, and Lake Hicpochee. They are all permanently inundated, although they may have extensive exposed shorelines during dry periods. Wetlands along their shores regularly burn during dry periods. Substrates are generally sandy, with varying amounts of organic accumulation. They tend be relatively shallow for their size, usually less than 20 ft deep. They may have floating vegetation around their edges, and may be dominated by either submerged vegetation or plankton in their deeper areas. The proportions of these communities can also vary seasonally and from year-to-year, largely because of varying climatic conditions. There are numerous streams and rivers in the more northern and coastal portions of the area. The largest are the Caloosahatchee River and Fisheating Creek, and their tributaries. Most of the others are small creeks draining into coastal estuaries. The smaller creeks may be greatly reduced in size during dry periods, but they virtually always have some flow, particularly in their lower reaches. Both herbaceous and forested wetlands are found at various locations along the stream and creek floodplains.

The tidal ecosystems of southwest Florida include herbaceous and forested wetlands and beaches. The wetlands can be either freshwater or saline as long as they are influenced by tidal water movements. The tidal marshes range from short, sparse herbaceous communities to tall, dense communities, and they can occur on organic, sand, marl, and rock substrates. As in the wet prairies and marshes, they can be invaded by wax myrtle or willow on freshwater sites. On more saline sites, red mangrove (Rhizophora mangle), black mangrove (Avicennia germinans), white mangrove (Laguncularia racemosa), and buttonwood (Conocarpus erectus) dominate the tidal forested wetlands on a similar range of substrates. They can occur as dense shrubby communities or well developed forests, but both have a sparse groundcover. The Bay-Hardwood Scrub community in the Everglades National Park Stairsteps was also included with the tidal forested wetlands. Beaches occur on high-energy coastal shorelines. They include the bare or sparsely vegetated sandy flats along the shore and the dunes behind the shore. The dunes are not normally inundated, but their water table is tidally influenced because of their proximity to the coast and the porosity of their sand substrate.

Use of the Pre-Development Vegetation Map

Several things are important to remember about the southwest Florida Pre-Development Vegetation Map when thinking about ways to use it.

The map is designed to show "pre-development" vegetation. Many areas currently have very different land covers from what are depicted on the map, and not just because of past or current agricultural or residential development. Changes in plant community type or characteristics could also be explained by altered hydrologic and/or fire regimes, as well as the presence of invasive exotic plants.

The map is designed to be used as a basis for reconstructing hydrology in pre-development southwest Florida for a hydrologic model with a mesh of about 20 acres. We did try to make the map as accurate as possible in terms of the type of plant community present on any particular site. However, this was significantly influenced by the degree of familiarity of those working on the map with different geographic areas in southwest Florida. In addition, while the use of soil - plant community relationships provided the best opportunity to create a pre-development vegetation map with the level of detail we needed, it was still a relatively coarse approach to mapping. Where there were extensive areas of disturbed soils, such as near the Gulf coast from Marco Island north, it is primarily a representation of the types of vegetation patterns likely to have been present prior to development. The same can be said for the use of current plant community (and disturbed land) distributions in the NPS lands, although it could be expected to be less of leap in arriving at their pre-development plant community distributions. While these approaches were adequate for our purposes of showing hydrologic patterns in southwest Florida, they would likely be very inadequate for many other purposes, particularly where accurate pre-development plant community type information is needed at exact geographic locations.

When portions of the map in the BCNP are highly magnified, it is possible to find relatively long, very thin polygons that can appear to extend as tails off of other polygons or that can exist as very narrow fringes along other polygons or as thread-like polygons floating in other polygons. These "slivers" appeared in the BCNP while we were editing this area of the map. We have eliminated over 20,000 of these "slivers", but some unknown number still remain. In any future editions of this map, we will try to further reduce their numbers. Given the small size of the "slivers", we do not feel they will adversely affect our intended uses of the map. They are small enough so that they can only be seen under extremely high magnification, and thus do not alter the visual appearance of the map for most uses. The small size should mean that they will not significantly affect the use of the map as the basis for the southwest Florida NSM. The size of the individual model cells are planned to be 20 acres or larger in size, and any remaining "slivers" should make up only a very small fraction of this area, and thus should not significantly affect the "average" attributes of any cell. Examples of situations where the "slivers" might present a problem would be if someone wanted a count or an average area of all polygons or of a certain class of polygons in a portion of the map that included the BCNP. Even without the "slivers", it would be inappropriate to make these kinds of summaries for the map as a whole or for areas that included a mix of one or more soil-based county maps and the plant-community based NPS lands map because of the differences in polygon sizes that existed in the original source maps.

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ATTACHMENT

EDITS TO INDIVIDUAL COUNTY AND NATIONAL PARK SERVICE LAND UNITS

Changes to Charlotte County (Partial) Vegetation Map

Changed numerous soil types/plant communities:

- Cypress to wet prairie (to correct problems on Cecil Webb WMA); soil types involved in change included:
    - Copeland Sandy Loam, Depressional
    - Felda Fine Sand, Depressional
    - Floridana Sand, Depressional
    - Malabar Fine Sand, Depressional
    - Pineda Fine Sand, Depressional
    - Winder Sand, Depressional
- Wet prairie to cypress (mostly around Telegraph Swamp); soil types involved in change included:
    - Copeland Sandy Loam, Depressional
    - Felda Fine Sand, Depressional
    - Floridana Sand, Depressional
    - Malabar Fine Sand, Depressional
    - Pineda Fine Sand, Depressional
    - Pompano Fine Sand, Depressional
    - Valkaria Fine Sand, Depressional
    - Winder Sand, Depressional

- Converted water in excavations and cattle water holes, which usually appeared angular in shape, to plant communities they were located in.

- Converted water in the center of a wet prairie to marsh

- Changed a few individual polygons to more correct plant communities, based normally on aerial photos

- Converted wet prairie above "lake" in upper Peace River estuary to tidal marsh

- Converted disturbed areas, mostly near coast to plant communities based largely on Jim Beever's experience in area. Many of these were located in Mangroves or Tidal marshes along the coast, which is what we converted them back to. An area along Alligator Creek was a band of Xeric Hammock down to where the creek splits.

- Adjusted straight lines along plant community boundaries to resemble more natural configurations.

Matched plant community types for polygons along Charlotte County boundary with Lee and Glades Counties to provide reasonable transitions. I tended to favor the larger of the two polygons and the more common plant community type in the area.

Changes to Western Collier County Vegetation Map

- Changed two soil types/plant communities that were located mostly in SGGE
    - Hallandale and Boca Fine Sands from hydric flatwood to cypress
    - Hallandale Fine Sand from mesic flatwood to hydric flatwood
- Changed Canaveral- Beaches Complex from Xeric Hammock to Beach
- Changed Tuscawilla Fine Sand from Hydric Hammock to Mesic Hammock?*
- Converted water in excavations and cattle water holes to plant communities they were located in.
- Eliminated canals and reconnected plant communities
- Changed a few individual polygons to more correct plant communities, usually of the basis of aerial photography. Also changed some around Corkscrew Swamp based on my familiarity with the area.
- Used Leighty et al. (1954) soils maps to correct developed areas in and around Immokalee, Marco Island, and Naples. See Table C for the crosswalk between Leighty's and our plant community classifications.
- Adjusted straight lines along plant community boundaries to resemble more natural configurations

Matched plant community types for polygons along Collier County boundary with Lee and Hendry Counties to provide reasonable transitions. I tended to favor the larger of the two polygons and the more common plant community type in the area. Matching the polygons between Collier County and the BCNP and ENP required the same process, but since the polygons had not previously been matched in the NSLP process, I needed to adjust both plant community types and polygon shapes to be able to match them across the boundaries. I used aerial photography in the Collier County soil survey (Liudahl et al.1998), McPherson's 1973 eastern Big Cypress Map and Leighty's 1954 soil maps to help make these decisions.

Changes to Glades County (Partial) Vegetation Map

- Changed Floridana Fine Sand, Depressional from cypress to marsh; then changed three of these polygons back to cypress based on aerials

- Replaced Caloosahatchee Canal with 1929 Caloosahatchee River and reconnected plant communities, including islands, which were set to match an adjacent plant community

- Replaced Lake Okeechobee levee with 1929 shoreline and estimated shoreline plant communities based on adjacent communities

- Converted water in excavations and cattle water holes to plant communities they were located in

- Eliminated levees and canals (mostly along lower Fisheating Creek) and reconnected plant communities

- Changed a few individual polygons to more correct plant communities, based normally on aerials

- Estimated plant community distributions at Caloosahatchee River spoil sites

- Adjusted straight lines along plant community boundaries to resemble more natural configurations

Matched plant community types for polygons along Glades County boundary with Charlotte and Hendry Counties to provide reasonable transitions. I tended to favor the larger of the two polygons and the more common plant community type in the area.

Changes to Hendry County Vegetation Map

- Changed plant communities from Wet Prairie to Hydric Flatwood on two soil types to match the soil type/plant community relationship in Collier County
    - Basinger Sand
    - Holopaw Sand, Limestone Substratum
- Changed two soil types/plant communities (just south of LaBelle) from marsh to cypress
    - Malabar Sand, Depressional
    - Pineda Sand, Depressional
- Changed Oldsmar Sand from Xeric Hammock to Mesic Flatwood
- Replaced Caloosahatchee Canal with 1929 Caloosahatchee River and reconnected plant communities, including islands, which were set to match an adjacent plant community
- Replaced Lake Okeechobee levee with 1929 shoreline and estimated shoreline plant communities based on adjacent plant communities
- Converted water in excavations and cattle water holes to plant communities they were in
- Eliminated canals and reconnected plant communities
- Changed a few individual polygons to more correct plant communities, based normally on aerials
- Estimated plant community distributions at Caloosahatchee River spoil sites
- Checked for cypress in southern Okaloacoochee Slough and decided the appropriate sites were a mix of cypress, willow, and marsh communities, and it would take too long to try to sort each individual polygon at this time. Regardless, it does not affect the resulting hydrology because all of these communities have the same hydrology.
- Adjusted straight lines along plant community boundaries to resemble more natural configurations

Matched plant community types for polygons along Hendry County boundary with Lee and Collier Counties to provide reasonable transitions. I tended to favor the larger of the two polygons and the more common plant community type in the area. Matching the polygons between Hendry County and the BCNP required the same process, but since the polygons had not previously been matched in the NSLP process, I needed to adjust both plant community types and polygon shapes to be able to match them across the boundaries. I used aerial photography in the Hendry County soil survey (Belz et al.1990), McPherson's 1973 eastern Big Cypress Map and Leighty's 1954 soil maps to help make these decisions.

Changes to Lee County Vegetation Map

- Converted disturbed areas, mostly near coast to plant communities based largely on Jim Beever's experience in area. Many of these were located in Mangroves or Tidal marshes along the coast, which is what we converted them back to

- Replaced Caloosahatchee Canal with 1929 Caloosahatchee River and reconnected plant communities, including islands, which were set to match an adjacent plant community

- Converted water in excavations and cattle water holes to plant communities they were located in

- Eliminated canals and reconnected plant communities

- Changed a few individual polygons to more correct plant communities, based normally on aerials

- Estimated plant community distributions at Caloosahatchee River spoil sites

- Adjusted straight lines along plant community boundaries to resemble more natural configurations

Matched plant community types for polygons along Lee County boundary with Charlotte and Collier Counties to provide reasonable transitions. I tended to favor the larger of the two polygons and the more common plant community type in the area.

Changes to University of Georgia's Big Cypress National Preserve Vegetation Map

We started with the current (199?) plant community map created by the University of Georgia (UGA) under contract with the National Park Service. Jim Burch reclassed most of the UGA classes to match those used in this study, and Mike Duever completed the reclassification. This map had 73 different classes, of which 65 were natural communities. The remaining classes, defined as Disturbed Areas, included four classes dominated by exotic vegetation, and one each of canals, human landscapes, roads, and spoil areas. All of the Disturbed Areas were converted to natural communities.

- I converted melaleuca (*Melaleuca quinquenervia*) to Flatwoods, usually Hydric, occasionally Mesic, depending on which was more common in an area.

- I converted the few Brazilian pepper (*Schinus terebinthifolius*) to the habitat they were located within.

- I did not retain straight lines associated with roads or other disturbances. Typically I merely connected similar habitats across the artificial boundary. In some cases I configured plant community boundaries so they had a more "natural" shape. This was most frequent along roads, which often had associated parallel canals, since the roads and canals were part of the GIS land cover theme and needed to be removed to recreate the pre-development landscape.

- I converted some areas where different communities were on the two sides of a line, usually a road, into a single community. This difference could be associated with several recent changes in the ecosystem. One situation was a probable difference in successional stage due to an altered fire regime, with the assumption that the earlier successional stage was the pre-development condition. Another situation could be an altered hydrologic regime. I assumed that I-75 (and Alligator Alley before it), the Turner River Road complex, and SR 29 significantly interfere with overland water flows, but Tamiami Trail (US 41) and the Loop Road do not. Where there are significant effects on water flows, I would expect wetter than natural conditions upstream and/or drier conditions downstream. Drier conditions could also increase the frequency and severity of fires. I also used McPherson's (1973) map of the Big Cypress and Leighty et al.'s (1954) soil map to help make decisions about these changes.

- I had classed Cypress (*Taxodium distichum* and *T. ascendens*) Savanna as Cypress, but later changed it back to agree with Jim Burch's decision to classify it as Scrub Cypress.

- I converted all Hydric Hammock (Bay Hardwood Scrub) south of Ochopee to Mangrove.

- I converted Wet Prairie and Marsh that occurred south of line I drew in disturbed coastal areas or along selected UGA coastal plant community polygons to Tidal Marsh. This line was based on McPherson (1973) and partially on Leighty et al. (1954). For Tidal Marsh, I am specifically referring to tidally-influenced, not saline plant communities, which is why I specifically did not say "saline" or "saltwater" marshes.

- I eliminated airboat trails in Tidal Marsh south of Ochopee.

- Spoil and landscaped areas and excavations were converted (divided as necessary) to surrounding plant communities.

- Adjusted straight lines along plant community boundaries to resemble more natural configurations.

There already was a good match between the plant community polygons for the BCNP and ENP. However, since the Hendry and Collier County polygons had not previously been matched with those of the BCNP in the NSLP process, I needed to adjust both plant community types and polygon shapes in both of the counties and the BCNP to be able to match them across the boundaries. I tended to favor the larger polygons and the more common plant community types in the area. I also had to make changes for short distances beyond the edges of the counties and BCNP to create reasonable patterns across the area. I used aerial photography in the Hendry and Collier County soil surveys (Belz et al.1990), McPherson's 1973 eastern Big Cypress Map and Leighty's 1954 soil maps to help make these decisions.

Changes to University of Georgia's Everglades Stairsteps Vegetation Map

- I made the following global changes to my original classification in the vegetation coverage. These communities were exclusively found in the tidal areas. I am specifically referring to tidal, not saline plant communities.

  - Bay Hardwood Scrub: I originally classed as Hydric Hammock, but changed it to Mangrove
  - Swamp Forest: I originally classed as Swamp Forest, but changed it to Mangrove
  - Black Rush (*Juncus roemerianus*): I originally classed as Wet Prairie, but changed it to Tidal Marsh
  - Cordgrass (*Spartina spp.*): I originally classed as Wet Prairie, but changed it to Tidal Marsh

- I changed the following communities to Tidal Marsh within what I defined as the tidal area, based on McPherson (1973), and the portions of Leighty et al. (1954) that were in the Stairstep area. These communities occurred in both tidal and non-tidal areas, so the changes had to be made polygon by polygon. (* not in NPS classification?)

  - Cattail (*Typha spp.*) Marsh
  - Common reed (*Phragmites spp.*)
  - *Freshwater Marsh
  - Graminoid Prairie/Marsh
  - Mixed Graminoids
  - *Non-vegetated (Mud?)
  - Prairies and Marshes
  - Sawgrass (*Cladium jamaicense*)
  - Seconary Canals
  - Shrublands

- Spike Rush (*Eleocharis cellulosa*)
- Tall Sawgrass (*Cladium jamaicense*)
- Willow (*Salix caroliniana*)

- Adjusted straight lines along plant community boundaries to resemble more natural configurations.

There already was a good match between the plant community polygons for the ENP and BCNP. However, since the Collier County polygons had not previously been matched with those of the ENP in the NSLP process, I needed to adjust both plant community types and polygon shapes in Collier County and the ENP to be able to match them across the boundaries. I tended to favor the larger polygons and the more common plant community types in the area. I also had to make changes for short distances beyond the edge of the county and ENP to create reasonable patterns across the area. I used aerial photography in the Collier County soil survey (Belz et al.1990), McPherson's 1973 eastern Big Cypress Map and Leighty's 1954 soil maps to help make these decisions.

Comparisons of Different Counties and NPS Lands

Xeric Flatwood and Xeric Hammock were only present in certain counties, while only Xeric Hammock was present in other counties.

More Marsh in Glades County, while more Wet Prairie in Charlotte County.

Also more Mesic Hammock and more xeric in Glades

Table 1. Hydrologic Regimes of Major Southwest Florida Plant Communities

SW Florida Plant Communities	Hydroperiod (mon)	Seasonal Water Level (in)	
		Wet	Dry (1,10)*
Xeric Flatwood	0	≤-24	-60, -90
Xeric Hammock	0		
Mesic Flatwood	≤1	≤2	-46, -76
Mesic Hammock			
Hydric Flatwood	1 - 2	2 - 6	-30, -60
Hydric Hammock			
Wet Prairie	2 - 6	6 - 12	-24, -54
Dwarf Cypress			
Marsh	6 - 10	12 - 24	-6, -46
Cypress	6 - 8	12 - 18	-16, -46
Swamp Forest	8 - 10	18 - 24	-6, -36
Open Water	>10	≥24	< 24, -6
Tidal Marsh	Tidal	Tidal	Tidal
Mangrove			
Beach			

* 1 = average year low water
10 = 1 in 10 year drought

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Table 2. Soil Types and Associated Plant Communities for the Southwest Florida Counties

Soil Type	Collier	Hendry	Lee	Glades	Char	Plant Community	Notes #Changed to
Adamsville Fine Sand		1				Mesic Flatwood	
Adamsville Variant Sand		1				Hydric Hammock	
Anclote Sand, Depressional			1		1	Cypress	
Aquents, Organic Substratum		1				Marsh	
Arents, Very Steep				1		Disturbed	
Astor Fine Sand, Depressional				1		Marsh	
Basinger Sand		#1				Wet Prairie	#Hydric Flatwood
Basinger Fine Sand	1			1		Hydric Flatwood	
Basinger Fine Sand, Occasionally Flooded	1					Mesic Hammock	
Basinger Fine Sand, Depressional				1		Wet Prairie	
Beaches			1		1	Beach	
Boca Sand		1				Mesic Flatwood	
Boca Fine Sand	1		1	1	1	Mesic Flatwood	
Boca Sand, Depressional		1				Cypress Forest	
Boca Fine Sand, Slough			1		1	Hydric Flatwood	
Boca Fine Sand, Tidal			1		1	Tidal Marsh	
Boca, Riviera, Limestone Substratum and Copeland FS, Depressional	1					Swamp Forest	
Bradenton Fine Sand			1		1	Hydric Hammock	
Caloosa Fine Sand			1		1	Disturbed	
Canaveral Fine Sand			1		1	Xeric Hammock	
Canaveral-Urban Land Complex			1		1	Disturbed	
Canaveral - Beaches Association	#1					Xeric Hammock	#Beach?
Captiva Fine Sand			1		1	Wet Prairie	
Chobee Muck					1	Swamp Forest	
Chobee Fine Sandy Loam, Depressional		1				Marsh	
Chobee Loamy Fine Sand, Depressional				1		Marsh	

Chobee Fine Sandy Loam, Limestone Substratum, Depressional		1				Swamp Forest	
Chobee, Limestone Substratum and Dania Mucks, Depressional	1					Swamp Forest	
Chobee, Winder and Gator Soils, Depressional	1					Wet Prairie	
Cocoa Fine Sand			1		1	Xeric Flatwood	
Copeland Sandy Loam, Depressional			1		1	Cypress	
Dania Muck		1		1		Marsh	
Daytona Sand			1**		1*	Xeric Flatwood*	Mesic Flatwood**(NO)
Delray Sand, Depressional		1				Swamp Forest	
Denaud Muck		1				Cypress Forest	
Denaud-Gator Mucks		1				Marsh	
Durbin and Wilfert Mucks, Frequently Flooded	1					Mangrove	
Eaugallie Sand			1		1	Mesic Flatwood	
Eaugallie Fine Sand				1		Mesic Flatwood	
Electra Fine Sand			1		1	Xeric Hammock	
Estero Muck			1		1	Tidal Marsh	
Estero and Peckish Soils, Frequently Flooded	#1					Salt Flats	#Tidal Marsh
Farmton Fine Sand					1	Mesic Flatwood	
Felda Fine Sand			1	1	1	Hydric Flatwood	
Felda Fine Sand, Depressional			1		1	Cypress	
Floridana Sand, Depressional			1		1	Cypress	
Floridana Fine Sand, Depressional				1		Cypress	
Floridana, Astor,and Felda Soils, Frequently Flooded				#1		Swamp Forest	#Floodplain Forest
Ft. Drum Fine Sand				1		Mesic Hammock	
Ft. Drum and Malabar, High, Fine Sands	1					Mesic Hammock	
Gator Muck		1	1	1	1	Marsh	
Gentry Fine Sand, Depressional		1				Marsh	
Hallandale Sand		1				Mesic Flatwood	
Hallandale Fine Sand	#1		1	1	1	Mesic Flatwood	#Hydric Flatwood
Hallandale Sand, Depressional		1				Wet Prairie	
Hallandale Fine Sand, Slough			1		1	Hydric Flatwood	
Hallandale Fine Sand, Tidal			1		1	Mangrove	

Hallandale - Pople Complex				1		Mesic Hammock	
Hallandale-Urban Land Complex			1		1	Disturbed	Mesic Flatwood
Hallandale and Boca Fine Sands	#1					Hydric Flatwood	#Cypress
Heights Fine Sand			1		1	Mesic Flatwood	
Hilolo Limestone Substratum, Jupiter and Margate Soils	1					Mesic Flatwood	
Holopaw and Okeelanta Soils, Depressional	1					Marsh	
Holopaw Sand		1				Hydric Flatwood	
Holopaw Fine Sand	1					Hydric Flatwood	
Holopaw Fine Sand, Limestone Substratum	1					Hydric Flatwood	
Holopaw Sand, Limestone Substratum		#1				Wet Prairie	#Hydric Flatwood
Holopaw Sand, Depressional		1				Marsh	
Immokalee Sand		1*	1**	1*	1*	Mesic Flatwood*	Hydric Flatwood** (NO)
Immokalee Fine Sand	1					Mesic Flatwood	
Immokalee-Urban Land Complex			1		1	Disturbed	Mesic Flatwood?
Isles Fine Sand, Depressional			1		1	Cypress	
Isles Fine Sand, Slough			1		1	Hydric Hammock	
Isles Muck			1		1	Mangrove	
Jupiter Fine Sand		1				Mesic Hammock	
Jupiter - Boca Complex	1					Swamp Forest	
Jupiter-Ochopee-Rock Outcrop Complex		1				Hydric Flatwood	
Kesson Muck, Frequently Flooded	#1					Salt Marsh	#Tidal Marsh
Kesson Fine Sand			1		1	Mangrove	
Lauderhill Muck		1		1		Marsh	
Malabar Sand		1				Hydric Flatwood	
Malabar Fine Sand	1		1	1	1	Hydric Flatwood	
Malabar Fine Sand, Depressional			1		1	Cypress	
Malabar Sand, Depressional		1				Marsh	
Malabar Fine Sand, High		1	1	1	1	Mesic Flatwood	
Margate Sand		1				Marsh	MM
Matlacha Gravelly Fine Sand			1		1	Disturbed	?

Matlacha Gravelly Fine Sand, Limestone Substratum			1		1	Disturbed	Mesic Flatwood?
Matlacha, Urban Land Complex			1		1	Disturbed	Mesic Flatwood?
Myakka Sand		1				Mesic Flatwood	
Myakka Fine Sand	1		1	1	1	Mesic Flatwood	
Myakka Fine Sand, Depressional			1		1	Wet Prairie	
Myakka Sand, Depressional		1				Marsh	MM
Ochopee Fine Sandy Loam	1					Scrub Cypress	
Ochopee Fine Sandy Loam, Low	1					Wet Prairie	
Okeelanta Muck		1				Marsh	
Okeelanta Muck, Depressional				1		Marsh	
Okeelanta and Dania Mucks, Depressional				1		Marsh	
Oldsmar Fine Sand	1			1		Mesic Flatwood	
Oldsmar Sand		1	1		1	Mesic Flatwood	
Oldsmar Sand, Depressional		1				Wet Prairie	MM
Oldsmar Sand, Limestone Substratum		1				Mesic Flatwood	
Oldsmar Fine Sand, Limestone Substratum	1*		1**		1*	Mesic Flatwood*	Hydric Flatwood** (NO)
Orsino Fine Sand			1		1	Xeric Flatwood	
Pahokee Muck		1		1		Marsh	MM
Paola Fine Sand, 1 to 8 PCT Slopes	1					Xeric Hammock	
Peckish Mucky Fine Sand			1		1	Mangrove	
Pennsucco Silt Loam	1					Wet Prairie	
Pineda Sand, Depressional		1				Wet Prairie	
Pineda Fine Sand, Depressional			1		1	Cypress	
Pineda Fine Sand, Limestone Substratum	1		1		1	Hydric Flatwood	
Pineda Sand, Limestone Substratum		1				Hydric Flatwood	
Pineda Fine Sand		1	1	1	1	Hydric Flatwood	
Pineda and Riviera Fine Sands	1					Hydric Flatwood	
Plantation Muck		1		1		Marsh	
Pomello Fine Sand	1			1		Xeric Hammock	
Pomello Fine Sand, 0 to 5 PCT Slopes		1				Xeric Hammock	
Pompano Sand		1				Wet Prairie	
Pompano Fine Sand			1		1	Wet Prairie	

Pompano Fine Sand, Depressional			1		1	Wet Prairie	
Pople Fine Sand				1		Mesic Hammock	
Punta Fine Sand			1		1	Mesic Flatwood	
Riviera Fine Sand		1				Hydric Flatwood	
Riviera Sand, Depressional		1				Wet Prairie	
Riviera Fine Sand, Limestone Substratum	1					Cypress Forest	
Riviera Sand, Limestone Substratum		1				Wet Prairie	
Riviera Sand, Limestone Substratum Depressional		1				Marsh	
Riviera, Limestone Substratum - Copeland Fine Sand	1					Swamp Forest	
Sanibel Muck				1		Marsh	
Sanibel Muck, Depressional				1		Marsh	
Satellite Fine Sand	1		1		1	Xeric Hammock	
Smyrna Fine Sand			1	1	1	Mesic Flatwood	
Smyrna-Urban Land Complex			1		1	Disturbed	Mesic Flatwood?
St. Augustine Sand			1		1	Disturbed	?
St. Augustine Sand, Organic Substratum-Urban Land Complex			1		1	Disturbed	Mangrove?
Tequesta Muck				1		Marsh	
Terra Ceia Muck		1	1	1	1	Marsh	
Tuscawilla Fine Sand	1*	1**				Hydric Hammock*	Mesic Hammock**
Udifluvents		1				Disturbed	
Udorthents		1				Disturbed	
Udorthents Shaped	1					Disturbed	
Urban Land	1		1		1	Disturbed	
Urban Land - Aquents Complex, Organic Substratum	1					Disturbed	
Urban Land - Holopaw - Basinger Complex	1					Disturbed	
Urban Land - Immokalee -Oldsmar, Limestone Substratum, Complex	1					Disturbed	
Urban Land - Matlacha - Boca Complex	1					Disturbed	
Urban Land - Satellite Complex	1					Disturbed	
Valkaria Sand		1				Wet Prairie	
Valkaria Fine Sand			1	1	1	Hydric Flatwood	
Valkaria Fine Sand, Depressional			1		1	Wet Prairie	

Wabasso Sand		1*	1**		1*	Mesic Flatwood*	Hydric Flatwood** (NO)
Wabasso Fine Sand	1				1	Mesic Flatwood	
Wabasso Sand, Limestone Substratum		1	1		1	Mesic Flatwood	
Water	1	1	1	1	1	Water	
Winder Fine Sand		1				Wet Prairie	
Winder Fine Sand, Depressional		1				Wet Prairie	
Winder Sand, Depressional			1		1	Cypress	
Winder, Riviera, Limestone Substratum, and Chobee Soils Depressional	1					Marsh	
Wulfert Muck			1		1	Mangrove	
	37	49	59	33	62		

Table 3. National Park Service Lands and Southwest Florida Feasibility Study Plant Community Crosswalk.

Jones et al. Plant Community (South Florida NPS Lands)	Jones Abbrev.*	Duever ENP Comm.	Duever BCNP Comm.
Australian Pine (Casuarina spp.)	EC	Disturbed Areas	
Bay Hardwood Scrub	SS	Mangrove	Mangrove
Bayhead	FSb	Hydric Hammock	Hydric Hammock
Beaches	BCH	Beach	Beach
Black (Avicennia germinans) Mangrove	FMa	Mangrove	
Black (Avicennia germinans) scrub	SMa	Mangrove	Mangrove
Black rush (Juncus roemerianus)	PGj	Tidal Marsh	Tidal Marsh
Brazilian Pepper (Schinus terebinthifolius)	ES	Disturbed Areas	Disturbed Areas
Broadleaf Emergents	PEb	Marsh	Marsh
Buttonbush (Cephalanthus occidentalis)	SBc	Marsh	
Buttonwood (Conocarpus erectus) Forest	FB	Mangrove	
Buttonwood (Conocarpus erectus) scrub	SC	Mangrove	
Cabbage Palm (Sabal palmetto) Forest	FC	Mesic Hammock	Mesic Hammock
Cajeput (Melaleuca quinquenervia)	EM	Disturbed Areas	Disturbed Areas
Cattail (Typha spp.) Marsh	PC	Marsh	Marsh
Cocoplum (Chrysobalanus icaco)	SBy	Mesic Hammock	Mesic Hammock
Common reed (Phragmites spp.)	PGp	Wet Prairie	Wet Prairie
Cordgrass (Spartina spp.)	PGs	Tidal Marsh	Tidal Marsh
Cypress (Taxodium distichum and T. ascendens) Savanna	SVC	Scrub Cypress	Scrub Cypress
Cypress Domes	FSd	Cypress	Cypress
Cypress Mixed Hardwoods	FSx	Cypress	Cypress
Cypress Pines	FSCpi	Hydric Flatwood	Hydric Flatwood
Cypress Strands	FSc	Cypress	Cypress
Cypress with pine	SVCpi	Hydric Flatwood	Hydric Flatwood
Dwarf Cypress	SVCd	Scrub Cypress	Scrub Cypress
Exotics	E	Disturbed Areas	Disturbed Areas
Floating/Floating Attached Emergents	PEf	Marsh	

Graminoid	PHg	Tidal Marsh	
Graminoid Prairie/Marsh	PG	Wet Prairie	Wet Prairie
Groundsel bush (Baccharis spp.)	SBb	Mesic Flatwood	
Halophytic Herbaceous Prairie	PH	Tidal Marsh	
Hardwood Scrub	SH	Mesic Hammock	Mesic Hammock
Java Plum (Syzygium cumini)	EJ	Disturbed Areas	Disturbed Areas
Lather Leaf (Colubrina asiatica)	EO	Disturbed Areas	
Maidencane (Panicum hemitomon)	PGa	Wet Prairie	Wet Prairie
Maidencane Spike rush	PGw	Wet Prairie	Wet Prairie
Major Canals (>30m wide)	C		Water
Major Roads (> 30m wide)	RD	Disturbed Areas	Disturbed Areas
Mangrove Forest	FM	Mangrove	
Mangrove Scrub	SM	Mangrove	Mangrove
Mixed Graminoids	PGx	Wet Prairie	Wet Prairie
Mixed Hardwood Swamp Forest	FSh	Swamp Forest	Swamp Forest
Mixed Hardwoods	FSa	Swamp Forest	Swamp Forest
Mixed Mangrove	FMx	Mangrove	Mangrove
Mixed Scrub	SMx	Mangrove	Mangrove
Mud	M	Tidal Marsh	
Muhly grass (Muhlenbergia filipes)	PGm	Wet Prairie	Wet Prairie
Non graminoid Emergent Marsh	PE	Wet Prairie	Marsh
Oak Sabal Forest	FO	Mesic Hammock	Mesic Hammock
Open Water	W	Water	Water
Palm (Sabal palmetto) Savanna	SVPM	Mesic Hammock	Hydric Flatwood
Paurotis Palm (Acoelorrhaphe wrightii) Forest	FP	Mesic Hammock	Mesic Hammock
Pine (Pinus elliottii var. densa) Savanna	SVPI	Hydric Flatwood	Hydric Flatwood
Pond Apple	SBa	Swamp Forest	
Pop Ash (Faxinus caroliniana)	SBf	Marsh	Marsh
Prairies and Marshes	P	Wet Prairie	Wet Prairie
Primrose (Ludwigia spp.)	SBl	Wet Prairie	
Red (Rhizophora mangle) Mangrove	FMr	Mangrove	
Red (Rhizophora mangle) scrub	SMr	Mangrove	Mangrove
Savanna	SV	Hydric Flatwood	Hydric Flatwood

Saw Palmetto (Serenoa repens) scrub	SP	Mesic Flatwood	Mesic Flatwood
Sawgrass (Cladium jamaicense)	PGc	Wet Prairie	Wet Prairie
Seconday canals (< 30m wide)	Cs?	Water	
Shrublands	SB	Marsh	Marsh
Slash pine mixed with palms	SVx	Mesic Flatwood	Mesic Flatwood
Slash pine with cypress	SVPIc	Hydric Flatwood	Hydric Flatwood
Slash pine with hardwoods	SVPIh	Mesic Flatwood	Mesic Flatwood
Spike rush (Eleocharis cellulosa)	PGe	Wet Prairie	Wet Prairie
Spoil Areas	SA	Disturbed Areas	Disturbed Areas
Structures and Cultivated Lawns	HI	Disturbed Areas	Disturbed Areas
Subtropical Hardwood Forest	FT	Mesic Hammock	Mesic Hammock
Succulent	PHs	Tidal Marsh	
Swamp Forest	FS	Mangrove	Mangrove
Tall Sawgrass (Cladium jamaicense)	PGct	Marsh	Marsh
Tropical Soda Apple (Solanum viarum)	EL	Disturbed Areas	
Wax myrtle (Myrica cerifera)	SBm	Wet Prairie	
White (Laguncularia racemosa) Mangrove	FMl	Mangrove	
White (Laguncularia racemosa) scrub	SMl	Mangrove	
Willow (Salix caroliniana)	SBs	Marsh	Marsh
	FSbc		Hydric Hammock
	PCl		Marsh
	PR		Wet Prairie
	SBt		Mesic Hammock
	SPVI		Mesic Flatwood
	SPVIc		Mesic Flatwood
	SVMP		Hydric Flatwood

* Some of the 2nd or later letters can be caps or lower case but they indicate the same community.

Table 4. General Corrections to Initial Soil/Plant Community Relationships

Type of Correction	Charlotte	Collier	Glades	Hendry	Lee	BCNP	ENP
Eliminated canals and reconnected plant communities	X	X	X	X	X	X	X
Converted water in excavations and cattle water holes, as well as filled sites, all of which often appeared angular in shape, to surrounding plant community (s)	X	X	X	X	X	X	X
Changed individual polygons to more correct plant communities, based normally on aerial photos, personal experience in some areas, and available references	X	X	X	X	X	X	X
Adjust plant community type across county and/or NPS lands boundaries	X	X	X	X	X	X	X
Adjusted straight lines along plant community boundaries to more natural configurations.	X	X	X	X	X	X	
Changed plant communities on selected soil types	X	X	X	X			
Replaced Caloosahatchee Canal with 1929 Caloosahatchee River and reconnected plant communities, including islands, which were set to match an adjacent plant community			X	X	X		
Estimated plant community distributions at Caloosahatchee River spoil sites			X	X	X		

Replaced Lake Okeechobee levee with 1929 shoreline and estimated shoreline plant communities based on adjacent plant communities		X	X		
Converted large disturbed areas, mostly near coast to plant communities based largely on Jim Beever's experience in area.	X			X	

Table 5. Collier County 1954 Soil Survey and Vegetation

Map Unit Symbol	Soil Name or Position - 1954 Collier Cty	SCS Vegetation Types	SWFFS Veg Types
Aa	Arzell Fine Sand	Slash Pines	Hydric Flatwood
Aa3	Arzell Fine Sand	Prairie	Wet Prairie
Ba	Blanton Fine Sand	Slash Pine	Xeric Flatwood
Bb	Broward Fine Sand	Slash Pines	Mesic Flatwood
Bc	Broward Fine Sand, heavy substratum	Slash Pines	Mesic Flatwood
Bc4	Broward Fine Sand	Palmetto	Mesic Flatwood
Bd	Broward Fine Sand, shallow	Slash Pines	Mesic Flatwood
Bd4	Broward Shallow	Palmetto	Mesic Flatwood
Be	Broward/Ochopee Complex	Slash Pines	Hydric Flatwood
Be7	Broward/Ochopee Complex	Mixed Palmetto and Prairie	Wet Prairie
Be8	Broward/Ochopee Complex	Mixed Pine and Cypress	Hydric Flatwood
Ca	Charlotte Fine Sand	Slash Pine	Hydric Flatwood
Cb	Coastal Beach	Cabbage Palmetto	Beach
Cc	Copeland Fine Sand	Subtropical Hammock/Flatwood	Mesic Hammock
Cd	Copeland Fine Sand, low	Cabbage Palmetto	Mesic Hammock
Ce	Copeland Fine Sand, shallow	Cabbage Palmetto	Mesic Hammock
Cf	Cypress Swamp	Cypress and other trees	Cypress
Fa	Felda Fine Sand	Grasses	Wet Prairie
Fb	Freshwater Marsh	Marsh Plants	Marsh
Ia	Immokalee Fine Sand	Slash Pines	Mesic Flatwood
Ka	Keri-Copeland Complex	Cabbage Palmetto & Slash Pines	Mesic Flatwood
Kb	Keri Fine Sand	Slash Pines	Mesic Flatwood
La	Lakewood Fine Sand	Scrub	Xeric Hammock
Ma	Made Land	Made Land	Disturbed
Mb	Mangrove Swamp	Mangrove	Mangrove
Mc	Matmon Loamy Fine Sand	Slash Pines	Mesic Flatwood

Oa	Ochopee Fine Sandy Marl	Grasses	Wet Prairie
Ob	Ochopee Fine Sandy Marl, shallow	Grasses	Wet Prairie
Ob2	Ochopee Fine Sandy Marl, shallow	Slash Pine	Hydric Flatwood
Ob5	Ochopee Fine Sandy Marl, shallow	Cypress	Cypress
Oc	Ochopee Fine Sandy Marl, tidal	Salt Tolerant Grasses	Tidal Marsh
Od	Ochopee Marl	Grasses	Wet Prairie
Oe	Ochopee Marl, deep	Grasses	Wet Prairie
Of	Ochopee Marl, shallow	Grasses	Wet Prairie
Pa5	Pompano Fine Sand	Cypress	Hydric Flatwood
Ra	Rockland	Slash Pine	Hydric Flatwood
Ra2	Rockland	Slash Pine	Hydric Flatwood
Ra3	Rockland	Prairie	Hydric Flatwood
Ra9	Rockland	Mixed Pine, Cypress, and Prairie	Hydric Flatwood
Sa	St. Lucie Fine Sand	Scrub	Xeric Hammock
Sb	Shell Mounds	Cabbage Palmetto	Xeric Hammock
Sc	Sunniland Fine Sand	Slash Pine	Mesic Flatwood
Ta	Tidal Marsh	Salt Tolerant Marsh Grasses & Shrubs	Tidal Marsh
Tb	Tucker Marl	Grasses	Wet Prairie

Table 6. Soils Common to Different Combinations of Counties

	Without Disturbed Soil Types and Water (%)*				
	Charlotte	Collier	Glades	Hendry	Lee
Charlotte	100	19	26	28	94
Collier	28	100	22	28	28
Glades	42	24	100	48	45
Hendry	29	20	31	100	27
Lee	98	19	29	27	100

* Percentage comparisons of number of soil types each pair of counties has in commom divided by total number of soil types in a county are horizontal, not vertical.

	Without Disturbed Soil Types and Water				
	Charlotte	Collier	Glades	Hendry	Lee
Charlotte	54	10	14	15	51
Collier	10	36	8	10	10
Glades	14	8	33	16	15
Hendry	15	10	16	51	14
Lee	51	10	15	14	52

	With Disturbed Soil Types and Water				
	Charlotte	Collier	Glades	Hendry	Lee
Charlotte	66	12	15	15	63
Collier	12	44	9	11	12
Glades	15	9	35	17	16
Hendry	15	11	17	54	15
Lee	63	12	16	15	63

Table 7. Major Plant Communities and Their Characteristics in Southwest Florida

Plant Community	Topographic Setting and Soils	Dominant Vegetation*	Hydrology	Fire
Xeric Flatwood	White well-drained sands on locally higher elevations or at the top of steep slopes.	Dense thickets of low (<10 ft high) shrubs and xeric oaks, including myrtle oak, live oak, and sand live oak, with scattered patches of mostly bare white sand and a very scattered overstory of slash pine.	Wet season water table usually more than 2 ft below ground.	Maintained by intense crown fires every 10-15 years. Because of little groundcover, occasional surface fires are light and patchy.
Xeric Hammock	White well-drained sands on locally higher elevations or at the top of steep slopes.	Dense, tall (10-20 ft) closed canopy forest of xeric oaks, including myrtle oak, live oak, and sand live oak, with a scattered overstory of slash or sand pine and little groundcover.	Wet season water table usually more than 2 ft below ground.	Develops in the absence of fire for 50 years.
Mesic Flatwood	Light-to-dark brown, sandy soils on sites with little topographic relief.	Open canopy of slash pine, with understory dominated by dense palmetto.	Inundated 0-1 month per year. Normal wet season water depths from 2 ft below ground to 0.2 ft above ground. Annual water table fluctuation of 4 ft.	Maintained by light-moderate intensity, growing season fires every 2-5 years.
Mesic Hammock	Sandy or rocky soils on elevated sites within or adjacent to larger wetlands.	Dense canopy of live oak and/or tropical hardwoods, with open-to-dense shrub and sapling subcanopy and a sparse groundcover.	Inundated 0-1 month per year. Normal wet season water depths from 2 ft below ground to 0.2 ft above ground. Annual water table fluctuation of 4 ft.	Found on sites that have not experienced a growing season burn for more than 80 years.

Hydric Flatwood	Light-to-dark brown, sandy soils on sites with little topographic relief.	Open canopy of slash pine, with diverse, primarily herbaceous groundcover, e.g. little bue maidencane, and other grasses, sedges, forbs, and some palmetto.	Inundated 1-2 months per year. Normal wet season water depths from 1 ft below ground to 0.50 ft above ground. Annual water table fluctuation of 4 ft.	Maintained by light-moderate intensity, growing season fires every 2-5 years.
Hydric Hammock	Loamy, rocky or sandy soils on elevated sites within or adjacent to larger wetlands.	Closed canopy forest, with laurel oak, sabal palm, red maple, swamp bay, slash pine, an open-to-dense shrub and sapling subcanopy, and a sparse groundcover.	Inundated 1-2 months per year. Normal wet season water depths from 1 ft below ground to 0.5 ft above ground. Annual water table fluctuation of 4 ft.	Found on sites that have not experienced a growing season burn for more than 80 years.
Wet Prairie	Depression and flowway wetlands on sand or marl soils.	Short (2-5 ft), open-to-dense, diverse primarily herbaceous community with many grasses, sedges, and forbs, e.g. sand cordgrass, beaksedges, milkworts, St. Johns-wort, and wax myrtle.	Inundated 2-6 months per year. Normal wet season water depths 0.5-1.3 ft. Annual water table fluctuation of 3.5 ft.	Maintained by moderately intense, growing season fires about every 2-5 years.
Dwarf Cypress	Depression and flowway wetlands on limestone bedrock.	Open stands of stunted cypress with a sparse herbaceous groundcover	Inundated 2-6 months per year. Normal wet season water depths 0.5-1.3 ft. Annual water table fluctuation of 3.5 ft.	Maintained by low intensity fires about every 20-50 years.
Marsh	Depression and flowway wetlands and fringes of lakes and streams on organic soils.	Tall (4-10 ft), dense, primarily herbaceous community, often with only a few species, e.g. pickerelweed, arrowhead, sawgrass, maidencane, and willow.	Inundated 6-10 months per year. Normal wet season water depths of 1-2 ft. Annual water table fluctuation of 2-3 ft.	Maintained by moderately intense, growing season fires about every 2-5 years.
Cypress	Depression or flowway wetlands and fringes of lakes and streams with sandy or shallow (<1 ft) organic soils.	Canopy dominated by cypress, with open-to-dense understory of shrubs and herbaceous vegetation.	Inundated 6-8 months per year. Normal wet season water depths of 1-1.5 ft. Annual water table fluctuation of 3 ft.	Maintained by light-moderate intensity, growing season fires every 20-50 years.

Swamp Forest	Depression or flowway wetlands with deep (>1 ft) organic soils.	Closed canopy of cypress and mixed hardwoods, e.g. red maple, sweetbay, pond apple, pop ash, and dahoon holly with occasional palms, and an open-to-dense understory of shrubs and herbaceous vegetation, e.g., buttonbush, fire flag, and ferns.	Inundated 8-10 months per year. Normal wet season water depths of 1.5-2 ft. Annual water table fluctuation of 2 ft.	Found on sites infrequently reached by fire.
Water	Basins or channels with water too deep for emergent vegetation.	Open water with submerged or floating aquatic plants, e.g., water lettuce.	Normally have water above ground. Edges or all (depending on size and depth) could dry down in extreme (>25year) droughts.	During extreme (>25 years) droughts, exposed dry organics on bottom can burn. Ponds can be created by organic soil fires.
Tidal Marsh	Coastal tidal sites with sand, rock or organic substrates.	Open-to-dense low diversity herbaceous communities.	Inundated by salt or fresh water and drained on regular daily-to-monthly schedule.	Maintained by moderately intense, growing season fires about every 1-4 years.
Mangrove Swamp	Coastal tidal sites with sand, rock or organic substrates.	Canopy dominated by red, black, or white mangroves or buttonwood, and little or no groundcover.	Inundated by salt or fresh water and drained on regular daily-to-monthly schedule.	Developed and maintained by absence of fire.
Beach	Sandy flat and dune substrates along and behind high energy shoreline	Bare sand along shoreline or in adjacent dunes.	Water depth underlying sand variable depending on tides and location on beach slope and dunes.	No fuels to support fire.

* The scientific names for these species are listed in Table 7.

Table 8. Scientific names for species listed in Table 7.

Common Name	Scientific Name	Common Name	Scientific Name
arrowheads	*Sagittaria sp.*	pickerelweed	*Pontederia cordata*
beaksedges	*Rhynchospora sp.*	pond apple	*Annona glabra*
black mangrove	*Avicennia germinans*	pop ash	*Fraxinus caroliniana*
blueberries	*Vaccinium sp.*	red mangrove	*Rhizophora mangle*
bluestems	*Andropogon sp.*	red maple	*Acer rubrum*
buttonbush	*Cephalanthus occidentalis*	sabal palm	*Sabal palmetto*
buttonwood	*Conocarpus erectus*	sand cordgrass	*Spartina bakeri*
cypress	*Taxodium distichum*	sand live oak	*Quercus geminata*
dahoon holly	*Ilex cassine*	sawgrass	*Cladium jamaicense*
fireflag	*Thalia geniculata*	silkgrass	*Pityopsis graminifolia*
gallberry	*Ilex glabra*	slash pine	*Pinus elliottii*
greenbriars	*Smilax sp.*	St. John's-wort	*Hypericum fasciculatum*
groundsel tree	*Baccharis halimifolia*	staggerbush	*Lyonia fruticosa*
laurel oak	*Quercus laurifolia*	swamp bay	*Persea palustris*
little blue maidencane	*Amphicarpum muhlenbergianum*	sweetbay	*Magnolia virginiana*
live oak	*Quercus virginiana*	water lettuce	*Pistia stratoites*
maidencane	*Panicum hemitomon*	wax myrtle	*Myrica cerifera*
milkworts	*Polygala sp.*	white mangrove	*Laguncularia racemosa*
myrtle oak	*Quercus myrtifolia*	white waterlily	*Nymphaea odorata*
palmetto	*Serenoa repens*	willow	*Salix caroliniana*