



2009 SFWMD PHOTOINTERPRETATION KEY

In 2009 the South Florida Water Management District implemented the 2009 LCLU project to update the ArcGIS Land Cover/ Land Use (LCLU) dataset using 2008 – 2009 aerial photographs produced and funded by Florida Department of Revenue (FDOR) as the source imagery. Delineation updates from 2004 -05 dataset were made on-screen during the photointerpretation process.

The classification system used for this project was the Florida Land Use, Cover and Forms Classification System (FLUCCS), which was originally compiled by the Florida Department of Transportation, State Topographic Bureau. The classification system was amended by the District for use on this project and these amendments are described within this document.

The following photointerpretation key was developed in order to document the decisions and mapping conventions applied during the photointerpretation process. The key was used to assist the photointerpreters in compiling the Land Cover/Land Use 2009 Mapping Project and helped to ensure that the photointerpretation was consistent throughout the project. It was designed to provide descriptions of the visual and spatial distribution characteristics of the classification types used for the project.

The photointerpretation key documents any special mapping conventions that were applied during the mapping effort. All photointerpretation was conducted in accordance with the Florida Land Use, Cover and Forms Classification System unless otherwise indicated within the photointerpretation key. The key also serves to provide insight for future users into the rationale for the delineations and classifications appearing within the database.

CREDITS

This South Florida Water Management District (SFWMD) Land Cover/Land Use (LCLU) 2009 Mapping Project PI Key was derived from a combination of materials relevant to land cover, land use mapping. The document was originally produced by Avineon, Inc. (formerly AGRA-Baymont, Inc. and Geonex Corporation) in 1995 as part of the St. Johns River Water Management District (SJRWMD) 1995 Land Use/Land Cover Mapping Project. The document has since been improved and updated by Photo Science, Inc. in 2003, and the SFWMD in 2009 to include additional reference information intended to assist users in accurately photo interpretation and mapping land cover and land use.

Classification codes are based on the Florida Land Use, Cover, and Forms Classification System; Department of Transportation, State Topographic Bureau, Thematic Mapping Section; January 1999 Edition.

The following individuals played a critical role in the development of the SFWMD LCLU 2009 Mapping Project PI Key:

James Cameron - SFWMD GIS Director
Kurt Saari - SFWMD GIS Manager
Kuang-Yao Lee - SFWMD Sr. GIS Data Steward
Jenifer Barnes - SFWMD Subject Matter Expert
Jim Kramp - SFWMD Subject Matter Expert
Cindy Bowes – Photointerpreter
Gary Krasovetz - Photointerpreter

UPDATE HISTORY

Revision 1.5 (8/1/2011):

- Updated natural color aerial photography and PI-Key descriptions for each classification

Revision 1.4 (6/15/2011):

- Moved “Abandoned Groves” from 3230 to 2240, which is consistent to FDOT FLUCCS 224

Revision 1.1 (1/10/2011):

- Added a page to describe the procedure to re-classify 1310 to 1210 (see Bookmark on “High-Density Residential Modification”)

The SFWMD LCLU 2009 Mapping Project PI Key, version 1.0, was updated by:
SFWMD LCLU Project Team, November 2010.

Changes from the 2004-05 version include the following:

- Added a 4th bullet under 5420 “Keys to Photo interpretation”.
- 2130 Woodland Pastures – Changed dual coding convention from a land cover class to a land use class where a separate land cover code is always required.
- Removed 6430 and consolidated into 6410. Removed all links in all PI Keys to 6430.
- Updated 6410 to include text pertaining to removal of 6430.

The SFWMD LCLU 2004-05 Mapping Project PI Key was updated by:
Photo Science, Inc., St. Petersburg, Florida

The SFWMD LCLU 1999 Mapping Project PI Key was originally designed and developed in 2003 by:
Avineon, Inc., Clearwater, Florida.

USER GUIDE

HOW TO ACCESS THE PI-KEY

This User Guide contains information on how to access and understand the Land Cover / Land Use (LCLU) classification system used by the South Florida Water Management District (SFWMD). Users can click the Classification Code bookmark in the left navigation menu to directly access the FLUCCS Photointerpretation Key page which describes the selected code.



If you do not see the bookmark links, click on the bookmark icon to open the menu.

The "Photointerpretation Structure Key" page provides an outline view of all the PI Keys in the document.

PAGE CONTENT DESCRIPTION

This LCLU classification system is arranged in hierarchical levels with each level containing land information of increasing specificity. The various categories and subcategories listed and defined herein reflect the types of data and information which were extracted from aerial images. The images that were used as part of the photointerpretation processes are displayed on each key page. Ground level field pictures, representing each classification type, are also included on each key page. For the 2009 update, natural color aerial photography from 2008-09 was used for photointerpretation. This updated color aerial photography, along with color infrared photography from 2004-05 are included in this document.

Each FLUCCS Photointerpretation Key page describes a unique FLUCCS code. The following sections are included on each page of the key:

1. **CLASSIFICATION CODE:** Located in the left navigation and at the top of each page is the entire four-digit FLUCCS code as applied during photointerpretation.
2. **LEVEL:** Lists each level within the four-digit FLUCCS code.
3. **DESCRIPTION:** This is the description of the classification code as it is used by the SFWMD in this dataset. Classification codes are based on the Florida Land Use, Cover, and Forms Classification System; Department of Transportation, State Topographic Bureau, Thematic Mapping Section; January 1999 Edition. They are modified as needed by the District to meet their mapping objectives.
4. **KEYS TO PHOTOINTERPRETATION:** These are descriptions which consist of the typical characteristics of each class. Features which are associated with the class and which are visible on the imagery are described. The apparent signature (colors, tones, textures, etc.) of the class on the imagery may be described as well as its typical location within the landscape.
5. **CONTEXT:** This section describes the context within which each class is typically found. It briefly describes (where applicable) one or more of the following characteristics: Landscape Position, Vegetation, Soils, and Hydrology.
6. **SIMILAR CLASSES:** Other FLUCCS classes which may share one or more of the same characteristics as the classification code being described are indicated in this section.
7. **SPECIAL MAPPING CONVENTIONS:** Describes the photointerpretation or mapping rules established to address the particular classification code. This section also describes differences

between the original FLUCCS system, as defined by the Department of Transportation (DOT), and the SFWMD system, which has been modified from the original DOT system.

8. **DUAL CODING CONVENTIONS:** This section describes the Land Cover/Land Use code combinations as applied to each class. Generally, the Land Cover code (LCCODE) and the Land Use code (LUCODE) are the same. However, instances where they are different are noted here.

Note: There are also PI Key pages for **MODIFIERS**. These are added to LCLU codes to denote types of vegetation or impact that are not classified under a particular FLUCCS code.

Photointerpretation Key Structure

You can click on any of the classifications in the structure below to access the detail page with a full description.

***1000 URBAN AND BUILT UP (not used in map)**

***1100 Residential, Low Density (not used in map)**

- 1110 Fixed Single Family Units
- 1120 Mobile Home Units
- 1130 Mixed Units, Fixed and Mobile Home Units
- 1180 Rural Residential
- 1190 Low Density Under Construction

***1200 Residential, Medium Density (not used in map)**

- 1210 Fixed Single Family Units
- 1220 Mobile Home Units
- 1230 Mixed Units, Fixed and Mobile Home Units
- 1290 Medium Density Under Construction

***1300 Residential, High Density (not used in map)**

- 1310 Fixed Single Family Units
- 1320 Mobile Home Units
- 1330 Multiple Dwelling Units, Low Rise
- 1340 Multiple Dwelling Units, High Rise
- 1350 Mixed Units, Fixed and Mobile Home Units
- 1390 High Density Under Construction

1400 Commercial and Services

***1410 Retail Sales and Services (not used in map)**

- 1411 Shopping Centers

***1420 Wholesale Sales & Services (not used in map)**

- 1423 Wholesale Sales & Services - Junk Yards

- 1460 Oil and Gas Storage - not Industrial or Manufacturing.
- 1480 Cemeteries
- 1490 Commercial and Services Under Construction.

1500 Industrial

- 1540 Oil and Gas Processing
- 1550 Other Light Industry
- 1560 Other Heavy Industrial

1600 Extractive

- 1610 Strip mines

- 1620 Sand and Gravel Pits
- 1630 Rock Quarries
- 1640 Oil and Gas Fields
- 1650 Reclaimed Lands
- 1660 Holding Ponds
- 1670 Abandoned Mining Lands

1700 Institutional

- 1710 Educational Facilities
- 1730 Military
- 1760 Correctional

1800 Recreational

- 1810 Swimming Beach
- 1820 Golf Course
- 1830 Race Tracks
- 1840 Marinas and Fish Camps
- 1850 Parks and Zoos
- 1870 Stadiums: Not Academic

1900 Open Land

- 1920 Inactive Land with Street Pattern

***2000 AGRICULTURE (not used in map)**

***2100 Cropland and Pastureland (not used in map)**

- 2110 Improved Pastures
- 2120 Unimproved Pastures
- 2130 Woodland Pastures
- 2140 Row Crops
- 2150 Field Crops
 - 2156 Sugar Cane
- 2160 Mixed Crops

***2200 Tree Crops (not used in map)**

- 2210 Citrus Groves
- 2230 Other Groves
- 2240 Abandoned Groves

2300 Feeding Operations

- 2310 Cattle Feeding Operations
- 2320 Poultry Feeding Operations

2400 Nurseries and Vineyards

2410 Tree Nurseries
2420 Sod Farms
2430 Ornamentals

2500 Specialty Farms

2510 Horse Farms
2520 Dairies
2540 Aquaculture

****2600 Other Open Lands - Rural (not used in map)***

2610 Fallow Cropland

****3000 UPLAND NONFORESTED (not used in map)***

3100 Herbaceous (Dry Prairie)

3200 Upland Shrub and Brushland

3210 Palmetto Prairies
3220 Coastal Shrub

3300 Mixed Rangeland

****4000 UPLAND FORESTS (not used in map)***

4100 Upland Coniferous Forests

4110 Pine Flatwoods
4120 Longleaf Pine - Xeric Oak
4130 Sand Pine
4140 Pine - Mesic Oak

4200 Upland Hardwood Forests

4210 Xeric Oak
4220 Brazilian Pepper
4240 Melaleuca
4270 Live Oak
4271 Oak - Cabbage Palm Forests
4280 Cabbage Palm

****4300 Upland Mixed Forests (not used in map)***

4340 Upland Mixed Coniferous / Hardwood
4370 Australian Pine

4400 Tree Plantations

4410 Coniferous Plantations
4420 Hardwood Plantations
4430 Forest Regeneration Areas

***5000 WATER (not used in map)**

***5100 Streams and Waterways (not used in map)**

5110 Natural River, Stream, Waterway
5120 Channelized Waterways, Canals

5200 Lakes

5300 Reservoirs

***5400 Bays and Estuaries (not used in map)**

5410 Embayments Opening Directly to Gulf or Ocean
5420 Embayments Not Opening Directly to Gulf or Ocean
5430 Saltwater Ponds

5600 Slough Waters

***5700 Ocean and Gulf (not used in map)**

5710 Atlantic Ocean
5720 Gulf of Mexico

***6000 WETLANDS (not used in map)**

6100 Wetland Hardwood Forests

6110 Bay Swamps
6111 Bayhead
6120 Mangrove Swamp
6170 Mixed Wetland Hardwoods
6172 Mixed Shrubs
6180 Cabbage Palm Wetland
*6190 Exotic Wetland Hardwoods (not used in map)
6191 Wet Melaleuca

6200 Wetland Coniferous Forests

6210 Cypress
6215 Cypress- Domes/Heads
6216 Cypress - Mixed Hardwoods
6240 Cypress - Pine - Cabbage Palm

6250 Wet Pinelands Hydric Pine
6260 Pine Savannah

6300 Wetland Forested Mixed

****6400 Vegetated Non-Forested Wetlands (not used in map)***

6410 Freshwater Marshes / Graminoid Prairie - Marsh
6411 Freshwater Marshes - Sawgrass
6420 Saltwater Marshes / Halophytic Herbaceous Prairie
6440 Emergent Aquatic Vegetation

6500 Non-Vegetated Wetland

6510 Tidal Flats

****7000 BARREN LAND (not used in map)***

7200 Sand Other Than Beaches

7300 Exposed Rock

7400 Disturbed Land

7420 Borrow Areas
7430 Spoil Areas
7470 Dikes and Levees

****8000 TRANSPORTATION, COMMUNICATION & UTILITIES (not used in map)***

8100 Transportation

8110 Airports
8113 Private Airports
8115 Grass Airports
8120 Railroads and Railyards
8140 Roads and Highways
8150 Port Facilities

8200 Communications

8300 Utilities

8310 Electrical Power Facilities
8320 Electrical Power Transmission Lines
8330 Water Supply Plants - Including Pumping Stations
8340 Sewage Treatment
8350 Solid Waste Disposal

***MODIFIERS**

Impact Modifiers (Burned, Off-Road Vehicles)

Species Modifiers (Brazilian Pepper, Melaleuca)

Vegetation Modifiers (Dead Trees, Exotics, Tree Islands)

1000 Urban and Built-Up

This Level 1 class is not used in the actual map. A more specific subclass must be selected. The Level 2 subclasses are:

- 1100 Residential, Low Density
- 1200 Residential, Medium Density
- 1300 Residential, High Density
- 1400 Commercial and Services
- 1500 Industrial
- 1600 Extractive
- 1700 Institutional
- 1800 Recreational
- 1900 Open Land

The following is a general description that applies to all the classes in the 1000 category.

BACKGROUND

Included in this very general category are cities, towns, villages, residential developments, malls, shopping centers, industrial and commercial complexes, institutions and mining operations. Some of the 1000 categories are not truly urban in nature - in particular, the [Extractive](#), or mining classes. But all of the 1000 classes define the land use, as opposed to cover. In several of the classes ([1180](#), [1650](#), [1670](#), [1900](#) and [1920](#)) a separate land cover code must also be assigned to each polygon.

The Urban and Built-Up classes are **Land Use** classes. For most of the 1000 classes the land use takes precedence when the criteria for more than one class are met. For example, residential areas that have sufficient tree canopy cover to satisfy the [4200 Upland Forest](#) criteria will still be classified as Residential, not forest. The exception to this is with [1180 Rural Residential](#), for which a land cover code is also required.

Residential land uses range from high-density urban housing developments to low-density rural areas. The variation extends from the multi-family apartment complexes generally located in larger urban centers to single-family houses with lot sizes of more than two acres.

MAPPING CONVENTIONS

If a residential area is under construction and the ultimate land use is discernible, it should be classified as [1190](#), [1290](#), or [1390](#), depending on density. For example, a medium density residential development under construction should be coded [1290](#). If other built-up land uses ([1500](#) through [1800](#)) are under construction, they are classified as though the construction were complete. The exception to this rule is [1490 Commercial and Services Under Construction](#), which is classified separately.

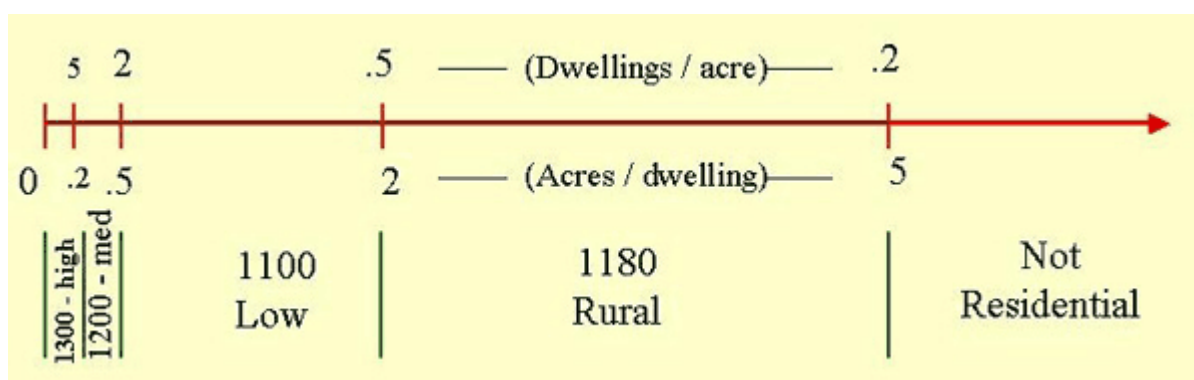
Minimum mapping units: The minimum mapping unit (MMU) for all uplands classes, including the 1000 class, is 5 acres.

Differentiating subclasses: Residential classes are differentiated based on the average density of dwellings in each mapping unit. It is not the intent of this map to precisely break out every possible change in density - rather, a reasonable grouping of homogeneous properties into larger mapping units is required. Many of these polygons will include some dwellings with larger or smaller acreage, but the density is based on an average. Note that property boundaries are not visible on photography, and groupings are to some extent arbitrary. Photointerpreters (PI's) attempt to

delineate the polygons to be as non-linear and compact in shape as possible. This produces a useable model of the landscape without excessive complexity.

Inconsistencies between residential density codes in the 1999 LCLU dataset were recognized and the parcel data was utilized in an effort to alleviate these inconsistencies. County parcel data was used as reference material in the production process as visual overlays in the editing windows. The parcel data was symbolized according to the acres per dwelling and helped categorize neighborhood polygon densities. In areas of disagreement (eg. empty lots) a five acre template was applied over the dataset, the dwellings were counted and calculated for appropriate code assignment. No line work was transferred from the county parcel data.

The drawing below illustrates how the residential classes are differentiated by density. Note that the relationship is far from linear. The top numbers indicate the number of dwellings per acre, while the lower numbers indicate the acreage per dwelling. The **1180 Rural Residential** class was added by the District in the 1999 map - in prior maps any density between 1/2 and 5 acres per dwelling was defined as **1100 Residential Low Density**.



Notes on differentiating subclasses for the other built-up categories are included in the general descriptions for **1400**, **1500**, **1600**, **1700**, and **1800**.

DUAL CODING CONVENTION

All of the 1000 classes are **Land Use** classes. The LUCODE and the LCCODE are the same **except** for the following, which **require a separate Land Cover code**: **1180 Rural Residential**, **1650 Reclaimed Mine Land**, **1670 Abandoned Mine Land**, **1900 Open Land**, and **1920 Inactive Land with Street Pattern**.

SIMILAR CLASSES

Classes in the Urban and Built-Up categories can be confused with those from other categories. The definitions have been constructed with the intention that only one set of Land Cover and Land Use codes should fit for any given location. See the notes under "Similar Classes" in each of the individual PI keys to help resolve potential conflicts.

Residential sections may occur as components of other land uses, such as institutions, farms, parks, airports and businesses. In those cases the dwellings are usually included in the surrounding use rather than coded as residential. For example, in the Institutional category residential units may be found on military bases in the form of barracks, apartments, dormitories or homes and on college and university campuses in the form of apartments and dormitories in close proximity to instructional buildings. Agricultural field operations and resort facilities commonly provide temporary lodging for their employees and these areas should be classified under Agriculture and Commercial and Services respectively. Look to specific PI keys for guidance in each case.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

1100 Residential, Low Density

This Level 2 class is not active in the map itself. A more specific subclass must be selected. The subclasses include:

- 1110 Fixed Single Family Units
- 1120 Mobile Home Units
- 1130 Mixed Units, Fixed and Mobile Home Units
- 1180 Rural Residential
- 1190 Low Density, Under Construction

For details on each active subclass, see the respective PI Key description. The following general description applies to all subclasses.

BACKGROUND

The 1100 class is reserved for Low Density Residential areas that have from 1/2 to 2 acres for each Dwelling Unit and areas with parcels averaging more than 2 acres per dwelling, which are classified as 1180 Rural Residential.

Areas of very low intensity residential land use (over five acres per dwelling), such as farmsteads will be incorporated into the surrounding land use, and the residential component ignored. Mapping units that have less than five acres per dwelling are considered residential, even though forest or open areas may be present.

Boundaries between new housing developments and agricultural areas tend to be distinct. Conversely, the boundaries may be vague and difficult to discern in areas with mixed or rural land uses when housing develops in smaller isolated units over an extended period of time. Polygon boundaries are determined by average housing densities and the relationship to the total urban complex.

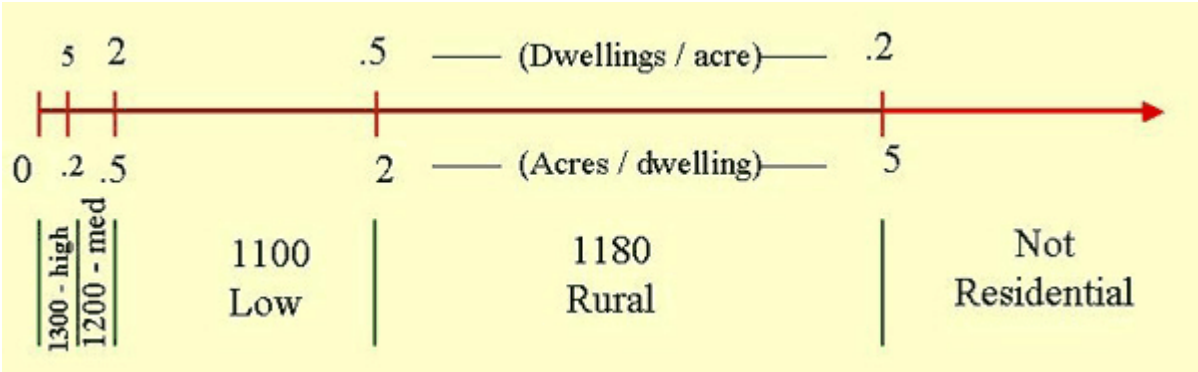
Low Density Residential areas can be found throughout the District. They are often located in newly established sections of large urban areas or on the urban-rural fringe.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit is always 5 acres for the 1100 classes.

Differentiating subclasses: The specific types of residential areas that are 1100 subclasses are not difficult to differentiate from each other. See the respective PI Key pages for more detailed information.

The drawing below illustrates how the residential classes are differentiated by density. Note that the relationship is far from linear. The top numbers indicate the number of dwellings per acre, while the lower numbers indicate the acreage per dwelling. The [1180 Rural Residential](#) class was added by the District in the 1999 map - in prior maps any density between 1/2 and 5 acres per dwelling was defined as 1100 Residential Low Density.



DUAL CODING CONVENTION

All 1100 classes are **Land Use** classes that do not require separate **Land Cover** coding **except 1180 Rural Residential**. The LUCODE **1180** **always** requires a different LCCODE.

SIMILAR CLASSES

Some Residential classes may be confused with classes in other categories such as [1400 Commercial and Services](#). The individual PI key pages provide details about how to differentiate these similar classes.

For those areas that have a mixture of residential and other such uses, where each land use is below MMU criteria, the PI must determine the predominant use and code accordingly.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

1110

Fixed Single Family Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1100 Residential, Low Density](#) - less than two dwelling units per acre

LEVEL 3: 1110 Fixed Single Family Units

DESCRIPTION

Fixed single-family structures are usually easily identified by their sizes, shapes, and the character of the associated developed area. Residential areas include the main houses, garages and other out-buildings, and the developed portions of the lot (lawns, gardens, mowed areas, fenced land, drives and paths, etc.). In some areas swimming pools are common, usually appearing as small flat rectangles, dark in tone on CIR film (unless not filled with water -- in which case they often appear light blue). Structures are commonly rectangular, ranging from 25' x 40' in size to 60' x 60'. Structures smaller or larger than this, but having general residential characteristics must be closely examined. Barns and sheds are usually distinguished from houses by their locations away from a main road, and by having few breaks in the roof line. Older structures are often differentiated by referring to a topographic map, where dwellings are shown as solid, while barns are open rectangles.

In poor rural areas, debris is noticeable around the houses and roof materials may be light-toned on one part of the house and dark-toned on another. Houses with dark roofs may be missed altogether due to significant tree cover; look for driveways and other signs of activity. Lawns and woody vegetation are dark magenta on winter CIR photography if the leaf area index is high; as vegetation becomes sparser, soil tones appear and the magenta fades to a light grayish-pink. Bare dry soil shows greenish-gray tones. Clay tile roofs also show greenish-gray tones, which may cause the interpreter to miss houses with clay tile roofs against a background of bare or nearly-bare soil.

Older subdivision developments are most often low-density areas, with a regular, rectilinear pattern of rectangular lots fronting the subdivision streets. Houses are usually set in the middle or toward the rear of the lot. Densities generally range from 1.0 Dwelling Units (D.U.) per acre (1-acre lots) to 0.1 D.U. per acre (10-acre lots) or less. This category also includes the estates of wealthy landowners, where the developed portion of the lot includes employee residences as well as a considerable amount of natural vegetation. In wealthier areas, what were once large single-family structures may have been converted into group residences or trade/service establishments (e.g., a small, private school). Typically, automobile parking areas associated with these converted structures are much larger than parking areas for private residences.

Areas of very low-density housing (between 2 and 5 acres for each dwelling), which may include some amount of woodland, grassland, or orchard, are classified as [1180 Rural Residential](#) if the primary use is residential (e.g., suburban "ranchettes").

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings, with garages and driveways present.
- Large yards and open areas between houses, with pools and other outdoor structures.
- Well watered or maintained lawns, with a moderate amount of trees and shrubs.
- Absence of large parking areas or large structures.

CONTEXT

Landscape Position - Dwellings of this density can be found throughout the District. They are often located in newly-established sections of large urban areas, or on the urban-rural fringe. In exurban

areas these structures tend to aggregate as linear "strip developments" along roads or shorelines. They are mapped as residential areas when residential structures predominate. With increasing densities in peri-urban areas, sub-division and street patterns are encountered in housing developments (or "housing estates"); very few non-residential uses occur in these denser areas.

SIMILAR CLASSES

- [1180 Rural Residential](#) - Residential density is 2 to 5 acres per dwelling unit.

SPECIAL MAPPING CONVENTIONS

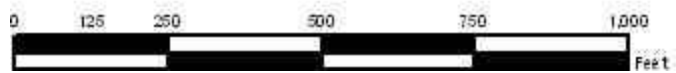
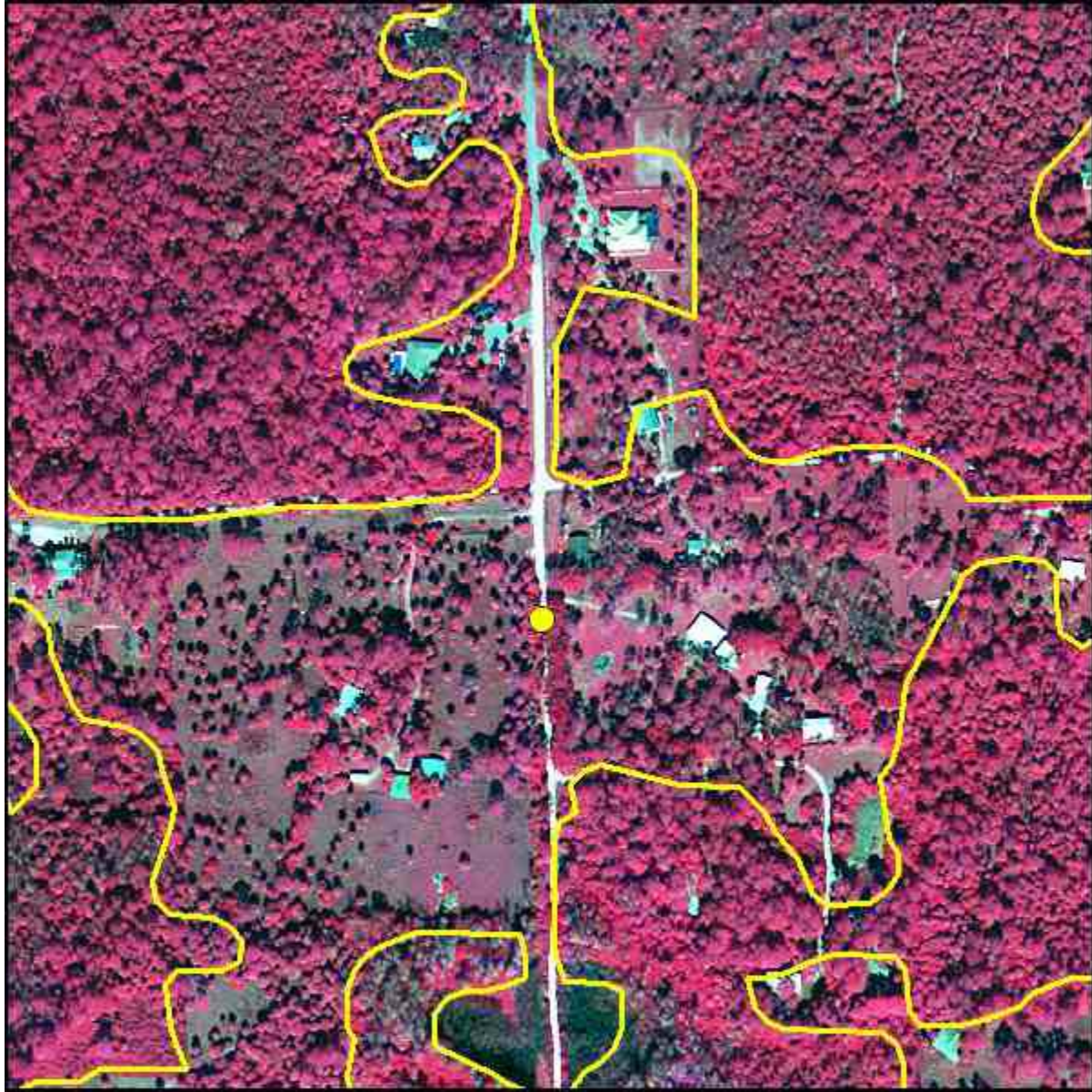
The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non-residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1110, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
442799.3 702798.26

1120

Mobile Home Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1100 Residential, Low Density](#) - less than two dwelling units per acre

LEVEL 3: 1120 Mobile Home Units

DESCRIPTION

Mobile homes are rectangular and light-toned, from 8' to 12' wide and 30' to 50' long. They may or may not be on permanent foundations. Any similar structure less than 30' long and 8' wide is assumed to be a travel trailer. In some cases, pull-out sections and awnings alter the basic rectangular shape, although the flat-roofed, rectangular body is still evident upon close inspection.

Mobile home parks (or areas of at least five acres) where each unit occupies a lot of over 0.5 acre are relatively rare. Mobile home parks are usually developed as medium- and high-density areas, with the units usually arranged as regular arrays with their narrow dimension fronting the streets. At high densities, very closely - spaced units may be placed at an angle to the street.

New mobile home parks appear very similar to new high-density fixed-unit single-family developments, including the use of storm-drainage ponds as water bodies integral to the development. The mobile homes, as a group, will show narrower, more rectangular shapes.

Mobile home parks often have associated storage areas for use by park residents for boats and travel trailers/campers/RVs. These storage areas should be mapped with the park. If ponds and storm water retention areas are present and can be connected to create a two acre or greater area, then these water bodies are mapped as [5300 Reservoirs](#).

A mobile home sales lot could be mistaken for a mobile home park unless it is noted that the mobile homes are much closer together and parked in a much more regular pattern in a sales lot than in a mobile home park. The sales lot will show no signs of landscaping. Groups of travel trailers may be parked closely together in these sales lots, too. The interpreter should also beware of office trailers parked at or near construction sites.

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings
- Narrow, rectangular shape
- Distinctive, regular pattern clearly distinguished from surrounding uses.

CONTEXT

Landscape Position - Mobile home residential areas are found almost anywhere that fixed-unit single-family residential areas are found. They occur in rural areas, at the urban fringe (often as infill among older, lower-density residential areas), and in medium-and high-density residential areas (often either adjacent to or incorporated within the newer subdivision developments or "housing estates"). In most instances, mobile home areas have clear boundaries which abut other residential areas, open areas, agricultural areas, limited-access highways, and large water bodies.

SIMILAR CLASSES

- [1110 Fixed Single Family Units](#) - These will generally be larger structures.
- [1220 Mobile Home Units](#) - these will be higher density

SPECIAL MAPPING CONVENTIONS

This class should only be used for areas of less than 2 mobile home units per acre.

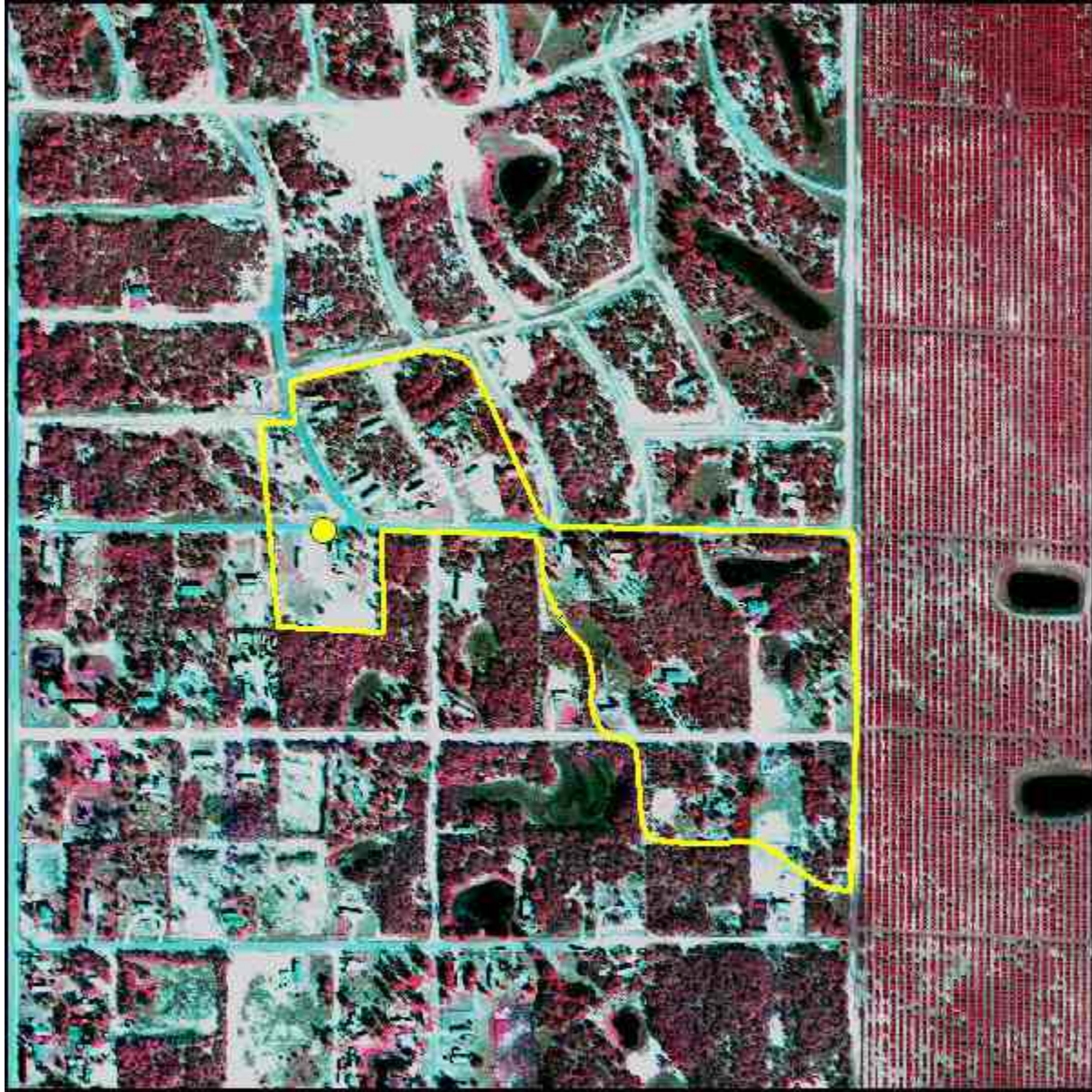
The polygon boundary should encompass the active mobile home area, corresponding to the "operational boundary" of adjacent land uses. Non-residential features should be excluded, to the extent practicable, from this polygon. All features that are inside the mobile home area are coded 1120, including gardens, lawns, fields, pools, garages, out-buildings, etc.

Priority classes such as water bodies and wetlands are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/03/07

COORDINATES
557012.69 1054243.72

1130

Mixed Units, Fixed and Mobile Home Units

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1100 Residential, Low Density - less than two dwelling units per acre

LEVEL 3: 1120 Mixed Units, Fixed and Mobile Home Units

DESCRIPTION

The description and keys to interpretation for mobile homes and fixed-units at the three different densities have been covered in the class descriptions for each type.

These "Mixed Units" classes will be used when: (1) there is a consistent mixture of both types of units; and (2) the only way possible to meet the five-acre minimum requirement for a residential area is by mixing both types of units.

KEYS TO PHOTOINTERPRETATION

- Fixed and Mobile Home Units appear intermixed.
- Separate delineation would result in linear or overly complex polygons.
- Separate delineation would result in polygons below the Minimum Mapping Unit (5 acres).

CONTEXT

Landscape Position - In exurban areas these structures tend to occur scattered among fixed-unit single-family detached structures in linear "strip developments", either along highways or fringing water bodies. They also occur in suburban areas as small sites set aside for mobile homes within a large high-density subdivision of fixed-unit single-family units.

SIMILAR CLASSES

1110 Fixed Single Family Units - dominated by fixed dwelling

1120 Mobile Home Units - dominated by mobile homes

SPECIAL MAPPING CONVENTIONS

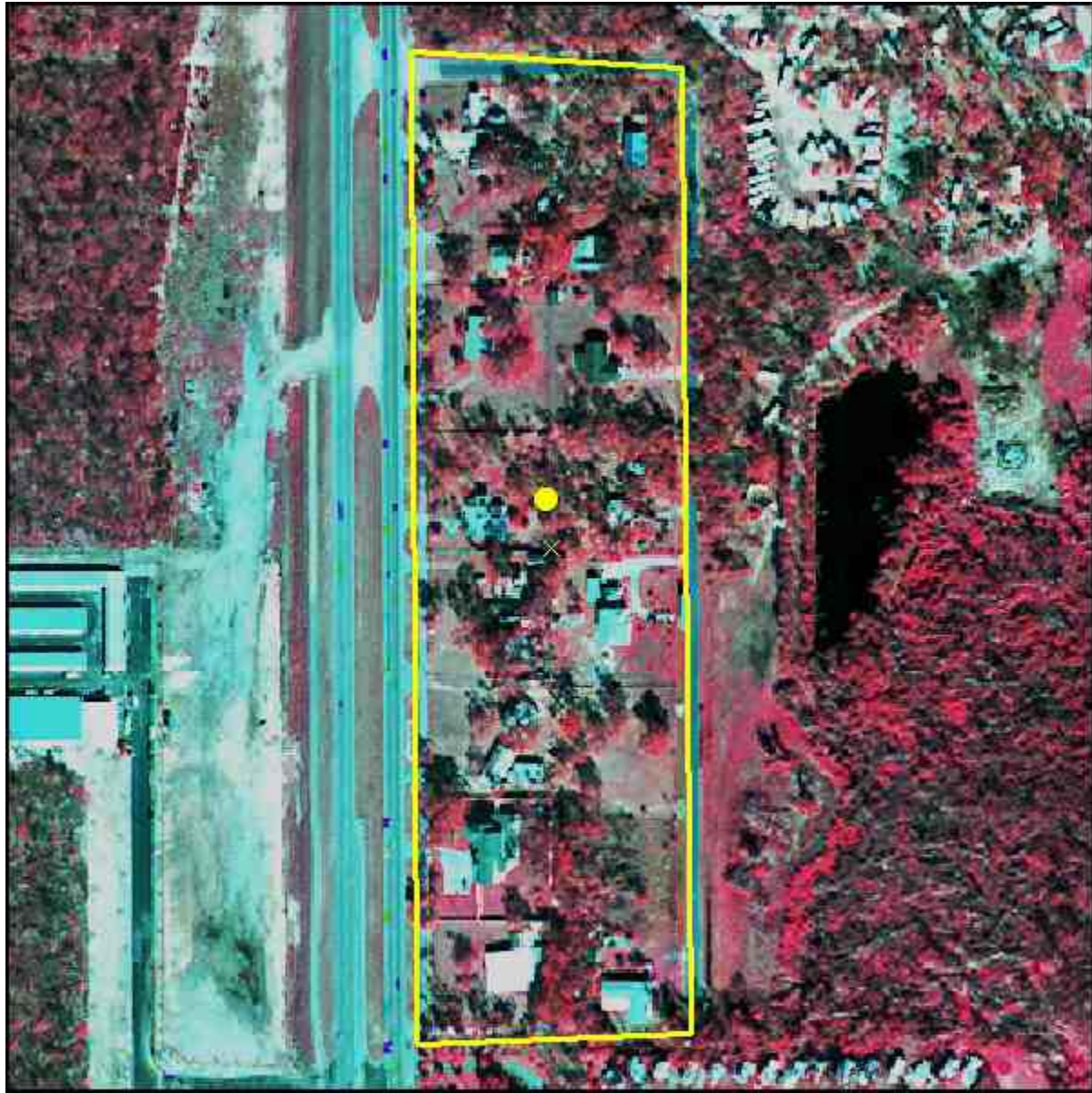
The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1130, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a Land Use class. The LUCODE and LCCODE are the same. A separate Land Cover code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000 Feet

NATURAL COLOR IMAGE



FIELD PICTURE



DATE
10/04/07

COORDINATES
514635.41 1391364.64

1180 Rural Residential

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1100 Residential, Low Density - less than two dwelling units per acre

LEVEL 3: 1180 Rural Residential

DESCRIPTION

This new subclass of 1100 is a SFWMD addition to the FLUCCS system. The density is 2 to 5 acres per dwelling. It is used for areas with low dwelling unit densities, but not low enough to be put into a non-residential category, as with farmsteads. The former 1100 Residential Low Density class did not differentiate between fairly dense residential areas and very low density rural areas - homes on 1/2 acre manicured lots were in the same category as homes surrounded by several acres of open or forested areas. 1180 Rural Residential applies to the lower density category.

Areas of very low intensity residential land use (over five acres per dwelling), such as farmsteads, will be given the appropriate non-residential category code(s), ignoring the residence. 1180 is used where the mapping unit is primarily residential, with rural or recreational uses sometimes present. It may contain a mosaic of small open areas, natural vegetation or miscellaneous covers/uses that cannot easily be broken out by the interpreter otherwise. Housing may be mixed in with other land covers and uses with no clear spatial pattern. Boundaries may not be distinct.

Photo interpreters should study graphic examples of how this class is correctly delineated.

KEYS TO PHOTOINTERPRETATION

- There are roughly two to five acres per dwelling unit.
- Density is low, but the aggregate area is primarily residential.
- Open or natural areas are patchy and too small (<2 acres) to be broken out separately from dwellings.
- Open areas reflect activities (cutting, digging, grazing and fencing) of many small landowners in close proximity. There may be a lack of general pattern or order.
- Large parking areas or pavement are typically absent.

CONTEXT

Landscape Position - Dwellings of this density can be found throughout the District, mostly in a rural context, or on urban-rural fringes.

SIMILAR CLASSES

- 1110 Fixed Single Family Units - Will have more of a 'neighborhood' appearance, not rural.
- 2000, 4000 - Agricultural or Forested areas usually show a broad spatial pattern related to the landform, vegetation or cropping.

SPECIAL MAPPING CONVENTIONS

1180 is an SFWMD modification to the FLUCCS system. The lowest density FLUCCS class is 1100 Residential Low Density, with over 1/2 acre per dwelling.

The polygon boundary should encompass the active residential area. All features that are inside the residential area are coded 1180, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data and should err on the side of capturing land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

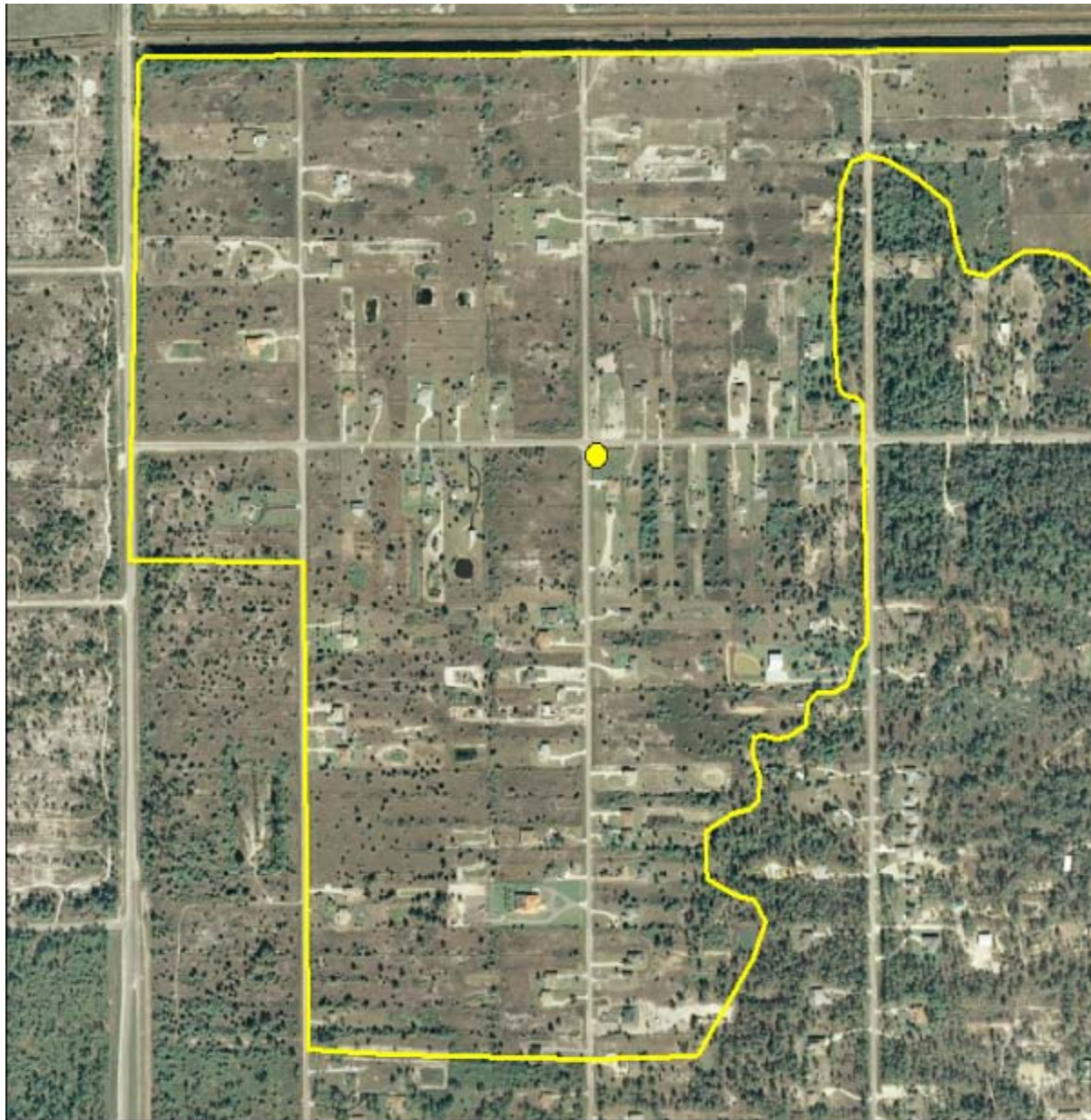
DUAL CODING CONVENTION

This is a **Land Use** class. **A separate Land Cover code is always required.**



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
463444.84 721477.09

1190

Low Density Under Construction

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1100 Residential, Low Density - less than two dwelling units per acre

LEVEL 3: 1190 Low Density Under Construction

DESCRIPTION

This class refers to low density residential areas that are in the process of construction, with more than 1/2 and less than 2 acres per dwelling. When completed they will be placed into the appropriate 1100 class. The existing infrastructure and construction at time of photography indicate the intended pattern and density, and show that the development is likely to be completed. Some of the dwellings are usually present already. If more than two thirds (67%) of the area is constructed, and work is in progress, the area should be coded with the appropriate Level 3 code, as though complete.

Future construction may be fast or slow - there is no time limit set on completion of the areas under construction. However, if the in-fill process is indefinitely stalled, the code 1920 Inactive Land with Street Pattern is used instead. Progress is indicated by cleared, un-vegetated areas, construction equipment, infrastructure such as roads, driveways and utilities, and by surrounding patterns of land use.

KEYS TO PHOTOINTERPRETATION

- Infrastructure such as roads, driveways and utilities, is present.
- Infrastructure shows the intended street patterns and housing density for most of the delineated area.
- Space for houses, roads and utilities has been cleared, leaving a bright (unvegetated) signature.
- Surrounding land uses show growth is occurring. This may include new schools and malls, new or expanded roads, and other changes.

CONTEXT

Landscape Position -Dwellings of this density can be found throughout the District. They are often located in large urban areas, or on the urban-rural fringe.

SIMILAR CLASSES

- 1110 Fixed Single Family Units - No evidence of current construction is apparent.
- 1290 Medium Density Under Construction - There are 2 to 5 dwellings per acre.
- 1920 Inactive Land with Street Patterns - No evidence of current construction is apparent.

SPECIAL MAPPING CONVENTIONS

Housing may be in a pre-construction state, with development appearing imminent. One indication is prepared lands adjacent to newly built subdivisions. Surrounding development densities may be used as a guide to assign appropriate density (1190, 1290 or 1390); however 1190 may be used as the default in areas in which it is impossible to determine the ultimate density. Areas that have had no recent activity, or are indefinitely stalled, should be coded 1920 - Inactive Land with Street Pattern.

In transitional areas where species-specific wetland (2 acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

92039.56 765206.88 (Images)

FIELD PICTURE



DATE
10/02/07

COORDINATES
468213.47 1511210.58 (Field Picture)

1200 Residential, Medium Density

This Level 2 class is not active in the map itself - a more specific subclass must be selected. The subclasses include:

- 1210 Fixed Single Family Units
- 1220 Mobile Home Units
- 1230 Mixed Units, Fixed and Mobile Home Units
- 1290 Low Density, Under Construction

For details on each active subclass, see the respective PI Key description. The following general description applies to all subclasses.

BACKGROUND

The 1200 class is reserved for Medium Density Residential areas that have from 2 to 5 dwelling units per acre.

Rural and recreational types of subdivisions will be included in the Residential category since this land is almost entirely committed to residential use even though forest or open areas may be present also.

Boundaries between new housing developments and agricultural areas tend to be distinct. Conversely, the boundaries may be vague and difficult to discern in areas with mixed or rural land uses when housing develops in smaller isolated units over an extended period of time. Polygon boundaries are determined by average housing densities and the relationship to the total urban complex.

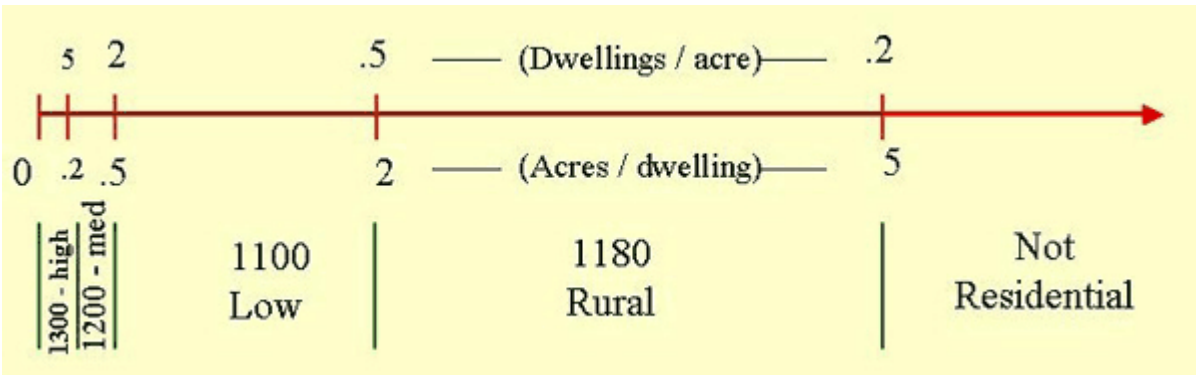
Dwellings of this density can be found throughout the District. They are often located in large urban areas or on urban-rural fringe.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit is always 5 acres for the 1200 classes.

Differentiating subclasses: The specific types of residential areas that are 1200 subclasses are not difficult to differentiate from each other. See the respective PI Key pages for more detailed information.

The drawing below illustrates how the residential classes are differentiated by density. Note that the relationship is far from linear. The top numbers indicate the number of dwellings per acre, while the lower numbers indicate the acreage per dwelling.



DUAL CODING CONVENTION

All 1200 classes are **Land Use** classes. The LUCODE and LCCODE are always the same. A separate **Land Cover** code is not required.

SIMILAR CLASSES

Some Residential classes may be confused with classes in other categories such [1400 Commercial and Services](#). The individual PI key pages provide details about how to differentiate these similar classes.

For those areas that have a mixture of residential and other such uses, where each land use is below MMU criteria, the PI must determine the predominant use and code accordingly.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

1210

Fixed Single Family Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1200 Residential, Medium Density](#) - two to five dwelling units per acre

LEVEL 3: 1210 Fixed Single Family Units

DESCRIPTION

Two to five single-family structures per acre meet density requirements for this class. Fixed single-family structures are usually easily identified by their sizes, shapes, and character of the associated developed area. Structures range from square, 50' x 50', to rectangular, 25' x 40', or somewhat smaller. The roof area appears to cover less than half of the lot area.

The overall pattern of many of these areas is an open mosaic of light-roofed structures against a magenta background (CIR). The mosaic may be a regular, rectilinear array of roofs, or a curving pattern, with streets readily visible within the pattern. When ponds or lakes are integral to the subdivision, if the water is connected by canal to navigable waterways, many of the waterfront lots will have piers, and boats will be docked there. If canals are present and connected to another water body, they would be mapped as [5120 Channelized River, Stream, Waterway](#). If ponds and storm water retention areas are present and can be connected to create a two acre MMU, then these water bodies are mapped as [5300 Reservoirs](#).

In some areas swimming pools are common, appearing either as small flat rectangles or small elevated, circular tanks, usually dark in tone on CIR unless not filled with water. (Swimming pools may appear light blue if dry.) The area of the house lot not covered by the roof is usually light magenta (grass) or dark magenta (shrubs). The roofs cast deep black shadows. (Skylight reflected from shaded areas is not caught on CIR film.) Roofs are generally white or light-toned.

Occasionally a dark-toned roof occurs. These, or roofs with irregular outlines, combined with the black shadows and the occasional black-toned swimming pool or evergreen shrub, can create a somewhat confusing image. If the interpreter gives such an area a cursory glance, some of the houses may be "lost" in the background "noise", giving the area lower apparent density than the actual density.

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings, with garages and driveways present.
- Large yards and open areas between houses, with pools and other outdoor structures.
- Well watered or maintained lawns, with a moderate amount of trees and shrubs.
- Absence of large parking areas or large structures.

CONTEXT

Landscape Position - Medium-density housing areas occur within urban and suburban areas anywhere that sub-division or urban street patterns are encountered. Very few non-residential uses occur in medium-density fixed-unit single-family housing areas. Newer subdivision developments or "housing estates" commonly occur at the urban fringe, often as infill among older residential areas. New medium-density developments generally have clear boundaries abutting lower-density residential areas, agricultural areas, limited-access highways or large water bodies. They may surround golf courses and include other recreational amenities. However, many residential areas within older urban lands are also medium-density. Here, boundaries may be vague and difficult to

discern when development is sporadic and occurs in isolated units over an extended period of time, especially in areas which abut mixed land uses.

SIMILAR CLASSES

[1110 Fixed Single Family Units](#) - Some Low Density Residential areas may appear similar.

[1310 Fixed Single Family Units](#) - Some High Density Residential areas may appear similar.

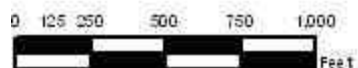
SPECIAL MAPPING CONVENTIONS

The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non-residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1210, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

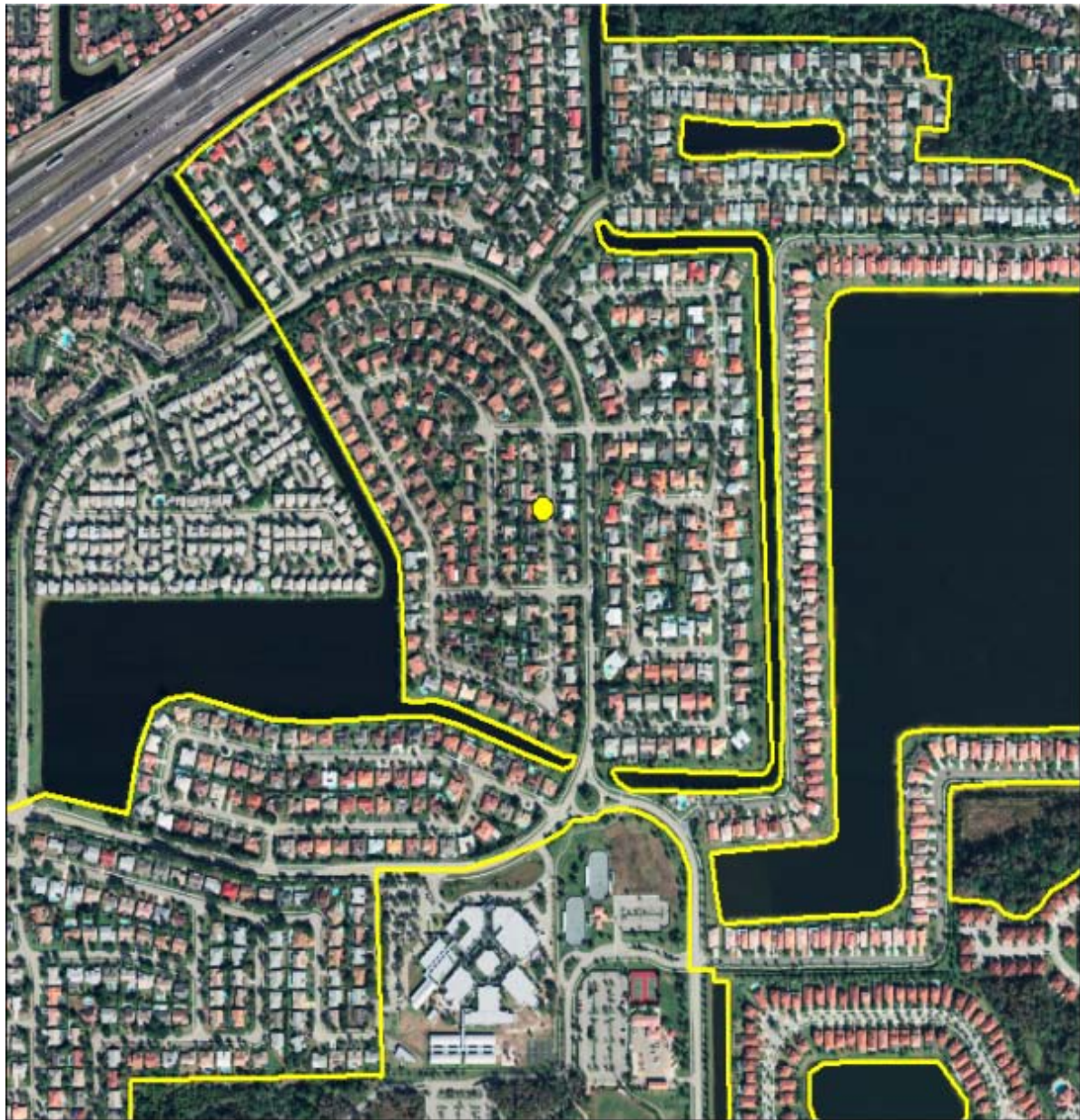
Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/16/07

COORDINATES
925489.21 715241.90

1220

Mobile Home Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1200 Residential, Medium Density](#) - two to five dwelling units per acre

LEVEL 3: 1220 Mobile Home Units

DESCRIPTION

Mobile homes are rectangular and light-toned, from 8' to 12' wide and 30' to 50' long. They may or may not be on permanent foundations. Any similar structure less than 30' long and 8' wide is assumed to be a travel trailer. In some cases, pull-out sections and awnings alter the basic rectangular shape, although the flat-roofed, rectangular body is still evident upon close inspection.

Mobile home parks (or areas of at least five acres) where each unit occupies a lot of over 0.5 acre are relatively rare. Mobile home parks are usually developed as medium- and high-density areas, with the units usually arranged as regular arrays with their narrow dimension fronting the streets. At high densities, very closely-spaced units may be placed at an angle to the street.

New mobile home parks appear very similar to new high-density fixed-unit single-family developments, including the use of storm-drainage ponds as water bodies integral to the development. The mobile homes, as a group, will show narrower, more rectangular shapes.

Mobile home parks often have associated storage areas for use by park residents for boats and travel trailers/campers/RVs. These storage areas should be mapped with the park. If ponds and storm water retention areas are present and can be connected to create a two acre or greater area, then these water bodies are mapped as [5300 Reservoirs](#).

A mobile home sales lot could be mistaken for a mobile home park unless it is noted that the mobile homes are much closer together and parked in a much more regular pattern in a sales lot than in a mobile home park. The sales lot will show no signs of landscaping. Groups of travel trailers may be parked closely together in these sales lots, too. The interpreter should also beware of office trailers parked at or near construction sites.

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings
- Narrow, rectangular shapes
- Distinctive, regular pattern clearly distinguished from surrounding uses.

CONTEXT

Landscape Position - Mobile home residential areas are found almost anywhere that fixed-unit single-family residential areas are found. They occur in rural areas, at the urban fringe (often as infill among older, lower-density residential areas), and in medium- and high-density residential areas (often either adjacent to or incorporated within the newer subdivision developments or "housing estates"). In most instances, mobile home areas have clear boundaries which abut other residential areas, open areas, agricultural areas, limited-access highways, and large water bodies.

SIMILAR CLASSES

1120 Mobile Home Units - these will be lower density
1210 Fixed Single Family Units - these will be generally larger structures
1320 Mobile Home Units - these will be higher density

SPECIAL MAPPING CONVENTIONS

This class should only be used for areas consisting of 2 to 5 mobile home units per acre.

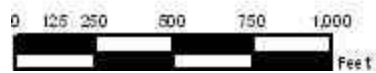
The polygon boundary should encompass the active mobile home area, corresponding to the "operational boundary" of adjacent land uses. Non-residential features should be excluded, to the extent practicable, from this polygon. All features that are inside the mobile home area are coded 1220, including gardens, lawns, fields, pools, garages, out-buildings, etc.

Priority classes such as water bodies and wetlands are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/03/07

COORDINATES
499671.83 1450272.57

1230

Mixed Units, Fixed and Mobile Home Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1200 Residential, Medium Density](#) - two to five dwelling units per acre

LEVEL 3: **1230 Mixed Units, Fixed and Mobile Home Units**

DESCRIPTION

The description and keys to interpretation for mobile homes and fixed-units at the three different densities have been covered in the class descriptions for each type.

These "Mixed Units" classes will be used when: (1) there is a consistent mixture of both types of units; and (2) the only way possible to meet the five-acre minimum requirement for a residential area is by mixing both types of units.

KEYS TO PHOTOINTERPRETATION

- Fixed and Mobile Home Units appear intermixed.
- Separate delineation would result in linear or overly complex polygons.
- Separate delineation would result in polygons below the Minimum Mapping Unit (5 acres).

CONTEXT

Landscape Position - In exurban areas these structures tend to occur scattered among fixed-unit single-family detached structures in linear "strip developments", either along highways or fringing water bodies. They also occur in suburban areas as small sites set aside for mobile homes within a large high-density subdivision of fixed-unit single-family units.

SIMILAR CLASSES

[1210 Fixed Single Family Units](#) - Dominated by fixed dwelling

[1220 Mobile Home Units](#) - Dominated by mobile homes

SPECIAL MAPPING CONVENTIONS

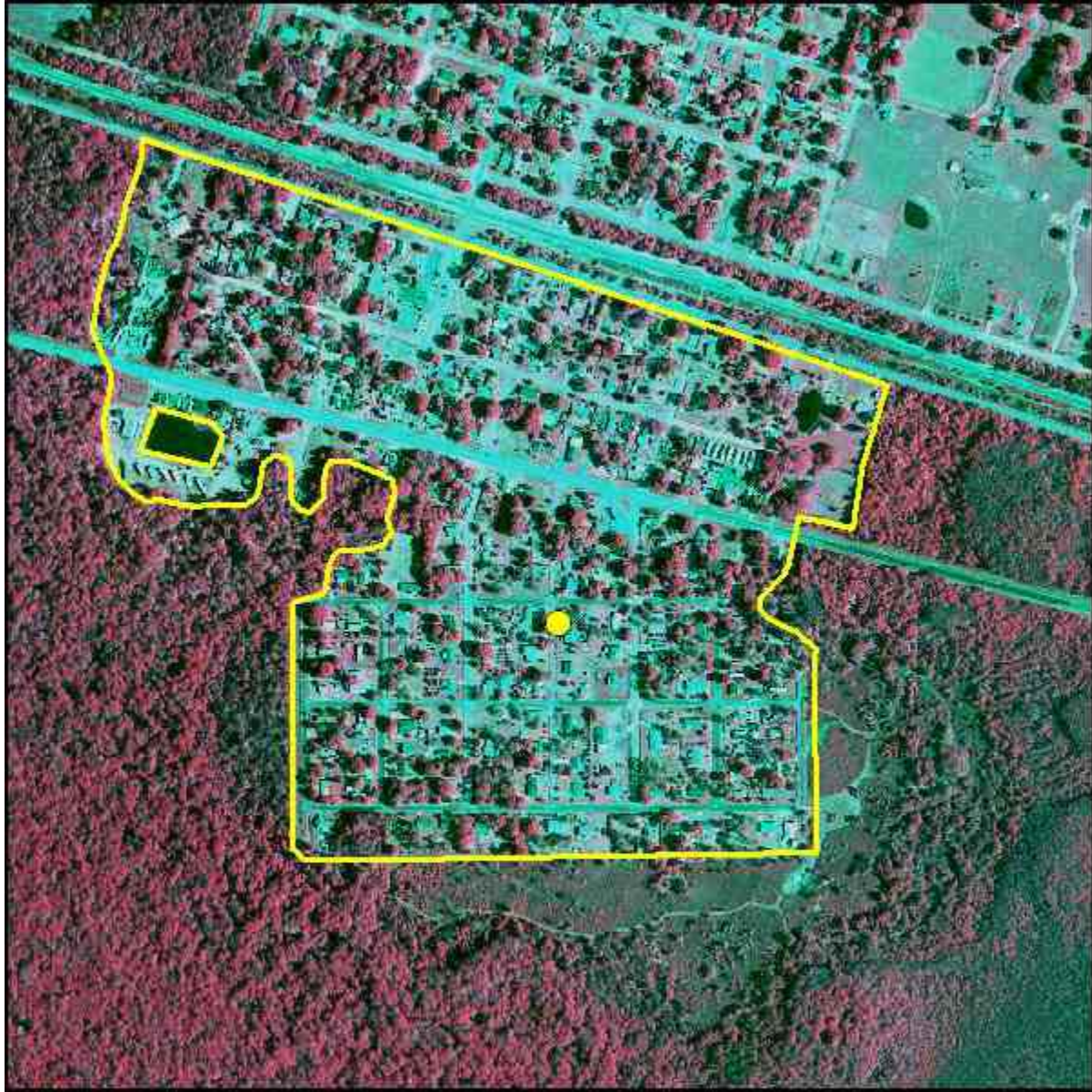
The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1230, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/03/07

COORDINATES
493006.96 1427093.91

1290

Medium Density Under Construction

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1200 Residential, Medium Density](#) - two to five dwelling units per acre

LEVEL 3: 1290 Medium Density Under Construction

DESCRIPTION

This class refers to medium density residential areas that are in the process of construction, with between two and five dwellings per acre when completed. The existing infrastructure and construction at time of photography are sufficient to show the intended pattern and density, and to conclude that the development is likely to be completed. In most cases, some of the dwellings are already present. If more than two thirds (67%) of the area is constructed, and work is in progress, these areas should be coded with the appropriate Level 3 code, as though complete.

There is no time limit set on completion of the areas under construction - progress may be fast or slow. However, if the in-fill process is indefinitely stalled, the code 1920 Inactive Land with Street Pattern is used instead. Progress is indicated by cleared, non-vegetated areas, construction equipment, infrastructure such as roads, driveways and utilities, and by surrounding patterns of land use.

KEYS TO PHOTOINTERPRETATION

- Infrastructure such as roads, driveways and utilities, is present.
- The infrastructure shows the intended street patterns and housing density for most of the delineated area.
- Space, for houses, roads, utilities, has been cleared, leaving a bright (non-vegetated) signature.
- Surrounding land uses show growth is occurring. This may include new schools and malls, new or expanded roads, and other changes.

CONTEXT

Landscape Position - Dwellings of this density can be found throughout the District. They are often located in large urban areas or on the urban-rural fringe.

SIMILAR CLASSES

[1190 Low Density Under Construction](#) - Some areas may appear similar.

[1390 High Density Under Construction](#) - Some areas may appear similar.

[1920 Inactive Lands with Street Pattern](#) - No evidence of current construction is visible.

SPECIAL MAPPING CONVENTIONS

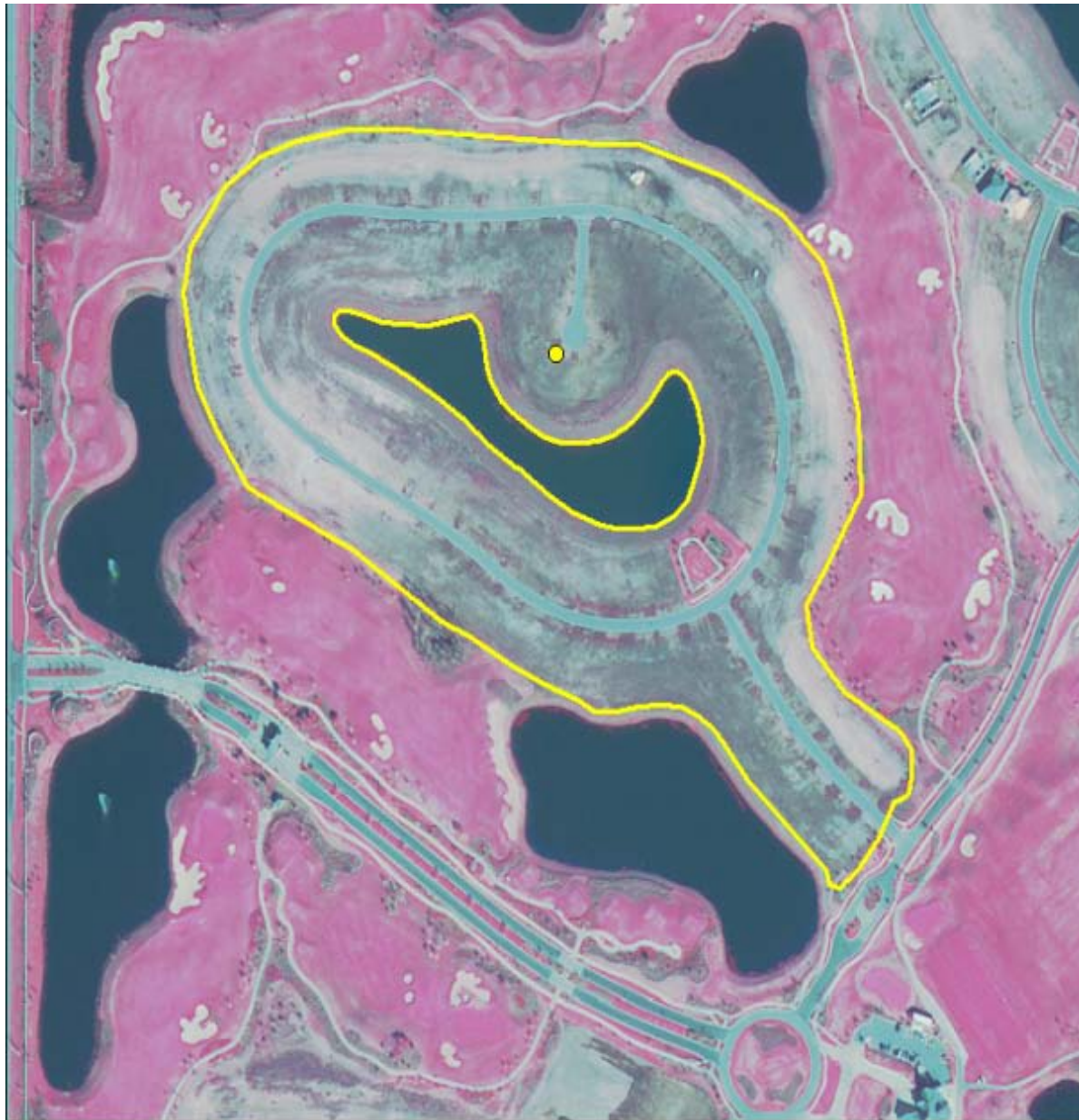
Housing may be in a pre-construction state, with development appearing imminent. One indication is prepared lands adjacent to newly built subdivisions. Surrounding development densities may be used as a guide to assign appropriate density ([1190](#), [1290](#) or [1390](#)); however [1190](#) may be used as the default in areas in which it is impossible to determine the ultimate density. Areas that have had no recent activity, or are indefinitely stalled, should be coded [1920 Inactive Lands with Street Pattern](#).

To reduce mapping costs, areas that have different housing densities may be aggregated, and the average density assigned to the polygon. Polygon shapes should be compact if possible, avoiding linear or convoluted shapes.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

578884.35 1468948.81 (Images)

FIELD PICTURE



DATE
10/02/07

COORDINATES
468215.66 1525828.53 (Field Picture)

1300 Residential, High Density

This Level 2 class is not active in the map itself - a more specific subclass must be selected. The subclasses include:

- 1310 Fixed Single Family Units
- 1320 Mobile Home Units
- 1330 Multiple Dwelling Units, Low Rise
- 1340 Multiple Dwelling Units, High Rise
- 1350 Mixed Units, Fixed and Mobile Home Units
- 1390 High Density Under Construction

For details on each active subclass, see the respective PI Key description. The following general description applies to all subclasses

BACKGROUND

The 1300 class is reserved for High Density Residential areas that have more than 5 dwelling units per acre.

Rural and recreational types of subdivisions will be included in the Residential category since this land is almost entirely committed to residential use even though forest or open areas may be present also.

Boundaries between new housing developments and agricultural areas tend to be distinct. Conversely, the boundaries may be vague and difficult to discern in areas with mixed or rural land uses when housing develops in smaller isolated units over an extended period of time. Polygon boundaries are determined by average housing density and the relationship to the total urban complex.

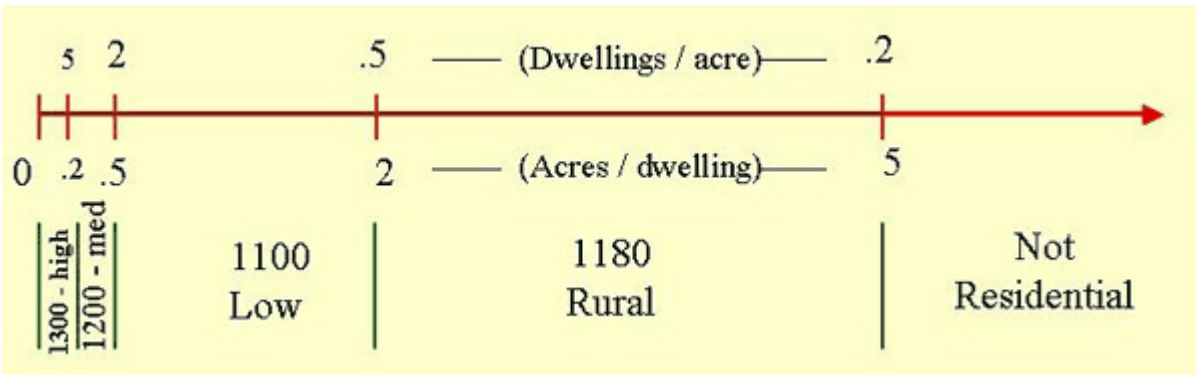
Dwellings of this density can be found throughout the District. They are often located in large urban areas or on urban-rural fringe.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit is always 5 acres for the 1300 classes.

Differentiating subclasses: The specific types of residential areas that are 1300 subclasses are not difficult to differentiate from each other. See the respective PI Key pages for more detailed information.

The drawing below illustrates how the residential classes are differentiated by density. Note that the relationship is far from linear. The top numbers indicate the number of dwellings per acre, while the lower numbers indicate the acreage per dwelling.



DUAL CODING CONVENTION

All 1300 classes are **Land Use** classes. The LUCODE and LCCODE are always the same. A separate **Land Cover** code is not required.

SIMILAR CLASSES

Some Residential classes may be confused with classes in other categories such as [1400 Commercial and Services](#). The individual PI key pages provide details about how to differentiate these similar classes.

For those areas that have a mixture of residential and other such uses, where each land use is below MMU criteria, the PI must determine the predominant use and code accordingly.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

1310

Fixed Single Family Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1300 Residential, High Density](#) - six or more dwelling units per acre

LEVEL 3: 1310 Fixed Single Family Units

DESCRIPTION

Six or more single-family structures per acre meet density requirements for this class. Fixed single-family structures are usually easily identified by their sizes, shapes, and character of the associated developed area. Structures range from square, 50' x 50', to rectangular, 25' x 40', or somewhat smaller. The roof area appears to cover more than half of the lot area. Roads, small recreational areas, and small public spaces serving the development are included; small water supply and "package" sewage treatment plants are not included if they can be mapped separately.

The overall pattern of most of these areas is a tight mosaic of light-roofed structures against a light background. The mosaic may be a regular, rectilinear array of roofs, or a curving pattern, with streets showing as fine white lines within the pattern. The areas generally have a crisp, "clean" appearance. When ponds or lakes are integral to the subdivision, if the water is connected by canal to navigable waterways, many of the waterfront lots will have piers, and boats will be docked there. If canals are present and connected to another water body, they would be mapped as [5120 Channelized River, Stream, Waterway](#). If ponds and storm water retention areas are present and can be connected to create a two acre MMU, then these water bodies are mapped as [5300 Reservoirs](#).

The newest subdivision developments are most often high-density areas, or a mix of high- and medium-density areas. Maximum densities in these new residential developments are usually high enough to include them in this class.

Occasionally a dark-toned roof is visible. These, or roofs with irregular outlines, combined with the black shadows and the occasional swimming pool or evergreen shrub, can create a somewhat confusing image. If the interpreter gives such an area a cursory glance, some of the houses may be "lost" in the background "noise", giving the area lower apparent density than the actual density.

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings, with garages and driveways present.
- Large yards and open areas between houses, with pools and other outdoor structures.
- Well watered or maintained lawns, with a moderate amount of trees and shrubs.
- Absence of large parking areas or large structures.

CONTEXT

Landscape Position - High-density housing areas occur within urban and suburban areas-anywhere that sub-division or urban street patterns are encountered. Very few non-residential uses occur in high-density fixed-unit single-family housing areas. Newer subdivision developments or "housing estates" commonly occur at the urban fringe, often as infill among older residential areas. New high-density developments generally have clear boundaries abutting lower-density residential areas, agricultural areas, limited-access highways or large water bodies. They may surround golf courses and include other recreational amenities. However, many residential areas within older urban lands are also high-density. Here, boundaries may be vague and difficult to discern when development is sporadic and occurs in isolated units over an extended period of time, especially in areas which abut mixed land uses.

SIMILAR CLASSES

- [1210 Fixed Single Family Units](#) - Some Medium Density Residential Areas may appear similar

SPECIAL MAPPING CONVENTIONS

The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value and not dual-coded. All features that are inside the residential area are coded 1310, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
1/12/07

COORDINATES
828494.77 1171636.72

High-Density Residential Modification

Review of Residential Density for LUCODE

Some of the high-density residential land use codes in the 2004 - 05 dataset may have been attributed improperly based on the empirical experience of LCLU Subject Matter Experts (SME). Since the 2008-09 dataset is being updated, based on the 2004-05, the assigned residential LU codes needed to be re-evaluated based on the acreage of each parcel property within a 1310 polygon (i.e., High-Density Residential, Fixed Single Family Unit). In other words, some of the high-density residential polygons need to be re-classed to medium-density residential as shown in the table below.

Adjustments of Residential Classes

2004-05	2008-09	LU Description
0.00 – 0.20	0.00 – 0.15	High
> 0.20 – 0.50	>0.15 - 0.50	Medium
> 0.50 - 2.00	>0.50 - 2.00	Low

Unit: Acres/Parcel

LU Code adjustment for LUCODE = 1310

The process workflow is described below:

1. **Query** polygon attribute records with LUCODE = 1310 (High Density Residential)
2. **Export** the selected features to a new featureclass
3. **Create** a new field called **iAcres** (floating)
4. **Populate** the polygon area (acres) in **iAcres** using the syntax
$$iAcres = \text{SHAPE_Area (sq. ft)} / 43560 \text{ (sq. ft * acre}^{-1}\text{)}$$
5. **Clip** the parcel data for the area of interest using the boundary of the Priority Area to reduce process time
6. **Create** a point featureclass of parcel centroids from step #5
7. **Intersect** the featureclass from step#2 with point centroids (step #6) with "Join Attribute", which results in a point featureclass
8. **Create** a frequency table based on FID
9. **Join** the frequency table with the featureclass from step #2
10. **Create** a table field called **iDensity**
11. **Populate** iDensity with $iAcres / [\text{frequency field}]$
12. **Select** records that are attributed with $0.15 < iDensity \leq 0.5$
13. **Reassign** LUCODE to 1210 of LCLU dataset¹
14. **Save** the dataset and complete the edits

¹ In the event that the parcel data for a specific polygon is incomplete, a representative area within the polygon is measured and the houses are counted by hand.

1320

Mobile Home Units

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1300 Residential, High Density](#) - six or more dwelling units per acre

LEVEL 3: 1320 Mobile Home Units

DESCRIPTION

Mobile homes are rectangular and light-toned, from 8' to 12' wide and 30' to 50' long. They may or may not be on permanent foundations. Any similar structure less than 30' long and 8' wide is assumed to be a travel trailer. In some cases, pull-out sections and awnings alter the basic rectangular shape, although the flat-roofed, rectangular body is still evident upon close inspection.

Mobile home parks (or areas of at least five acres) where each unit occupies a lot of over 0.5 acre are relatively rare. Mobile home parks are usually developed as medium- and high-density areas, with the units usually arranged as regular arrays with their narrow dimension fronting the streets. At high densities, very closely-spaced units may be placed at an angle to the street.

New mobile home parks appear very similar to new high-density fixed-unit single-family developments, including the use of storm-drainage ponds as water bodies integral to the development. The mobile homes, as a group, will show narrower, more rectangular shapes.

Mobile home parks often have associated storage areas for use by park residents for boats and travel trailers/campers/RVs. These storage areas should be mapped with the park. If ponds and storm water retention areas are present and can be connected to create a two acre or greater area, then these water bodies are mapped as [5300 Reservoirs](#).

A mobile home sales lot could be mistaken for a mobile home park unless it is noted that the mobile homes are much closer together and parked in a much more regular pattern in a sales lot than in a mobile home park. The sales lot will show no signs of landscaping. Groups of travel trailers may be parked closely together in these sales lots, too. The interpreter should also beware of office trailers parked at or near construction sites.

KEYS TO PHOTOINTERPRETATION

- Relatively small buildings
- Narrow, rectangular shapes
- Distinctive, regular pattern clearly distinguished from surrounding uses.

CONTEXT

Landscape Position - Mobile home residential areas are found almost anywhere that fixed-unit single-family residential areas are found. They occur in rural areas, at the urban fringe (often as infill among older, lower-density residential areas), and in medium- and high-density residential areas (often either adjacent to or incorporated within the newer subdivision developments or "housing estates"). In most instances, mobile home areas have clear boundaries which abut other residential areas, open areas, agricultural areas, limited-access highways, and large water bodies.

SIMILAR CLASSES

1220 Mobile Home Units - these will be lower density.

1310 Fixed Single Family Units - These will generally be larger structures.

SPECIAL MAPPING CONVENTIONS

This class should only be used for areas consisting of 6 or more mobile home units per acre.

The polygon boundary should encompass the active mobile home area, corresponding to the "operational boundary" of adjacent land uses. Non-residential features should be excluded, to the extent practicable, from this polygon. All features that are inside the mobile home area are coded 1320, including gardens, lawns, fields, pools, garages, out-buildings, etc.

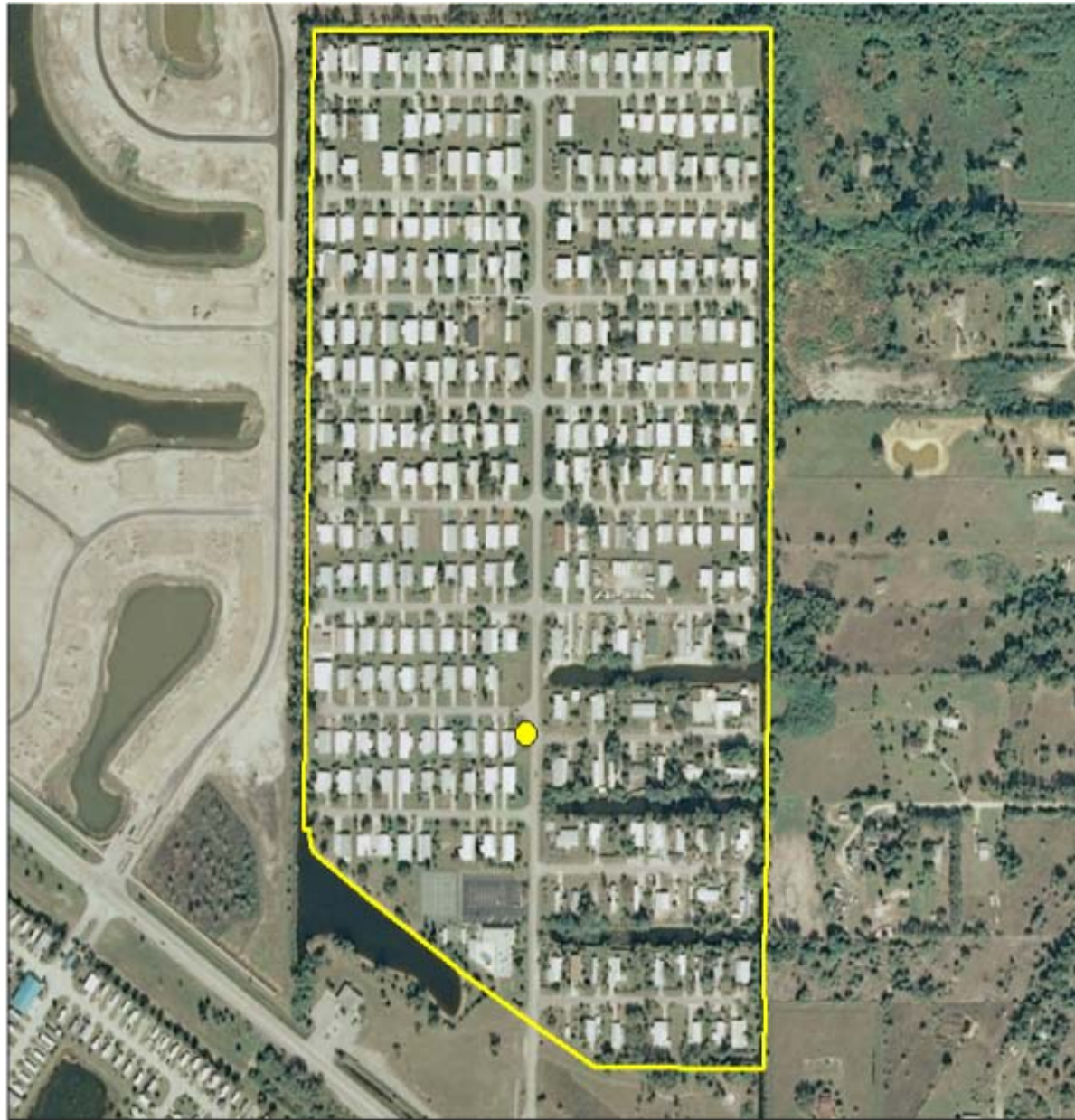
Priority classes such as water bodies and wetlands are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
439218.24 621591.85

1330

Multiple Dwelling Units, Low Rise

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1300 Residential, High Density - six or more dwelling units per acre

LEVEL 3: 1330 Multiple Dwelling Units, Low Rise

DESCRIPTION

Low-Rise Multiple Dwelling Units include two-story town houses, one- or two-story "garden apartments" and duplexes.

Two-story detached structures in neighborhoods with densities less than two structures per acre are generally single-family structures, unless other evidence points to the contrary, such as large parking areas. In older neighborhoods with urban street patterns, two-family houses may occur in areas of one- or two-story detached structures (which are usually single-family houses). The two-family houses may sometimes be identified by a division line in the back yard or by some duplication of features, such as walkways and driveways.

Newer low-rise units often occur in groups, and show a regular or symmetrical geometric arrangement of structures within clearly-defined landscaped grounds, including parking areas and recreational amenities (swimming pools, etc.), associated with the units. Single- and multiple-story town houses and garden apartments generally have one dwelling unit per twenty feet of length; the dwelling units estimated this way should correspond to the number of front walkways or private back yards.

Off-street parking may give an indication of the number of units, since there should be roughly as many spaces (from 2/3 to 1-1/2) as dwelling units.

KEYS TO PHOTOINTERPRETATION

- Often occur in groups
- Show a regular or symmetrical geometric arrangement of structures
- Some duplication of features such as walkways or driveways

CONTEXT

Landscape Position - Most of the low-rise residential areas are newer developments. They commonly occur at the urban fringe, often as infill developments among older, lower-density residential areas. In most instances the low-density housing developments have clear boundaries which abut other residential areas, agricultural areas, limited-access highways, and large water bodies, etc.

SIMILAR CLASSES

1310 Fixed Single Family Units - Dominated by single family dwellings

1320 Mobile Home Units - Dominated by mobile homes

1340 Multiple Dwelling Units, High Rise - Units of more 3 or more stories.

SPECIAL MAPPING CONVENTIONS

The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1330, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

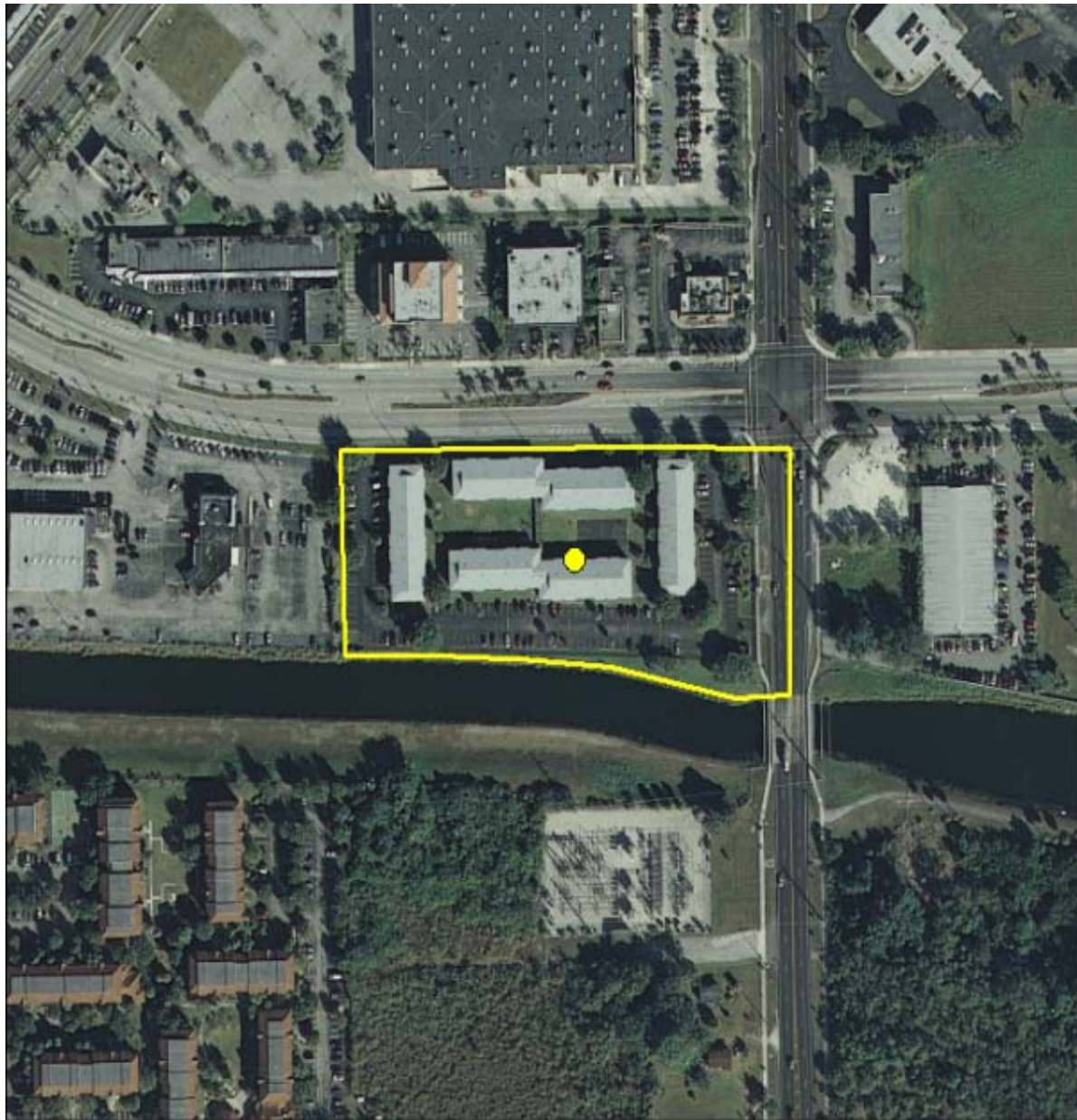
This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/19/06

COORDINATES
862756.82 450106.43

1340

Multiple Dwelling Units, High Rise

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1300 Residential, High Density - six or more dwelling units per acre

LEVEL 3: 1340 Multiple Dwelling Units, High Rise

DESCRIPTION

High-Rise Multiple Dwelling Units include town houses, apartments and condominiums of three stories or more. Subsidiary parking, recreational and open landscaped areas are included. Small water supply and "package" sewage treatment plants are not included if they can be mapped separately.

In older urban areas of detached three-story units, multi-family structures are assumed at densities of six multi-story structures per acre or greater, with two dwelling units per story.

In newer developments, multi-story apartment buildings in suburban/urban areas on the average have one dwelling unit per 1,000 square feet of floor area per story, with correspondingly large parking areas. They often occur in groups, and show a regular or symmetrical geometric arrangement of structures. They are often cross-shaped, or with wings and ell's which permit a large amount of window area per apartment. High-rise units are generally located on clearly-defined, landscaped grounds, including the parking areas and recreational amenities (swimming pools, etc.), associated with the development.

Single (isolated) high-rise residential structures may be distinguished from commercial or industrial buildings by their association with residential neighborhoods, and because their roofs, although usually flat, are without large roof-mounted air-conditioning or ventilating units. (Each apartment will usually have its own unit.) The structures may have off-street parking areas, but lack the loading docks of commercial or industrial buildings.

KEYS TO PHOTOINTERPRETATION

- Often appear as groups of cross-shaped structures
- Show a regular or symmetrical geometric arrangement of structures
- Generally located on well-landscaped grounds
- Parking areas and recreational facilities often visible
- Using stereoscopic comparison to adjacent trees or garages for height reference could be helpful in defining height requirement

CONTEXT

Landscape Position - Most of the high-rise residential areas are newer developments. They commonly occur within high-density areas of detached single-family housing and low-rise residential structures. They are often adjacent to shopping centers, commercial strip developments, and downtown commercial areas. In some instances groups of high-rise developments have clear, but irregular boundaries, with other intensive land uses, but equally often, they occur as scattered developments with a well-defined boundary for only a single building or a small group of buildings. This is common with newer developments.

SIMILAR CLASSES

1330 Multiple Dwelling Units, Low Rise - Units of 2 stories or less

SPECIAL MAPPING CONVENTIONS

The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1340, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

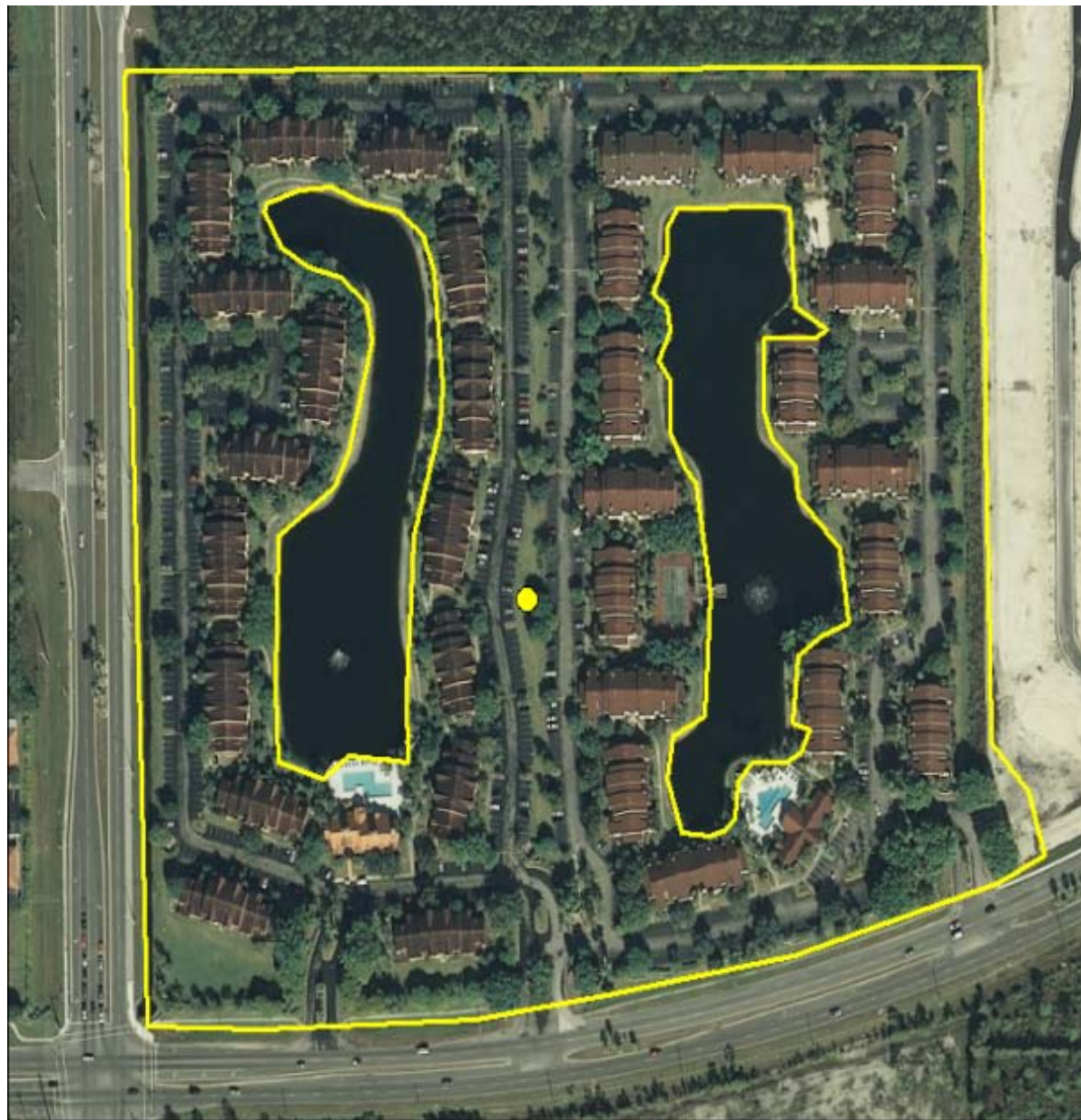
Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
05/10/07

COORDINATES
382477.68 827083.16

1350

Mixed Units, Fixed and Mobile Home Units

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1300 Residential, High Density - six or more dwelling units per acre

LEVEL 3: 1350 Mixed Units, Fixed and Mobile Home Units

DESCRIPTION

The description and keys to interpretation for mobile homes and fixed-units at the three different densities have been covered in the class descriptions for each type.

These "Mixed Units" classes will be used when: (1) there is a consistent mixture of both types of units; and (2) the only way possible to meet the five-acre minimum requirement for a residential area is by mixing both types of units.

KEYS TO PHOTOINTERPRETATION

- Fixed and Mobile Home Units appear intermixed.
- Separate delineation would result in linear or "gerrymandered" polygons.
- Separate delineation would result in polygons below the Minimum Mapping Unit (5 acres).

CONTEXT

Landscape Position - In exurban areas these structures tend to occur scattered among fixed-unit single-family detached structures in linear "strip developments", either along highways or fringing water bodies. They also occur in suburban areas as small sites set aside for mobile homes within a large high-density subdivision of fixed-unit single-family units.

SIMILAR CLASSES

1310 Fixed Single Family Units - Dominated by fixed dwelling

1320 Mobile Home Units - Dominated by mobile homes.

SPECIAL MAPPING CONVENTIONS

The polygon boundary should encompass the active residential area, corresponding to the "operational boundary" of adjacent land uses. Non residential features should be excluded, to the extent practicable, from this polygon. Open areas, such as pastures and forests, that are adjacent to the residential area should be classed with the land cover value, and not dual-coded. All features that are inside the residential area are coded 1230, including gardens, lawns, fields, pools, stables, garages, out-buildings, etc. Polygon boundaries may not necessarily coincide with ownership boundaries. The PI is not required to replicate collateral property data, and should err on the side of land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses and cemeteries are always broken out if they meet minimum size criteria.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



COORDINATES
637972.70 140917.22 (Images)

FIELD PICTURE



DATE
10/02/07

COORDINATES
543134.12 1069232.40 (Field Picture)

1390

High Density Under Construction

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1300 Residential, High Density - six or more dwelling units per acre

LEVEL 3: 1390 High Density Under Construction

DESCRIPTION

This class refers to high density residential areas that are in the process of construction. The existing infrastructure and construction at time of photography are sufficient to show the intended pattern and density, and to conclude that the development is likely to be completed. In most cases, some of the dwellings are already present. If more than two thirds (67%) of the area is constructed, and work is in progress, these areas should be coded 1300, as though complete.

There is no time limit set on completion of the areas under construction. However, if the in-fill process is indefinitely stalled, the code 1920 Inactive Land with Street Pattern is used instead. Progress is indicated by cleared, non-vegetated areas, construction equipment, infrastructure such as roads, driveways and utilities, and by surrounding patterns of land use.

KEYS TO PHOTOINTERPRETATION

- Houses are dense, usually in very regular pattern and orientation.
- Houses tend to be of similar design and appearance.
- Infrastructure, such as roads, driveways and utilities, is present.
- Infrastructure shows the intended street patterns and housing density for most of the delineated area.
- Space, for houses, roads and utilities, has been cleared, leaving a bright (non-vegetated) signature.

CONTEXT

Landscape Position - Most high-density residential areas are new subdivision developments. They commonly occur at the urban fringe, often as infill developments among older, lower-density residential areas. In most instances the high - density developments have clear boundaries which abut lower-density residential areas, agricultural areas, limited-access highways, and large water bodies, etc.

SIMILAR CLASSES

- 1290 Medium Density Under Construction - Some Medium Density UC Residential areas may appear similar.
- 1920 Inactive Land with Street Patterns - No current construction activity is visible.

SPECIAL MAPPING CONVENTIONS

Housing may be in a pre-construction state, with development appearing imminent. One indication is prepared lands adjacent to newly built subdivisions. Surrounding development densities may be used as a guide to assign appropriate density (1190, 1290 or 1390); however 1190 may be used as the default in areas in which it is impossible to determine the ultimate density. Areas that have had no recent activity, or are indefinitely stalled, should be coded 1920 Inactive Land with Street Pattern.

To reduce mapping costs, areas that have varying housing densities may be aggregated together, assigning the average density to the polygon. Polygon shapes should be compact if possible, avoiding linear or convoluted shapes.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

502380.58 1498564.22 (Images)

FIELD PICTURE



DATE
07/21/06

COORDINATES
947212.24 936960.35 (Field Picture)

1400

Commercial and Services

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: **1400 Commercial and Services**

DESCRIPTION

This is an active Level 2 class that includes a broad range of uses which can be difficult to differentiate individually. Only the Level 3 classes [1460 Oil and Gas Storage](#) and [1480 Cemeteries](#), and the Level 4 classes [1411 Shopping Centers](#) and [1423 Junk Yards](#) are delineated separately. This broad class includes many operations providing diverse products and services which often occur in complex mixtures. Subclasses include retail and wholesale, professional, cultural and entertainment, and tourist services, as well as others. There are about 40 level 3 and level 4 subclasses listed in the [FLUCCS Handbook](#) in the 1400 general class - for a complete listing see the Handbook. All of these subclasses are represented in the LCLU 2009 data layer as 1400, except the four noted above.

The 1400 class also includes commercial resorts catering to tourists and vacationers. Resorts are difficult to identify on aerial photography and often contain recreational facilities such as swimming pools and ball courts. Also included in the 1400 class are warehouses, campgrounds and amusement parks.

The 1400 mapping unit should include all secondary structures associated with an enterprise in addition to the main building and integral areas assigned to support the base unit. Included are sheds, warehouses, office buildings, driveways, parking lots and landscaped areas. Also within the mapping units there are likely to be inclusions of other uses, such as light industrial and residential, that are below minimum mapping criteria.

This class can be difficult to differentiate from similar classes. Ancillary land use data (i.e. parcel maps) should be used if available.

KEYS TO PHOTOINTERPRETATION

- The 1400 polygon often contains a diversity of commercial land uses, as well as non-commercial inclusions. Facility sizes may vary significantly.
- Commercial advertising signs or their shadows may be evident.
- Parking facilities will be located near structures to give patrons easy access to service. Parking geometry reflects easy access for passenger cars to each building.
- Sites are usually lacking natural vegetation, trees, or open space but may be nicely landscaped. Lots are generally well kept.
- There is an absence of heavy machinery, raw materials or fences.
- Larger facilities may show trucking or other transportation services for accepting shipment of goods or supplies.

CONTEXT

- **Landscape Position** - This land use is not limited to a particular area of the District, but can be found in almost any urbanized or relatively built-up areas.
- **Vegetation** - Most is not natural, but a result of landscaping.

SIMILAR CLASSES

- [1100](#) to [1300](#) Residential - Residential strips may look similar; parking is more dispersed and uniform in residential strips.
- [1500 Industrial](#) - Tends to lack vegetation or planned landscaping
- [1700 Institutional](#) - Tends to have large lawns and planned landscaping
- [1800 Recreational](#) (indoor activities) - May require ancillary data to determine

SPECIAL MAPPING CONVENTIONS

The SFWMD maps all Commercial and Services other than [1460 Oil and Gas Storage](#), [1480 Cemeteries](#), [1411 Shopping Centers](#) and [1423 Junk Yards](#) into this single Level 2 category. This decision was based on error assessments which indicated a high degree of difficulty in accurately differentiating between the various Commercial and Services subclasses, and a lack of user demand for this differentiation.

If an urban area is under construction and the ultimate land use is discernible as commercial, it should be classified as [1490 Commercial and Services Under Construction](#).

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/20/06

COORDINATES
844086.16 481611.56

1410

Retail Sales and Services

This Level 3 class is not used in the map itself - all retail areas are mapped as the more general Level 2 class 1400 Commercial and Services, except for [1411 Shopping Centers](#), [1423 Junk Yards](#) and [1490 Commercial and Services Under Construction](#).

BACKGROUND

This land use is comprised of varying size and shape buildings with attendant parking facilities for customers. Buildings are often single detached structures, for uses such as drug stores or grocery stores. Flat roofs are common for the larger buildings, and parking areas (public or private) are generally small in comparison with structure areas.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all 1400 Commercial and Services classes is 5 acres.

Differentiating subclasses: Retail Sales and Services areas, as defined above, are difficult to distinguish from other land uses in central business districts on aerial photography, especially when the central business district includes large office buildings.

Most land uses in these business areas will therefore be mapped at the more general Level 2 class 1400 Commercial and Services.

See the PI key for the Level 4 class [1411 Shopping Centers](#) for indicators that assist in differentiation.

DUAL CODING CONVENTION

All of the 1400 classes are **Land Use** classes. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

SIMILAR CLASSES

- [1100 to 1300 Residential](#) - Residential strips may look similar; parking is more dispersed and uniform in residential strips.
- [1500 Industrial](#) - Tends to lack vegetation or planned landscaping
- [1700 Institutional](#) - Tends to have large lawns and planned landscaping
- [1800 Recreational](#) (indoor activities) - May require ancillary data to determine

For more information:

See the PI keys for both [1400 Commercial and Services](#) and [1411 Shopping Centers](#) for more information.

1411 Shopping Centers

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1400 Commercial and Services and Services](#)

LEVEL 3: [1410 Retail Sales and Services](#)

LEVEL 4: 1411 Shopping Centers

DESCRIPTION

This land use is comprised of varying size and shape buildings with common parking facilities for customers, having the structures arranged around the parking area. Buildings may be made up of single structures with multiple units (strip stores), single structures for a single unit (such as a department/discount store) or multiple unconnected buildings for multiple units (upscale "bungalow" or "cottage" units).

Parking areas are large in comparison with structure areas. The structures in a given shopping center are often uniform in size and arrangement. Many of the larger structures have loading docks on the side of the building away from the main parking area - as do most light manufacturing plants. Store managements make their employees park at the far end of the parking lot, giving customers the spaces closer to the stores. At industrial sites, no such concern exists. If the photography were taken on a weekend, it may differentiate the empty parking lot of a light manufacturing plant from the active parking lot of a shopping center.

KEYS TO PHOTOINTERPRETATION

- Large flat roofs are the rule in shopping centers.
- Shopping centers usually have a unique "bi-modal" parking pattern which distinguishes them from light manufacturing plants.

CONTEXT

Landscape Position - This land use type is found in urban and suburban settings throughout the project area, especially along major highways and at highway and road intersections. These land uses (especially smaller shopping centers) may also be adjacent to or within residential areas. The boundaries of shopping centers are usually regular and distinct.

SIMILAR CLASSES

- [1550 Other Light Industrial](#) - Loading docks and trucks may be visible.
- [1560 Other Heavy Industrial](#) - These are usually large sites with large, complex buildings.

SPECIAL MAPPING CONVENTIONS

Those areas that are not clearly related to the functions of the facility are not included. Adjacent land cover areas, such as pastures and forests, are assigned the appropriate land cover value, and not dual-coded. Only those features that are inside the operational boundaries are coded 1411.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1411 mapping unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/09/07

COORDINATES
404219.43 765738.87

1420

Wholesale Sales and Services

This Level 3 class is not used in the map itself - all wholesale areas are mapped as the more general Level 2 class [1400 Commercial and Services](#), except for [1423 Junk Yards](#), [1411 Shopping Centers](#) and [1490 Commercial and Services Under Construction](#).

BACKGROUND

This category is reserved for those land uses associated with the storage and wholesale distribution of products and materials, except for the storage of products and materials subsidiary to an industrial operation. The primary structures associated with this category are identified by their characteristic size, shape and adjacent features. Normally, these structures are large, one to two stories in height, box-like in shape, designed to hold large quantities of products. Active access roads (dark and well-defined on CIR photography), rail spurs, piers and conveyors, or other signs of materials movement should be evident. Loading docks may not be present if roads or rail spurs appear to enter the structure.

Wholesale Sales and Services are often associated with industrial areas or within commercial strip developments. Industrial areas and commercial strips commonly occur near urban areas, but may be found in suburban or rural areas adjacent to airports or in relatively open country. Look for Wholesale Sales and Services activities in any of these contexts.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all [1400 Commercial and Services](#) classes is 5 acres.

Differentiating subclasses: Wholesale Sales and Services areas, as defined above, are difficult to distinguish from other land uses in central business districts on aerial photography, especially when the central business district includes large office buildings.

Most land uses in these business areas will therefore be mapped at the more general Level 2 class [1400 Commercial and Services](#).

See the PI key for the Level 4 class [1423 Wholesale Sales and Services - Junk Yards](#) for indicators that assist in differentiation.

DUAL CODING CONVENTION

All of the [1400](#) classes are **Land Use** classes. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

SIMILAR CLASSES

- [1100](#) to [1300](#) Residential - Residential strips may look similar; parking is more dispersed and uniform in residential strips.
- [1500 Industrial](#) - Tends to lack vegetation or planned landscaping
- [1700 Institutional](#) - Tends to have large lawns and planned landscaping
- [1800 Recreational](#) (indoor activities) - May require ancillary data to determine

For more information:

See the PI keys for both [1400 Commercial and Services](#) and [1423 Wholesale Sales and Services - Junk Yards](#) for more information.

1423 Junk Yards

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1400 Commercial and Services](#)

LEVEL 3: [1420 Wholesale Sales and Services](#)

LEVEL 4: 1423 Junk Yards

DESCRIPTION

Junk yards include all commercial scrap yards. Automobile junk yards are the most common and are identified by irregular rows of cars in lots usually screened from public view by high fences. Look for the fence shadows and a small office building near the street-side entrance to the lot, either inside or outside of the fence. Cars are visible, massed very close together, and sometimes piled atop one another. Commercial scrap yards storing metals and other materials for industrial use will appear somewhat similar, but without the rows of junked cars.

In addition, to qualify as a junk yard, an area must contain more than twenty junked automobiles or pieces of equipment. Some fields may contain scattered pieces of equipment and old cars, but are not junk yards.

Areas having the general appearance of junkyards, but in remote locations, must be examined closely for signs of commercial activity (an office and a perimeter fence) and activity in the yard (distinct roads and paths). If these activity indicators are missing, the area should be mapped as [8350 Solid Waste Disposal](#).

Scrap yards adjacent to an Industrial land use, used for storage of raw materials for the industrial operation, are mapped as part of that operation, and not included in this class.

KEYS TO PHOTOINTERPRETATION

- Distinctive signature of cars massed together is a distinguishing feature.
- Vegetation, if present, appears unmanaged.

CONTEXT

Landscape Position - Junk yards (scrap yards) are often associated with industrial areas or within commercial strip developments. Auto junk yards are especially common along major highways, extending back from the road for a considerable distance.

SIMILAR CLASSES

- [1550 Other Light Industrial](#) - Loading docks and trucks may be visible.
- [1560 Other Heavy Industrial](#) - These are usually large sites with large, complex buildings.

SPECIAL MAPPING CONVENTIONS

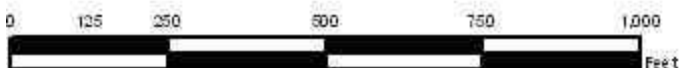
Those areas that are not clearly related to the functions of the facility are not included. Adjacent land cover areas, such as pastures and forests, are assigned the appropriate land cover value, and not dual-coded. Only those features that are inside the operational boundaries are coded 1423.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1423 mapping unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
505456.62 1426419.97

1460

Oil and Gas Storage

Not Attached to Industrial or Manufacturing Facilities

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1400 Commercial and Services](#)

LEVEL 3: 1460 Oil and Gas Storage; not attached to industrial or manufacturing facilities

DESCRIPTION

This class identifies storage facilities used in the retail and wholesale sales of petroleum, oil and lubricating type products. The storage facilities may be in or near an industrial or manufacturing area but are not directly associated with such a facility. The 1460 mapping unit will include tanks, spill enclosures, internal roads, railroads, spurs, piers, embankments, supervisory and maintenance facilities and all open areas associated with those features. Non-petroleum products such as soybean oil may also be stored. Heavy viscosity products may require steam generating plants.

KEYS TO PHOTOINTERPRETATION

- Large cylindrical tanks, appearing as circular shapes
- Extensive pumping and transport facilities, including pipeline systems, service roads, piers, railroads and spurs
- Revetments (spill prevention enclosures with embankments) usually enclose storage areas. Evidence of spills may be present. Water may be ponded and treatment/stormwater lagoons may be present.
- Vegetation tends to be sparse in tank areas. Landscaping is controlled.

CONTEXT

- **Landscape Position** - These facilities are often associated with industrial areas or may exist separately in open areas, where they have distinct, well-defined revetment boundaries with extensive land uses (agricultural, forest lands, etc.) or water. The industrial areas commonly occur near urban areas, but may be found in suburban or rural areas adjacent to airports or in relatively open country.

SIMILAR CLASSES

- [1540 Oil and Gas Processing](#) - These have extensive industrial operations on site.
- [1550 Other Light Industrial](#) - Loading docks and trucks may be visible.
- [1560 Other Heavy Industrial](#) - These are usually large sites with large, complex buildings.
- [1640 Oil and Gas Fields](#) - These will not have major storage facilities.

SPECIAL MAPPING CONVENTIONS

Those areas that are not clearly related to the functions of the facility are not included.

Adjacent land cover areas, such as pastures and forests, are assigned the appropriate land cover value, and not dual-coded. Only those features that are inside the operational boundaries are coded 1460.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1460 mapping unit.

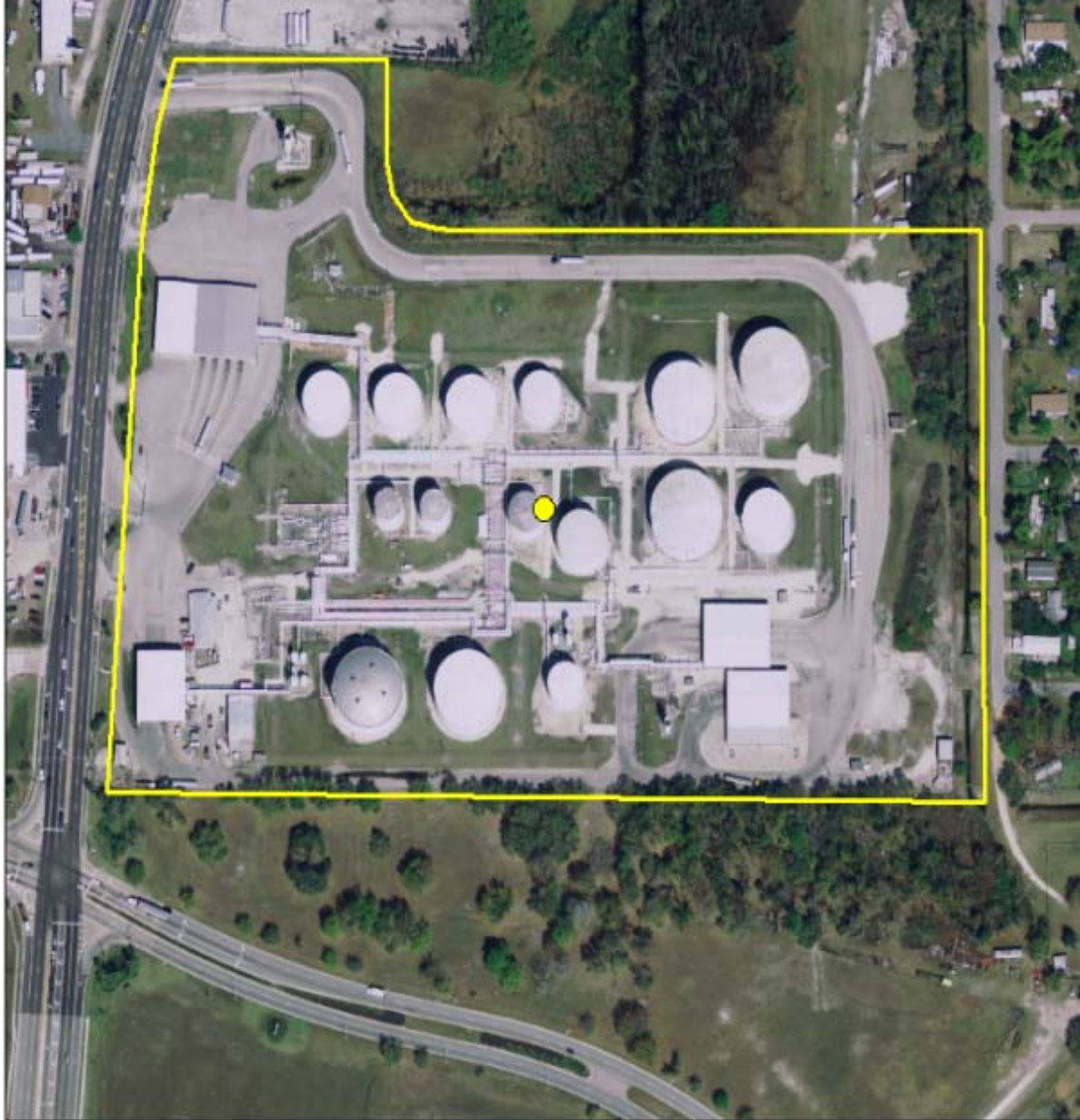
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
537621.88 1486573.49

1480 Cemeteries

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1400 Commercial and Services

LEVEL 3: 1480 Cemeteries

DESCRIPTION

This class includes all burial grounds of any age and type. This is a diverse group, which includes both human and pet cemeteries; old, inactive cemeteries covered by dense canopy; brand new facilities with open expanses of lawn that are not yet "populated" and all combinations in between. Recognition of older cemeteries may be aided by collateral data.

KEYS TO PHOTOINTERPRETATION

- Cemeteries are usually identified on topographic maps by point symbols.
- Newer facilities may have relatively smooth and even textured land with well maintained, irrigated lawns and paved roads.
- Newer facilities may have few or scattered trees. Older ones may be under dense canopy.
- There may be small to medium sized structures (e.g. mausoleums) dispersed about the facility.
- Road pattern and landscaping may have a formal, aesthetic appearance reflecting the religious functions. Roads may curve and wind through the site. There is usually a formal landscaped entrance.
- The headstones and their shadows may form a checker board pattern, or one of closely-spaced rows of white dots.
- Boundaries with adjacent land uses are usually distinct.

CONTEXT

- **Landscape Position** - Cemeteries may be found throughout the District, but are usually closer to populated areas. Their size tends to correlate to the size of the surrounding communities, with larger cemeteries near major urban areas. Small cemeteries are often located next to churches, and should be coded as cemeteries if greater than the 5 acre MMU.

SIMILAR CLASSES

- 1700 Institutional - Often have many smaller structures, including onsite residences
- 1900 Open Land - Does not have enough indication of a land use to assign another code
- 3000 Upland Non-Forested - Vegetation may be diverse in type, texture and pattern.

SPECIAL MAPPING CONVENTIONS

Cemeteries are a priority class and should always be broken out if they meet MMU criteria of 5 acres. Ancillary data should be used, if available, to locate and confirm the presence of cemeteries.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/16/07

COORDINATES
792509.81 967602.99

1490

Commercial and Services Under Construction

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1400 Commercial and Services

LEVEL 3: 1490 Commercial and Services Under Construction

DESCRIPTION

This class includes all 1400 classes that are in the process of construction. It includes 1400 Commercial and Services, 1411 Shopping Centers and 1423 Junk Yards. For a detailed description of those classes see the PI key pages for each one.

This class can be difficult to differentiate from similar classes, especially when under construction. Ancillary land use data (i.e. parcel maps) should be used if available.

KEYS TO PHOTOINTERPRETATION

- See descriptions for 1400, 1411 and 1423.
- Much of the land surface is likely to be un-vegetated and disturbed.
- Construction equipment and building may be visible.
- There are likely to be mounds of fill material, temporary dirt roads, ponding, construction material, construction trailers and other signs of on-going construction.
- Areas under construction will be very light-toned, with a white signature where soil is exposed.

CONTEXT

- **Landscape Position** - Commercial areas are located throughout the District, in association with developed areas and transportation volume. They may be within or independent from developed areas. They are usually located along main transportation routes or at the intersections of secondary transportation corridors.

SIMILAR CLASSES

- 1190, 1290, 1390 - all Residential Under Construction Classes - Sill show the typical residential pattern; individual buildings generally smaller than commercial buildings.
- 7400 Disturbed Land - Evidence of current construction not usually evident; old machinery may be visible.
- 7420 Borrow Areas - Evidence of excavation such as pits and trenches

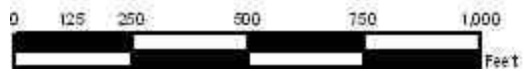
SPECIAL MAPPING CONVENTIONS

Many of the indicators of the 1400 classes are not visible during the construction period. Ancillary data such as parcel or zoning maps may be needed to differentiate this code from other "under construction" classes.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/17/07

COORDINATES
502890.32 1480035.15

1500 Industrial

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: 1500 Industrial

DESCRIPTION

This class is an active Level 2 class and is used when none of the more specific Level 3 subclasses can be applied.

The Level 3 subclasses include:

[1540 Oil and Gas Processing](#)
[1550 Other Light Industrial](#)
[1560 Other Heavy Industrial](#)

The Industrial class includes those land uses where manufacturing, assembly or processing of materials and products occurs. Industrial areas include a wide array of industry types ranging from light manufacturing and industrial parks to heavy manufacturing plants. Also included are those facilities for administration and research, assembly, storage and warehousing, shipping and associated parking lots and grounds.

Typical examples of the Industrial class found in Florida are pulp and lumber mills, oil refineries with tank farms, chemical plants and brick making plants.

Areas that have mixed Industrial classes (multiple subclasses, each one below the MMU) will be classified with the appropriate Level 3 code, if applicable, depending on the predominant type of industries in the polygon. If none of those are the predominant use, then the area is classified as 1500 Industrial.

If an Industrial area is under construction and the ultimate land use is discernible, it should be classified as if the construction were complete.

KEYS TO PHOTOINTERPRETATION

- Visible indicators of industrial operations include stockpiles of raw materials, large power sources and waste management areas.
- Industrial areas may have an unkempt look in comparison with commercial or institutional areas, denoting private use.
- They tend to lack vegetation or planned landscaping.

CONTEXT

- **Landscape Position** - Industrial facilities are often clustered together in larger areas with appropriate zoning, utilities, transportation and other factors. They tend to be located adjacent to urban areas, and with access to major transportation routes, including roads, railroads, water and airports. Heavy industrial concentration is often located by port or rail facilities. Finished products and warehouses tend to be located in urban fringe areas. Fabricating and assembly industries are usually located adjacent to central business districts.

SIMILAR CLASSES

- [1400 Commercial and Services](#) - Generally well-kept lots; may be nicely landscaped
- [1600 Extractive](#) - Large areas of surface disturbance; waste piles, excavating equipment may be visible

SPECIAL MAPPING CONVENTIONS

If an Industrial area is under construction and the ultimate land use is discernible as industrial, it should be classified as 1500 - Industrial.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
533367.43 1487134.29

1540 Oil and Gas Processing

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1500 Industrial](#)

LEVEL 3: **1540 Oil and Gas Processing**

DESCRIPTION

This category includes facilities that produce gasoline, kerosene, jet fuel, asphalt, liquid gases and other petroleum products. It also includes the processing and recycling of used petroleum products and storage facilities for petroleum products. All subsidiary features, such as transportation, offices, cooling ponds and open areas that are within the operational boundaries and related to the operation are included in the mapping unit.

KEYS TO PHOTOINTERPRETATION

- Complex arrangement of buildings, pipelines, towers, vessels, impoundments and lagoons
- Closed vessels for handling liquids, gases, chemicals and suspensions
- Tanks, pipelines and towers for cracking or distillation
- Steam generating plants for heating viscous liquids
- Located away from residential areas

CONTEXT

- **Landscape Position** - These operations are generally located away from residential areas, but close to industrial areas where labor, transportation, and other resources are available. Pipelines, rail lines, harbors, and highways are likely features in the surrounding landscape.

SIMILAR CLASSES

- [1460 Oil and Gas Storage](#) - Revetments enclosing storage areas visible
- [1500 Industrial](#) - Most classes in the Industrial class appear to have similar signatures. Oil and gas processing plants are differentiated by the concentration of tanks, pipelines, towers and stacks characteristic of such plants
- [1560 Other Heavy Industrial](#) - Tends to have extensive handling, transport, and storage capabilities

SPECIAL MAPPING CONVENTIONS

Only those features that are inside the facility boundaries and actively involved in its operation are coded as 1540. These may include parking and transportation areas, treatment facilities, ponds and impoundments, fuel storage, office buildings and open areas lying within the operational boundary.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1540 mapping unit.

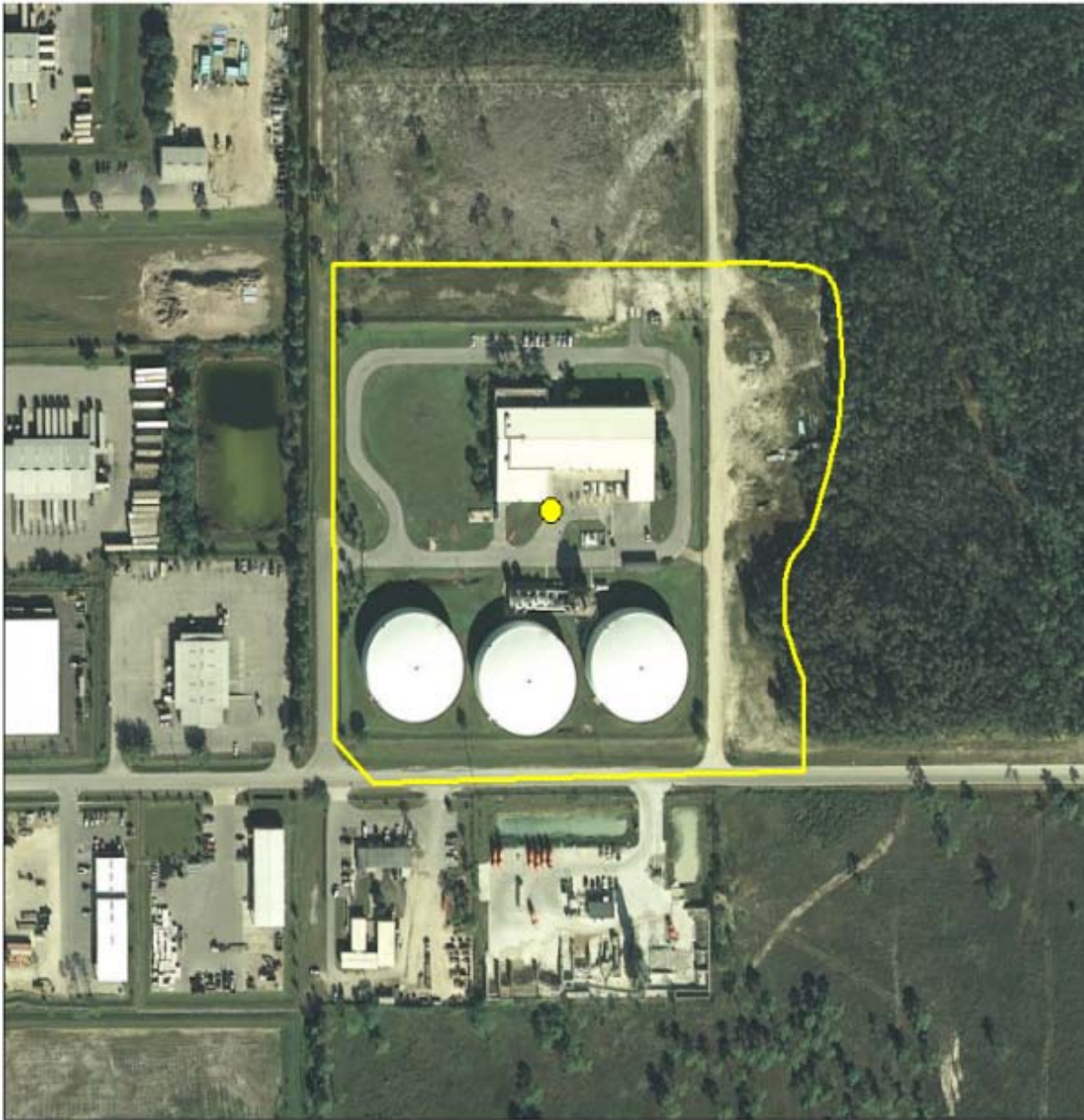
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and the LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
386122.27 834841.37

1550 Other Light Industrial

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1500 Industrial

LEVEL 3: 1550 Other Light Industrial

DESCRIPTION

This class is primarily for fabrication industries, which use the products from other processing and manufacturing industries to make parts and finished products. It also includes any light industries that do not fit in any of the other 1500 Industrial classes. Examples of this class are steel fabrication, small boat manufacturing and electronic manufacturing/assembly.

Light industries tend to be enclosed operations characterized by the buildings used for equipment, materials and manufacturing. They lack the extensive handling, transport, heavy lifting, storage, waste treatment and power facilities that characterize processing and heavy industrial operations.

Light manufacturing can also be distinguished from most commercial operations by the patterns of cars parked in the parking areas and by the size, arrangement and details of the structures. The cars all park as close as possible to the entrance and not in the more regular pattern associated with commercial operations. The buildings shapes are usually rectangular, similar to warehouses, but distinguished from wholesale operations by the subsidiary facilities.

There are a number of land use classes that have a similar appearance on aerial photography, characterized by rectangular buildings. Ancillary land use data should be checked, if available, to confirm this class. Light manufacturing may be mixed with other uses, in which case the predominant use should be established and assigned to the mapping unit.

In transitional areas where species-specific wetland (2 acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

KEYS TO PHOTOINTERPRETATION

- Good highway access
- Medium size parking lots where cars may be parked in a somewhat irregular pattern
- Buildings are medium sized, usually one-story, rectangular; distinguishable from wholesale storage by subsidiary features.
- Storage, equipment and other features tend to be enclosed rather than outdoors.
- Typical roof types are flat, saw tooth and monitor. Ventilators and skylights are common at manufacturing sites.
- Loading docks and trucks may be visible.
- Landscaping may be planned, but there is little or no natural vegetation.

CONTEXT

- **Landscape Position** - Light industry is found throughout the District, in the vicinity of heavy industry, industrial parks, commercial strips and major road intersections. The boundary between light industry areas, especially industrial parks, and other land uses are often regular and well-defined.

SIMILAR CLASSES

- [1400 Commercial and Services](#) - Tend to lack subsidiary features on site
- [1500 Industrial](#) - Most classes in the Industrial class can appear to have similar signatures
- [1560 Other Heavy Industrial](#) - Tends to have extensive handling, transport and storage capabilities

SPECIAL MAPPING CONVENTIONS

Only those features that are inside the facility boundaries and actively involved in its operation are coded as 1550. These may include parking and transportation areas, treatment facilities, fuel storage, office buildings and open areas lying within the operational boundary.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1550 mapping unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/19/06

COORDINATES
865855.72 458563.62

1560

Other Heavy Industrial

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1500 Industrial

LEVEL 3: 1560 Other Heavy Industrial

DESCRIPTION

This class is used for any processing or heavy manufacturing operations that are not included in the 1550 Light Industrial or 1560 Oil and Gas Processing classes. It includes such specific heavy industries as ship building and repair, pre-stressed concrete plants, metal fabrication and large lumber mills.

Heavy manufacturing plants that use any type of raw materials are included in this class. It also includes plants that require minerals or wood-based materials as long as they produce a finished manufacturing product. Facilities that produce primary materials from wood-based materials or minerals belong in the 1500 Industrial class.

Heavy manufacturing operations are characterized by large, heavy steel frame, one-story buildings which support overhead traveling cranes. Outside (open) storage of finished products is typical and large cranes are used for heavy lifting in those storage yards. Occasionally, outside storage of impervious raw materials and waste are seen, but such storage is not usual as with the heavy processing industries. Railroad lines and spurs are common, with the spurs often entering the buildings.

Size and other characteristic features help differentiate heavy industry from other Industrial classes. However, the class is primarily determined by the type of process and product, not by size or visible indicators alone. Manufacturing codes from ancillary data sources provide such information.

Heavy industries tend to have extensive handling, transport, heavy lifting, storage, waste treatment and power facilities. Light industrial operations, in comparison, are usually enclosed operations without such extensive outdoor activities.

Other Industrial, Extractive and Utility classes can have a similar appearance on aerial photography. Ancillary land use data should be checked, if available, to confirm this class. Heavy manufacturing may be mixed with other uses, in which case the predominant use should be determined and the polygon classified accordingly.

In transitional areas where species-specific wetland (2 acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

KEYS TO PHOTOINTERPRETATION

- There is little or no vegetation or planned landscaping.
- There is often an unkempt, "industrial" look to the property.
- Operations are usually fenced and secured.
- They may have open areas for storage or outdoor equipment or parking.
- The sites are usually large; buildings tend to be large and complex.

CONTEXT

- **Landscape Position** - Heavy industries are often clustered in areas with appropriate zoning, utilities, transportation and other factors. They tend to be located adjacent to urban areas, with access to major transportation routes, including roads, railroads, water and airports. Heavy industrial concentration is often located by port or rail facilities. Alternatively, it may be located in more remote areas where raw materials, energy or water are available.

SIMILAR CLASSES

- **1500 Industrial** - Most classes in the Industrial group can appear to have similar signatures. Heavy industry is differentiated by size and other characteristics, but appearance alone will not differentiate it from similar classes. Ancillary land use data indicating the type of manufacturing will be critical in many cases.
- **1550 Other Light Industrial** - Operations are mainly enclosed; buildings are simple rectangular.

SPECIAL MAPPING CONVENTIONS

Only those features that are inside the facility boundaries and involved in its operation are included in the 1560 mapping unit. These may include parking and transportation areas, treatment facilities, fuel storage, office buildings and open areas within the operational boundary.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out, even if located within the 1560 mapping unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/15/07

COORDINATES
815352.02 986358.07

1600 Extractive

LEVEL 1: [1000 Urban and Built-Up](#)
LEVEL 2: **1600 Extractive**

DESCRIPTION

This is an active Level 2 class that should be applied only when one of the more specific Level 3 and Level 4 subclasses cannot be determined. This may occur when the particular type of extractive activity is not discernible from the aerial photo. The subclasses include:

- [1610 Strip Mines](#)
- [1620 Sand and Gravel Pits](#)
- [1630 Rock Quarries](#)
- [1640 Oil and Gas Fields](#)
- [1650 Reclaimed Mine Land](#)
- [1660 Holding Ponds](#)
- [1670 Abandoned Mine Land](#)

General Description, modified from FDOT manual:

Extractive areas encompass both surface and subsurface mining operations. Included are strip mines - clays, peat and heavy metals; sand and gravel pits; rock quarries - including limerock and phosphate; and oil and gas fields. Holding ponds, reclaimed and abandoned mines are also included. Industrial complexes where the extracted material is refined, packaged or further processed, belong in the [1500 Industrial](#) class. The recognizable impacts of these activities on the landscape will vary from the giant pit mines covering vast areas to oil wells which cover only a few square feet. Consistent identification of these diverse mining areas can be difficult from remote sensing data alone.

Flooded pits and quarries, which may be part of a mining operation, will be classified as [1660 Holding Ponds](#). The presence of water bodies does not necessarily imply inactive or unused extractive areas. Ponds or lakes are often an integral part of an extractive operation.

Abandoned and inactive mining operations are a part of the extractive category. Reclaimed mine lands are also included with either managed or natural re-vegetation. Both [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#) are land use classes that require interpretation of land cover also. Areas of tailings and abandoned pits and quarries may remain recognizable for a long time. Such areas may be barren for decades after deposition. At some point of restoration the mining signature will not be recognizable, and such areas are mapped in other appropriate categories.

KEYS TO PHOTOINTERPRETATION

- Large areas of surface disturbance; scouring and piling of land and overburden; often ponded
- Deep (rock quarry) or shallow (sand and gravel pits) excavations that are often ponded
- Presence of waste piles, piles of mined materials, and a variety of excavating equipment such as bulldozers, shovels, dredges and drag lines
- Transportation equipment such as trucks, mini cars, railway equipment and conveyors
- Some mining operations require considerable processing before shipping and will have large structures and associated refining equipment

- Most operations are quite large and impressive on the landscape

CONTEXT

- **Landscape Position** - These land uses may be found in any area of the District, depending on the specific class of activity.

SIMILAR CLASSES

All active mining classes have a potential for similar appearance on an aerial photo. When the particular type of extractive activity cannot be determined, the Level 2 1600 code should be used. Ancillary data, such as soils, should be used to help determine the type of mine prior to using the more general class.

- [7400 Disturbed Land](#) - 7400 may be used as a land cover code with land uses [1650](#) or [1670](#), or it may be used by itself if the land use cannot be determined.

SPECIAL MAPPING CONVENTIONS

This classification was modified by the District. Flooded open water pits and quarries that are part of *inactive* mining operations are classified as [5300 Reservoirs](#). If the mining operation is still active, these are classified as [1660 Holding Ponds](#).

This Level 2 code may be used when it is impossible to distinguish between [1610 Strip Mines](#), [1620 Sand and Gravel Pits](#) and [1630 Rock Quarries](#). The PI must always use the most specific class possible.

DUAL CODING CONVENTION

All the 1600 classes are **Land Use** classes. The LUCODE and LCCODE are the same, **except** [1650 Reclaimed Mine Land](#) and [1670 Reclaimed Mine Land](#). **These require a separate Land Cover code.**

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/03/07

COORDINATES
450210.73 1474121.31

1610 Strip Mines

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: 1610 Strip Mines

DESCRIPTION

Strip mining is a method that accesses buried material by stripping off the top surface of the land. If the product is covered, all overburden is removed to gain access to the product. Two broad categories of strip mining are: area strip mining, which is practiced on relatively level terrain; and contour strip mining, which is done in hilly terrain.

The operations are easily identified by characteristic land scarring, either as enormous pits or in long shallow trenches with the overburden piles along the trenches. Active operations are indicated by the presence of power shovels, dredges or other heavy tracked construction equipment, bulldozers, trucks, maintenance and supervisory buildings.

Cooling canals for thermal electric or nuclear power plants might be confused with strip mines. The canals are a regularly spaced series of parallel trenches which cover many square miles. The canals are connected to each other and to the power plant discharge canal, whereas the water filled trenches of strip mines do not interconnect.

Abandoned or inactive strip mines are flooded. The water is a deep black and the surrounding area is reddish-gray as vegetation re-establishes itself on the overburden and open areas. Abandoned mines remain in the Extractive category until succession has produced a cover which appears as a dark magenta tone on CIR photography, unless there is evidence that the site is being reclaimed.

This Level 3 class also includes mining operations such as clay, peat and heavy metals.

KEYS TO PHOTOINTERPRETATION

- This mining method is identified by its land scarring, either in pit form or in long trenches, with tailings along the trenching operation.
- A series of elongated piles of spoil is present.
- Clay and heavy metals mining tend to be large operations.

CONTEXT

- **Landscape Position** - Strip mining operations are generally located in open, rural areas. The exact location depends on the geology of the area. Boundaries with adjacent land uses are distinct.

SIMILAR CLASSES

- [1620 Sand and Gravel Pits](#) - Conical piles of sand and gravel may be visible.
- [1630 Rock Quarries](#) - Most quarries are flooded.
- [1650 Reclaimed Mine Land](#) - Vegetation tends to have a planned, landscaped appearance.
- [1670 Abandoned Mine Land](#) - Vegetation has a more random, unplanned appearance.

SPECIAL MAPPING CONVENTIONS

The 1610 mapping unit includes active and inactive mining operations and all other features that are part of the mining operation. This includes storage areas, material stockpiles, parking, offices and other buildings, roads and open areas that are inside the operational boundary. Those areas that are outside the active perimeter and not related to the operation are not included.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they should be broken out. Also broken out are [1660 Holding Ponds](#), [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#) areas, if they meet minimum size criteria. These classes can overlap and intermingle in mining areas, or change quickly with water level fluctuations. Portions of the site may be temporarily vegetated or water-filled. Pls should consider the predominant uses and avoid excessively detailed line work.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
415477.21 741030.45

1620 Sand and Gravel Pits

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: **1620 Sand and Gravel Pits**

DESCRIPTION

This class includes active sand and gravel mining operations and their associated features, as well as clay pits. The operations usually include processing facilities for sorting, cleaning, crushing, etc. Concrete batch plants or Portland cement operations may also be located at the mining sites. Active operations are indicated by the presence of power shovels, dredges, heavy tracked construction equipment, bulldozers, trucks, washing and screening equipment, and buildings for maintenance, storage, and supervision.

Sand and gravel operations are often located near built up areas, supporting local demands for construction materials. They tend to be relatively small in size compared to other strip mining operations such as metals and phosphates. Clay pits will appear similar to dry sand and gravel pits, but will lack processing equipment.

KEYS TO PHOTOINTERPRETATION

- Signatures tend to be very light, bright tones for unsaturated areas.
- Stockpiles are conical, often found at the end of elevated conveyor belts.
- Sides of excavations are smooth, scalloped and sloping, compared to jagged vertical walls of rock quarries.
- NRCS county soil maps should assist in locating these sites.
- Pits may be flooded or dry, depending on depth, status, and water conditions.

CONTEXT

- **Landscape Position** - These operations are generally located near built up areas, serving the local demand for construction materials.

SIMILAR CLASSES

- [1610 Strip Mines](#) - Major land scarring apparent on photo
- [1660 Holding Ponds](#) - Almost always have a deep black signature
- [7200 Sand Other Than Beaches](#) - Do not have construction equipment, trucks, etc.
- [7420 Borrow Areas](#) - Appear as a depression, with a regular, often rectangular shape

SPECIAL MAPPING CONVENTIONS

The 1620 mapping unit includes all active and inactive mining operations themselves and their other associated features. Those areas that are outside the active facility perimeter and not related to its functions are not included.

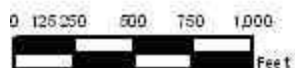
Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they should be broken out. Also broken out are [1660 Holding Ponds](#), [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#), if they meet minimum

size criteria. These classes can intermix on the sites, or change quickly with water level fluctuations. Portions of the site may be temporarily vegetated or filled with water. PIs should consider the predominant uses and avoid excessively detailed line work.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
430957.64 788086.89

1630 Rock Quarries

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: **1630 Rock Quarries**

DESCRIPTION

Limestone and phosphate are the rock materials quarried in the District. Limestone quarries are usually smaller operations that produce broken limestone which is crushed for use as roadway base material or for making concrete or cement. The rock may be crushed to make sand or gravel for local construction; in that case the operation is still mapped as a rock quarry.

Phosphate mining operations tend to be larger, intensive operations with characteristic site geometry, massive equipment, and settling ponds.

Most quarries are flooded because of the low, flat topography and high water table in limestone terrain. Blasting is carried out under water and draglines remove the broken rock, excavating to depths averaging forty feet in the process. Look for draglines, broken rock drying in "surge piles" at the edge of the quarry and trucks or conveyors moving the partially dried rock to the crushers of a nearby processing plant. Quarry edges, when visible, are vertical and jagged, unlike the edges of sand and gravel pits, or clay pits, which usually show smoother, scalloped, sloping edges. The water is very turbid in an active quarry, appearing a grayish green on CIR photography, while the active quarry area is a bright white.

KEYS TO PHOTOINTERPRETATION

- The quarry pits are deep, with jagged, vertical walls, unlike sand, gravel and clay pits.
- Rock piles lack the smooth, uniform texture and color of finer materials.
- The excavation equipment is characteristic of rock quarrying, with draglines visible in active pits.
- Broken rock lies in "surge piles" at the edge of the quarry and is conveyed by trucks or conveyors to nearby processing plants, which may be on site.
- Rock quarries, which usually support local construction, may be small compared to intensive operations such as heavy metals and phosphates.

CONTEXT

- **Landscape Position** - Rock quarries are moving away from populated areas to avoid impacts such as dust, noise and traffic. However, many are still near developed areas, to take advantage of lower transportation costs.

SIMILAR CLASSES

- [1600 Extractive](#) - Most classes in the extractive group can present similar signatures.
- [7000 Barren Land](#) - Has a similar appearance, but no indicators characteristic of mining.

SPECIAL MAPPING CONVENTIONS

The 1630 mapping unit includes all active and inactive mining operations and their associated features. Those areas that are outside the facility perimeter and not related to its functions are not included.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they should be broken out. Also broken out are [1660 Holding Ponds](#), [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#) areas, if they meet minimum size criteria. These classes can intermix on the sites, or change quickly with water level fluctuations.

Temporarily inactive sites remain in the [1630](#) category. Reclaimed sites are classified as [1650 Reclaimed Mine Land](#) and abandoned sites as [1670 Abandoned Mine Land](#). At some point of restoration or re-growth the mining function may not be apparent from the aerial photography. If so, such areas are assigned to other appropriate classes.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/02/07

COORDINATES
535430.82 1493734.52

1640 Oil and Gas Fields

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1600 Extractive

LEVEL 3: 1640 Oil and Gas Fields

DESCRIPTION

These areas are the sources of crude petroleum products. No refining facilities are associated with these land uses and they are often difficult to recognize. Native vegetation is left intact where possible in an effort to minimize environmental impacts. The key features for identification of this land use are the well pads and numerous cleared linear corridors for access roads and pipes for the transport of the petroleum products to a central handling facility for shipping to the refinery.

Well pads are identified as clearings in the native vegetation, typically at the end of an access road or directly adjacent to such a road, with a regularly shaped area of crushed stone or other non-native material around the well head. With high resolution CIR photography, the well may be visible with sufficient magnification. Access roads and pipe corridors are visible as areas of cleared vegetation with varying amounts of herbaceous or shrubby growth depending on the amount of traffic and the status of maintenance. The vegetation will produce a magenta or greenish shade depending on the type of vegetation and the amount of moisture present. Wetter areas or winter dormant herbaceous vegetation typically present the greenish tones while shrubs and growing herbaceous materials produce magenta signatures. Storage facilities (e.g., tanks) are also present in the vicinity of the distribution center.

KEYS TO PHOTOINTERPRETATION

- Well head pads and drilling equipment are present, visible as clearings in the native vegetation, typically at the end of an access road.
- Access roads and pipe corridors are visible as straight lines of cleared vegetation with varying herbaceous or shrub overgrowth.
- Flow control and storage tank facilities are present.
- In forested areas oil and gas fields may appear as a patchwork of small clearings connected by a grid system of access roads.

CONTEXT

- **Landscape Position** - Oil and Gas Fields are located in undeveloped areas. Very few examples of this land use occur in Florida. The only area of oil and gas fields within the South Florida Water Management District is found east of Fort Myers and Naples, specifically the area of southeastern Charlotte, western Hendry and northern Collier Counties. Small exploratory well fields may also be found in other areas north of the Everglades.

SIMILAR CLASSES

- **1460 Oil and Gas Storage** - Gas storage tanks are often horizontal cylinders with rounded ends.

SPECIAL MAPPING CONVENTIONS

The 1640 mapping unit includes active and inactive mining operations and all associated features. Those areas that are outside the facility perimeter and not related to its functions are not included. Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they should be broken out.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
11/20/07

COORDINATES
556744.34 699859.55

1650 Reclaimed Mine Land

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: **1650 Reclaimed Mine Land**

DESCRIPTION

This class is for mining sites that have been or are being restored to approximate a natural state or converted into other types of land use, such as pasture, recreation or development. It does not include portions of active mining areas that are temporarily inactive or abandoned mine lands.

On close inspection, the geometry of the site will reflect the extent of previous mining operations, examples of which may be active in the surrounding landscape.

KEYS TO PHOTOINTERPRETATION

- Waste areas and spoil piles from mining operations may still remain. Portions of the site may be abandoned.
- Artificial water bodies created from the mining or reclamation activities are often present, in contrast to natural lakes or a lack of surface water features in the surrounding landscape.
- If there are no indications or signature of prior mining activities, the area should be classified as the natural cover type or appropriate land use class.

CONTEXT

- **Landscape Position** - Reclaimed lands are generally located in rural areas with a history of mining activities, some of which may be currently active.
- **Vegetation** - Vegetation is likely to be sparse compared to natural areas, and tends to have a planned, landscaped appearance. Vegetative communities are usually not the same as adjacent natural areas.

SIMILAR CLASSES

- [1600 Extractive](#) - Most classes in the Extractive class can present similar signatures.
- [1610 Strip Mines](#) - Major land scarring apparent on photo
- [1670 Abandoned Mine Lands](#) - Vegetation has a more random, unplanned appearance.
- [3100 Herbaceous \(Dry Prairie\)](#) - Shows no evidence of mining activity
- [3200 Shrub and Brushland](#) - Vegetation has a natural appearance; no evidence of mining activity
- [3300 Upland Non-Forested \(Mixed\)](#) - Vegetation has a natural appearance; no evidence of mining activity
- [7400 Disturbed Land](#) - Has a more whitish, scoured appearance, with some active site preparation or other activity visible

SPECIAL MAPPING CONVENTIONS

The 1650 mapping unit includes the former operational area of mining operations that have been reclaimed; this includes former storage areas, material stockpiles, parking, offices and other buildings, roads and open areas that were at one time inside the operational boundary.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they should be broken out. Also broken out are [5300 Reservoirs](#) and [1670 Abandoned Mine Lands](#). These classes can be intermixed on mining sites - some aggregation may be required at the discretion of interpreters. PIs should consider the predominant uses or cover and avoid excessively detailed line work.

DUAL CODING CONVENTION

This is a **Land Use** class. **Dual coding is always required - a land cover code must be assigned** in addition to the 1650 code. The **Land Cover** code is frequently from one of the [3000](#) classes, "Upland Non-Forested".

No 2004-05 CIR image available: 1650 not used in 2004-05 update

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

853487.96 564940.17 (Image)

FIELD PICTURE



DATE

n/a

COORDINATES

n/a (Field Picture)

1660 Holding Ponds

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: **1660 Holding Ponds**

DESCRIPTION

This class includes the artificial bodies of water within the operational boundary of active mining sites. The ponds may be part of the active mining process or inactive at the time of photography. If they are clearly in a final state of reclamation or abandonment they should be classed as [5300 Reservoirs](#).

Man-made ponds and lakes often form an integral part of the extractive process. They serve a variety of purposes such as storm water treatment, settling ponds and the discharge point for de-watering operations.

Determination of the intended use of the ponds is usually not possible using aerial photos. Areas of open water on a mining site are therefore classed [5300 Reservoirs](#) or [5200 Lakes](#) rather than 1660 Holding Ponds, unless there is evidence (e.g. equipment present) that shows there is active mining in the pit.

KEYS TO PHOTOINTERPRETATION

- Man-made ponds of varying size and shape, located in and around mining areas
- Ponds are almost always black on CIR photography or streaked with white from the reflection of ripple patterns. More turbid sites may appear grayish green, and active sites may also have an unnatural light blue color on CIR.

CONTEXT

- **Landscape Position** - Holding Ponds can be found throughout the District in mostly remote, exurban areas.

SIMILAR CLASSES

- [5300 Reservoirs](#) - Evidence of active extraction not apparent

SPECIAL MAPPING CONVENTIONS

Priority classes such as natural water bodies and wetlands are broken out if they meet their minimum size criteria of 2 acres. Ponds and quarries are usually classified as [5300 Reservoirs](#) if they are clearly in a final state of reclamation or abandonment.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
414653.33 738398.32

1670 Abandoned Mine Land

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1600 Extractive](#)

LEVEL 3: **1670 Abandoned Mine Land**

DESCRIPTION

This class includes abandoned mining sites that have not been restored to a natural state or converted into other land uses. It does not include those portions of active mining areas that are temporarily inactive, or reclaimed mining lands.

On close inspection, the geometry of the site will reflect the extent of previous mining operations, which are likely to be active in other parts of the surrounding landscape. The topography may have a diverse, lumpy appearance, reflecting the former mining processes.

KEYS TO PHOTOINTERPRETATION

- Spoil areas are reverting back to natural vegetation; usually grassy or scrub-shrub in appearance.
- There may be regularly spaced piles of spoil material created by swiveling drag lines.
- Waste areas and spoil piles from mining operations may still remain. Portions of the site may be reclaimed, although most of the area is not.
- Artificial water bodies created from the mining activities are often present, in contrast to natural lakes or even a lack of surface water features in the surrounding landscape.
- If there are no indications of prior mining activities, the area should be classified as the natural cover type or appropriate land use class.

CONTEXT

- **Landscape Position** - Abandoned mining lands are generally located in rural areas with a history of mining activities. Surrounding areas may be currently active.
- **Vegetation** - Vegetation is likely to be sparse compared to natural areas and tends to have a random, chaotic appearance.

SIMILAR CLASSES

- [1610 Strip Mines](#) - Major land scarring apparent on photo
- [1650 Reclaimed Mine Land](#) - Vegetation has a more planned, landscaped appearance.
- [3100 Herbaceous \(Dry Prairie\)](#) - Shows no evidence of mining activity
- [3200 Shrub and Brushland](#) - Vegetation has a natural appearance; no evidence of mining activity
- [7400 Disturbed Land](#) - Has a more whitish, scoured appearance, with some active site preparation or other activity visible

SPECIAL MAPPING CONVENTIONS

This is a SFWMD modification of the FLUCCS system, which does not have a class for abandoned mining lands.

The 1670 mapping unit includes the former operational area of mining operations, including former storage areas, material stockpiles, parking, offices and other buildings, roads and open areas that were at one time inside the operational boundary.

Priority classes such as water bodies and wetlands should be broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. **Dual coding is always required** - a **Land Cover** code must be **assigned** in addition to the 1670 code. The **Land Cover** code is frequently from one of the [3000 Upland Non-Forested](#) or [4000 Upland Forested](#) classes.

No 2004-05 pictures available: 1650 not used in 2004-05 update

CIR DOQQ IMAGE



FIELD PICTURE



DATE

n/a

COORDINATES

n/a

1700 Institutional

LEVEL 1: [1000 Urban and Built-Up](#)
LEVEL 2: **1700 Institutional**

DESCRIPTION

This class includes a broad range of Institutional uses which can be difficult to differentiate individually. Only the [1710 Educational Facilities](#), [1730 Military](#) and [1760 Correctional](#) subclasses are broken out separately. 1700 includes uses such as educational, religious, medical and health care, governmental, correctional, commercial child care and others. Included within a particular Institutional unit are all buildings, grounds, parking lots, recreational areas, green houses, gardens and other features that are attached to the facility.

Educational institutions encompass all levels of public and private schools, colleges, universities, training centers, etc. The entire areas enclosing buildings, campus open space, dormitories, recreational facilities and parking lots are included into this category where they are identifiable.

KEYS TO PHOTOINTERPRETATION

- Institutions often have many smaller structures, including on-site residences.
- Many facilities are self sufficient - they may have their own power generator and sanitary disposal systems.
- Institutions are often fenced - passage may be restricted or controlled. Correctional facilities tend to be confined facilities enclosed within multiple fence structures.
- They normally have good transportation access.
- They tend to have large lawns and planned landscaping, with an absence of natural vegetation.
- Some operations are quite large and impressive on the landscape.

CONTEXT

- **Landscape Position** - The location depends on the type of institution. Most educational and medical facilities are located in populated areas. Military or correctional facilities are often in more isolated areas. Water Management District headquarters tend to be located next to airports.

SIMILAR CLASSES

- [1400 Commercial and Services](#) - Features such as office buildings may look the same whether public or private. Ancillary land use data may be used to differentiate.

SPECIAL MAPPING CONVENTIONS

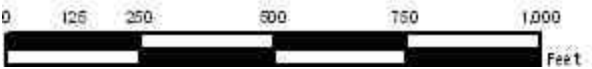
Those areas that are not clearly related to the functions of the institution are not included. Land cover areas, such as pastures and forests, that are adjacent to the facility should generally be classed with the land cover value and not dual coded. Only those features that are inside the facility boundaries and actively involved in its operation are coded 1700. These may include gardens, lawns, fields and recreational areas. Spatial integration and function determine whether features are included in the

1700 mapping unit. The PI is not required to discern ownership or replicate property ancillary data and should err on the side of capturing land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses, landfills and treatment facilities, are exceptions to the above. If these features meet their minimum size criteria they are always broken out, even if located within the 1700 mapping unit.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/10/07

COORDINATES
385925.89 804480.38

1710 Educational Facilities

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1700 Institutional

LEVEL 3: 1710 Educational Facilities

DESCRIPTION

Educational facilities include all public and private schools, colleges, universities, training centers, etc. It is not possible to identify many smaller private schools or professional educational facilities from aerial photos as they can occupy the same types of structures, or parts of structures, used by non-educational land uses. Supplemental data is often necessary to accurately determine this class.

In rural areas, many of these structures have been abandoned and must be examined for signs of activity on the aerial photo if first identified from a topographic map. The important identifying features of these facilities are well known. The public school is one of the easier items to identify due to its size, shape, and the related and well-defined physical education areas. Even in the elementary schools, baseball diamonds are evident and often other playground equipment and use patterns can be seen. In the high schools, the baseball diamonds are joined by soccer and football fields and track facilities. Separate on-premise parking for staff and students is provided. Older school facilities in the central urban core are limited in area as compared to newer facilities and often the parking or physical education facilities may be in a separate location from the school building itself. A flagpole (or shadow of a flagpole) and landscaped areas can often be distinguished.

Universities, colleges and some private secondary schools often occupy large areas of land. Main buildings (administration and maintenance buildings, classrooms, libraries, cafeterias, student centers, dormitories, group residences and staff houses on or adjacent to the main campus), campus open spaces, parking lots, all supporting facilities and any other features that are functionally related to the educational institution are included in this class.

Also included are stadiums and other recreational facilities, experimental farms, greenhouses and research field station structures and other agricultural uses specifically associated with the campus where they are identifiable, as well as research parks operated by the university.

Nearby or adjacent industrial parks should be examined closely for signs of connections with the campus. If the aerial photo or supplemental data indicate university ownership, they are also included in the 1710 Educational Facilities class.

KEYS TO PHOTOINTERPRETATION

- Often noted on topographic maps by either name or symbol
- Related and well defined physical education areas are visible
- High schools likely have visible baseball diamonds, soccer and/or football fields
- Universities often occupy large areas of land
- Collateral data may be needed to identify smaller educational facilities

CONTEXT

- **Landscape Position** - Educational facilities are found throughout the District. They may be adjacent to almost any land use, including light industrial. In rural areas the campus boundaries are usually clearly defined. In urban or suburban areas, the campus may extend in

irregular fashion into the surrounding land uses. Some facilities (stadiums or sports fields of urban universities) may be away from the main campus and unidentifiable as educational facilities without supplemental data.

SIMILAR CLASSES

- [1400 Commercial and Services](#) - Features such as office buildings may resemble educational facilities. Ancillary land use data may be used to differentiate these classes.
- [1700 Institutional](#) - Ancillary data and context will help to determine whether the facility should be properly classified as educational.

SPECIAL MAPPING CONVENTIONS

Those areas that are not clearly related to the functions of the educational institution are not included. Land cover areas, such as pastures and forests, that are adjacent to the facility should generally be classed with the land cover value and not dual coded. The PI must delineate the operational boundary of the educational facility as apparent on the aerial photo.

Only those features that are inside the facility boundary and actively involved in its operation are coded 1710 Educational Facilities. These may include gardens, lawns, fields and recreational areas. Spatial integration and function determine which features are included in the 1710 mapping unit. The PI is not required to discern ownership or replicate property ancillary data, and should err on the side of describing land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses, landfills and treatment facilities, are exceptions to the above. If these features meet their minimum size criteria they are always broken out, even if located within the 1710 mapping unit.

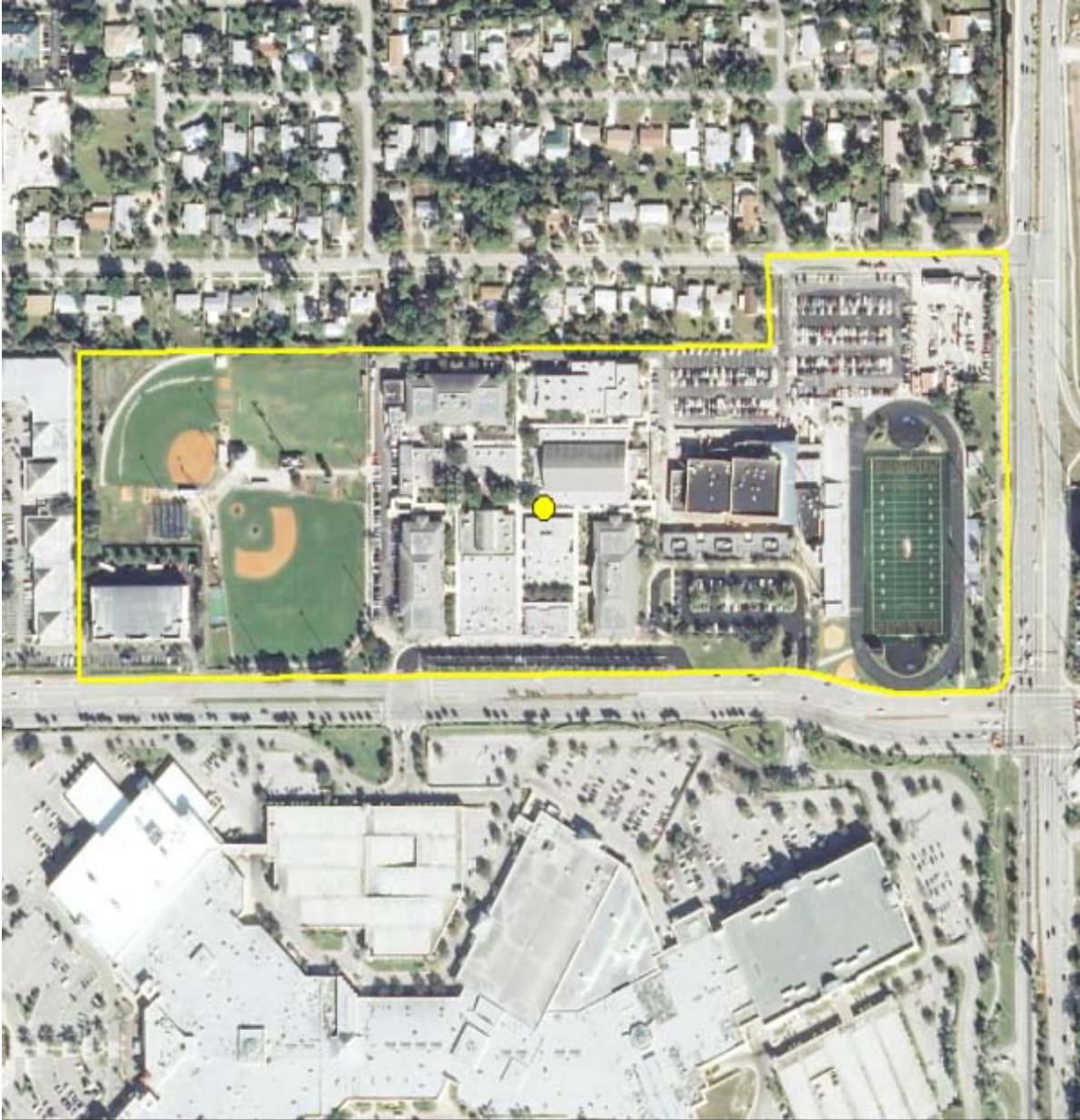
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
11/20/07

COORDINATES
395424.10 669313.78

1730 Military

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1700 Institutional](#)

LEVEL 3: 1730 Military

DESCRIPTION

This class includes areas used by the military, ranging from large bases, reservations and training camps to small installations, such as Coast Guard lighthouses and armories. Military facilities are characterized by a wide variety of features including training camps, missile sites, etc. Administration, storage, repair, security and other functional military buildings are included, along with practice ranges, storage lots and buffer zones. Auxiliary land uses, particularly residential, commercial and other supporting uses located within the operational boundary of the military base are included in this category.

KEYS TO PHOTOINTERPRETATION

- Obvious military equipment; tanks, airplanes, missile silos, etc.
- Administration, storage, repair, security and other functional buildings
- Practice ranges, storage areas and/or equipment storage lots
- Presence of air strips or drop zones
- Usually the installation will be surrounded by chain link fence

CONTEXT

- **Landscape Position** - Military bases are often located in isolated areas. However, they may support commercial, residential, and other uses that are located in close proximity to the base itself.

SIMILAR CLASSES

- [1100](#) to [1300](#) Residential - Residential areas that are not within the operational boundary of the base should be coded as Residential.
- [1400 Commercial and Services](#) - Features such as office buildings may look the same whether public or private. Ancillary land use data may be used to differentiate these classes.
- [1700 Institutional](#) - Ancillary data and context will help to determine whether the facility is more properly classified as Institutional.

SPECIAL MAPPING CONVENTIONS

Those areas that are not clearly related to the functions of the institution are not included. Land cover areas, such as pastures and forests, that are adjacent to the facility should generally be classed with the land cover value and not dual coded. The PI must delineate the general boundary of the base and differentiate it from non-military areas.

Only those features that are inside the facility boundary and actively involved in its operation are coded 1730. These may include gardens, lawns, fields and recreational areas. Spatial integration and function determine which features are included in the 1730 mapping unit. The PI is not required to

discern ownership or replicate property ancillary data and should err on the side of describing land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses, landfills and treatment facilities, are exceptions to the above. If these features meet their minimum size criteria they are always broken out, even if located within the 1730 mapping unit.

Transportation features (roads, railroads, airports, etc.) within Military installations that are large enough to be separately classified will be assigned an [8100 Transportation](#) level code for land use rather than 1730 Military.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are generally the same; however wetlands or vegetated areas within the visibly apparent military boundary should be dual coded with the LUCODE = 1730 and the appropriate LCCODE.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/02/07

COORDINATES
545442.61 1487459.35

1760 Correctional

LEVEL 1: 1000 Urban and Built-Up
LEVEL 2: 1700 Institutional
LEVEL 3: 1760 Correctional

DESCRIPTION

Correctional institutions include federal, state and county prisons. All structures and grounds associated with this category are included; e.g., agricultural areas associated with prison farms. Identification of correctional facilities is accomplished through either the interpretation process or as the result of supporting supplemental data.

Prisons usually occupy large areas, especially when away from urban areas. They typically are set among well-developed and landscaped open areas, with the prison building or buildings surrounded by subsidiary structures such as staff residences, steam and power plants, water towers, maintenance buildings, recreational facilities and parking lots. Identification is confirmed by security features such as perimeter fences and guard towers (or the shadows of guard towers).

Normally, the prison buildings are enclosed by multiple fences. When a large number of structures are present, their regular and repetitive arrangement is similar to that seen in military installations. However military installations will have a clearly visible perimeter patrol road inside the fence, unlike prisons where the road may not be present or shows few signs of activity if detected.

Prison farms may also be fenced, and will show road and track patterns which connect the farm lands to the prison.

KEYS TO PHOTOINTERPRETATION

- Multiple fences normally visible
- Normally occupy large tracts of land
- Usually located outside of urban areas
- Guard towers are an indicator of correctional facilities

CONTEXT

- **Landscape Position** - Correctional Institutions can be found in any exurban area. Boundaries with adjoining land uses will be clearly defined.

SIMILAR CLASSES

- 1100 to 1300 Residential - Residential areas that are not within the operational boundary of the facility should be coded residential.
- 1400 Commercial and Services - Features such as office buildings may look the same whether public or private. Ancillary land use data may be used to differentiate these classes.
- 1700 Institutional - Ancillary data and context will help to determine whether the facility is Correctional.

SPECIAL MAPPING CONVENTIONS

Those areas that are not clearly related to the functions of the institution are not included. Land cover areas, such as pastures and forests, that are adjacent to the facility should generally be classed with the land cover value, and not dual coded. The PI must delineate the general boundary of the facility and differentiate it from non-correctional areas.

Only those features that are inside the facility boundary and actively involved in its operation are coded 1760. These may include gardens, lawns, fields and recreational areas. Spatial integration and function determine which features are included in the 1760 mapping unit. The PI is not required to discern ownership or replicate property ancillary data and should err on the side of describing land cover and environmental function.

Priority classes such as water bodies, wetlands, golf courses, landfills and treatment facilities, are exceptions to the above. If these features meet their minimum size criteria they are always broken out, even if located within the 1760 mapping unit.

Transportation features (roads, railroads, airports, etc.) within correctional installations that are large enough to be separately classified will be assigned an [8100 Transportation](#) level code for land use rather than 1760 Correctional.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/15/07

COORDINATES
713601.47 1080229.81

1800 Recreational

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: **1800 Recreational**

DESCRIPTION

This is an active Level 2 class that should be used only when one of the more specific subclasses cannot be applied. The Level 3 subclasses are:

- [1810 Swimming Beach](#)
- [1820 Golf Course](#)
- [1830 Race Tracks](#)
- [1840 Marinas and Fish Camps](#)
- [1850 Parks and Zoos](#)
- [1870 Stadiums - Not Academic](#)

The 1800 code includes areas used for outdoor activities such as community sports, open-air performances, or those used as fairgrounds, as well as those areas where the apparent recreational activity does not fit into one of the Level 3 classes, or cannot be readily determined.

Those areas that are not clearly related to recreational functions are not included. Land cover areas such as pastures and forests that are adjacent to the facility should generally be classed with the land cover value and not dual coded. Only those features that are inside the recreational facility boundaries and actively involved in its operation are included in this class. These may include gardens, lawns, fields and recreational areas. Spatial integration is the key indicator. The PI is not required to use ownership or property ancillary data and should err on the side of land cover and environmental function.

This class does not include fields attached to other facilities where the primary use is different, such as commercial or institutional facilities. For those examples, the [1400](#) or [1700](#) codes would be used, respectively, and would include the attached athletic fields.

KEYS TO PHOTOINTERPRETATION

- Well organized grounds with parking facilities; Parking areas are often not paved.
- Easily recognizable fields with shapes and markings associated with sports complexes
- Community recreational facilities for baseball, football, soccer, tennis etc.
- Small buildings on site used for food service, rest rooms and/or utilities

CONTEXT

- **Landscape Position** - These land uses may be found in any area of the District, depending on the specific class of activity.

SIMILAR CLASSES

Recreational areas are usually distinguishable by characteristic features. Features like golf courses and stadiums are distinctive and easy to interpret. Problems may arise with:

- Indoor recreational uses - These will be difficult to distinguish from commercial and institutional uses. The error is not significant.
- Resorts - These will often have recreational facilities, but are classified as [1400 Commercial and Services](#).
- Institutions - Schools will have recreational facilities that are to be included in the [1700](#) mapping units. To be classed as 1800, the recreational areas should be independent from commercial or institutional operations.

SPECIAL MAPPING CONVENTIONS

This Level 2 code is to be used only when it is impossible to assign one of the more specific Level 3 subclasses. The PI must always use the most specific class possible.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
07/21/06

COORDINATES
958267.52 948497.38

1810 Swimming Beach

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1800 Recreational](#)

LEVEL 3: **1810 Swimming Beach**

DESCRIPTION

This class includes saltwater and freshwater beach areas, both public and private, that are accessible from land and available for recreational purposes. Recreational structures and features are not required to be evident, as long as public access is feasible.

This class includes most of the District's beach segments along the Atlantic Coast and the Gulf of Mexico. It also includes beaches along bays, estuaries and freshwater systems if they meet minimum size criteria.

KEYS TO PHOTOINTERPRETATION

- The following features may be visible on the photography: picnic areas, service stands, piers and boardwalks, fenced areas, protected swimming areas, ball courts and other recreational areas.
- Parking areas are present, with no indication of purposes other than beach recreation. These may be actual paved parking lots, or simply cars that are visible along the access roads or on the beach itself. Note: winter photography may not show many cars due to decreased activity.
- Public beaches, if large enough, are usually indicated on topographic maps.

CONTEXT

- **Landscape Position** - The presence of residential, commercial or other recreational uses in the vicinity of the beach is a confirmation of this class. Accessibility from land by roads is also sufficient to assume recreational uses. There are few beach segments along the Atlantic coast or Gulf of Mexico that are not used for recreational purposes.

SIMILAR CLASSES

- [6500 Non-Vegetated Wetlands](#) - Generally tidal flats and shorelines
- [7200 Sand Other Than Beaches](#) - Dunes or other sand areas not part of a beach

SPECIAL MAPPING CONVENTIONS

The SFWMD classifies most coastal beaches as 1810, based on their accessibility for recreation, whether or not constructed facilities are present.

This class generally refers to a sandy, non-vegetated, recreational strip of land. The beach delineation includes all recreational area between the water line and the next inland land use or land cover. It may have inclusions of vegetation or other land uses that are too small to meet minimum size criteria.

Swimming beaches are mapped where visible if they meet the minimum area criteria of 5 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
05/07/07

COORDINATES
401536.64 80302.37

1820 Golf Courses

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1800 Recreational

LEVEL 3: 1820 Golf Courses

DESCRIPTION

Golf courses are easily recognizable by their landscaped features and have no similar classes. They are a priority land use to the District due to their environmental significance and are always required to be broken out from other land uses. The 1820 mapping unit includes all facilities that are involved with the operation of the golf course and associated recreation, including club houses, storage buildings and parking lots. Other recreational facilities such as swimming pools and tennis courts are included if they are auxiliary to the golf club. This class does not include adjacent land uses not directly related to recreation. Water features and wetlands are common in and around the courses and must also be broken out wherever they meet the 2 acre MMU criteria

This class also includes golf courses under construction.

KEYS TO PHOTOINTERPRETATION

- Distinctive pattern of well-watered and maintained grass areas
- Ponds and lakes of varying size and shape
- Fairway strips appear as a smooth light magenta tone, with similarly toned tees and greens at either end
- Sand traps generally appear as whitish "dots" or small rounded polygons in and around fairways
- Areas between fairways often shrubby or wooded with a darker magenta signature
- Likely to contain a large "clubhouse" structure
- Parking lot adjacent to facility

CONTEXT

- **Landscape Position** - Golf courses are located throughout the state, usually in proximity to populated areas or transportation corridors. They are often constructed on low-lying ground such as pine flatwoods and may be adjacent to, or displace wetlands.

SIMILAR CLASSES

Nothing else looks like a golf course. However, they may be woven into other land uses - Residential in particular. Many residential communities in the District are built around or adjacent to golf courses. They may also be mixed into Institutional or Commercial uses.

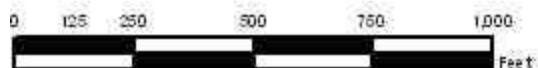
SPECIAL MAPPING CONVENTIONS

The golf course itself must be broken out wherever possible. However, discretion should be used to avoid excessive interior linework. Housing areas around golf courses should be delineated and classified separately from the golf course, as long as the minimum mapping unit requirement of 5 acres is met. Wooded or open areas that are inside the 1820 polygon are generally coded 1820.

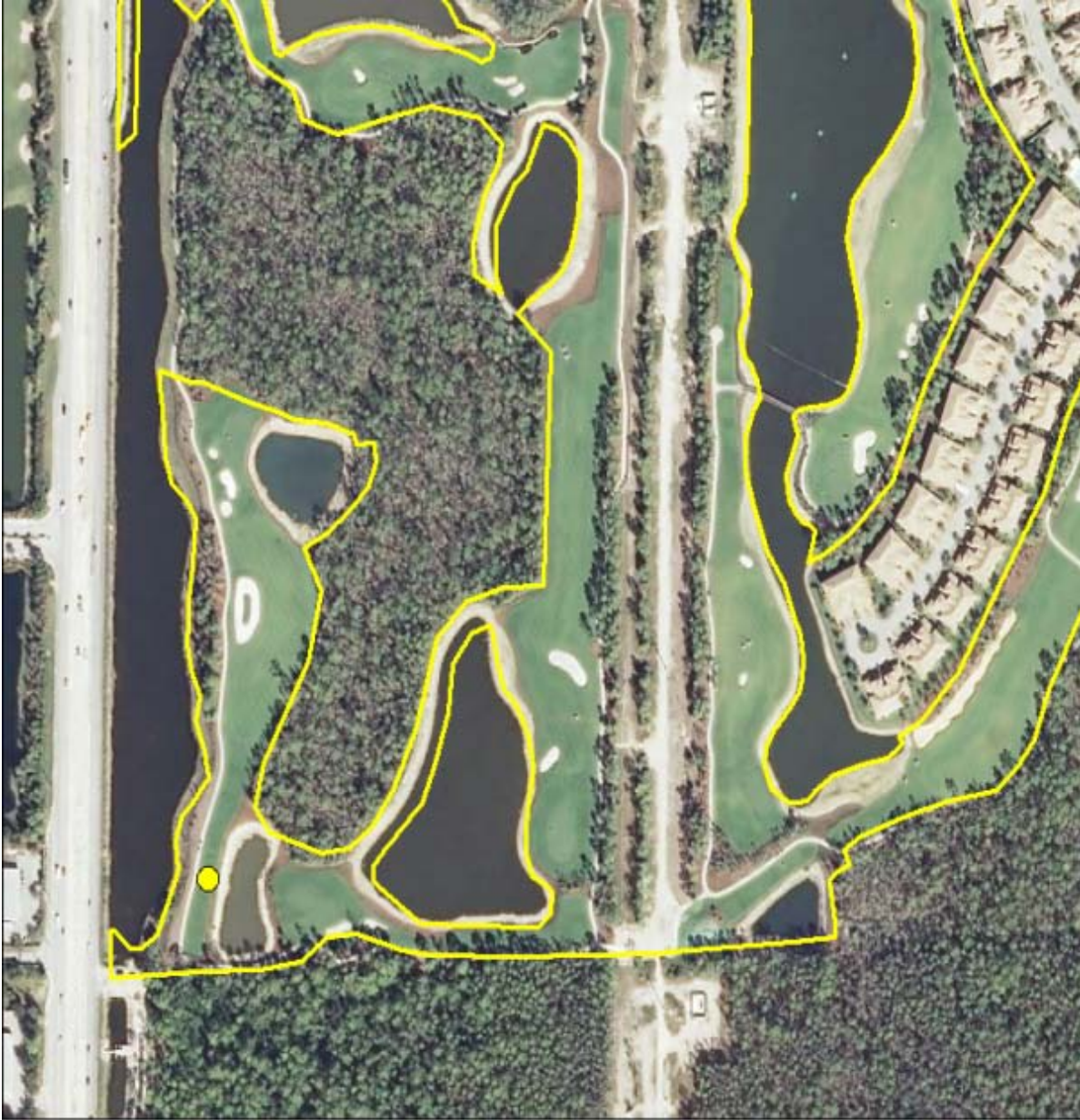
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/09/07

COORDINATES
431148.38 657205.42

1830 Race Tracks

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1800 Recreational](#)

LEVEL 3: 1830 Race Tracks

DESCRIPTION

This class includes a variety of racing operations that are readily identifiable on aerial photography. Examples are auto and motorcycle racing, drag strips, horse racing and dog racing. The mapping unit includes all features associated with the operation, including parking facilities, stadium and stands, storage and staging areas and open areas that are inside the operational boundary.

At many automobile and motorcycle race tracks, grandstands and other spectator areas flank only a small portion of the track, which itself is an irregular, closed loop. Drag strips may resemble an air strip due to their straight smooth design and two vehicle width. The distinguishing feature, however, will be the grandstands and the parking facilities, and the lack of hangars or aircraft service features.

KEYS TO PHOTOINTERPRETATION

- Many racing tracks have a distinctive oval shape
- There are large parking areas adjacent to track, often unpaved
- Public area is likely to be well-kept and landscaped
- Stadium-type seating is usually present, except for very small operations. The stands themselves may be limited to a small portion of the total track area.

CONTEXT

- **Landscape Position** - Large race tracks are found in urban or urban fringe areas. Various types of local interest racing are also located in rural areas.

SIMILAR CLASSES

- [2510 Horse Farms](#) - The lack of spectator seating or large parking areas helps distinguish these.
- [8113 Private Airports](#) - Private air strips may appear similar to drag racing strips, but will not have stadiums and large parking areas.

SPECIAL MAPPING CONVENTIONS

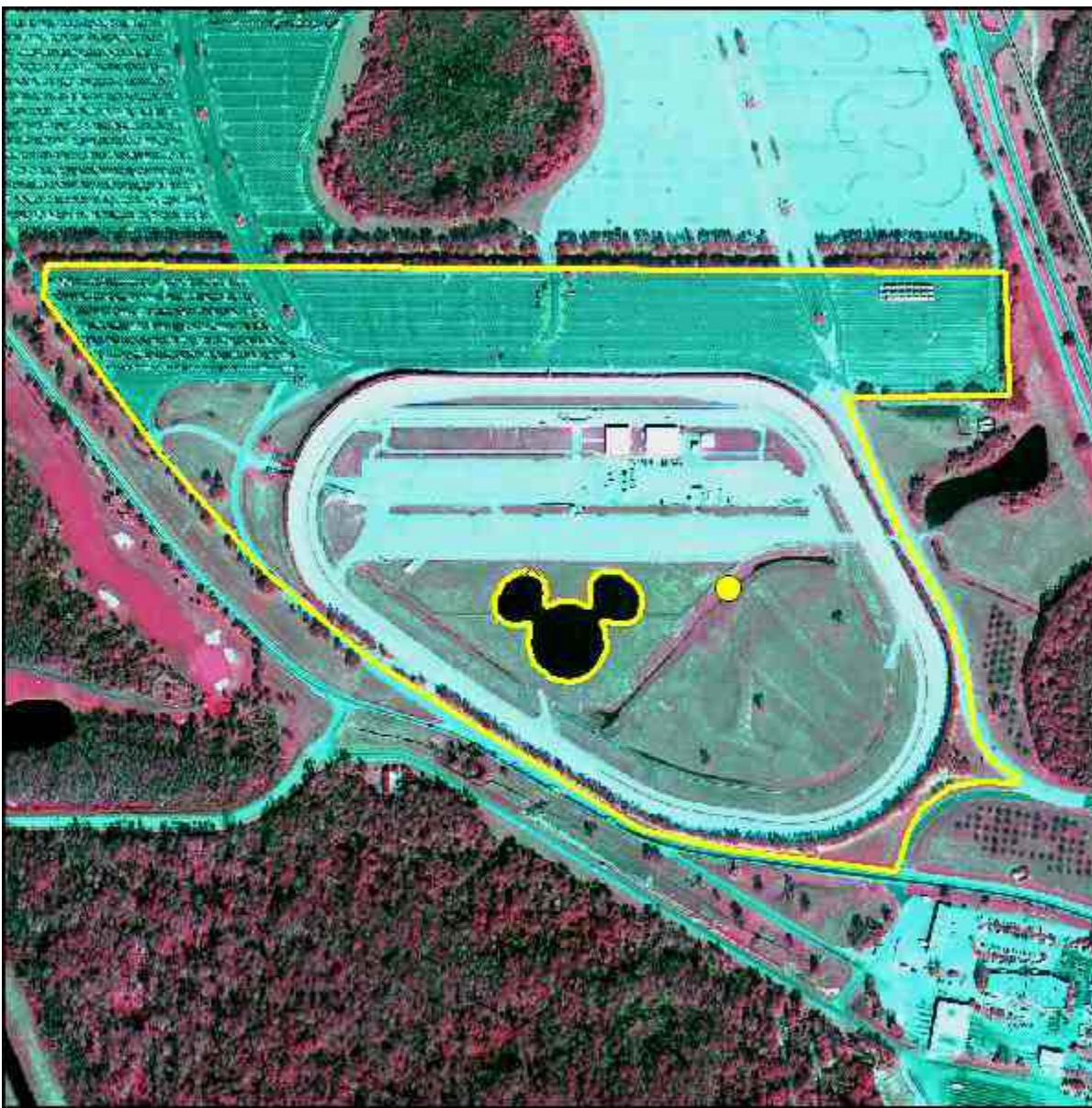
Included within the mapping unit are all buildings, grounds, parking lots, recreational areas and other features that appear to be part of the facility. Those areas that are not clearly related to the functions of the facility are not included. Adjacent open areas are assigned the appropriate land cover value. Only those features that are inside the operational boundaries are coded 1830.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out.

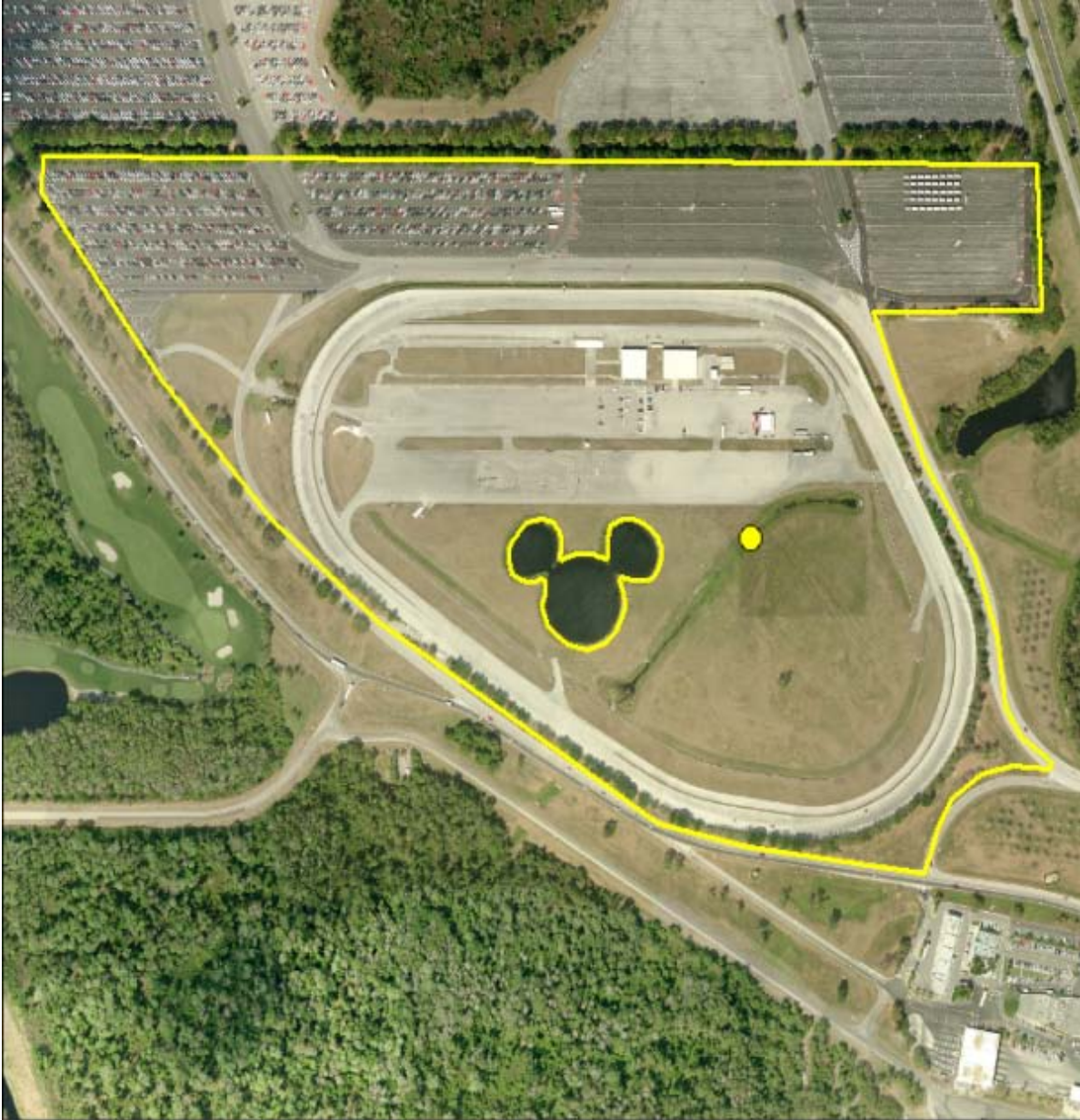
DUAL CODING CONVENTION

This is a **Land Use** class.; The LUCODE and LCCODE are the same. Separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/02/07

COORDINATES
470719.03 1477322.81

1840 Marinas and Fish Camps

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1800 Recreational](#)

LEVEL 3: 1840 Marinas and Fish Camps

DESCRIPTION

Marinas include fresh water and marine harbors, yacht clubs and boat launching sites that are primarily used for recreational marine craft. Boat mooring areas near the marina are mapped as part of the marina area.

The shore facilities include storage sheds, maintenance buildings, club houses and restaurants, and parking areas. Boat launching sites are identified by a paved or unpaved parking area at the water's edge, with one or more short launching ramps leading to the water. Cars with boats on trailers or cars with empty boat trailers may be visible in the parking area.

Marine railways, boats in slings, or boats on cradles may be visible near the water.

Fish camps include boat launching sites, docking facilities, fishing piers, bait house and store facilities, and any lodging or camping facilities. Parking areas are generally not well developed, but provide space for vehicles and for trailers. Some fish camps provide rental water craft and may have storage facilities for these.

This class does not include associated boat yards used for building and repairing boats. The mapping unit does not include adjacent open areas, or those portions of piers and docks that extend out over a water body.

KEYS TO PHOTOINTERPRETATION

- Indicator features include boats and boat ramps, docks, parking areas, land and water access routes, fueling facilities and buildings associated with the operations.
- Piers show distinctive rectilinear geometric patterns, bright white against the black tone of the water on CIR film.
- Buildings may include storage sheds, maintenance buildings, club houses and restaurants, and supply stores.
- Boat trailers and associated wide parking areas are usually present.
- Channels through adjacent water bodies or wetlands may provide access to the marina.

CONTEXT

- **Landscape Position** - Marinas are shoreline uses that tend to occur in areas protected from storms by natural coves or bays, breakwaters, or inland areas connected by canals to an open water body. They are usually close to developed areas for better access. Fish camps are likely to be in more remote areas, often in association with parks, public lands, and other natural areas.

SIMILAR CLASSES

- [1400 Commercial and Services](#) - Boat repair service facilities may look similar, but will lack many of the above indicators.

- 1550 Light Industrial - Loading docks and trucks are a typical feature.

SPECIAL MAPPING CONVENTIONS

Included within the mapping unit are all buildings, grounds, parking lots, recreational areas and other features that are attached to the facility. Those areas that are not clearly related to the functions of the facility are not included. Adjacent open areas are assigned the appropriate land cover value.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out.

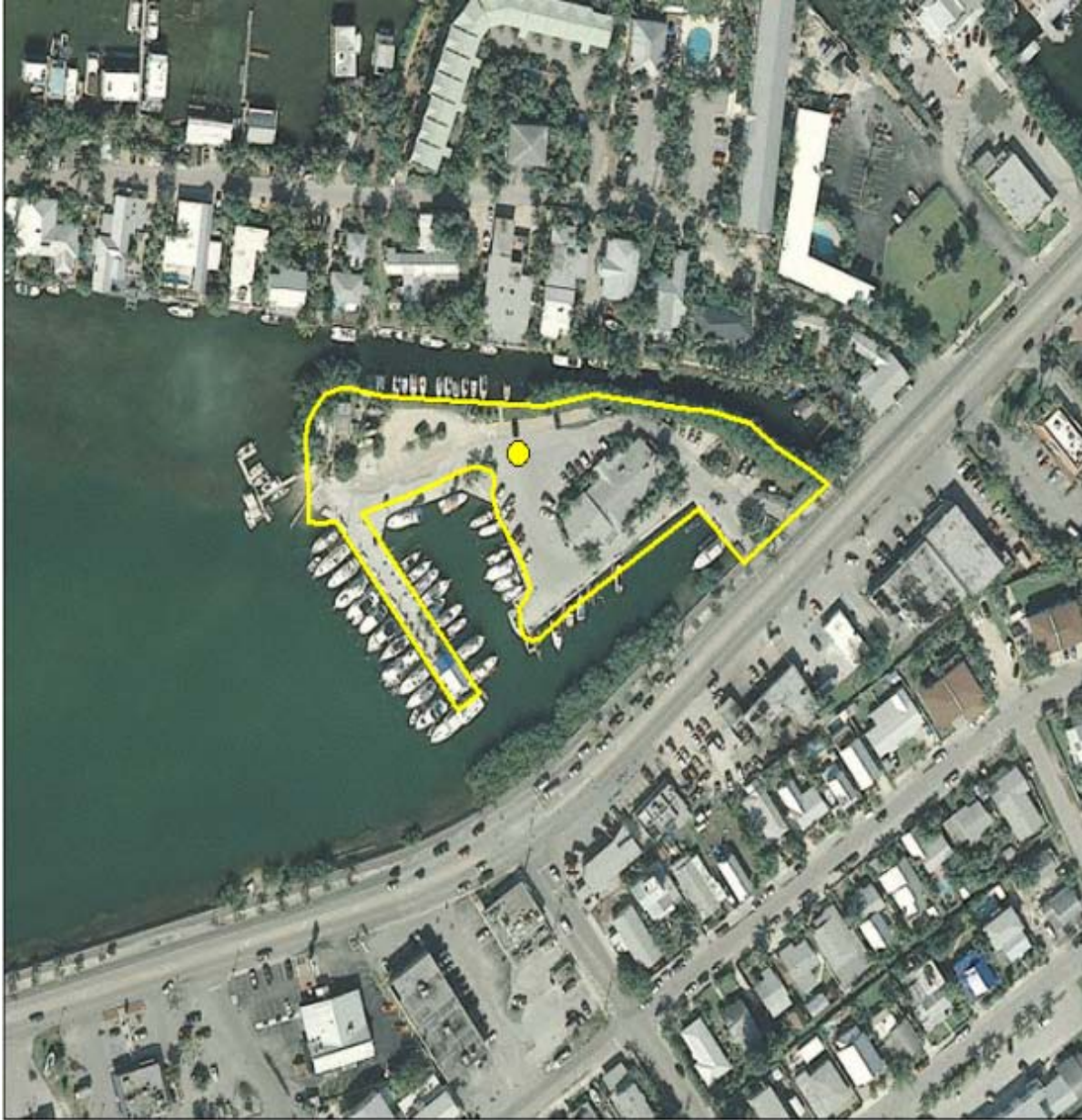
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
05/07/07

COORDINATES
397289.21 83863.25

1850 Parks and Zoos

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1800 Recreational](#)

LEVEL 3: 1850 Parks and Zoos

DESCRIPTION

This class covers the operational facilities that make up the active service areas of various outdoor and recreational land uses. The class includes public and private parks - both rural and urban, campgrounds, zoos, fairgrounds, botanical gardens and other. Note that amusement parks are not included in this class - they are classified as [1400 Commercial and Services](#). The parks may contain a variety of sub-activities, including play facilities, athletic fields, small museums, zoos, exhibit areas, campgrounds, swimming areas, monuments and fountains, gardens and other facilities. Some of these sub-activities would be assigned to other classes if they were not in the larger context of a park.

Zoos are indicated by animal houses/cages plus areas surrounded by fences or moats. They also contain numerous winding light-toned walkways and roads, and maintenance and storage buildings.

State parks and other public or private outdoor scenic/recreational areas are designed for more active recreation. They are largely left in natural cover, except for parking areas at public access points, camping areas, and visitor facilities. Roads and trails are visible leading to scenic and water access areas. Group or organized camps within the park are identified by a denser network of trails and dirt roads. Individual camping areas or cabins are spaced alongside these roads.

This class does not include the surrounding open and natural areas, even though they may be associated and/or on the same properties, unless they are an active, accessible part of the operations. The intent is to avoid mapping open or natural areas as a land use and thereby missing the land cover values. Open areas outside of the active park facilities are not dual coded with the land use value, since this Land Cover/Land Use data layer does not attempt to delineate ownership boundaries.

KEYS TO PHOTOINTERPRETATION

- This class has many types of facilities - few indicators apply universally.
- Winding walkways and other landscaping features are designed for aesthetic appeal.
- Shaded picnic areas and/or food service facilities are usually present.
- Parking facilities must be present.

CONTEXT

- **Landscape Position** - Leisure parks and zoos are usually near populated or high-access areas, and often are adjacent to residential neighborhoods. Boundaries with adjacent land uses are regular and distinct. Outdoor recreation parks tend to be in a rural context, associated with other open areas, public lands and water bodies.

SIMILAR CLASSES

- **1400 Commercial and Services** - Recreational vehicle parks and private campgrounds are classified as **1400 Commercial and Services**. However, campgrounds that are subsidiary to larger park facilities, such as National Forests, are still classified as 1850 Parks and Zoos.
- **1700 Institutional** - Institutional facilities may have many of the same features. The PI must determine which use - Institutional or Recreational - is predominant.
- **1800 Recreational** - Other recreational classes such as beaches, marinas, community recreational, and other uses may occur within parks and zoos as sub-activities. These should not be broken out unless they are spatially and functionally independent.
- Natural areas such as **1900 Open Land**, **3000 Upland Non-Forested**, **4000 Upland Forests** - May overlap this class and may be located on park lands. The key is to break out active, high access operational areas from low access areas with natural functions and values.

SPECIAL MAPPING CONVENTIONS

This class can legitimately overlap with other classes that have similar indicators. PIs need to determine which use is predominant. Ancillary data, such as parcel data, should be used for that purpose, but PIs should use discretion when dissecting the mapping unit into recreational, institutional and commercial sub-units. PIs should avoid excessively detailed line work while capturing useful information. Linear or overly complex polygons should be avoided, in favor of ones with compact shapes. This is similar to conventions for mapping residential areas.

Included within the mapping unit are all buildings, grounds, parking lots, recreational areas, and other features that are attached to the park facility. Only those features that are inside the operational boundaries are coded 1850.

Priority classes such as water bodies, wetlands, golf courses and treatment facilities are exceptions to the above. If these features meet their minimum size criteria they are always broken out.

DUAL CODING CONVENTION

This is a **Land Use** class. A separate **Land Cover** code is not required, unless large inclusions of other classes occur within operational boundaries. For example, a 5 acre patch of forest inside a municipal park could be dual coded as LC=**4200**/ LU=1850.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
01/09/07

COORDINATES
957960.52 75111760

1870 Stadiums - Not Academic

LEVEL 1: 1000 Urban and Built-Up

LEVEL 2: 1800 Recreational

LEVEL 3: 1850 Stadiums - Not Academic

DESCRIPTION

This class includes those stadiums designed for sports events and **not** associated with educational facilities such as high schools, colleges or universities. It does not include race tracks, parks, fairgrounds or community recreational facilities. Stadiums are characterized by large scale parking facilities and spectator structures.

The white markings of the playing fields, such as the base paths and sidelines of a baseball diamond, should stand out clearly against the dark background of the playing surface on high-contrast CIR film. Football field lines should also be visible and the shadows of the goal posts may be visible at either end of the field.

KEYS TO PHOTOINTERPRETATION

- The structures and/or playing fields have a distinctive round or oval shape, depending on the sport.
- Stadiums may be enclosed by domed top.
- Field markings are recognizable and characteristic.
- Grounds are well maintained and landscaped.
- Very large parking areas are included in the mapping unit.
- Large scoreboards may be visible.

CONTEXT

- **Landscape Position** - Stadiums are normally located in populated or high-access areas, but may be found in any area of the District.

SIMILAR CLASSES

- 1830 Race Tracks - Have a distinct oval racing track

SPECIAL MAPPING CONVENTIONS

The mapping unit includes all buildings, grounds, parking lots, recreational areas, and other features that are attached to the stadium.

Adjacent open areas are assigned the appropriate land cover code. Only those features that are inside the operational boundaries of the stadium are coded 1870.

Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria of 2 acres they are always broken out.

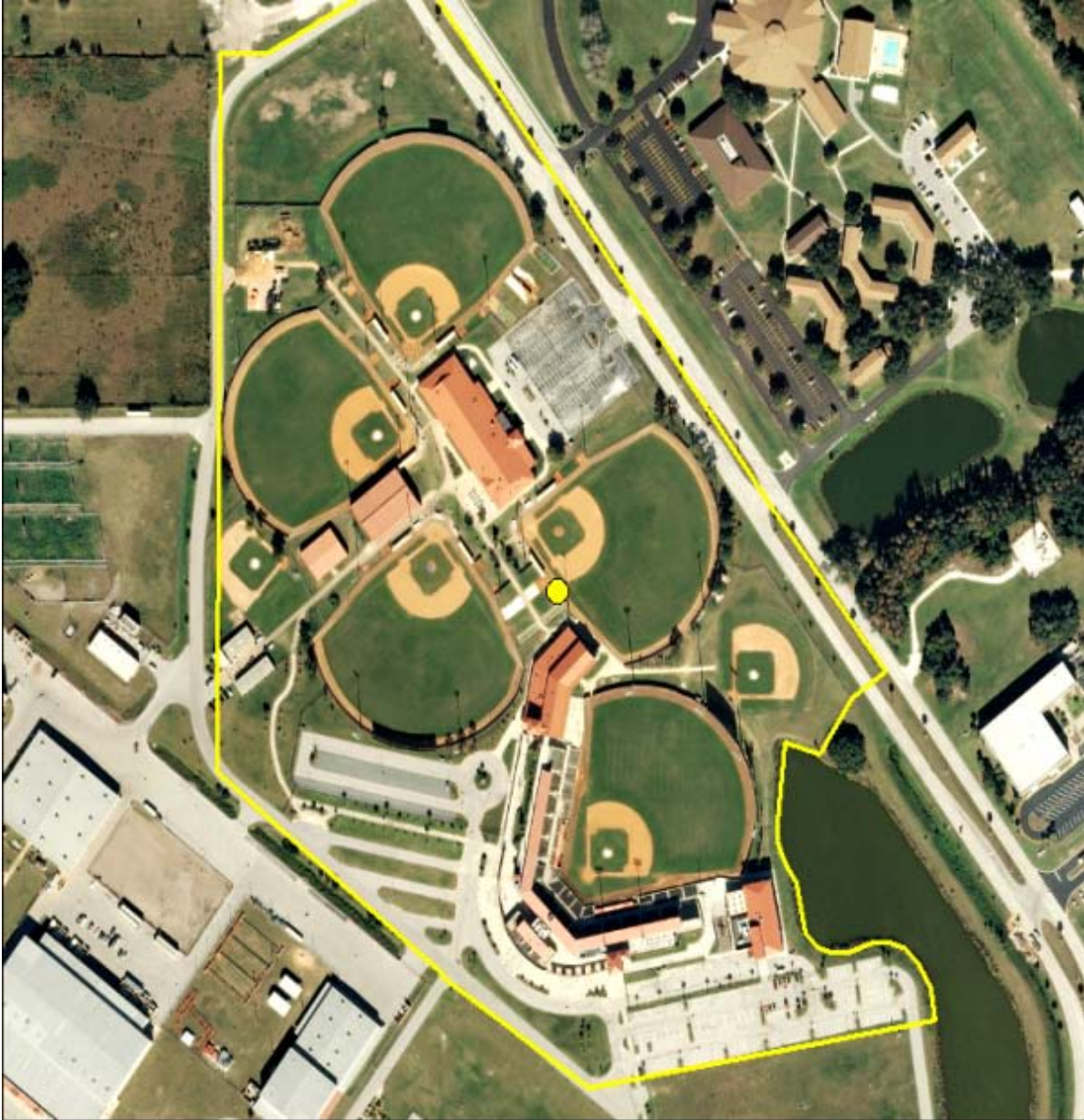
DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/02/07

COORDINATES
538877.06 1441803.86

1900 Open Land

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: **1900 Open Land**

DESCRIPTION

This category includes open, undeveloped land within urban areas which tends to have transitional or uncertain land uses. The associated land cover types are typically from [3000 Upland Non-Forested](#) or [7000 Barren Land](#) classes. This class is not used to code forests or wetlands (classes for which land use tends to be more stable), except where they may occur as small inclusions within the 1900 polygon. The Level 3 subclass [1920 Inactive Land with Street Patterns](#) is delineated separately.

Open Land has few if any structures, and there is not enough indication of the land use (current or intended) to justify assigning any other LCLU class. Often, urban inactive land may be in a transitional state and ultimately will be developed into one of the typical urban land uses. At the time of the inventory, however, the land use cannot be determined from the aerial photo.

Many different types of land cover can occur on open urban lands. For this reason, a separate land cover code is always required. The most common land covers are from the [3000 Upland Non-Forested](#) classes.

KEYS TO PHOTOINTERPRETATION

- Signatures may range from heavily vegetated to a disturbed, scoured, white appearance.
- There is not enough indication of the land use to justify any other LCLU code.

CONTEXT

- **Landscape Position** - Land is considered to be in an urban context if it is situated within a larger matrix of development. This matrix is spatially defined by the concentration of land uses, transportation barriers and other constraints to movement and access. Open Land may be found in any area of the District.
- **Vegetation** - Ranges from barren land with no vegetation to grasses, shrubs or a combination of the two, and may even include scattered trees.

SIMILAR CLASSES

- [1190](#), [1290](#), and [1390](#) - Residential Under Construction - These will have enough infrastructure, and usually buildings, to show that construction is in progress.
- [1920 Inactive Land with Street Pattern](#) - Street patterns are evident, but development is either stalled or has been abandoned.
- [2120 Unimproved Pastures](#) - Pasture will be in a more agricultural context.
- [3000 Upland Non-Forested](#) - These classes are generally in a more rural and undeveloped setting.
- [7400 Disturbed Land](#) - This class is characterized by man-made alterations.

SPECIAL MAPPING CONVENTIONS

This class should be delineated whenever possible in order to depict open areas situated in an urban context, since these areas are more likely to undergo rapid changes.

DUAL CODING CONVENTION

This is a **Land Use** class. **Dual coding is always required** - a **Land Cover** code must be assigned in addition to the 1900 code. Typical **Land Cover** codes are from the 3000 and 7000 classes.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
07/21/06

COORDINATES
528148.78 1447592.57

1920

Inactive Lands with Street Pattern

LEVEL 1: [1000 Urban and Built-Up](#)

LEVEL 2: [1900 Open Land](#)

LEVEL 3: **1920 Inactive Lands with Street Pattern**

DESCRIPTION

This class includes open areas where development had started but was for some reason halted and appears in an abandoned state at the time of the inventory. It does not include developments that are under construction, incomplete or that are slowly being completed. Lands in this class have street patterns but few if any buildings.

A site is probably abandoned when the soil tones are a grayish magenta and darker magenta on CIR "salt and pepper" patterns (of scattered weeds and shrubs) appear. Then, but for the street pattern, the area would be considered undeveloped land.

The examples of this class in the District are notable, usually sizable, and have a distinct, vacant appearance in contrast to developing areas.

Many different types of land cover can occur on open urban lands. For this reason, a separate land cover code is always required. The most common land covers are from the [3000 Upland Non-Forested](#) and [4000 Upland Forested](#) categories, but many other types of cover may be present.

KEYS TO PHOTOINTERPRETATION

- A street pattern is visible, although the streets may not be maintained.
- There are few if any structures. If present, they tend to be spaced randomly in the polygon rather than in an organized or clustered manner.
- Absence of landscaping; the appearance is overgrown and indicates neglect.

CONTEXT

- **Landscape Position** - This class may be found in urban or rural settings. It may be in lowland areas where the hydrology is an obstacle. It is likely to occur in areas where the land values were low, but other factors, such as remoteness or hydrology, rendered the project infeasible.

SIMILAR CLASSES

- [1190, 1290, and 1390 Residential Under Construction](#) - These will have enough infrastructure, and usually buildings, to give the appearance that construction is in progress. The appearance indicates activity.
- [1490 Commercial and Services Under Construction](#) - same as above

SPECIAL MAPPING CONVENTIONS

There may be a number of different land cover types occurring together and these communities may be patchy, intergraded and otherwise difficult to map. Pls need to determine which covers are predominant and avoid dissecting the mapping unit with excessively detailed linework. Convolved polygons should be avoided in favor of ones with compact shapes.

DUAL CODING CONVENTION

This is a **Land Use** class. **Dual coding is always required** - a **Land Cover** code must be **assigned** in addition to the 1920 code. Typically, the **Land Cover** codes are from the 2000, 3000, 4000, and 7000 classes.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/17/07

COORDINATES
709611.04 1100774.95

2000 Agriculture

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level 2 subclasses are:

- 2100 Cropland and Pastureland
- 2200 Tree Crops
- 2300 Feeding Operations
- 2400 Nurseries and Vineyards
- 2500 Specialty Farms
- 2600 Other Open Lands

BACKGROUND

Agricultural uses cover a large percentage of the District and are very significant to the District's mission of water resource management. The preservation of farmland with its economic and natural resource benefits is a prime concern of the District. Agricultural activities have a significant effect on water supply, water quality, flooding and natural resources, and can vary significantly in their nutrient requirements, run-off and leaching, supplemental water needs and benefits to natural systems. Such variables are important inputs to the models and analysis conducted by the SFWMD and others to predict how watersheds will function. In view of the above, it is important to have clear definitions and accurate delineation of these classes.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all agricultural classes is 5 acres.

Differentiating subclasses: The agricultural classes are generally open, cultivated lands that can look similar on aerial photography. The land uses can change very frequently from one class to another, depending on management. Also, the agricultural areas may be intermixed with other general uses, such as forestry, mining, rural residential, and rangelands, making context alone an unreliable indicator. As a result of all these factors, there is a strong possibility for confusion between the agricultural classes. In order to differentiate these classes it is necessary to look closely at the details in the PI key pages for each class.

DUAL CODING CONVENTION

Most of the Agricultural classes are designated as **Land Cover** classes. These are generally defined as a certain type of crop, in which case the land cover can readily be inferred from what is being grown. Some of the subclasses are designated as **Land Use** classes. These are defined as a type of operation, such as Feeding Operations or Dairies, that define land use rather than cover. In almost all the subclasses, the LCCODE and LUCODE are the same. A separate dual code may be required in the case of Dairy and Feeding Operations, for example, which have a number of components that are differentiated by the use of different **Land Cover** codes.

SIMILAR CLASSES

Agricultural lands can be confused with a number of other classes. These include [1180 Rural Residential](#), [1900 Open Lands](#), [3000 Upland Non-Forested](#) and [4400 Tree Plantations](#). Also, agricultural lands that have hydric soils should be classed as Wetlands where wetland vegetation is visible on the aerial photography. In most cases these would be wet prairies being used for pasture.

Farmland that is temporarily flooded should not be classified as open water or wetlands, if it is clear that it is an active farming area.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

2100 Cropland and Pastureland

This Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

- 2110 Improved Pasture
- 2120 Unimproved Pasture
- 2130 Woodland Pasture
- 2140 Row Crops
- 2150 Field Crops
- 2160 Mixed Crops

There is one Level 4 subclass:

- 2156 Sugar Cane

BACKGROUND

The vast majority of farmland in the District falls under this general class. These classes vary significantly in their nutrient requirements, run-off and leaching potential, supplemental water needs and benefits to natural systems. For example, unimproved pastures are usually low intensity operations with significant habitat value and a low level of impacts. In comparison, row crops are intensively managed, have little habitat value, high nutrient requirements and significant potential for off-site impacts.

Cropland and pastureland uses can have a strong influence on water supply, water quality, flooding and natural resources. These in turn are important inputs to models and analysis conducted by the SFWMD and others to predict how watersheds will function.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all agricultural classes is 5 acres.

Differentiating subclasses: The agricultural classes are generally open, cultivated lands that can have a similar appearance on aerial photography. The land uses can change very frequently from one to another. Also, agricultural areas may be mixed with other uses, such as forestry, mining, rural residential and rangelands, making context alone an unreliable indicator. As a result of these factors, there is a strong possibility for confusion. In order to differentiate these classes it is necessary to look closely at the details in the PI key pages for each class.

DUAL CODING CONVENTION

All of the 2100 classes are **Land Cover** classes that do not require dual coding - the LCCODE and LUCODE are the same. However, some of the **Land Use** classes, such as [1180 Rural Residential](#) and [1650 Reclaimed Mine Land](#), may use one of the 2100 classes as a **Land Cover** class.

SIMILAR CLASSES

Pastureland in particular can be confused with a number of different other classes. These include [1180 Rural Residential](#), [1900 Open Land](#), [3000 Upland Non-Forested](#) and [4400 Tree Plantations](#). Also,

pasturelands that have hydric soils should be classed as wetlands. Farmland that is temporarily flooded can be confused with water bodies or wetlands. Such areas should be classified as farmland, if it is clear that it is an active farming area.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

2110

Improved Pasture

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2110 Improved Pastures**

DESCRIPTION

Improved pastures are the most intensively managed of the pastureland classes. They are usually cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. In most cases they show some direct evidence of cattle, such as watering ponds, troughs, feed bunkers, fencing, corrals, barns or cow trails. The signature is fairly smooth and uniform, but shade trees are often present. These fields may be cut for hay at some times of the year. Improved pastures are usually in areas associated with other agricultural and livestock activities.

The signature of improved pastures is generally very smooth and uniform. Management includes mechanical and chemical brush control, and application of fertilizers and other chemicals. Irrigation during dry seasons and water removal during wet periods may be accomplished by shallow, open ditch systems or underground drainage, and pumping systems.

(The interpreter should be aware that pumps and ditch irrigation are commonly used for unimproved pastures as well and the critical identifying factor for the Improved Pasture land use type is the monotypic appearance of the CIR signature.)

KEYS TO PHOTOINTERPRETATION

- Water ponds, troughs and feed bunkers may be present.
- Cow trails may be visible.
- Visible fence lines may be observed.
- A distinct smooth pink signature is usually present indicating maintenance.
- Trees may be present for shading.
- Hay bales may be present at some times of the year.

CONTEXT

- **Landscape Position** - Improved pastures are often found on broad flat areas that were formerly flatwoods. They tend to grade into unimproved pastures and woodlands pastures, and may be adjacent to wetlands. The context of the surrounding landscape is helpful in distinguishing this class from hay fields ([2150 Field Crops](#)) or grasslands ([3100 Herbaceous - Dry Prairie](#)).
- **Vegetation** - Improved pastures are dominated by a single grass species following clearing or brush removal activities, tilling and replanting. Some introduced species and weeds are present in most of these pastures. Shrubs such as wax myrtle may be present in very small numbers and are often very small in size due to the intensive brush control programs employed.
- **Soils** - This cover type occurs on a wide variety of soil types. Most are found on acidic, sandy soils or loamy sands of former pine flatwoods sites.
- **Hydrology** - These cover types are usually not inundated and often contain ditches as discussed above. High water tables may be present during the wet season depending on the soil type on which they occur and inundation, if it does occur, is brief.

SIMILAR CLASSES

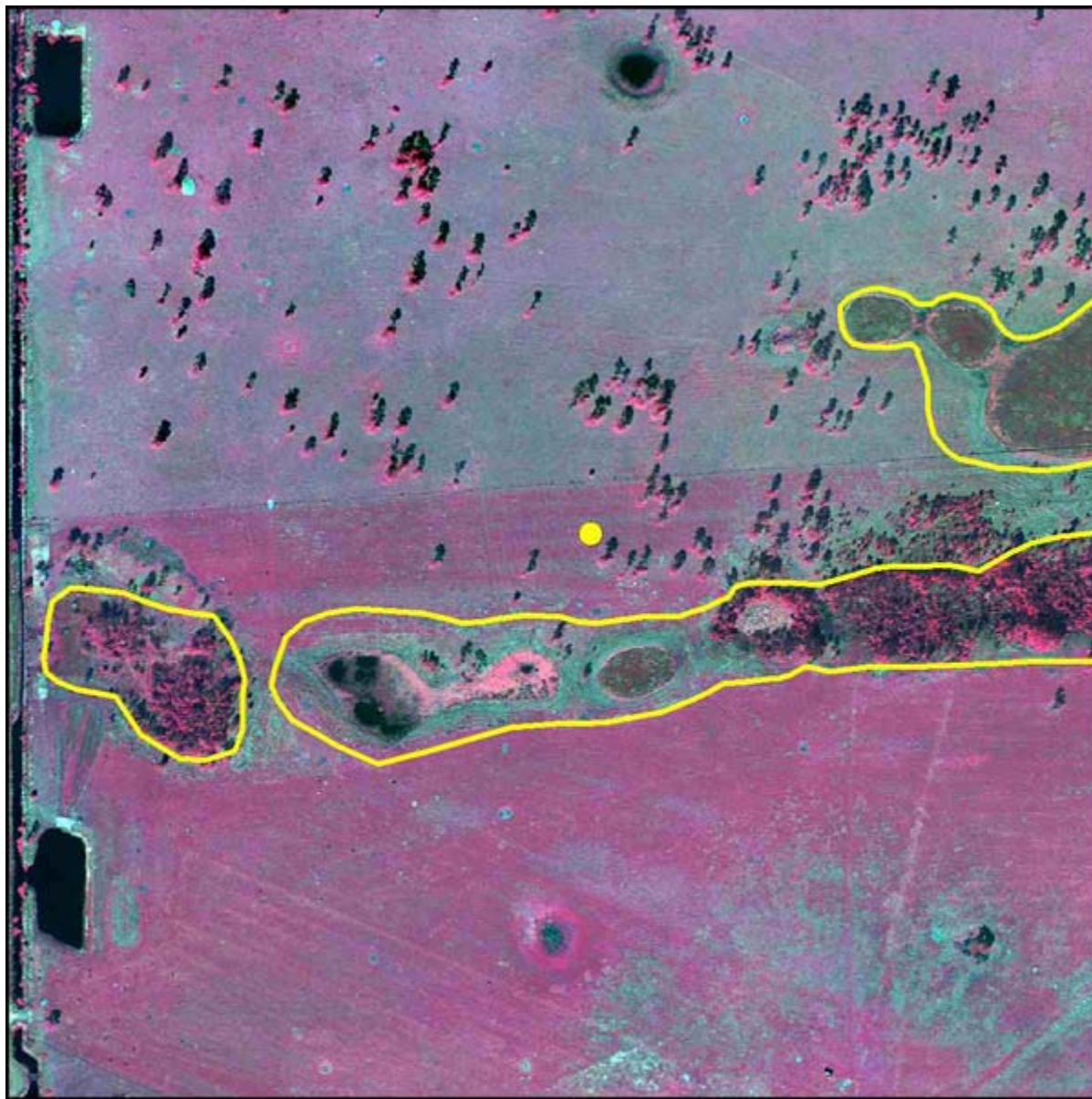
- [2120 Unimproved Pasture](#) - Unimproved Pasture will have a rougher texture than Improved Pasture, due to more natural vegetation and less intense management.
- [2130 Woodland Pasture](#) - Woodland Pastures will have at least 25% of the area in tree canopy.
- [2150 Field Crops](#) - Field crops (wheat, oats and hay) may have a similar smooth signature and are easy to confuse with improved pasture. Spatial context is helpful in distinguishing field crop from improved pasture. Field crops are generally found in areas managed for agronomic crops, characterized by rectangular fields, farm roads, utility buildings, visible rotations, etc. Improved pastures are generally in less intensive areas managed for livestock and forage. If the area shows signatures of both field crops and pasture, it should be classified as [2110 Improved Pasture](#).
- [3100 Herbaceous \(Dry Prairie\)](#) - The 3100 class should be reserved for areas where cattle are not present or are not likely to be present. These may be in more urban settings, or in more remote areas formerly considered as rangelands.

SPECIAL MAPPING CONVENTIONS

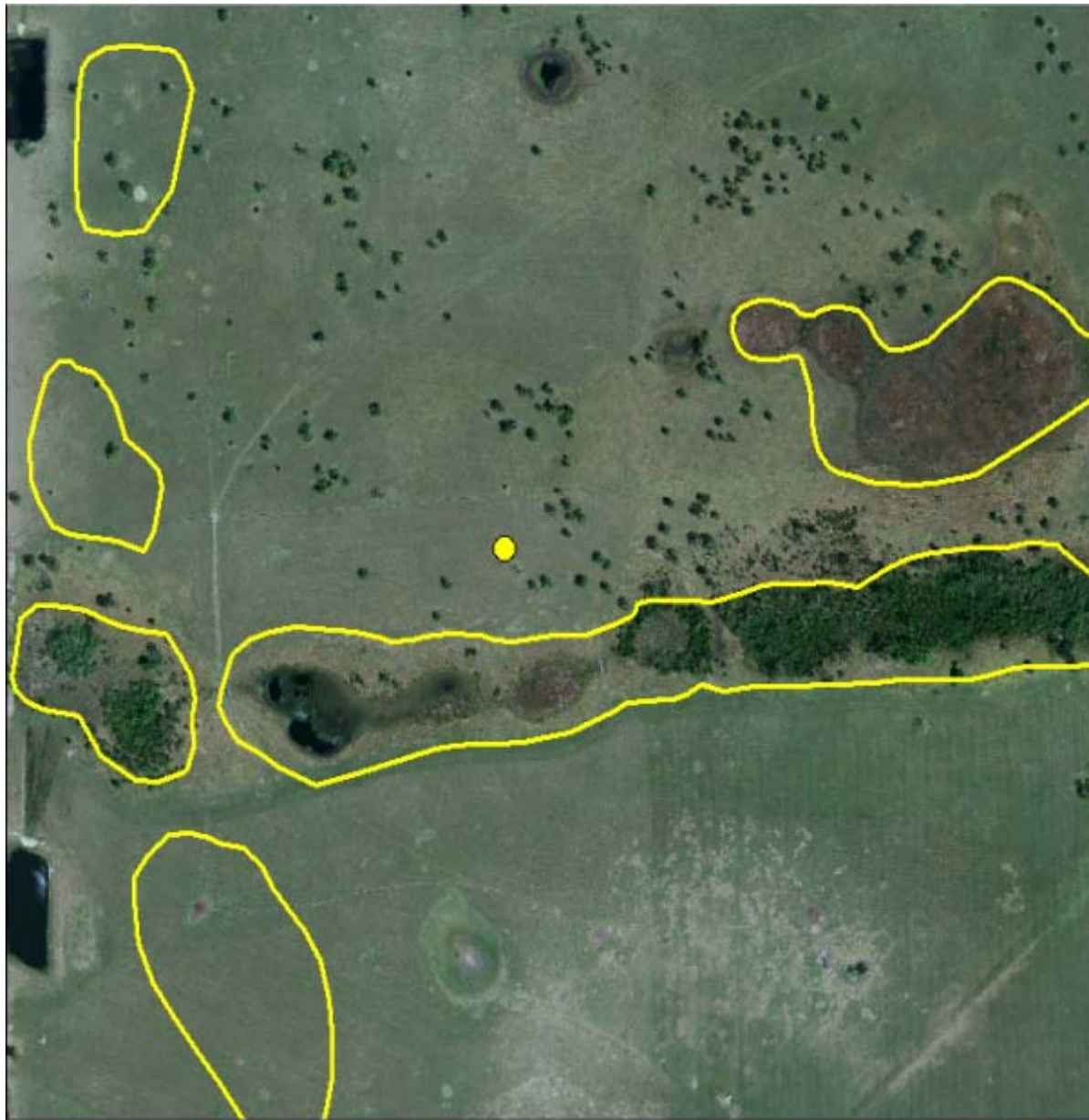
The mapping unit includes barns, ranch houses, trailers and other features common to the industry. Small inclusions of other land cover or land uses may also be included, if under the minimum size criteria. Tree canopy may be present up to 25% of the total area, but if it is in patches larger than 5 acres these patches must be broken out as [2130 Woodland Pasture](#). Priority classes such as water bodies, wetlands, dumps and feedlots must always be broken out separately, if they meet size criteria.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. However, some of the **Land Use** classes - such as [1180 Rural Residential](#), [1650 Reclaimed Mine Land](#) and [2520 Dairies](#) - may use [2110](#) as a **Land Cover** class.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/14/07

COORDINATES
756239.40 1080364.81

2120

Unimproved Pasture

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2120 Unimproved Pasture**

DESCRIPTION

This class is similar to [2110 Improved Pasture](#), but with lower intensity of management. The grasses are primarily a mixture of native grasses rather than a uniform, seeded pasture crop. Normally, this land will not be managed with brush control and/or fertilizer application.

The texture of unimproved pastures is less smooth and uniform than improved pastures. Colors may vary depending on the types and patterns of growth, producing a mottled appearance. Trees and shrubs may be present, either dispersed or patchy. Tree canopy, if present, covers less than 25% of the total area. If more than 25% tree canopy is present, the area is classified as [2130 Woodland Pasture](#).

This land use type results in a very smooth to slightly stippled texture with a color of greens with faint pink (CIR) occasionally present depending on the mixture of grasses and the presence of low saw palmetto. Mixed grasses (mainly native species) result in mottled appearance to the color and the texture. Additionally, pines or other trees (oaks or palms) may be present at varying densities and shrubs or patches of shrubs may be visible. These pastures may be ditched for water removal during wet periods and irrigate during dry weather. Ditches are generally widely spaced.

Management may include irregular mechanical brush control and application of fertilizers and other chemicals.

KEYS TO PHOTOINTERPRETATION

- Cleared land with major stands of trees and brush where native grasses have been allowed to develop.
- Evidence of cattle may be observed on the photography, such as water ponds, troughs, feed bunkers and cattle trails.
- Hay bales may be present at some times of the year.
- The area is fenced and the fence lines may be visible. Boundaries at fence lines are generally distinct.

CONTEXT

- **Landscape Position** - Unimproved pastures are often found on broad flat areas that were formerly pine flatwoods. They are usually associated with other agricultural and livestock activities. They tend to grade into improved pastures and woodlands pastures, but may grade in to almost any other land cover type, including wetlands. The surrounding landscape is helpful in distinguishing this class from hay fields ([2150 Field Crops](#)) or grasslands ([3100 Herbaceous - Dry Prairie](#)).
- **Vegetation** - Unimproved pastures are dominated by a variety of native grasses remaining following clearing or brush removal activities. Some introduced species are also present in most of these land cover types. Shrubs such as wax myrtle and saw palmetto are often scattered within the pasture.

- **Soils** - This cover type occurs on a wide variety of soil types. Most are found on acidic, sandy soils or loamy sands of former pine flatwoods sites.
- **Hydrology** - These cover types are usually not inundated and often contain ditches as discussed above. High water tables may be present during the wet season depending on the soil type on which they occur and inundation, if it does occur, is brief.

SIMILAR CLASSES

- [1900 Open Land](#) - A more natural area; generally not fenced
- [2110 Improved Pasture](#) - Improved Pasture will have a smoother texture.
- [2130 Woodland Pasture](#) - Woodland Pasture will have at least 25% of the area in tree canopy.
- [2150 Field crops](#) - Field crops (wheat, oats and hay) may have a smoother signature similar to improved pasture. Field crops are generally found in areas managed for agronomic crops, characterized by rectangular fields, farm roads, utility buildings, visible rotations, etc. Unimproved pastures are generally in less intensive areas managed for livestock and forage.
- [2610 Fallow Cropland](#) - Abandoned farm buildings, unmaintained roads and irrigation systems are characteristic of this class.
- [3100 Herbaceous \(Dry Prairie\)](#) - The 3100 class should be reserved for areas where cattle are not present or are not likely to be present. These may be in more urban settings, or in more remote areas formerly considered as rangelands.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes barns, ranch houses, trailers and other features common relevant to agriculture. Small inclusions of other land cover or land uses may also be included, if under the minimum size criteria. Tree canopy may cover up to 25% of the total area, but if canopy patches are larger than 5 acres they must be broken out as [2130 Woodland Pasture](#). Priority classes such as water bodies, wetlands, dumps, and feedlots must always be broken out separately, if they meet size criteria.

DUAL CODING CONVENTION

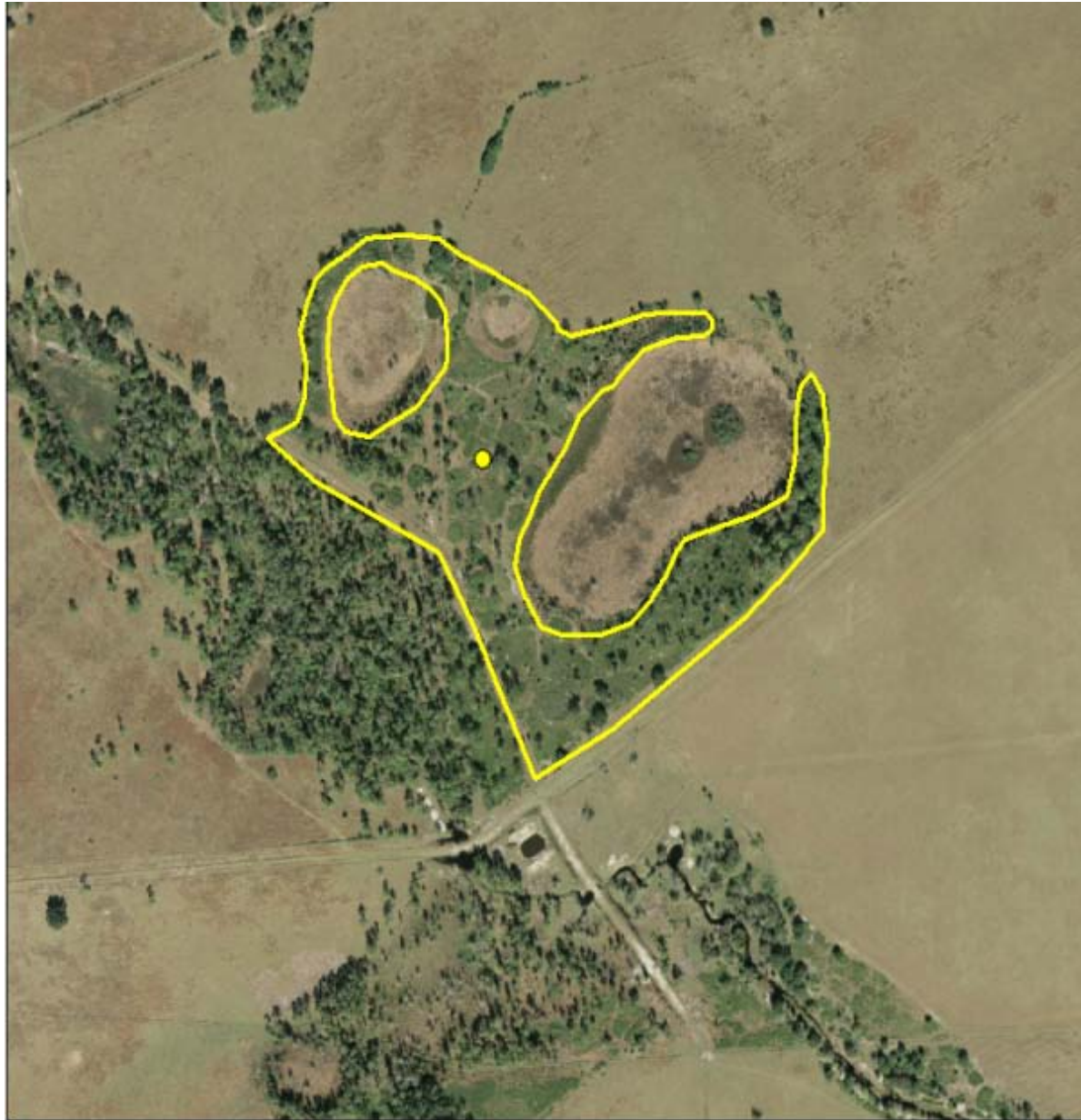
This is a **Land Cover** class. The LCCODE and LUCODE are the same. However, some of the **Land Use** classes, such as [1180 Rural Residential](#) and [1650 Reclaimed Mine Land](#), may use 2120 as a **Land Cover** class.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

526229.96 1253369.14 (Images)

FIELD PICTURE



DATE
03/14/07

COORDINATES
754865.04 1080554.27 (Field Picture)

2130

Woodland Pastures

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2130 Woodland Pastures**

DESCRIPTION

Pasturelands that have from 25% to 100% forest canopy are included in this class.

Pastures are generally unimproved. Evidence of cattle grazing may be difficult to see on photography, due to tree cover. Such evidence, if visible, may include cattle trails leading to feed bunkers, salt licks and watering areas, or cattle themselves. Supplemental data and field verification may be needed to accurately map this class.

KEYS TO PHOTOINTERPRETATION

- Twenty-five percent or more tree cover is present.
- Visible evidence of cattle activity may include cattle trails, feed bunkers, salt licks, hay bales or watering areas. Cattle crossings may be visible on the roads, defining a grazing boundary.
- Cattle themselves may be visible in some areas.
- Fence lines are usually obscured by canopy, but may be visible in open areas.

CONTEXT

- **Landscape Position** - This type can be found in any forested area within the project limits. Wetlands may be present within woodland pastures.
- **Vegetation** - Woodland pastures are dominated by a variety of native tree and shrub species. Most often the type will be of the pine flatwoods or pine and oak types.
- **Soils** - This cover type occurs on a wide variety of soil types. Most are found on acidic, sandy soils or loamy sands of former pine flatwoods sites.
- **Hydrology** - These cover types are usually not inundated. High water tables may be present during the wet season depending on the soil type on which they occur and inundation, if it does occur, is brief.

SIMILAR CLASSES

- [2120 Unimproved Pasture](#) - Less than 25% of the total area is in tree canopy.
- [2230 Other Groves](#) - Active pecan groves may show evidence of cattle grazing, but should not be classified as 2130 Woodland Pasture unless the grove is no longer active. They have a more uniform texture and color and trees are in rows.
- [2240 Abandoned Groves](#) - No indication of grazing is present.
- [3200 Shrub and Brushland](#) - These may look similar because shrub vegetation is present and tree canopy may comprise up to 25% of the cover. However, cattle are not present or likely to be present.
- [4110 Pine Flatwoods](#) - No indication of grazing is present.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes barns, ranch houses, trailers and other operational features. Open areas may cover up to 75% of the total area, but if those areas are larger than 5 acres they should be broken out. In transitional areas where species-specific wetland (2 acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit. PI's must use discretion to avoid excessive line work while adding useful information.

Priority classes such as water bodies, wetlands, dumps, and feedlots must always be broken out separately, if they meet their respective MMU.

DUAL CODING CONVENTION

This is a Land Cover class. The **LCCODE** and **LUCODE** are the same. However, some of the Land Use classes, such as [1180 Rural Residential](#) and [1650 Reclaimed Mine Lands](#), may use 2130 as a Land Cover class.

CIR DOQQ IMAGE



0 125 250 500 750 1,000 Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

457028.78 943489.62 (Images)

FIELD PICTURE



DATE
10/15/07

COORDINATES
449746.77 704562.48 (Field Picture)

2140 Row Crops

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2140 Row Crops**

DESCRIPTION

This class is for cultivated annual crops that exhibit a narrow row spacing. It does not include field crops, which do not exhibit rows on photography or trees and shrubs, which tend to have a wider spacing. Also not included are farms specializing in ornamentals and flowers. Typical row crops include corn, tomatoes, potatoes, cabbage, beans, tobacco and a host of other plants used mainly for animal and human consumption.

Row crops range from vast mono-cultures of animal feeds to tiny commercial truck farms and everything in between. The appearance of the fields varies according to the specific crop and season, from bare smooth soil to ridges to fully covered fields. Some fields may also be in cover crops or in a fallow state. The reliable indicators are the agricultural context and the appearance of fine textured rows on most plots.

KEYS TO PHOTOINTERPRETATION

- The active fields have straight rows of crops and furrows or plow lines.
- In wetter areas drainage ditches and levies or subsurface drains are present.
- Rows are visible even after harvesting of crops.
- Farm buildings and equipment are seen in surrounding areas.
- Irrigation systems are usually present.
- Bare soil may be visible with varying amounts of pink and/or reds (CIR) from the crops.

CONTEXT

- **Landscape Position** - Row crops usually occur in an agricultural context. Truck farms may operate on urban fringes, especially if on-site marketing is used. A variety of other agricultural uses may be practiced in the surrounding area, including field cropping, pastures, nurseries and tree crops.
- **Soils** - Areas with naturally hydric soils are sometimes used for row cropping and other agricultural operations. If they are active farm operations they are coded as agricultural rather than wetlands or water bodies. PI's should check public lands maps to determine whether the operation is still active or in a process of restoration.

SIMILAR CLASSES

- [2430 Ornamentals](#) - Row spacing is wider than row crops.
- [2410 Tree Nurseries](#) - individual crowns are generally more apparent - field verification may be needed.
- [2610 Fallow Cropland](#) - Has a more shrubby, irregular appearance.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes barns, offices, farm houses, warehouses, private air strips, farm roads and any other operational features.

Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria. However, areas that are active farm plots and only temporarily under water should not be coded as water bodies. A note may be added by the PI to indicate the field is inundated at the time of the photography.

DUAL CODING CONVENTION

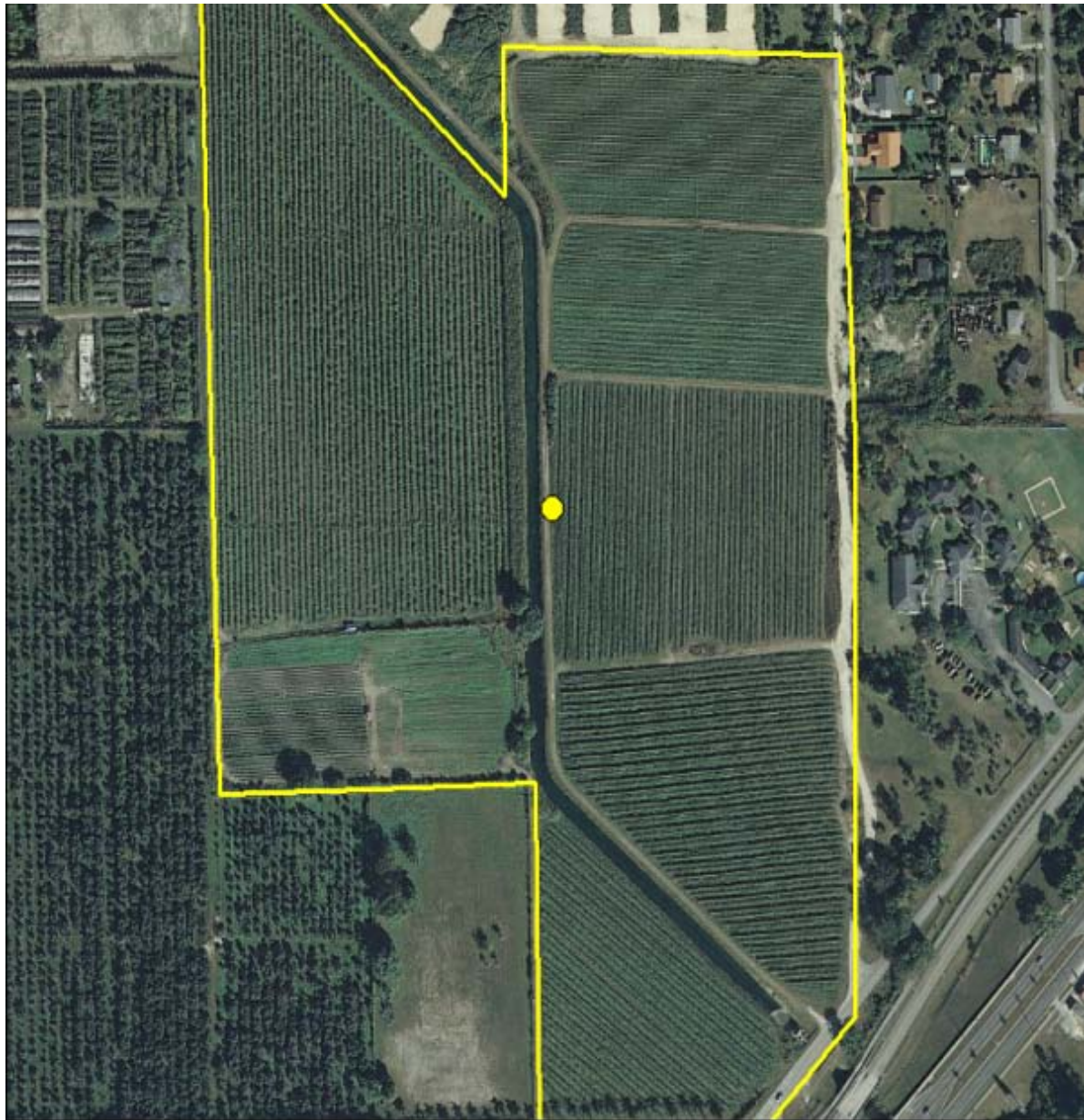
This is a **Land Cover** class. The LUCODE and LCCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/19/07

COORDINATES
854467.65 444277.31

2150 Field Crops

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2150 Field Crops**

DESCRIPTION

Field crops are agronomic crops that, due to spacing or growth habit, do not exhibit a pattern of parallel rows on the photography. Examples in Florida are wheat, oats, hay, other grasses, sugar cane and watermelons. **The fact that an area is mowed at some times is not sufficient for inclusion in this class** - it must be actively managed as a cultivated field crop. Fields are either rectangular or circular in shape, with the circular fields usually used for hay production. Hay crops tend to be isolated or will appear in clusters of only a few fields. Broad expanses of rectangular fields are generally sugar cane and are coded as [2156](#).

In the SFWMD the primary field crop types are hay, grasses and sugar cane. They may be very difficult to differentiate from improved pasture in many cases - context may be a decisive factor in distinguishing one from the other. Field checks may be the only way to determine the actual use of some fields, especially when crop growth is in the early stages. However, since hay crops are similar in function to other classes such as pasture, the error cost is low and does not warrant extensive checking. In fact, the farmer may rotate fields between pasture and hay over successive seasons or years.

KEYS TO PHOTOINTERPRETATION

- Typical field crops are included as well as hay production areas.
- Flat, smooth signature from hay, grasses.
- Bright pink signature from fertilization and maintenance.
- Fence lines may be visible.
- Mow lines and hay bales are often visible.
- Subsurface or surface drainage, canals, and/or irrigation may be visible.
- No visible evidence of grazing livestock.
- Field shapes are regular or rectangular and have mostly straight edges.

CONTEXT

- **Landscape Position** - The PI has to consider the context if other indicators are not conclusive. Cropland and pasture lands may occur together, but areas that are predominantly crop land will have more of the indicators shown above (fence lines, mow lines and rectangular fields) as well as other features such as storage buildings, cultivating equipment, vehicles, irrigation equipment, solid waste sites and processing facilities. Field crops may occur almost anywhere, but are typically found in areas of pasture and ranching or dairy/horse farms. Sugar cane fields are generally found around the southern portions of Lake Okeechobee.
- **Soils** - A wide variety of soils from sandy to peat, and varying drainage classes are used for Field Crops.

SIMILAR CLASSES

- [2110 Improved Pasture](#) - Will have evidence of grazing, or a grazing context
- [2160 Mixed Crops](#) - Will have less uniformity than field crops
- [2610 Fallow Cropland](#) - Will show signs of abandonment, overgrowth
- [3100 Herbaceous \(Dry Prairie\)](#) - Not actively managed for crops, although cutting may occur

SPECIAL MAPPING CONVENTIONS

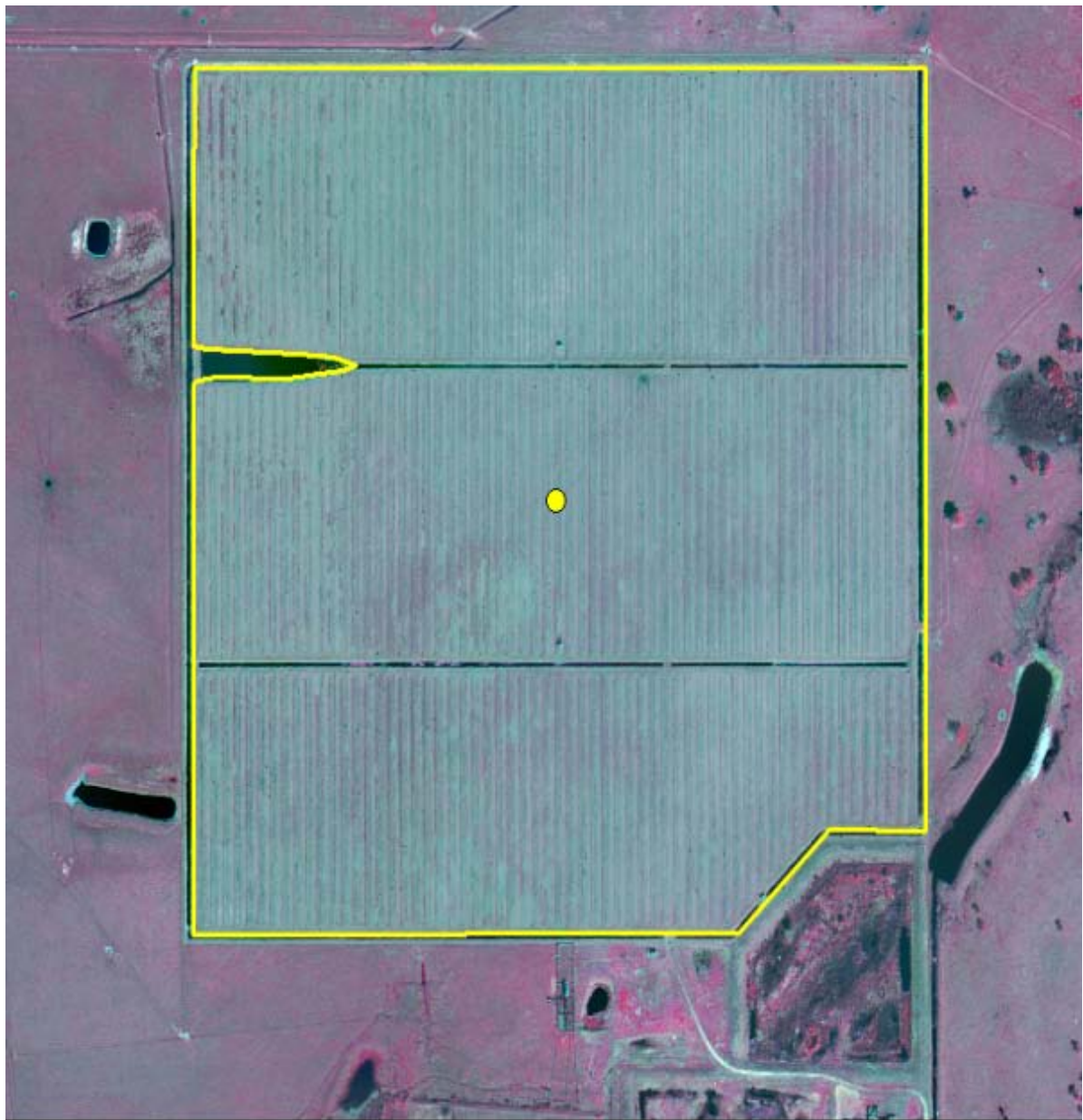
This land cover type on the aerial photography often appears as pasture that is not supporting livestock at the time of photography but is rotated to field crop production, specifically hay. If the area shows any evidence of cattle, or its signature could be classed as either pasture or field crops, the area should be classified as [2110 Improved Pasture](#).

Spatial context is helpful in distinguishing this class from [2110 Improved Pasture](#). Field crops will generally be found in a more intensively managed setting, surrounded by similar areas with rectangular fields, farm roads, etc. Improved pasture will generally be found in a less intensively managed environment.

NOTE: Areas of field crops associated with a dairy shall be coded as part of the dairy operation and not coded as 2150.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

647839.63 1065502.39 (Images)

FIELD PICTURE



DATE
n/a

COORDINATES
n/a (Field Picture)

2156 Sugar Cane

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: [2150 Field Crops](#)

LEVEL 4: 2156 Sugar Cane

DESCRIPTION

Sugar cane is a giant, robust tropical grass native to Asia. It is Florida's most valuable field crop.

Sugar cane fields occur as large expanses of regularly shaped fields and are generally found around the southern portions and shores of Lake Okeechobee.

In the SFWMD, Palm Beach County accounts for approximately 70% of the sugar cane acreage. The remainder is grown in the adjacent counties of Hendry, Glades and Martin.

These fields are sometimes rotated with other crops being produced in between cane crops. If cane is produced at any time, the field should be assigned to this class even if some other crop is being produced. Collateral data may be useful in determining sugar cane production areas.

KEYS TO PHOTOINTERPRETATION

- Very smooth texture and even height with generally bright red color (CIR).
- Fields are rectangular in shape and extensive amounts of land in blocky pattern of many individual fields are visible.
- Larger irrigation ditches and access roads separate the fields with smaller ditches also present between fields.
- Harvested or fallow fields appear as any variation between light greenish color and black.
- Black returns often occur from fields which have recently been burned and harvested and not yet tilled for replanting.

CONTEXT

- **Landscape Position** - The major cane production areas are generally away from centers of population due to the agricultural practices involved in harvesting the crop. Cane fields are burned prior to harvest and the smoke can be a problem in lands adjacent to urban areas.
- **Soils** - Generally restricted to organic muck soils.
- **Hydrology** - Due to their location in areas of organic muck soils and former Everglades or marsh systems, water is present in these fields during wet periods. Irrigation and drainage systems consisting of varying size canals and ditches are a prominent feature around, but generally not within (as with row crops) cane fields.

SIMILAR CLASSES

- [2110 Improved Pastures](#) - Will have evidence of grazing, or a grazing context
- [2610 Fallow Cropland](#) - Will show signs of abandonment, overgrowth
- [3100 Herbaceous \(Dry Prairie\)](#) - Not actively managed for crops, although cutting may occur

SPECIAL MAPPING CONVENTIONS

If sugar cane is produced at any time, the field should be assigned to this class even if some other crop is being produced.

DUAL CODING CONVENTION

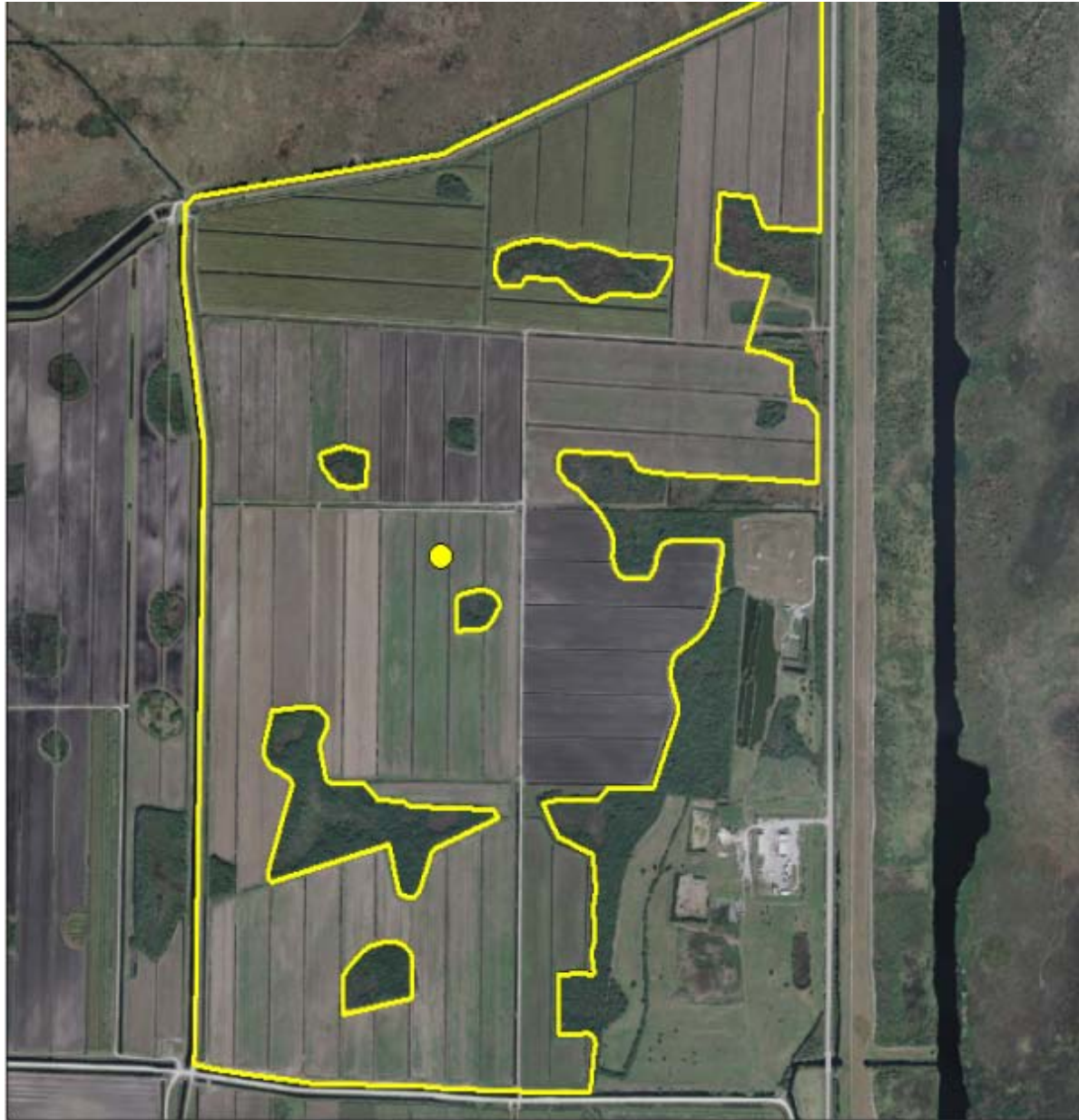
This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 250 500 1,000
Feet

NATURAL COLOR IMAGE



0 250 500 1,000
Feet

COORDINATES
612797.49 931180.07 (Images)

FIELD PICTURE



DATE
01/14/07

COORDINATES
861980.20 429677.30 (Field Picture)

2160 Mixed Crops

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2100 Cropland and Pastureland](#)

LEVEL 3: **2160 Mixed Crops**

DESCRIPTION

This class is used for areas where the type of crop cannot be determined, either because the photosignature does not indicate a specific type of crop or various crop types are in plots that cannot be delineated separately. It may not be possible to break out the different crop types if each plot is below the minimum mapping unit (5 acres), or if the stage of the rotation (e.g. freshly plowed) does not reveal what type of crop will be grown.

The crop patterns in some areas can vary from season to season. Where mixtures of row crops, field crops, pastures, fallow cropland and other crops occur together, a precise delineation is not always cost effective - some aggregation or generalization may be justified. PI's must use discretion to avoid excessive line work while adding useful information.

This class should not be used if a reasonable assumption about the crop type can be made based on context, surrounding uses and other possible indicators. In general, it should be reserved only for mixtures of crops that are too complex to differentiate efficiently.

KEYS TO PHOTOINTERPRETATION

- Crop type is not identifiable due to temporary inactivity or the stage of crop rotation. Some plots may be freshly tilled.
- Multiple crop types occur on small areas, each type below the minimum size criteria of 5 acres. Crop patterns appear somewhat random.
- The mixture of cropping methods indicates that the land use changes often.
- The specific crop type cannot be determined from the photography or supplemental data.

CONTEXT

- **Landscape Position** - This class tends to be limited to mostly smaller operations, such as truck farms, or farms used for a second income. These are likely to be in agricultural zones in or near urban areas. A variety of other agricultural uses may be practiced in the surrounding area, including field cropping, pastures, nurseries and tree crops.

SIMILAR CLASSES

- [2140 Row Crops](#) - Have straight rows of crops and furrows or plow lines are visible
- [2150 Field Crops](#) - Have a bright pink, flat, smooth signature from fertilization and maintenance
- [2430 Ornamentals](#) - Row spacing is wider than for row crops; shade cloths may appear as black rectangles.

SPECIAL MAPPING CONVENTIONS

This is a SFWMD modification to the FLUCCS system, which does not have a class for mixed crops.

This class should not be used if a reasonable assumption about the crop type can be made based on context and other indicators. It should be reserved mainly for mixtures where more specific classification is not possible.

The mapping unit includes any barns, offices, farm houses, green houses, warehouses, farm roads and other features that are part of the farming operation or inside the operational boundary. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

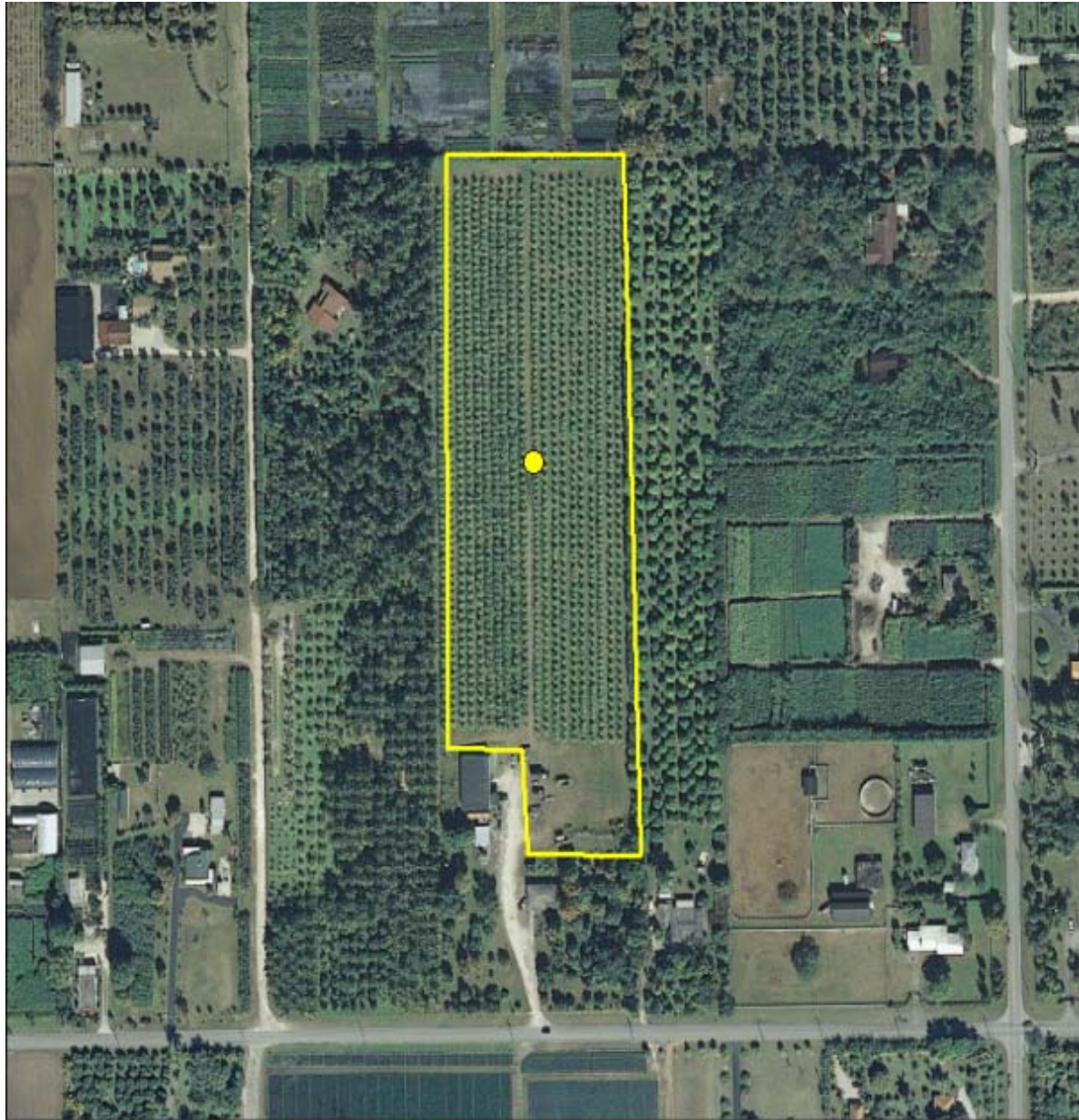
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

504737.78 878027.78 (Images)

FIELD PICTURE



DATE

01/14/07

COORDINATES

504737.78 878027.78 (Field Picture)

2200 Tree Crops

This Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

[2210 Citrus Groves](#)
[2230 Other Groves](#)

BACKGROUND

This class is used for tree crop operations that produce fruit, nuts or other resources not including wood products.

Examples in Florida include citrus fruit, peaches, mangos and avocados. It also includes pecans and other nut trees. This class does not include tree nurseries, vineyards, floriculture or ornamentals. It also does not include tree plantations or any uses that primarily produce wood products. If the groves are abandoned they should be classified as [2240 \(Abandoned Groves\)](#).

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit for all Agricultural classes is 5 acres.

Differentiating subclasses: The agricultural classes are generally open, cultivated lands that can have a similar appearance on aerial photography. The land uses can change very frequently from one to another. Also, agricultural areas may be mixed with other uses, such as forestry, mining, rural residential and rangelands, making context alone an unreliable indicator. As a result of these factors, there is a strong possibility for confusion. In order to differentiate these classes it is necessary to look closely at the details in the PI key pages for each class.

DUAL CODING CONVENTION

All of the 2200 classes are **Land Cover** classes. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

SIMILAR CLASSES

Tree Crops can be confused with other classes such as [2140 Row Crops](#), [4400 Tree Plantations](#) and [2410 Tree Nurseries](#). Tree Crops have wider-spaced rows and trees that are generally visible, while some crop types may have visible rows, but no trees visible. Active pecan groves may show evidence of cattle grazing, but should not be classified as [2130 Woodland Pasture](#) unless the grove is no longer active. Tree Crops also have a more uniform appearance than nurseries or vineyards, which can have a variety of species. Older abandoned groves show encroachment of other shrubs and should be classified as a Land Use in the Upland Non-Forested category as [2240 \(Abandoned Groves\)](#).

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

2210 Citrus Groves

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2200 Tree Crops](#)

LEVEL 3: **2210 Citrus Groves**

DESCRIPTION

This class includes active citrus groves, such as oranges, grapefruits and tangerines. If the groves are abandoned they should be classified as [2240 \(Abandoned Groves\)](#).

The mapping unit includes all facilities that are related to the citrus operation or located within the operational boundary of the enterprise.

KEYS TO PHOTOINTERPRETATION

- Uniformly spaced rows of trees give the appearance of a grid pattern. There may be intermittent spaces within groves.
- The groves and its sub-units tend to be large, rectangular areas with straight rows. One operation may cover thousands of acres.
- Irrigation and drainage canals are usually present.
- Healthy trees produce circular crowns with a medium-dark green crown (dark brown/red color on CIR). Larger trees may grow together into what appear to be long, wide hedges.
- Groves appear to be well-managed and currently in production.

CONTEXT

- **Landscape Position** - Citrus is typically planted on well-drained, sandier textured soils, but hydric soils have also been converted to citrus groves in some places. Artificial drainage and irrigation are used in most cases to keep soils in acceptable moisture ranges.
- **Soils** - Citrus groves are typically found on well-drained sandy soils.

SIMILAR CLASSES

- [2140 Row Crops](#) - Rows have more of a linear pattern, crowns are usually not distinct.
- [2230 Other Groves](#) - Crowns can appear to be less rounded than citrus and often taller.
- [2240 Abandoned Groves](#) - Groves will look unmanaged with underbrush, vines, and dead or dying trees.
- [2410 Tree Nurseries](#) - Nurseries have smaller, tighter crowns-field verification may be necessary.
- [4410 Coniferous Pine](#) - Characteristic pine signature.
- [4430 Forest Regeneration](#) - Recently cleared areas, with lines of piled up slash and debris.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes offices, on-site marketing and processing facilities, permanent and temporary housing, warehouses, private air strips, farm roads and any other operational features. Any features not involved in the operation or not located within operational boundaries are not included.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

589500.20 1302364.46 (Images)

FIELD PICTURE



DATE
10/03/07

COORDINATES
450942.22 1509035.67 (Field Picture)

2230 Other Groves

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2200 Tree Crops](#)

LEVEL 3: **2230 Other Groves**

DESCRIPTION

This class includes tree crops such as fruit orchards, pecans and other nut trees, and also groves where the type of fruit being grown is unable to be determined. If the groves are abandoned they should be classified as [2240 \(Abandoned Groves\)](#).

These groves appear as regularly spaced trees of similar size and crown shape/diameter in regular blocks. Trees do not necessarily produce circular crowns like citrus, however. Additionally they may be taller (when mature) than citrus and have varying reddish color return depending on the crop in production which is not as dark as the dark brown red color of most citrus. As trees become larger, they may form what appear as long hedges with each crown touching its neighbor along the long axis of the row of trees.

Varying amounts of bare soil are visible between the rows depending on the age of the grove and maintenance practices and/or schedules.

The type of grove is often not possible to determine without collateral data. Size and shape of trees, especially in more mature groves should distinguish this class from the more rounded crowns of citrus trees.

KEYS TO PHOTOINTERPRETATION

- Uniformly spaced rows of trees give the appearance of a grid pattern. There may be intermittent spaces within grove.
- The groves and its sub-units tend to be large, rectangular areas with straight rows. One operation may cover thousands of acres.
- Irrigation and drainage canals are usually present.
- Healthy trees produce circular crowns with a dark brown/red color (CIR). Larger trees may grow together into what appear to be long, wide hedges.
- Groves appear to be well-managed and currently in production.

CONTEXT

- **Landscape Position** - This land use type occupies much smaller areas than that of citrus groves. Irrigation and drainage canals are still present throughout the grove system providing water (pumped into the grove during dry times) and drainage for excess rain water and high water tables during wet periods. These other groves tend to be located in the southern portions of the District.
- **Soils** - This land use type is typically found on well-drained sands.

SIMILAR CLASSES

- [2130 Woodland Pasture](#) - Active pecan groves may show evidence of cattle grazing but will not be coded as 2130 unless the grove is no longer active.

- [2210 Citrus Groves](#) - Trees have more rounded crowns.
- [2240 Abandoned Groves](#) - Groves will look unmanaged with underbrush, vines, and dead or dying trees.
- [2410 Tree Nurseries](#) - Nurseries have smaller, tighter crowns-field verification may be necessary.
- [4410 Coniferous Pine](#) - Characteristic pine signature.
- [4430 Forest Regeneration](#) - Recently cleared areas with lines of piled up slash and debris.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes all associated offices, on-site marketing and processing facilities, permanent and temporary housing, warehouses, private air strips, farm roads and any other operational features. Any features not involved in the operation or not located within operational boundaries are not included.

Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria.

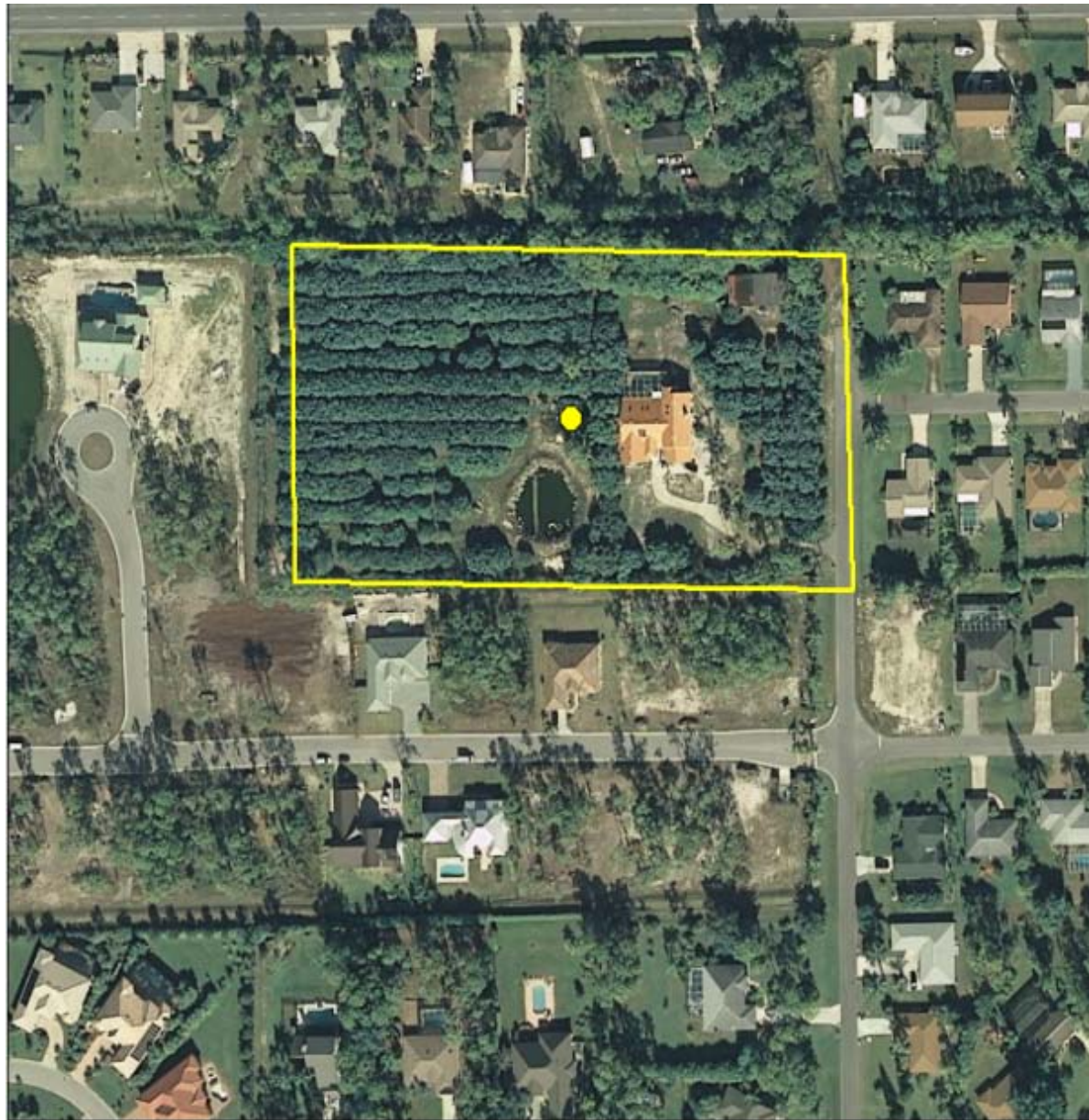
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE

10/06/04

COORDINATES

399244.41 745246.06

2240 Abandoned Groves

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2200 Tree Crops](#)

LEVEL 3: **2240 Abandoned Groves**

DESCRIPTION

This classification is used to identify groves or orchards that are no longer being maintained and are basically out of production. Older abandoned groves show encroachment of other shrubs (Brazilian pepper and wax myrtle) and grasses in between the trees, and other species of shrubs and trees replacing stressed or dead trees.

KEYS TO PHOTOINTERPRETATION

- Uniformly spaced rows of dead or dying trees give the appearance of a grid pattern.
- Significant understory will be visible.
- Groves appear unmanaged-dead trees, vine infestation, inconsistent spacing and irregular crown sizes.
- Tree canopy may become overgrown eliminating access needed for harvesting.

CONTEXT

- **Landscape Position** - Abandoned groves are most likely to be found in agricultural areas transitioning to development. They may also be found in remote areas that were impacted by adverse climate or disease.
- **Soils** - Groves are typically found on well-drained sandy soils.

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Evidence of cattle grazing will be present.
- [2210 Citrus Groves](#) - Crown sizes will appear consistent with no overgrowth of natural vegetation.
- [2230 Other Groves](#) - Crown sizes will appear consistent with no overgrowth of natural vegetation.
- [3200 Shrub and Brushland](#) - Natural shrubby vegetation is the dominant ground cover.
- [3300 Mixed Rangeland](#) - Natural shrubby vegetation and grasslands are the dominant ground cover.

SPECIAL MAPPING CONVENTIONS

This is a SFWMD modification to the FLUCCS system.

The 2240 Abandoned Grove class is used to indicate groves which have been abandoned and have returned to a naturally vegetated state. Many former grove areas have been cleared of their trees and have become maintained areas of Crops or Pasture and the appropriate 2000 Agriculture level III class should be used. These areas are often distinguishable by scars that appear as rows of dots where the trees were present. If trees have been removed and the area has not been replanted then 2610 Fallow Cropland should be used.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

747569.83 1099796.95 (Images)

FIELD PICTURE



DATE
01/12/07

COORDINATES
852099.12 1124991.65 (Field Picture)

2300 Feeding Operations

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: **2300 Feeding Operations**

DESCRIPTION

This Level 2 class should be used only for animal feeding operations that do not fall in to one of the two active subclasses of cattle or poultry feeding. The most common usage for this class is for swine production, which is not prevalent in the District at this time.

This class does not include facilities used to process livestock into consumer food products. These facilities, such as meat packing plants, are classified as [1500 Industrial](#).

Feeding operations are specialized livestock production enterprises. They have large animal populations restricted to relatively small areas, which results in a concentration of waste material that is an environmental concern. The attendant waste disposal and mitigation problems justify a separate category for these relatively small areas.

As with dairies, feeding operations may have a number of sub-components. If so, they are classified as follows:

- Central Buildings and Processing Facilities - LC 2300, LU 2300.
- Central, High-Intensity Pasture - LC 2300, LU 2300. (include with processing facility)
- Outlying Pasture - LC [2100s](#), LU [2100s](#).
- Treatment Ponds and Lagoons - LC [8360](#), LU 2300

KEYS TO PHOTOINTERPRETATION

- Modern swine production facilities, if introduced, are large, industrial, indoor facilities rather than outdoor feedlots. Animals are not typically visible.
- Usually large, specialized livestock production areas with confined feeding.
- The concentration of livestock on small areas usually causes a severe impact to ground cover.
- Structures to shelter the animals and equipment are visible.
- Fences, access paths, and waste disposal ponds may be visible.

CONTEXT

- **Landscape Position** - Some operations are located near urban areas to take advantage of proximity to transportation facilities and processing plants. However, environmental concerns usually dictate that these facilities be located a sufficient distance from residential areas.

SIMILAR CLASSES

- [2520 Dairies](#) - large buildings for shelter and/or milking apparent

SPECIAL MAPPING CONVENTIONS

The 2300 Feeding Operations code applies to the buildings and adjacent high intensity areas which are an integral part of the feeding operation.

Related treatment ponds should be dual-coded. - e.g. [8360/2300](#).

Included within the 2300 polygon are all buildings, grounds, parking lots, storage areas and other related features.

Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. A separate **Land Cover** code is only required as noted above.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

755004.88 1037683.82 (Images)

FIELD PICTURE



DATE
n/a

COORDINATES
n/a (Field Picture)

2310

Cattle Feeding Operations

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2300 Feeding Operations](#)

LEVEL 3: **2310 Cattle Feeding Operations**

DESCRIPTION

This class is for concentrated feedlot operations that produce accelerated growth of cattle prior to processing into food products. It is not for breeding, grazing or dairy operations, and it does not include facilities (meat packing plants) used to process the livestock into consumer food products.

Feeding operations are specialized, livestock production enterprises that are rare but highly significant wherever they do occur. They have large animal populations restricted to relatively small areas, which results in a concentration of waste material that is an environmental concern. The attendant waste disposal and mitigation problems justify a separate category for these relatively small areas.

The signature of this class is distinct - highly impacted ground cover around a core facility, with pronounced trails and ditches. In impacted areas the ground is wet, causing a characteristic dark color on CIR photos.

KEYS TO PHOTOINTERPRETATION

- These are usually large, specialized livestock production areas with confined feeding.
- The concentration of livestock on small areas usually causes a severe impact to ground cover.
- Fences, heavily used trails, feeding troughs, shelters, and waste disposal features (treatment ponds, waste piles) may be visible.

CONTEXT

- **Landscape Position** - Feedlots are rare, but highly significant in terms of water resources. Some operations are located near urban areas to take advantage of transportation facilities and processing plants. However, environmental concerns usually dictate a distance from residential areas.

SIMILAR CLASSES

- [2110 Improved Pasture](#) - Ground cover is not heavily impacted
- [2520 Dairies](#) - Dairies may have concentrated feeding operations. Such areas are included as part of the dairy facility, and not delineated separately.

SPECIAL MAPPING CONVENTIONS

DUAL CODING CONVENTION

This is a **Land Use** class. A separate **Land Cover** code **may** be required, as described below.

- Central Buildings and Processing Facilities - LC 2310, LU 2310.
- Central, High-Intensity Pasture - LC 2310, LU 2310. (include with processing facility)

- Outlying Pasture - LC 2100s, LU 2100s.
- Other Treatment Ponds - LC 8360, LU 2310.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

713244.92 1105103.01 (Images)

FIELD PICTURE



DATE
10/15/07

COORDINATES
665485.66 1110832.62 (Field Picture)

2320

Poultry Feeding Operations

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2300 Feeding Operations](#)

LEVEL 3: 2320 Poultry Feeding Operations

DESCRIPTION

This class includes commercial facilities that raise chickens for human consumption. It does not include meat packing plants, which are classified as [1500 Industrial](#).

Poultry operations have a very distinctive appearance on aerial photos - very long, narrow, white buildings set in parallel, with relatively clean surrounding grounds. These are the opposite of cattle feedlots, which appear to be very impacted, and have a more "messy " appearance.

Poultry waste materials may be treated or spread on-site, or removed for outside uses such as fertilizer.

KEYS TO PHOTOINTERPRETATION

- Long rectangular chicken coops are present.
- The surrounding area is relatively un-impacted.
- Small reservoirs may be seen adjacent to buildings, used for water supply and storm water and/or wastewater treatment.
- Fields around the facility may show varying degrees of enrichment (pinkish colors on CIR) due to waste spreading or wastewater irrigation activities.

CONTEXT

- **Landscape Position** - Poultry operations are common in parts of the District, typically located in agricultural areas. They do not have waste mitigation issues to the degree that swine and cattle feeding operations do. However, odor and other environmental concerns usually require their being located a substantial distance from residential areas.

SIMILAR CLASSES

- [2400 Nurseries and Vineyards](#) - Greenhouses may resemble chicken coops. Context should be checked carefully. Other types of crop production may also have greenhouses.

SPECIAL MAPPING CONVENTIONS

If there are sub-components to the operation, they are classified as follows:

- Central Buildings and Processing Facilities - LC 2320, LU 2320
- Treatment Ponds - LC [8360](#), LU 2320

Included within the 2320 polygon are all buildings, grounds, storage areas and other features that are involved in the operation or within the operational boundary. Open lands adjacent to the facility are not coded 2320 unless there are indications of impacts from the poultry operation. Property

boundaries are not expected to coincide with the 2320 mapping unit. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

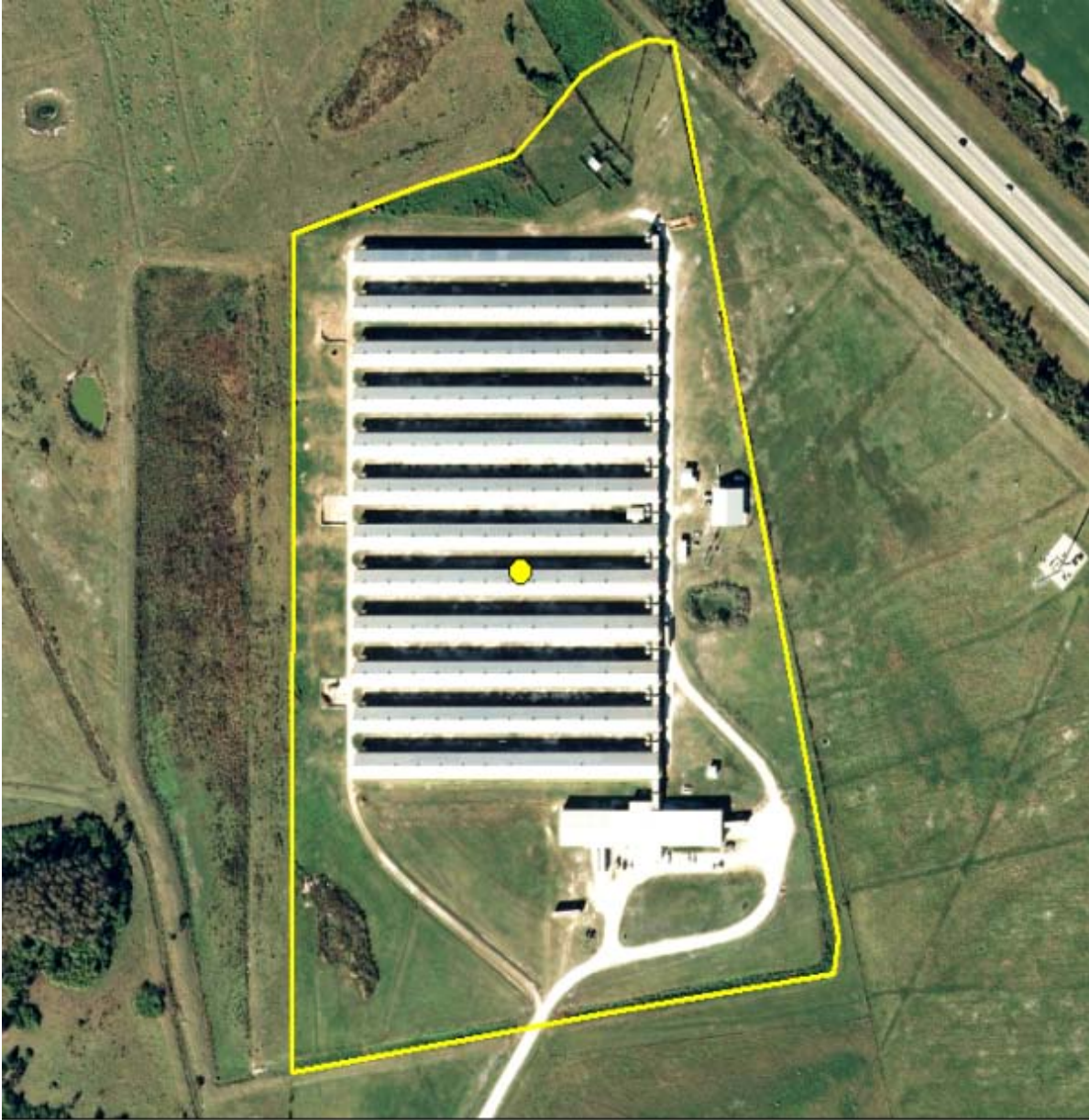
DUAL CODING CONVENTION

This is a **Land Use** class. Dual coding is only required in the case of treatment ponds. (See above)

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
594478.55 1341820.74

2400

Nurseries and Vineyards

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: 2400 Nurseries and Vineyards

DESCRIPTION

This Level 2 class includes Nurseries and Vineyards that are not described by one of the three active subclasses. The subclasses are [2410 Tree Nurseries](#), [2420 Sod Farms](#) and [2430 Ornamentals](#). The 2400 code is used for nurseries and vineyards whose purpose is other than tree production.

Some of the subclasses are very similar in both definition and appearance, and will be difficult to differentiate at farms that have a mixture of different uses. For example, one small retail nursery may grow ornamental trees, small ornamentals, ferns and flowers. In these cases the PI must try to determine the predominant use and code it accordingly. If the predominant use cannot be determined, then the general code 2400 may be used.

Greenhouses or nurseries that are attached and subsidiary to a larger farm operation of another type, such as row crops or citrus groves, are included in those land uses and not classified in the 2400 Nurseries and Vineyards class.

KEYS TO PHOTOINTERPRETATION

- There are usually small plots focused around long narrow rows of greenhouses or long narrow rows of planted vines.
- There may be a number of different types of plants with various row widths.
- Typically have numerous short rows running perpendicular to longer rows
- These uses often found in areas of rich humus soils associated with rivers, wetlands and basin depressions.

CONTEXT

- **Landscape Position** - Nurseries and vineyards may be associated with farm operations, forestry, landscaping or urban marketing operations. There are, in general, few environmental concerns or nuisance factors and they can be located almost anywhere. Sizes range from tiny plots to very large commercial operations.
- **Vegetation** - N/A
- **Soils** - N/A
- **Hydrology** - N/A

SIMILAR CLASSES

[2200 Tree Crops](#) - Nurseries have multiple varieties, giving a less uniform appearance. Vineyards have a closer spacing and individual plants are not visible.

SPECIAL MAPPING CONVENTIONS

This Level 2 classification code is used primarily for vineyards.

The mapping unit includes greenhouses, offices, residential buildings, parking areas, farm roads and any other operational features. Only features that are involved in the enterprise or within the operational boundary are included. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
08/15/06

COORDINATES
769399.12 902734.41

2410 Tree Nurseries

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2400 Nurseries and Vineyards](#)

LEVEL 3: **2410 Tree Nurseries**

DESCRIPTION

This class includes nurseries which grow trees for transfer to other destinations. There may be other products grown at the facility, such as flowers and ornamentals, but they are not the predominant use. Trees may be grown in-ground or in containers.

Most tree nurseries are for ornamental trees used for landscaping. These trees can range from small potted plants to large specimens, and many varieties are typically present. Also included are timber nurseries, which have plants that appear small and uniform on the photography.

KEYS TO PHOTOINTERPRETATION

- Trees are in rows similar to citrus groves, but there are many different types of trees with varying shaped crowns, texture and color. Some areas may be under artificial shading.
- Sizes range from tiny plots to very large commercial operations.
- Greenhouses and equipment storage areas are often present.

CONTEXT

- **Landscape Position** - Nurseries may be associated with tree crops, forestry, landscaping or retail operations. They do not present environmental or nuisance concerns and can be located almost anywhere within the District.

SIMILAR CLASSES

- [2200 Tree Crops](#) - Trees tend to be mature and uniform, over large areas.
- [2430 Ornamentals](#) - 2430 is used for smaller ornamentals, such as container grown plants.
- 4400 Tree Plantations and 4410 Coniferous Pine - These may contain nurseries, but the acreage is mostly in permanent plantation.
- [4430 Forest Regeneration](#) - Trees are small but permanent, not for transplant.

SPECIAL MAPPING CONVENTIONS

This class includes timber nurseries, which is a modification of the FLUCCS system. (In the FLUCCS system, timber nurseries are classified with the code 2460.)

The mapping unit includes greenhouses, offices, residential buildings, parking areas, and any other features involved in the enterprise or within the operational boundary. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

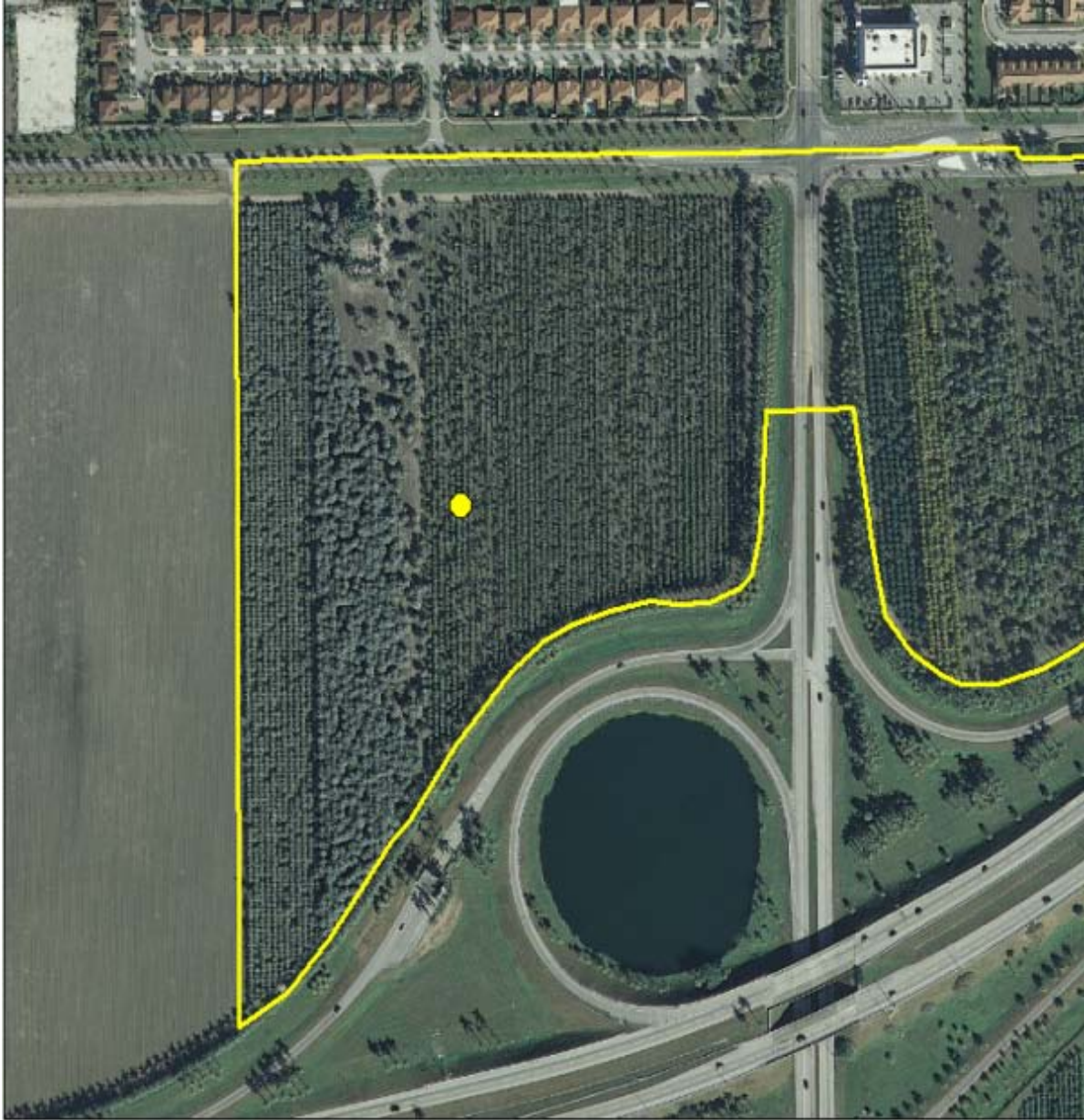
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/19/06

COORDINATES
862416.60 437247.82

2420 Sod Farms

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2400 Nurseries and Vineyards](#)

LEVEL 3: 2420 Sod Farms

DESCRIPTION

This class describes sod (turf) farms. They are usually large, intensively managed areas of short, uniform turf. The crop requires extensive fertilization and machinery, indicated by the presence of buildings, tanks and storage areas.

Irrigation canals are usually present around the fields with the smaller irrigation/drainage ditches in between smaller blocks or fields of sod. These fields produce a very manicured look much the same as lawns without the landscaping shrubbery. Intensive management is apparent with small roads and maintenance and storage sheds for equipment and chemicals (fertilizers, herbicides and pesticides).

Harvested fields will either show as bare soil (light greenish or whitish color) or as intermixed narrow strips of bare soil and magenta or pinkish on CIR from the strips of sod left to grow the next crop. The strip harvest method is not commonly used in commercial sod fields, but may be observed in pastures which have been leased or sold for sod production.

Sod farms have signatures similar to well-manicured pastures, hay crops or urban lawns. Some pastures may be leased for sod production; these should be classified as 2420 Sod Farms if sod production appears to be the predominant use.

Sod farms are a priority class because, like golf courses, they use high rates of fertilizers and other chemicals that can migrate to ground or surface waters. Prolonged use as sod farms can also deplete surface soils.

KEYS TO PHOTOINTERPRETATION

- Growing turf has an even green natural color signature (bright red on CIR).
- Areas may be patchy, rectangular and in different stages of growth.
- Ponds may be used for irrigation and irrigation patterns may be evident as circles or blocks of uniform signature.
- Irrigation and drainage canals and ditches are usually present, with smaller ditches in between fields or blocks of sod, to insure proper moisture conditions.
- Features such as cattle, hay bales, silos, etc. will not be present. Trees and shrubs are not present in the sod fields.
- Harvested areas appear as long strips or rectangular patches of bare soil in random locations.

CONTEXT

- **Landscape Position** - This land use may occur anywhere within the project area but typically would be expected to occupy areas between urban development and remote agricultural lands so as to take advantage of readily available labor pools and distribution/marketing facilities.
- **Soils** - Sod farms require well-drained soils with uniform, controlled moisture conditions and fertilization for healthy growth.

SIMILAR CLASSES

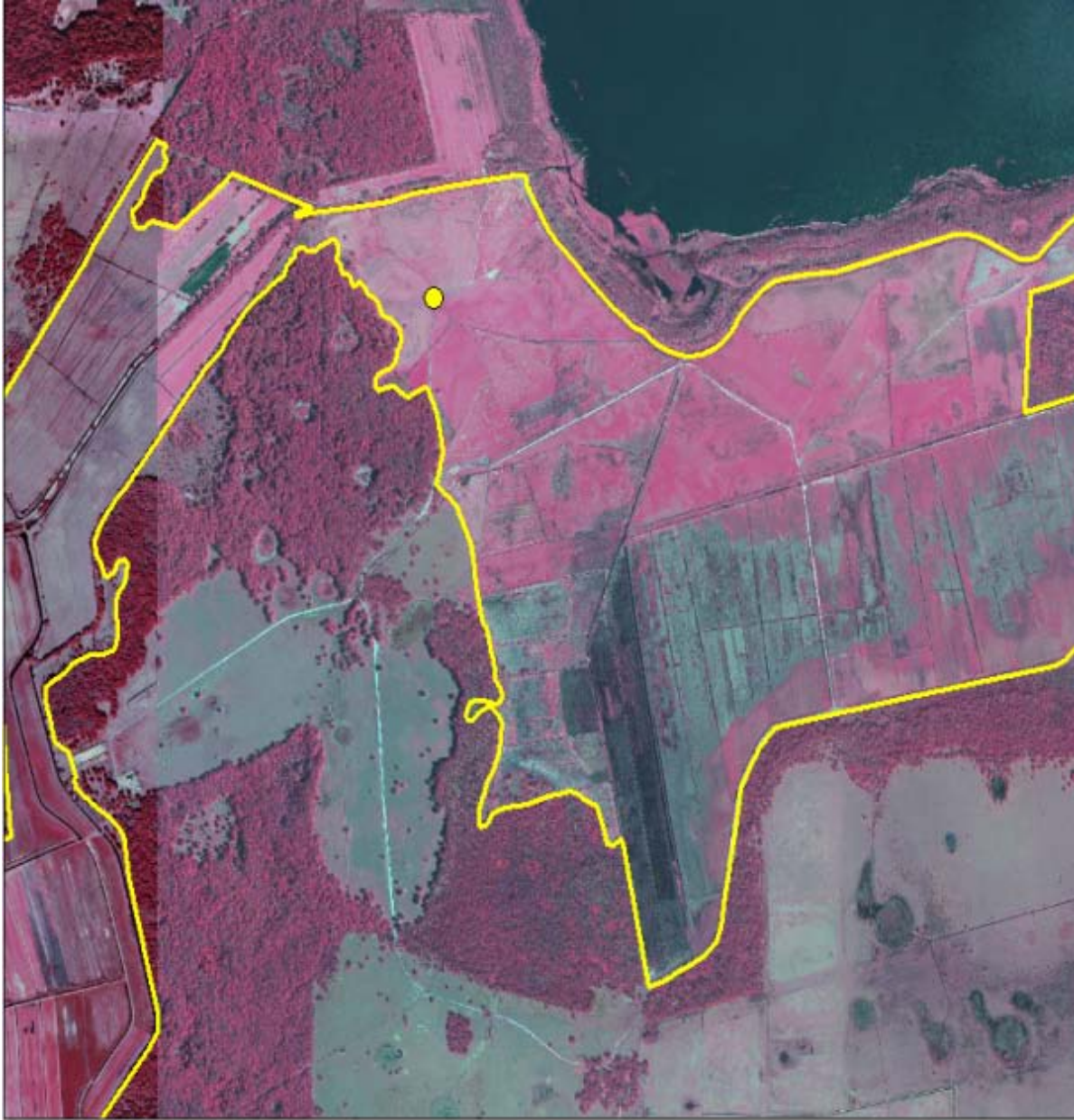
- [2110 Improved Pastures](#) - Evidence of grazing will be present.
- [2150 Field Crops](#) - Hay bales may be visible.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes offices, storage areas for equipment and materials, and any other features involved in the enterprise or within the operational boundary. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



0 5001,000
Feet

NATURAL COLOR IMAGE



0 5001,000
Feet

COORDINATES
518491.45 1332454.52 (Images)

FIELD PICTURE



DATE
10/15/07

COORDINATES
507587.04 1416386.01 (Field Picture)

2430 Ornamentals

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2400 Nurseries and Vineyards](#)

LEVEL 3: 2430 Ornamentals

DESCRIPTION

This class describes facilities that raise ornamental plants for off-site use. It does not include ornamental trees, which are classified as [2410 Tree Nurseries](#).

The signature is similar to [2410 Tree Nurseries](#), with rows of varying height, spacing, size and color tones producing a mottled texture on the photography. Plants are grown in containers arranged in different patterns of strips, blocks or rows. They may also be grown under black shade cloth or in greenhouses. Inclusions of other products, such as trees and flowers, may be present, but the predominant use is for ornamentals and the most common method is in containers, in rows, outdoors.

KEYS TO PHOTOINTERPRETATION

- Plants are arranged in linear or rectangular patterns.
- Shade cloth may be used for artificial shading, appearing as rectangular areas with black returns similar to water. Black plastic may also be used for ground cover to control weeds.
- Row spacing is wider than row crops and narrower than tree crops or citrus.

CONTEXT

- **Landscape Position** - Ornamental nurseries may be associated with other types of agriculture, tree crops, landscaping or retail operations. Combined production/retail operations in urban and suburban areas are common. Ornamental nurseries tend to be smaller in size than other agribusiness operations, but can be extensive, as shown in the image below. They do not present environmental or nuisance concerns in general and can be located almost anywhere within the District, most commonly near other agricultural areas or on the outer fringes of developed areas.

SIMILAR CLASSES

- [2140 Row Crops](#) - Management is less intensive; greenhouses, artificial shading, and other features are not prevalent.
- [2410 Tree Nurseries](#) - Rows are wider and tree crowns are evident.
- [5300 Reservoirs](#) - Shade cloth and ground covers can present a black return similar to water.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes greenhouses, offices, residential buildings, parking areas, and any other features involved in the enterprise or within the operational boundary. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/03/07

COORDINATES
493542.29 1520335.61

2500 Specialty Farms

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: **2500 Specialty Farms**

DESCRIPTION

This class describes operations that maintain animals and does not include pasture or feedlot operations. In the SFWMD classification system, 2500 is an active, general class that includes any specialty farms that are not described in one of three active subclasses - [2510 Horse Farms](#), [2520 Dairies](#) or [2540 Aquaculture](#). Examples of this class are dog kennels, ostrich, llama, or buffalo farms, tropical fish farms and captive breeding programs. The 2500 class is considered an Agricultural class and does not include [1800 Recreational](#) or [1700 Institutional](#) facilities which may raise animals.

KEYS TO PHOTOINTERPRETATION

- This class covers a large range of diverse activities - no indicators will apply precisely to all classes. Supplemental data is usually needed to recognize these uses.
- Operations are specialized for the production or breeding of show animals or specialty foods.
- Structures and acreage requirements will vary depending on operation.
- Operations are usually fenced and may contain groupings of small agricultural structures.
- The caretaker or owner dwelling is usually on premises as these tend to require a great deal of specialized attention.

CONTEXT

- **Landscape Position** - Specialty farms can occur anywhere, but are more common in rural areas where open space, farm labor and privacy are available.

SIMILAR CLASSES

- [1100 Residential, Low Density](#) and [1180 Rural Residential](#) - If rural residences operate a specialty farm on site they should be coded 2500.
- [1850 Parks and Zoos](#) - Animal exhibits or research are usually in urban or urban fringe areas.
- [2300 Feeding Operations](#) - These will usually have more visible impacts.
- [2430 Ornamentals](#) - Evidence of horticulture should be visible.

SPECIAL MAPPING CONVENTIONS

Included within the 2500 polygon are all buildings, grounds, cages, residences and other related features. The operational boundaries may not be the same as property boundaries.

Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
N/A

COORDINATES
376234.20 869407.90

2510 Horse Farms

LEVEL 1: [2000 Agriculture](#)

LEVEL 2: [2500 Specialty Farms](#)

LEVEL 3: **2510 Horse Farms**

DESCRIPTION

This category defines farms which stable, breed and train horses for a variety of purposes. The purposes may include private or commercial use or for sporting uses such as hunting, exhibition, racing, riding and harness racing.

Horse farms are characterized by a grouping of buildings in a rural area surrounded by pasture, often having an oval or circular dirt "race" track for training of the horses. Small arenas which have hurdles or fences for training of jumping horses may also be present. These arenas may be covered with dirt or grass. Key features identifying this land use category would be improved (or "intensively managed" unimproved) pastures close to the main buildings, small pastures or holding areas near main buildings and the presence of long barns or stables capable of housing the horses.

This class does not include commercial stables set up just for riding, which should be assigned to the 1800 Recreational class. Riding stables are in urban areas and lack the extensive pastures, barns, fencing and other features of a farm. Where horses are clearly present, and the proper code is not apparent, the area should be classified as 2510.

Horse farms may be confused with other pastures, especially where a cattle operation may also have some horses and riding track present. In such cases one of the pasture categories ([2110](#) to [2130](#)) is preferable.

KEYS TO PHOTOINTERPRETATION

- Extensive pasture areas are present, which may be mowed or cultivated for hay and other support crops. Pastures are usually well maintained.
- Barns or stalls for horses are present. Other buildings may include offices and residences.
- Stock ponds, tanks or feeding troughs may be visible.
- Track, training/exercise areas, pools, double fences are visible. Training areas may be large oval tracks or small circular facilities

CONTEXT

- **Landscape Position** - Horse farms occur in an agricultural context or at the fringes of urban areas. They are found in rural areas of the District and are often adjacent to a paved road or at the end of a dirt road leading to the headquarters area from a paved road.

SIMILAR CLASSES

- [1830 Race Tracks](#) - Horse race tracks have extensive parking and stadium seating.
- [2110](#), [2120](#), [2130](#) - Pastures - Normally lack training facilities
- [2520 Dairies](#) - Dairies have a variety of other indicators.

SPECIAL MAPPING CONVENTIONS

Where horses are clearly present and there is doubt about which code to use, the PI should choose 2510 Horse Farms instead of [1800 Recreational](#).

Included within the 2510 polygon are all buildings, grounds, parking lots, recreational areas, and other related features. Adjacent areas that are not involved in the horse farm operation are not included. The boundaries of the horse farm may not be the same as property boundaries. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



COORDINATES
558539.67 1459499.10 (Images)

FIELD PICTURE



DATE
10/16/07

COORDINATES
445774.93 703732.76 (Field Picture)

2520 Dairies

LEVEL 1: 2000 Agriculture
LEVEL 2: 2500 Specialty Farms
LEVEL 3: 2520 Dairies

DESCRIPTION

Dairies are commercial operations that produce, process and distribute milk and other dairy products. **Dairies have a number of sub-components that must be broken out separately.** These include the central barns and processing facilities, with associated high-use pasture, outlying pastures and dairy lagoons. All of these components are coded differently if they meet size criteria.

Solid waste facilities, including manure piles, may also be found within the operational boundaries of a dairy; however, they are not delineated separately, but are included in the 2520 polygon.

This land use is very similar in appearance to a Horse Farm except that there tends to be more barns and the barns tend to be longer. Additionally, the holding pens near the barns have more paths worn in them from an increased number of animals and definite trails lead to and from the barns. An oval or circular track will not be present in this land use. As with Horse Farms, only the headquarters, workers residences, barns/maintenance facilities, holding pens and immediately adjacent pastures should be included in this category. Out pastures, almost always improved, should be included in the appropriate pasture land use category.

Dairy sub-components are classified as follows:

- Central Barns, Processing Facilities - LC 2520, LU 2520
- Central, High-Intensity Pasture - LC 2520, LU 2520 (include with processing facility)
- Outlying Pasture - LC 2100s, LU 2100s
- Other Treatment Ponds - LC 8360, LU 2520

KEYS TO PHOTOINTERPRETATION

- Facilities appear to be intensively managed. To maximize production, dairies maintain a high concentration of animals and equipment in a small area.
- Feed silos are typically present.
- Large buildings for shelter and/or milking are present.
- Dairies are always surrounded by areas of pasture.
- Cattle tracks may be visible, especially leading to barns.
- Manure piles and storage areas for feed, straw and other materials are present.

CONTEXT

- **Landscape Position** - Dairies are found in rural areas of the District, usually located in agricultural areas to take advantage of open lands and minimize conflicts with adjacent land uses.

SIMILAR CLASSES

- [2100 Pasture and Cropland](#) - Will not have the large buildings and intensive management of dairies.
- [2310 Cattle Feeding Operations](#) - Feed lots are even more intensive and show significant surface impact.
- [2510 Horse Farms](#) - Cleaner, more uniform, less intense and less industrial appearance. Presence of riding/training facilities, such as oval tracks.

SPECIAL MAPPING CONVENTIONS

The 2520 code applies to the buildings and adjacent high intensity areas which are an integral part of the managed enterprise. Related treatment ponds should be dual coded - e.g. [8360/2520](#).

Included within the 2520 polygon are all buildings, grounds, parking lots, storage areas and other related features. The boundaries of the dairy operation as apparent on the aerial photography may not coincide with its actual property boundaries.

Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. Dual coding is only required in the case of treatment ponds and lagoons. (See above)



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



012250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/14/07

COORDINATES
756025.30 1060019.14

2540 Aquaculture

LEVEL 1: [2000 Agriculture](#)
LEVEL 2: [2500 Specialty Farms](#)
LEVEL 3: **2540 Aquaculture**

DESCRIPTION

This class includes facilities that raise marine or aquatic plant and animal species under natural or artificial conditions for human and animal consumption. The operations may be very large and organized or small and informal. They tend to be easy to recognize, as a series of small ponds near each other, with peripheral structures and equipment on-site.

KEYS TO PHOTOINTERPRETATION

- Aquaculture sites have a series of small, usually rectangular, excavated ponds, typically arranged in a parallel or rectangular pattern.
- Color tones are black unless shallow aquatic vegetation is present, which produces pink and reddish overtones on CIR and green on natural color to the water signature.
- Associated structures, reservoirs and drainage features are likely to be present.

CONTEXT

- **Landscape Position** - Aquaculture sites are located where a sufficient water supply is available by way of a shallow water table, surface water or ground water source and effluent options are available. They are typically found in rural areas where site conditions, labor and other factors are favorable.

SIMILAR CLASSES

- [5300 Reservoirs](#) - These must be 2 acres to be mapped. Aquaculture ponds are typically smaller and exist in series.
- [8360/8340 Other Treatment Ponds/Wastewater Treatment Facilities](#) - Rapid infiltration beds may look similar to aquaculture, but are only partially wetted and are more spread out.

SPECIAL MAPPING CONVENTIONS

The mapping unit includes buildings, storage areas, drainage ditches and any other features involved in the enterprise or within the operational boundary. Priority classes such as water bodies and wetlands are always broken out if they meet their minimum size criteria of 2 acres.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000 Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

COORDINATES

499626.68 993367.64 (Images)

FIELD PICTURE



DATE
01/17/07

COORDINATES
664696.18 776869.97 (Field Picture)

2600 Other Open Lands - Rural

This Level 2 class is not used in the map itself - the only Other Open Lands class used is the Level 4 subclass:

[2610 Fallow Cropland](#)

BACKGROUND

This class includes those agricultural lands whose intended usage cannot be determined. It includes fallow cropland, lands on the urban fringe that may be in the process of transition, but show no positive identifying features. It also includes dead or deserted crops.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit for all open land classes is 5 acres.

Differentiating subclasses: The only subclass used is the Level 4 class - [2610 Fallow Cropland](#)

DUAL CODING CONVENTION

All of the 2600 classes are **Land Use** classes. **A separate Land Cover code is always required.**

SIMILAR CLASSES

Other Open Land can be confused with a number of different classes. These include [1180 Rural Residential](#), [1900 Open Land](#), [3000 Upland Non-Forested](#) and [4400 Tree Plantations](#). Agricultural land that is temporarily flooded can be confused with water bodies or wetlands. Such areas should be classified as Agricultural if it is clear that it is an active agricultural area.

For more information:

See the PI key for [2610 Fallow Cropland](#) for more details and graphic examples.

2610

Fallow Cropland

LEVEL 1: 2000 Agriculture

LEVEL 2: 2600 Other Open Lands - Rural

LEVEL 3: 2610 Fallow Cropland

DESCRIPTION

This class includes agricultural land that is normally harvested, but has been taken out of the normal crop rotation. It does not include farmland that is temporarily unvegetated as part of the normal rotation, such as during the period of soil preparation prior to re-planting. This code is used for fallow crops or any other agricultural use types where the original crops have been removed. If citrus or other tree crops are present then 2240 Abandoned Groves should be used.

Fields do not have to be abandoned and the entire operation in disuse for this type to be present, however. Portions of an otherwise active agricultural operation may be lying fallow and fit within this category. Boundaries will generally be distinct and rectangular. Farmers usually try to maximize production by maintaining a tight rotation schedule, assisted by the use of synthetic fertilizers and irrigation. In the past, lands were kept fallow as a way to allow the soil to rest and rebuild, but now it is a less frequent practice that usually indicates some difficulty, transition or change of plans.

KEYS TO PHOTOINTERPRETATION

- The former cropland is out of the normal annual rotation cycle - generally out of production for more than one year, and old rows may still be visible.
- Signatures range from the magenta or light pinkish color of low herbaceous vegetation to the dark magenta to bright to bright pink or red of medium height shrubs and trees (on CIR).
- Newer fallow cropland will have a smooth texture. The longer it is out of production the more irregular and shrubby its appearance.
- The presence of an ditch pattern between fields and the advanced condition of colonization by native vegetation in the absence of intensive land management necessary to produce crops will be readily visible.
- Abandoned farm buildings and un-maintained roads and irrigation systems.
- Fence lines may still be visible.
- Fallow land may include land set aside for cover crops - growing vegetation that will not be harvested, such as weeds or other non woody vegetation.

CONTEXT

- **Landscape Position** - This class is only used for fields that are in an area normally used for harvested crops. Most adjacent fields and properties should be in normal rotation, unless for some reason the whole area is temporarily affected. Context is critical, because fallow fields could easily be confused with many other classes if only signature is considered. Fallow cropland may be found throughout the project area in rural settings.
- **Vegetation** - Low, herbaceous vegetation, with a possible scattering of shrubs.
- **Soils** - Fallow fields may be found on any upland soil type within the project limits, but will most often be present on well drained sands with low fertility.
- **Hydrology** - Variable depending on the disrepair of the irrigation/drainage system.

SIMILAR CLASSES

- 2120 Unimproved Pasture - Tends to have a more shrubby and irregular signature
- 2140 Row Crops - Straight rows visible
- 2150 Field Crops - Mow lines and hay often visible
- 3000 Upland Non-Forested classes - Very little indication of management

SPECIAL MAPPING CONVENTIONS

NONE

DUAL CODING CONVENTION

This is a **Land Use** class. **A separate Land Cover code is always required.**

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

53263.58 690636.11 (Images)

FIELD PICTURE



DATE
07/19/06

COORDINATES
864442.05 442904.85 (Field Picture)

3000 Upland Non-Forested

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level 2 subclasses are:

3100 Herbaceous
3200 Shrub and Brushland
3300 Mixed

For details on each, see their respective PI Key pages.

This SFWMD class is a departure from the original FLUCCS system. The class has been renamed from 'Rangeland' to 'Upland Non-Forested' to better describe land cover in open upland landscapes. However, while the name is different, the usage does not vary significantly from statewide practice. It is simply intended to be a more accurate description and expands the class to include open upland areas that do not fit the rangeland definition, such as open urban areas. More explanation of the changes follows.

BACKGROUND

The historic meaning of 'Rangeland' comes from a national USDA definition, referring to natural plant cover composed of principally native grasses, forbs and shrubs that are valuable for forage. In Florida, such lands were frequently found at the margins of marshes and therefore characterized as transitional between uplands and wetlands. While they may be adjacent to wetlands and occasionally inundated, the 3000 classes never include wetland areas. It is the intent of the District to make a clear differentiation between uplands and wetlands. Any areas that meet wetlands definitions must be coded in the 6000 Wetlands class.

In the FLUCCS system, Rangeland had the following general characteristics:

- Capable of being grazed by cattle (although there may be no clear indications on photo).
- Management practices include brush control, regulation of grazing intensity and season of use.
- Predominantly native vegetation. If re-vegetated, it is managed like native vegetation.
- The land is not fertilized, cultivated or irrigated. It may be cut for hay or other purposes.

The above meaning still applies in the SFWMD system. There are many areas that are typical rangeland. However, there are also open, non-forested uplands in both rural and urban landscapes that do not fit the traditional definition or any other class. Rangeland was the most similar class to such areas, so they were usually mapped in the 3000s. Such landscapes are diverse in nature and may have any of the following characteristics:

- Land cover and/or use may be transitional and future use not evident.
- Prior use may have been agriculture, citrus, silviculture, mining or wetlands and is frequently not discernible from the aerial photo alone.
- Vegetation within the polygon is diverse in type, texture and pattern.
- The shape of the polygon is irregular, giving a natural appearance.
- Management is of very low intensity, but too low to qualify as unimproved pasture or hay crop.
- Clear indication of cattle is lacking. The presence or absence of cattle cannot be concluded.

Two FLUCCS codes that were historically used to classify such areas are 1900 Open Land and 2600 Other Open Land - Rural. These were catch-all categories for areas that were in transition or of indeterminate use or cover. Such attributes do not give a clear enough description of the polygon. Most importantly, they do not describe vegetation. Also, the fact that land use (vs. cover) is transitional or cannot be determined is not a useful definition. Rather, it is the case for much of the District, especially the "natural" areas. In the new system, the class 2600 is an inactive class; 1900 is still used to signify open lands in an urban context, but always in conjunction with a land cover code - generally from the 3000 Upland Non-Forested classes.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for differentiating between Level 2 classes **within** the 3000 series and **adjacent to each other** is 5 acres (i.e. 3100 vs. 3200 vs. 3300). This allows aggregation in order to conform to general mapping practice and to avoid unnecessary linework in areas that are very similar, intermixed, transitional or difficult to break out into distinct sub-areas.

Differentiating subclasses: The subclasses 3100, 3200, and 3300 are based on the proportions of herbaceous vs. shrub vegetation and the presence of trees. In general, if the vegetation is herbaceous over 67% of the area or more, then 3100 is used. If more than 67% of the area is composed of shrubs then it is classed as 3200. If there is a mixture and neither reaches 67% dominance, then the class 3300 is used. The herbaceous or shrub component may have up to 25% trees. If there are inclusions of solid forest patches within the polygon, then the proportion of herbs vs. shrubs applies to the remaining area.

DUAL CODING CONVENTION

For most of the Upland Non-Forested classes, the **Land Cover** and **Land Use** codes are the same. However, there are many cases where they are different. These include land uses such as 1180 Rural Residential, 1650 Reclaimed Mine Land, 1670 Abandoned Mine Land, 1900 Open Land and 1920 Inactive Land with Street Pattern, which are land uses requiring a separate **Land Cover** code, which most often comes from the 3000 classes.

SIMILAR CLASSES

2120 Unimproved Pasture or 2130 Woodland Pasture are used where livestock grazing is evident. Upland Non-Forested classes are commonly used to indicate citrus groves which have been abandoned for long periods of time (more than six years), have less than 50% citrus trees standing within the original grove and have returned to a naturally vegetated state.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

3100 Herbaceous (Dry Prairie)

LEVEL 1: [3000 Upland Non-Forested](#)

LEVEL 2: **3100 Herbaceous (Dry Prairie)**

DESCRIPTION

This is one of three land cover classes used for upland non-agricultural, non-forested lands which exhibit no evidence of cattle grazing. 3100 Herbaceous (Dry Prairie) is used for areas that have over 67% herbaceous cover, not counting any forested inclusions, which may be up to 25% of the area. This class may be used with a separate land use code, such as [1180 Rural Residential](#) or [1900 Open Lands](#) or it may be used for both LCCODE and LUCODE when no other mapped land use code applies.

This class includes prairie grasses which occur on the upland margins of the wetland zone and inundation by water is infrequent. Generally, it is the marginal area between marsh and upland forested areas. These grasslands are generally treeless but in wet areas would have many types of soils resulting in a variety of vegetation types dominated by grasses, sedges, rushes and other herbs while dryer grass areas would be dominated by wire grasses with some saw palmetto present.

KEYS TO PHOTOINTERPRETATION

- Sixty-seven percent or more herbaceous cover is present, not including forest patches. The cover may be naturally occurring grassland or an introduced mixture of species, depending on land use.
- Scattered shrubs and trees may be present. Forest patches cover less than 25% of total area and scattered trees cover less than 25% of the herbaceous area.
- Usually shows fine texture with smooth and mottled tones, unlike the smooth textures and uniform tones of planted or improved grassland.
- This class may be in a transition zone between forested and herbaceous communities, or in re-vegetated areas that have been disturbed.
- This class includes unimproved rural land or open urban areas that do not fit any other land use in the classification system.
- This class usually has natural shapes, follows landforms and frequently transitions to forested or brush communities.
- The land is typically not fertilized, cultivated or irrigated. Brush control or hay cutting may be practiced.

CONTEXT

- **Landscape Position** - This land cover type typically occurs in broad flat expanses in central portions of the state and is geographically concentrated in two main areas of the project limits; the Kissimmee River valley (north and west of Lake Okeechobee) and in a corridor along Fisheating Creek from the western shore of Lake Okeechobee west-northwesterly to Arcadia. Other smaller occurrences of this type are scattered and may be dotted with cabbage palm hammocks. The land cover type usually grades into wet flatwoods, wet prairies (savannahs), marsh, stream swamps or hardwood hammocks along streams and creeks, or upland live oak or cabbage palm hammocks.
- **Vegetation** - Shrubs may be present but they must not be a dominant part of the community and therefore, are usually widely spaced and sparse. Typical species include the bluestems (*Andropogon* spp.), threeawns (*Ansticia* spp.), the panic grasses (*Panicum* spp.) and lovegrasses (*Eragrostis* spp.). Low shrubs such as fetterbush (*Lyonia lucida*), rusty *Lyonia* (L.

ferruginea), dwarf blueberry (*Vaccinium myrsinites*) and wax myrtle (*Myrica cerifera*) may also be scattered throughout the area.

- **Soils** - Generally moderately to well drained, acid sandy soils as are found in flatwoods communities.
- **Hydrology** - These communities have good drainage and are infrequently inundated. Water tables may be near the surface, however, during the wet season.

SIMILAR CLASSES

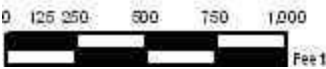
- [2120 Unimproved Pasture](#) and [2130 Woodland Pasture](#) - These classes may look very similar to 3100, but livestock grazing is evident.
- [3300 Mixed Upland Non-Forested](#) - Neither herbaceous vegetation or shrubs are dominant.

SPECIAL MAPPING CONVENTIONS

This classification has been modified by the SFWMD. It is to be used solely for upland non-agricultural, non-forested lands which exhibit no evidence of cattle grazing.

DUAL CODING CONVENTION

This is a **Land Cover** code. The LCCODE and LUCODE are usually the same. However, 3100 is often used as the LCCODE for various land uses, such as [1180 Rural Residential](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#), [1900 Open Land](#), [1920 Inactive Land with Street Pattern](#), [8320 Electrical Power Transmission Lines](#) and [1850 Parks and Zoos](#). Herbaceous areas that are traditional rangelands or do not fit any other mapped **Land Use** class are coded as LC=3100/LU=3100.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
439432.59 620532.0

3200

Shrub and Brushland

LEVEL 1: [3000 Upland Non-Forested](#)

LEVEL 2: **3200 Shrub and Brushland**

DESCRIPTION

This is one of three land cover classes used for upland non-agricultural, non-forested lands which contain no evidence of cattle grazing. 3200 Shrub and Brushland is used for areas that have over 67% shrub cover and less than 33% herbaceous cover. This proportion ignores any forested patches, which may cover up to 25% of the total area. Vegetation is usually native rather than introduced.

3200 Shrub and Brushland includes areas where tree species are regenerating naturally after clear cutting or fire, but are less than 20 feet tall. This includes native hardwood and coniferous species, but does not apply to plantations. Regenerating plantations are coded as [4430 Forest Regeneration](#).

This class does **not** include coastal scrub or areas where Brazilian pepper is the dominant shrub species. These are mapped at Level 3.

KEYS TO PHOTOINTERPRETATION

- Sixty-seven percent or more of the cover is shrub and brush, not including forest patches.
- Brushland may have a wide variety of species of small woody shrubs or one dominant species that is well adapted for the site and terrain. (Except for those shrub classes mapped at Level 3.)
- The signature is typically a coarse texture with mottled tones, unlike the smoother textures of herbaceous cover.
- Often found on arid areas; a sandy or droughty understory may be visible.
- The land is not fertilized, cultivated or irrigated. No regular brush control is occurring.
- This class may be in a transition zone between forested and herbaceous communities, or in re-vegetated areas that have been disturbed.
- This class typically has natural shapes, follows landforms and frequently transitions to forested or herbaceous communities.

CONTEXT

- **Landscape Position** - This land cover type usually grades into flatwoods, wet flatwoods, wet prairies (savannahs), marsh, stream swamps or hardwood hammocks along streams and creeks, or upland live oak or cabbage palm hammocks.
- **Vegetation** - Common species include gallberry, wax myrtle, saltbush, blueberries, rusty lyonia, fetterbush and other shrubs and brush, as well as various types of short herbs and grasses.
- **Soils** - Occurs on a wide variety of soils including acidic, well to somewhat poorly-drained sands, loamy sands and highly disturbed soils.
- **Hydrology** - This community is an upland association which may experience a high water table for portions of the growing season but rarely experiences inundation. If inundated, the duration is usually very short and results from a storm event.

SIMILAR CLASSES

- [2240 Abandoned Groves](#) - Groves will look unmanaged with underbrush, vines, and dead or dying trees
- [3210 Palmetto Prairies](#) - Usually a more even-toned, reddish signature.
- [3220 Coastal Scrub](#) - Found in coastal areas, with some sandy areas apparent

SPECIAL MAPPING CONVENTIONS

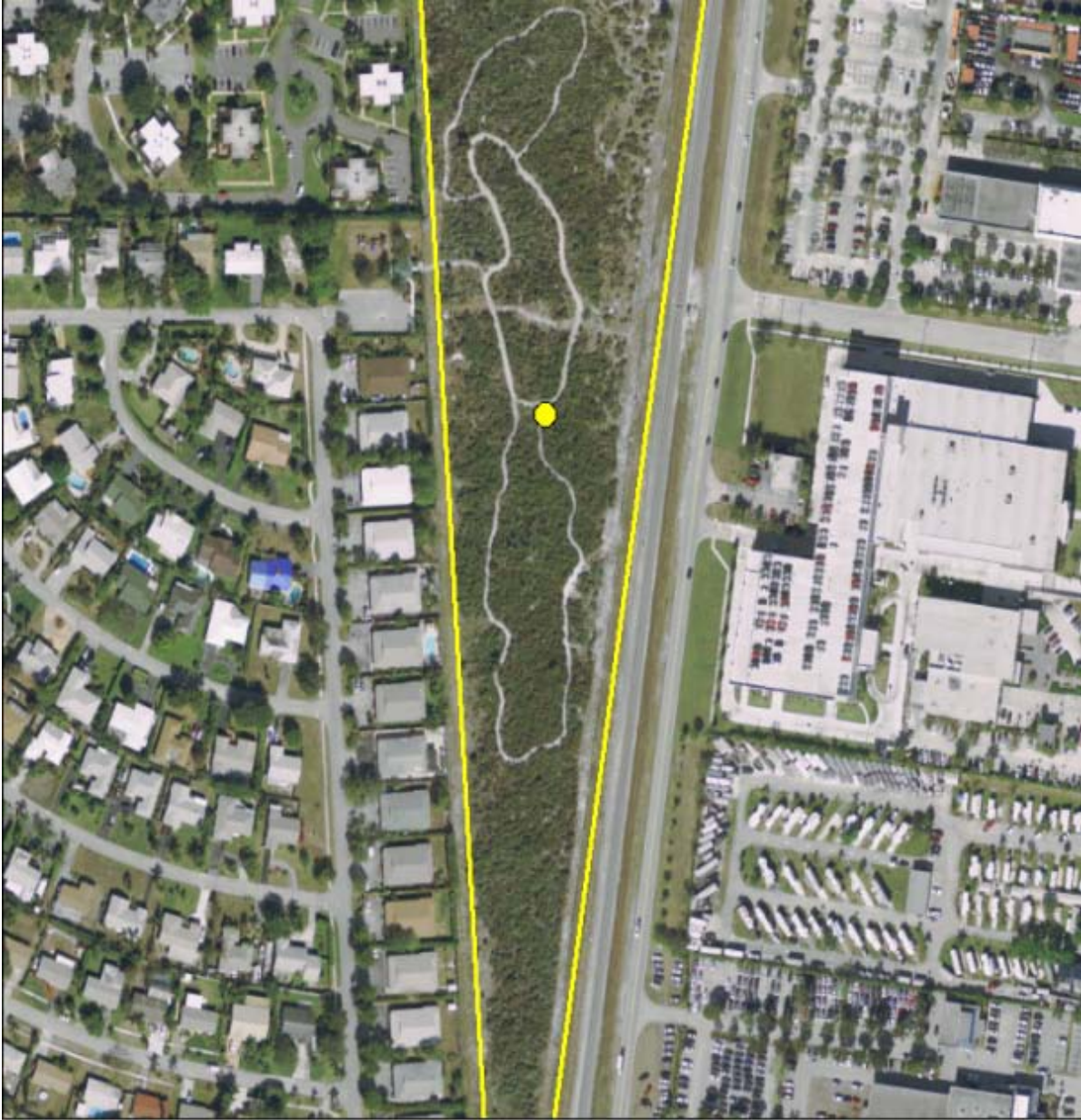
This classification has been modified by the SFWMD. It is to be used solely for upland non-agricultural, non-forested lands which have no evidence of cattle grazing.

DUAL CODING CONVENTION

3200 is a **Land Cover** code. It is used as a dual code in conjunction with various land uses, including [1180 Rural Residential](#), [1650 Reclaimed Mining Land](#), [1670 Abandoned Mining Land](#), [1920 Inactive Land with Street Pattern](#), [8320 Utility Corridors](#) and [1850 Parks and Zoos](#). Shrub and Brushland areas that are traditional rangelands or do not fit any other mapped **Land Use** class are coded as LC=3200/LU=3200.



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
01/08/07

COORDINATES
958542.40 762880.30

3210 Palmetto Prairies

LEVEL 1: [3000 Upland Non-Forested](#)

LEVEL 2: [3200 Upland Shrub and Brushland](#)

LEVEL 3: **3210 Palmetto Prairies**

DESCRIPTION

This class includes nearly treeless plains with a dense ground cover dominated by saw palmetto. It also may include grasses, herbs and other low shrubs, but saw palmetto must be the dominant species for inclusion in this class.

It is commonly found as the understory in pine flatwoods communities.

Depending on the amount of saw palmetto and its height, this class has a more mottled appearance than [3100 Herbaceous \(Dry Prairie\)](#). Color returns are about the same and with a quick glance, some areas dominated by saw palmetto may be first identified as [3100 Herbaceous \(Dry Prairie\)](#) due to the evenness of height of the saw palmetto or the washed out color return which may result from this species.

KEYS TO PHOTOINTERPRETATION

- Sixty-seven percent or more of the vegetative cover is saw palmetto.
- Texture is more stippled due to the presence of saw palmetto.
- The land is not fertilized, cultivated or irrigated. No regular brush control is occurring.
- This class typically has natural shapes, follows landforms and frequently transitions to forested or herbaceous communities.

CONTEXT

- **Landscape Position** - This land cover type typically occurs on broad flat expanses in central portions of the state and is geographically concentrated in two main areas of the project limits; the Kissimmee River valley (north and west of Lake Okeechobee) and in a corridor along Fisheating Creek from the western shore of Lake Okeechobee west-northwesterly to Arcadia. Other smaller occurrences of this type occur scattered within pine flatwoods areas. This land cover type usually grades into wet flatwoods, wet prairies (savannahs), marsh, stream swamps or hardwood hammocks along streams and creeks, or upland live oak or cabbage palm communities.
- **Vegetation** - Saw palmetto (*Serenoa repens*) is the dominant species in this land cover type. Other shrubs and grasses occur intermixed in openings between palmetto clusters. Typical species include the bluestems (*Andropogon* spp.), threeawns (*Ansticia* spp.), the panic grasses (*Panicum* spp.), lovegrasses (*Eragrostis* spp.), low shrubs such as fetterbush (*Lyonia lucida*), rusty *Lyonia* (*L. ferruginea*), dwarf blueberry (*Vaccinium myrsinites*), gallberry [*Ilex glabra*] and wax myrtle (*Myrica cerifera*).
- **Soils** - Generally moderately to well drained, acid sandy soils as are found in flatwoods communities.
- **Hydrology** - These communities have good drainage and are seldom inundated. Water tables may be near the surface, however, during the wet season.

SIMILAR CLASSES

- **3100 Herbaceous (Dry Prairie)** - A smoother, generally more grayish signature, with no discernible height
- **3200 Upland Shrub and Brushland** - More diverse signature, due to a variety of shrub species
- **3220 Coastal Shrub** - Found in coastal areas, with some sandy areas apparent

SPECIAL MAPPING CONVENTIONS

This classification has been modified by the SFWMD. It is to be used solely for upland non-agricultural, non-forested lands which have no evidence of cattle grazing and where saw palmetto is the dominant vegetative cover.

Where found in pine flatwood communities, palmetto prairies may be separated out when sufficiently large enough (greater than 5 acres) and where pine canopy areal coverage is less than 10% of the polygon.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000 Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
07/15/06

COORDINATES
698857.45 1066172.42

3220 Coastal Shrub

LEVEL 1: [3000 Upland Non-Forested](#)

LEVEL 2: [3200 Upland Shrub and Brushland](#)

LEVEL 3: **3220 Coastal Shrub**

DESCRIPTION

Coastal Shrub is characterized as stabilized, wind-deposited coastal dunes that are vegetated with a dense thicket of salt-tolerant shrubs, especially saw palmetto. Other typical vegetation includes sand live oak, cabbage palm, myrtle oak, yaupon and sea grape.

It is found on deep, wind-deposited sands which have been wind sorted and wave washed. Coastal Shrub dunes are generally quite stable but are susceptible to severe damage if the vegetation is disturbed. Coastal Shrub species are frequently dwarfed and pruned as a result of the salt spray-laden winds that kill twigs on the seaward side, producing a smooth, dense, upward-slanting canopy resembling a sheared hedge.

Coastal Shrub is probably the most rapidly disappearing community in Florida. It is most extensive along the Atlantic Coast where being elevated and next to the coast, it is considered a prime source of resort or residential property. Coastal Shrub originally comprised a nearly continuous band along the Atlantic shoreline. Now it occurs largely as broken and isolated small stretches. In South Florida, it has also been disturbed by invasions of exotic species, principally Brazilian pepper and Australian pine.

KEYS TO PHOTOINTERPRETATION

- A mixture of shrubs and trees along coastal areas.
- Shrubs exhibit a fairly uniform height, fluffy or "cottony" texture (sometimes so uniform and monotypic that the texture is smooth) and a light, faded pink or reddish color on CIR.

CONTEXT

- **Landscape Position** - This community occurs on the backside of the beach dune usually beginning just over or at the top. Proceeding downslope, the community grades into mangrove or, in the absence of grade to a lagoon, the community grades to an upland situation occupied by Tropical Hardwoods, Australian pine or Brazilian pepper.
- **Vegetation** - This community type is dominated by saw palmetto, sea grape, scrubby oaks, railroad vine, sea oats and other salt tolerant herbaceous and shrubby species. Australian pine and Brazilian pepper may be intermixed but are not dominant.
- **Soils** - Coastal marine sands which are well to excessively drained.
- **Hydrology** - Xeric conditions prevail except for occasional wash-over during heavy storm surge.

SIMILAR CLASSES

- [3200 Upland Shrub and Brushland](#) - Found in inland areas, away from the coast
- [3210 Palmetto Prairie](#) - Found in inland areas, away from the coast; saw palmetto the dominant species

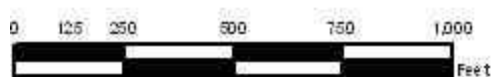
SPECIAL MAPPING CONVENTIONS

This class is to be used only in coastal areas of the District.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
01/11/07

COORDINATES
904432.28 1094327.94

3300

Mixed Upland Non-Forested

LEVEL 1: [3000 Upland Non-Forested](#)

LEVEL 2: **3300 Mixed Upland Non-Forested**

DESCRIPTION

This is one of three land cover classes used for upland non-agricultural, non-forested lands which contain no evidence of cattle grazing. 3300 Mixed Upland Non-Forested is used for areas in which **neither** herbaceous species nor shrubs cover more than 67% of the area. If herbaceous vegetation covers more than 67% of the area, it is classed as [3100 Herbaceous](#). If shrubs cover more than 67% of the area, it is classed as [3200 Shrub and Brushland](#).

The 3300 Mixed class may include areas where tree species are regenerating naturally after clear cutting or fire, but are less than 20 feet tall. These include native hardwood and coniferous species, but does not apply to plantations. Regenerating plantations are coded as [4430 Forest Regeneration](#).

KEYS TO PHOTOINTERPRETATION

- The percentage of both herbaceous cover and shrubs is between 33% and 67% - neither one covers more than 67% of the area.
- There is a mixture of rough and smooth texture usually showing two or more distinct tones (herbaceous vs. shrubs).
- There may be a mixture of trees (less than 25%) without a dominant understory vegetation.
- This class may be in a transition zone between forested and herbaceous communities, or in re-vegetated areas that have been disturbed.
- This class includes unimproved rural land that does not fit any other land use in the classification system.
- This class includes agricultural property where the farming use has been abandoned and natural vegetation has re-established.
- The land is typically not fertilized, cultivated or irrigated. Brush control or hay cutting may be practiced.

CONTEXT

- **Landscape Position** - This land cover type usually grades into flatwoods, wet flatwoods, wet prairies (savannahs), marsh, stream swamps or hardwood hammocks along streams and creeks, or upland live oak or cabbage palm hammocks.
- **Vegetation** - Typical herbaceous species include the bluestems, threeawns, panic grasses, and lovegrasses. Typical shrubs include fetterbush, rusty Lyonia, dwarf blueberry and wax myrtle. Also included are saw palmetto and Brazilian pepper, but only where they are not the dominant species.
- **Soils** - Can be found on a wide variety of soils including acidic, well to somewhat poorly drained sands, loamy sands and highly disturbed soils.
- **Hydrology** - This community is an upland association which may experience a high water table for portions of the growing season but rarely experiences inundation. If inundated, the duration is usually very short and results from a storm event.

SIMILAR CLASSES

- [2120 Unimproved Pasture](#) and [2130 Woodland Pasture](#) - These classes may look very similar to 3300, but livestock grazing is evident.
- [2240 Abandoned Groves](#) - Groves will look unmanaged with underbrush, vines, and dead or dying trees.
- [3200 Shrub and Brushland](#) - Dominated by shrubs (>67%).

SPECIAL MAPPING CONVENTIONS

This classification has been modified by the SFWMD. It is to be used solely for upland non-agricultural, non-forested lands which contain no evidence of cattle grazing.

DUAL CODING CONVENTION

3300 is a **Land Cover** code. It is used as a dual code in conjunction with various land uses, including [1180 Rural Residential](#), [1650 Reclaimed Mining Land](#), [1670 Abandoned Mining Land](#), [1920 Inactive Land with Street Patterns](#), [8320 Utility Corridors](#) and [1850 Parks and Zoos](#). Mixed Upland Non-Forested areas that are traditional rangelands or do not fit any other mapped **Land Use** class are coded as LC=3300/LU=3300.



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

642203.29 1150426.71 (Images)

FIELD PICTURE



DATE
01/09/07

COORDINATES
791950.89 1003194.71 (Field Picture)

4000 Upland Forests

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level 2 subclasses are:

- 4100 Upland Coniferous Forests
- 4200 Upland Hardwood Forests
- 4300 Upland Mixed Forests
- 4400 Tree Plantations

Upland forests are landscape units which support a tree canopy closure of **25 percent or more**. This is a SFWMD modification of the FLUCCS system, which specifies a canopy closure of 10 percent or more. The SFWMD has also modified the Level 2 forest codes [4300](#). The FLUCCS class [4300](#) is a continuation of the Upland Hardwood Forest class; in the SFWMD [4300](#) is changed to Upland Mixed Forests, which in the FLUCCS system is [4340](#).

Trees are woody plants that are over 20 feet tall in their growth stage at the time of photography. Immature trees that are under 20 feet tall are considered shrubs.

BACKGROUND

The Upland Forests include both xeric (dry) and mesic (moderately moist) forest communities. Wetland, or hydric, forest communities are classified in the [6000](#) Wetland classes. Also included in the Upland Forest category are areas in which timber harvesting has occurred but which exhibit no evidence of being developed for other intended uses. Clear cuts in an area in which rotation forest management is practiced is a prime example of such a case.

Florida's forests serve as a vital resource from not only a commercial viewpoint, but also from an aesthetic and recreational one. In Florida, slightly less than 50 percent of the land base (17 million acres) is identified by the United States Forest Service as forest land. Approximately 40 percent is commercial timber land. A very significant portion of this land is allocated to pine plantation monoculture. Based on the 1980 Forest Service inventory, there are approximately six and one-half million acres of pure natural and planted longleaf and slash pine stands in Florida. There are also many stands of pure hardwood species groups occurring in Florida. However, the majority of forest lands occur as mixed communities of tree species and species groups. For purposes of classification, a class is assigned if 67 % or more of the total canopy can be assigned to that species or community group. If there is less than 67% dominance, the 4340 Upland Mixed Coniferous/Hardwood class is used. The classification is based upon the species composition of the tree canopy as interpreted from aerial imagery.

MAPPING CONVENTIONS

Minimum mapping units: This general class is not active in the data layer; The most specific subclass that applies to the mapping unit must be always used.

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately. In transitional areas where species specific wetland (2 acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit. PIs must use discretion to avoid excessive linework while adding useful information.

Differentiating subclasses: Differentiating between natural forest communities requires extensive experience in photointerpretation. The communities can only be identified by the signatures of individual species, rather than by the general color, texture and patterns of the mixture or community. It is generally accepted that PIs cannot recognize these species unless they have extensive experience in the field comparing features on the ground against the exact same feature on recent photography. Also required is an understanding of the forest ecology. These skills are difficult to obtain, which accounts for the high levels of error sometimes found in mapping plant communities.

Photointerpreters consider the effects of seasonal changes on plant growth to interpret the signatures of different plant species. For example, most hardwoods are deciduous and subject to a period of winter dormancy. This dormancy period provides a contrast in color tones between hardwoods and conifers and is the reason why most land cover mapping projects try to obtain winter photography. Catching the "leaf off" period is difficult in Florida. The seasonal changes are often rapid and PIs must pay careful attention to the date of photography in order to interpret the signatures properly.

Photointerpretation of vegetation is a science and an art which is beyond the scope of this guide to document. The PI key pages will only focus on defining which species and communities are included in each class. Mapping teams are required to provide the necessary expertise from field work, training, reference materials and, most of all, actual mapping experience with proper quality control.

DUAL CODING CONVENTION

All of the forest communities are **Land Cover** classes that do not normally require a separate **Land Use** code - LCCODE and LUCODE are normally the same. However, in some cases, a separate **Land Use** code is required. The following land uses must be classified where they occur in a forested polygon: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mining Land](#), [1670 Abandoned Mining Land](#) and [1850 Parks and Zoos](#).

SIMILAR CLASSES

The most serious error in forest mapping is to confuse upland and wetlands forests. The District places a high priority on establishing a wetland/ upland boundary. Unfortunately, some forest species and communities stretch across this boundary and canopy signatures do not clearly indicate where hydric soils stop and upland soils begin. The problem is addressed with experience, ancillary data, magnified stereo viewing of imagery, field checking and tolerance of an acceptable level of error.

Upland forests may also be confused with woodland pastures and non-forested uplands. These classes often border each other, creating errors in transitional zones of a lesser significance than wetlands/uplands error.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

4100

Upland Coniferous Forests

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: **4100 Upland Coniferous Forests**

DESCRIPTION

This Level 2 class should only be used for upland coniferous forests that do not meet the requirements of a more specific Level 3 subclass.

The canopy closure must be **25 % or more** with at least 67% dominance by coniferous species. The trees must average over 20 feet tall at the time of photography.

The Upland Coniferous class may include forest communities such as pine flatwoods, sand pine and mixed communities of pine-dominated xeric and mesic oaks.

Upland coniferous forests are naturally generated. They do not include tree plantations or planted groves of citrus or other tree crops. However, almost all forests are subject to human influence and the composition of the forests is, to a large or small degree, determined by management factors.

KEYS TO PHOTOINTERPRETATION

- The canopy closure must be **25 % or more** with at least 67% dominance by coniferous tree species.
- Up to 33% of the canopy may be comprised of hardwood species.

CONTEXT

- **Landscape Position** - Coniferous forests are found throughout the District wherever hydrology, fire and management practices permit. Forests may be found on any of the land uses and may occur as inclusions in most of the other land cover types. They may occur as scattered individual trees, as denser patches or both.
- **Vegetation** - see respective subclasses
- **Soils** - see respective subclasses
- **Hydrology** - see respective subclasses

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Pasture will show evidence of grazing.
- [2200 Tree Crops](#) - Trees are grown in rows.
- [4340 Upland Mixed Coniferous/Hardwood](#) - Some mixed classes may appear similar if coniferous species make up a significant portion of the area.

SPECIAL MAPPING CONVENTIONS

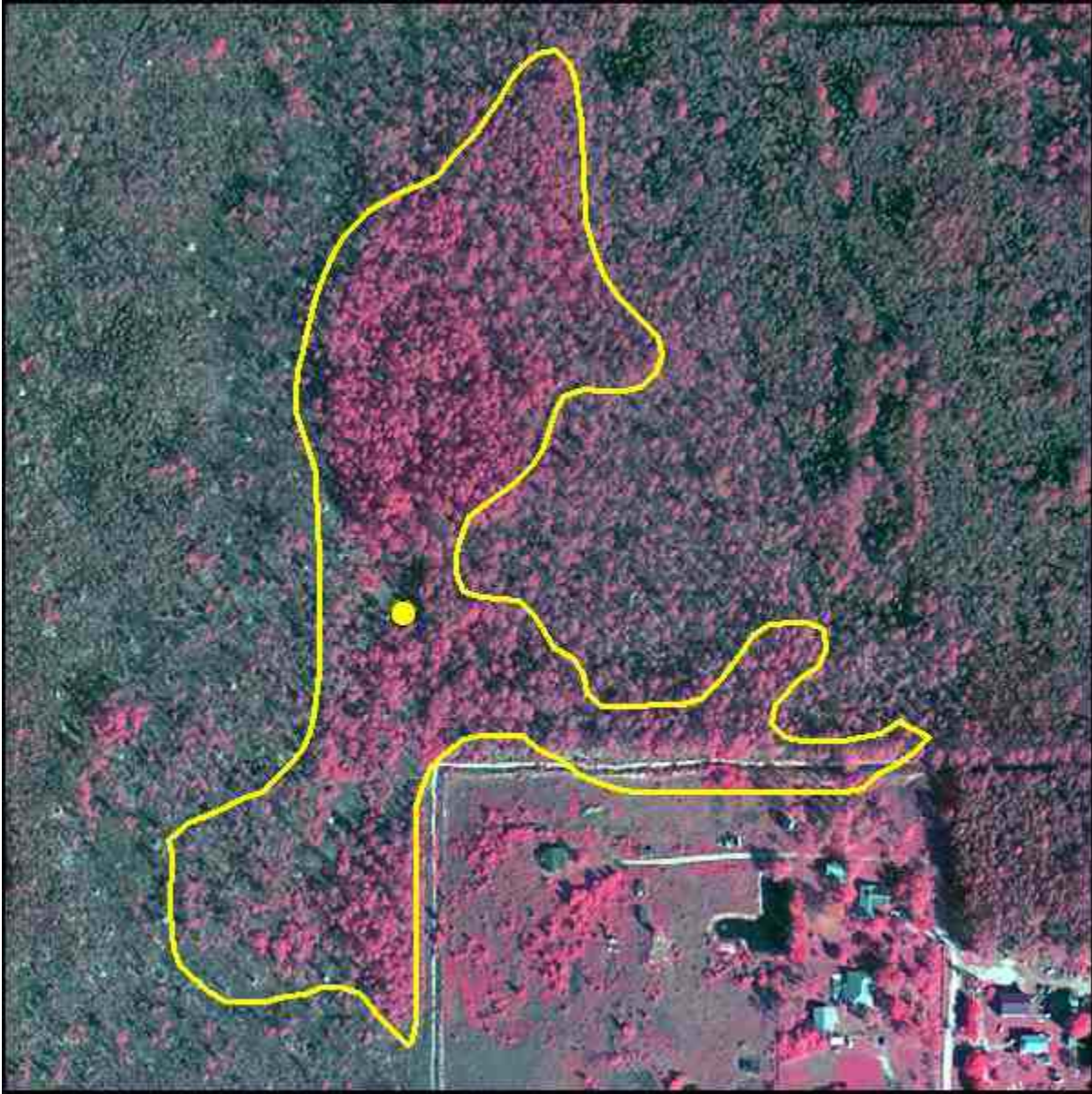
Trees may occur in a matrix of herbs, shrubs, and other cover types, which can cover up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acres) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

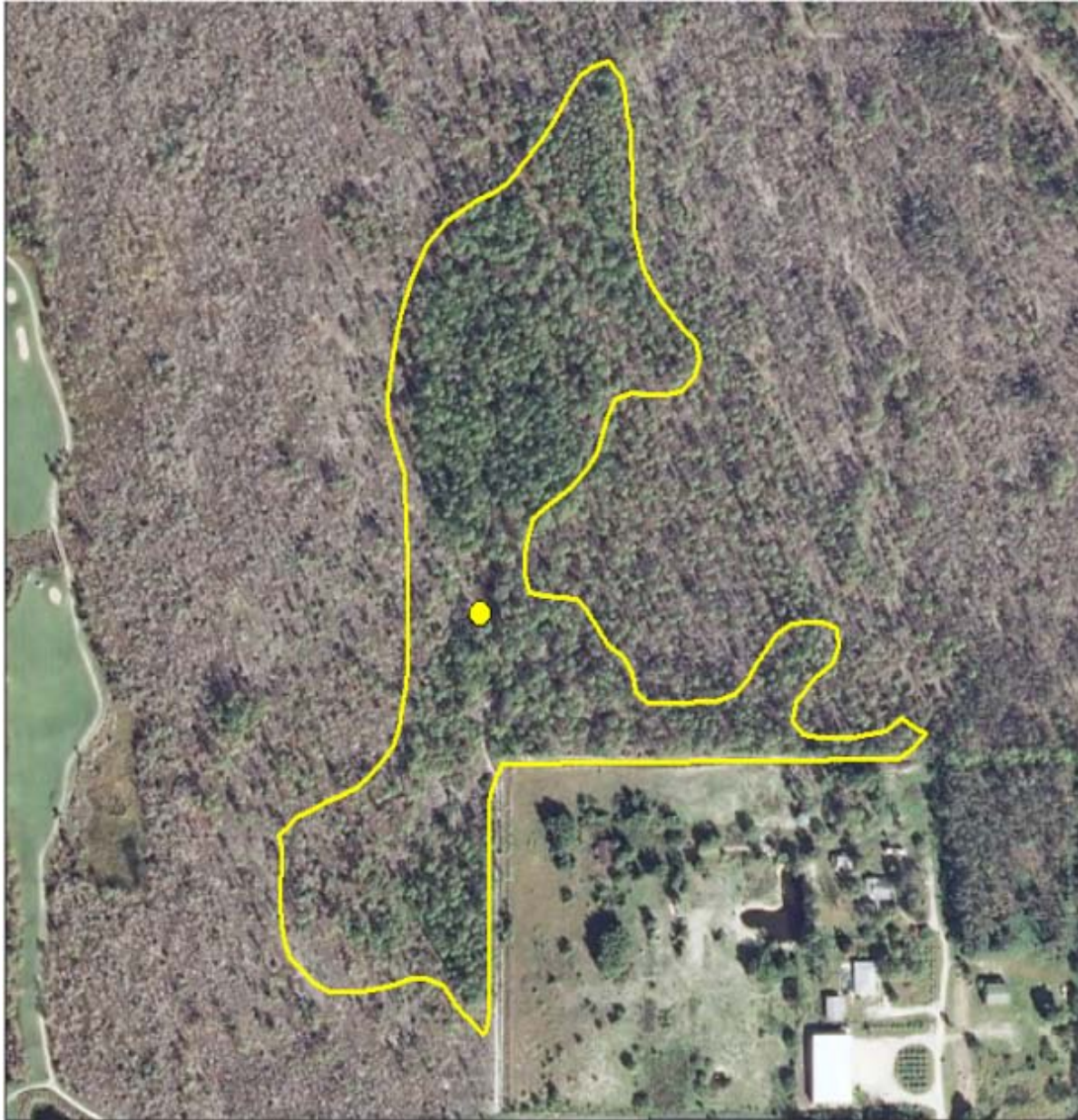
DUAL CODING CONVENTION

This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where coniferous forests occur in association with a mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#) and [1850 Parks and Zoos](#).

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
07/15/06

COORDINATES
424991.42 708547.63

4110 Pine Flatwoods

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4100 Upland Coniferous Forests](#)

LEVEL 3: **4110 Pine Flatwoods**

DESCRIPTION

This class includes naturally generated pine flatwoods. Pine species must achieve 67% crown canopy dominance and the trees must average over 20 feet tall at the time of photography. The pine flatwoods class in the SFWMD is dominated by slash pine.

Pine flatwoods are generally the most prevalent community type in undeveloped areas. Originally, longleaf pines were common on drier sites while slash pines, which are less fire-resistant, were confined to moist sites - wildfire being the contributing factor in this distribution. However, fire control and artificial reforestation have extended the range of slash pine into former longleaf sites.

This class also includes pine rockland communities of the Everglades and Lower Keys.

KEYS TO PHOTOINTERPRETATION

- **The canopy closure must be 25% or more.**
- Saw palmetto is often visible as irregular shaped patches with detectable height.
- Rounded, asymmetrical and "feathered", medium to dark green canopies, brick red on CIR image; individual trees visible.
- Grassy understories are paler green, with various pinkish tones on CIR. Saw palmetto is visible as irregular shaped green patches, pink to pinkish red patches on CIR, with "feathered" edges and relatively smooth textured tops. Saw palmetto has detectable height whereas areas of grasses are generally smooth without any noticeable relief. More mesic areas may contain noticeable amounts of cabbage palm and/or shrubs yielding smooth bright red CIR signatures as an understory component.
- Flatwoods are often pockmarked with wet depressions dominated by prairie/marsh vegetation or cypress.

CONTEXT

- **Landscape Position** - This community generally grades to hardwood communities (either wetland or upland) in more mesic areas along streams, rivers and other water bodies or may be found surrounded by pasture.
- **Vegetation** - Dominant species include slash pine, saw palmetto, gallberry and various grasses. More mesic areas may also contain cabbage palm, St. Johns wort and wet site grasses and grass-like plants. Pine rockland communities are vegetated by stunted slash pines with an understory of shrubs (palms) and herbs.
- **Soils** - Typical soils are represented by imperfectly or poorly drained, acidic sands with varying depth (typically 1-3 feet) to an organic or clay hardpan. The hardpan restricts downward movement of water. Drier areas have more depth to hardpan or poorly developed hardpan. Pine rockland communities occur on outcrops of Miami limestone.
- **Hydrology** - Typical flatwoods do not have saturation or inundation except following heavy rains.

SIMILAR CLASSES

- [4120 Longleaf Pine - Xeric Oak](#) - Crown canopy dominated by pine with mid-story of oak and visible sandy areas
- [4130 Sand Pine](#) - Occurs on hilly terrain and sandy soils; has a dark red or purplish signature
- [6250 Wet Pinelands - Hydric Pine](#) - Absence of saw palmetto and other upland shrubs; grasses predominate with darker, green tones in the understory. Hydric conditions produce muted color tones in the canopy, which may be wider spaced and appear stunted or ragged compared to upland pine

SPECIAL MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix that covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where pine flatwoods occur in association with another mapped **Land Use**, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), and possibly [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#).

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE

05/10/07

COORDINATES

378325.41 820411.02

4120

Longleaf Pine - Xeric Oak

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4100 Upland Coniferous Forests](#)

LEVEL 3: **4120 Longleaf Pine - Xeric Oak**

DESCRIPTION

This class includes naturally generated longleaf pine and xeric oaks. The canopy closure must be **25 % or more** and the trees must average over 20 feet tall at the time of photography. The pine canopy, dominated by longleaf pine, is typically sparse and irregular, revealing its oak mid-story, which may include bluejack oak, turkey oak, sand post oak and other drought-tolerant oaks and hardwoods.

The distribution of longleaf pine restricts this community to the following areas of the District: Osceola, Orange, Polk and Charlotte Counties; northwestern Lee County; western Glades County; northeastern, northwestern and southwestern Highlands County; northern and western Okeechobee County.

KEYS TO PHOTOINTERPRETATION

- This community is similar to and occupies the same sites as the xeric oak community, except that longleaf pine is the dominant species.
- Longleaf pines are very tall with large flattened crowns.
- Natural color oak mid-story is often visible and is textured bluish-green. In CIR blue-gray in signature when leaves are on, and understory is dull pink or brownish pink low shrubs.
- Sandy areas can be seen through canopy.
- Brighter green signature grasses scattered among shrubs may be visible. Grayish-green in CIR.

CONTEXT

- **Landscape Position** - This community is found on slight ridges within the flatwoods or in areas of pasture. Topographic relief should be apparent on either the aerial photography or the USGS topographic map. It often grades into [4210 Xeric Oak](#) and [4110 Pine Flatwoods](#), but may be surrounded by [2120 Unimproved Pasture](#).
- **Vegetation** - Longleaf pine dominates the canopy with live oak, turkey oak, bluejack oak, sand live oak, fetterbush and varying amounts of saw palmetto and numerous grasses and forbs present.
- **Soils** - Comprised of deep, well-drained, infertile sands.
- **Hydrology** - This community is very dry and has a deep seasonal water table. Flooding or inundation is not a consideration in this community.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - These lack the mid-story canopy of longleaf pine/xeric oaks as described above.
- [4210 Xeric Oak](#) - Overstory pines are not present.

SPECIAL MAPPING CONVENTIONS

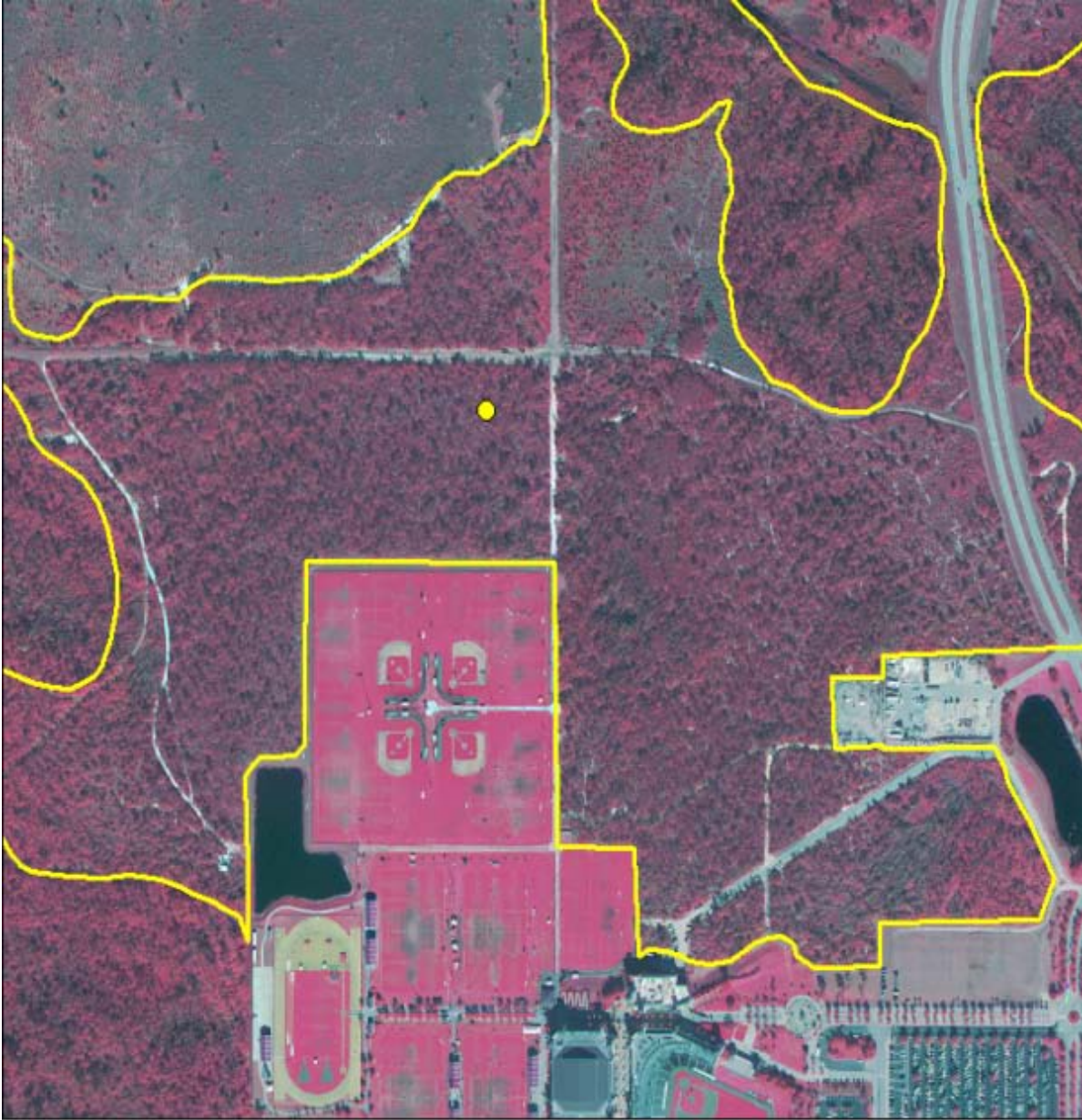
Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where this class occurs in association with a mapped land use, a separate **Land Use** code may be required. Examples: 1180 Rural Residential, 1920 Inactive Land with Street Pattern, 1650 Reclaimed Mine Land, 1670 Abandoned Mine Land and 1850 Parks and Zoos.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

476523.58 1457839.75 (Images

FIELD PICTURE



DATE
10/15/07

COORDINATES
388803.05 727125.26 (Field Picture)

4130 Sand Pine

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4100 Upland Coniferous Forests](#)

LEVEL 3: **4130 Sand Pine**

DESCRIPTION

This class includes sand pines, generated either naturally or by aerial seeding. The canopy closure must be **25 percent or more** and the trees must average over 20 feet tall at the time of photography.

The distribution of sand pine limits this community to the following areas within the District: coastal and former dune ridges immediately inland of the coast in Broward, Palm Beach, and Martin Counties; St. Lucie County except the southwestern areas around Lake Okeechobee; all but southeast and south central Osceola County; Orange, Polk, Highlands, and Charlotte Counties; western Glades and Lee Counties; coastal Collier County.

KEYS TO PHOTOINTERPRETATION

- A root disease complex gives many sand pine stands a disheveled appearance. Its dark crown coloration distinguishes it from other southern pines.
- Many stands have a uniform appearance due to the even-aged growth habit of this species. This may produce a carpet-like appearance and even-toned signature, which is medium green (dark red or purplish in color on CIR).
- Crowns are usually dense and overlapping in clusters, with a patchy distribution.
- The canopy may be tightly packed or open with visible patches of sand.
- Sand pine occurs on hilly terrain and sandy soils. Rolling topography should be evident on the aeriels or topography maps.

CONTEXT

- **Landscape Position** - As with the Longleaf Pine-Xeric Oak, this community occurs on the rolling sandhill areas and former dunes both inland and along the coast. Rolling topography should be evident on the photo or the USGS Quad collateral data. Examples may be found embedded within urban areas or tend to occupy higher positions grading downslope to [2110-2130 Pastures](#), [4110 Pine Flatwoods](#), [4120 Longleaf Pine-Xeric Oak](#), or more mesic to wet communities such as [6110 Bay Swamps](#).
- **Vegetation** - Dominant species include sand pine, sand live oak, other xeric oaks, rosemary, saw palmetto and various grasses and forbs.
- **Soils** - Occurring on deep, very well drained to excessively drained sandy soils of old dunes and ridges.
- **Hydrology** - This community has a deep water table and never experiences inundation unless during severe storm surge or catastrophic flooding.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - The scrubby pine flatwoods on drier soils may appear similar.
- [4120 Longleaf Pine - Xeric Oak](#) - The pine canopy is taller and a mid-story canopy of oaks is present.

SPECIAL MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

4130 is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where sand pine occurs in association with a mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#) and [1850 Parks and Zoos](#).

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
387652.66 706589.92

4140

Pine - Mesic Oak

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4100 Upland Coniferous Forests](#)

LEVEL 3: **4140 Pine - Mesic Oak**

DESCRIPTION

This class includes naturally generated forests of slash pine and mesic oaks. The canopy closure must be **25 % or more** and the trees must average over 20 feet tall at the time of photography.

The Pine - Mesic Oak class often forms a transitional community between other communities and wetlands associated with lakes, rivers or streams. Pine and oak "hammocks" may also be left in unimproved pastures as shade for cattle.

Oaks must be well represented (at least 33% of the species) for this code to be applicable.

KEYS TO PHOTOINTERPRETATION

- Open (>25% aerial cover) sparsely stocked, asymmetrical but generally rounded, "fluffy" crowns with feathered edges of pines (brick red to brownish red on CIR); more rounded and symmetrical crowns (red to dark red on CIR) of the oaks.
- Understory tones are variable, but generally greenish returns with pink CIR hues mixed in from grasses and low shrubs.
- In some instances, smooth areas are visible within or as part of the canopy layer resulting from grape vines growing in and on the trees (bright reds on CIR).

CONTEXT bright reds

- **Landscape Position** - This community can be found almost anywhere in the project area where mesic conditions exist and trees have not been cleared.
- **Vegetation** - Slash pine dominates this land cover type with laurel oak, water oak and some live oak as the typical species mixed with the pines.
- **Soils** - This land cover type occurs on well drained to somewhat poorly drained mineral soils, usually acidic sands. Fairly high amounts of organic matter are common in the surface layers.
- **Hydrology** - This community is typically dry to moist with a seasonal high water table below the soil surface. Inundation and saturation are unlikely except following extreme storm events or in areas where the community forms the transition from wetland to upland and flooding occurs.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - Oaks or other hardwood species, if present, will be less than 33% of the area.
- [4120 Longleaf Pine - Xeric Oak](#) - Often a sparse canopy of pines, with sandy areas visible through the canopy

SPECIAL MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where this class occurs in association with a mapped land use, a separate **Land Use** code may be required. Examples: 1180 Rural Residential, 1920 Inactive Land with Street Pattern, 1650 Reclaimed Mine Land, 1670 Abandoned Mine Land and 1850 Parks and Zoos.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
n/a

COORDINATES
435641.93 143641.93

4200

Upland Hardwood Forests

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: 4200 Upland Hardwood Forests

DESCRIPTION

This Level 2 class includes upland hardwood forests that do not meet the requirements of a more specific Level 3 or Level 4 subclass. The canopy closure must be **25 % or more** with at least 67 % dominance by hardwood species. The trees must average over 20 feet tall at the time of photography.

The Uplands Hardwoods class may include forest communities such as oak-pine-hickory, Brazilian pepper, live oak, wax myrtle-willow (non-hydric), mixed temperate or tropical hardwoods and beech-magnolia. Xeric oaks and cabbage palm forests must be broken out separately. Note that [4370 Australian pine](#), although a hardwood species, is not included here.

Uplands forests are naturally generated and do not include hardwood plantations or planted groves of citrus or pecans. However, almost all forests are subject to human influence, and the composition of the forests is, to a large or small degree, determined by management factors.

KEYS TO PHOTOINTERPRETATION

- The canopy closure must be **25 % or more** with at least 67 % dominance by hardwood tree species.
- Up to 33% of the canopy may be comprised of coniferous species, generating a characteristic brick red return on CIR throughout the year.
- Hardwoods usually have large radial crowns and exhibit a fluffy and textured tone. The mixture of hardwood species may generate a slight variety of green tones on natural color. Healthy, growing deciduous trees will give a strong, bright red CIR return.
- Hardwoods are deciduous and are subject to a period of winter dormancy. This dormancy period provides a contrast in color tones between hardwoods and conifers. The seasonal changes are often rapid, and PIs must pay careful attention to the date of photography in order to interpret the signatures properly.

CONTEXT

- **Landscape Position** - Hardwood forests are found throughout the District wherever hydrology, fire, and management practices permit. Forests may be found on any of the land uses and may occur as inclusions in most of the other land cover types. They may occur as scattered individual trees, as denser patches or both.
- **Vegetation** - see respective subclasses
- **Soils** - see respective subclasses
- **Hydrology** - see respective subclasses

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Pasture will show evidence of grazing.
- [2200 Tree Crops](#) - Trees are grown in rows.

- [4340 Upland Mixed Coniferous / Hardwood](#) - Some mixed classes may appear similar if coniferous species make up only a small portion of the area.

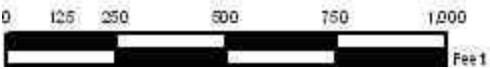
SPECIAL MAPPING CONVENTIONS

Trees may occur in a matrix of herbs, shrubs and other cover types, which can cover up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acres) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

4200 is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where hardwood forests occur in association with a mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#) and [1850 Parks and Zoos](#).



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
01/09/07

COORDINATES
952803.03 762580.54

4210 Xeric Oak

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: **4210 Xeric Oak**

DESCRIPTION

This class includes forest communities dominated by Xeric Oaks. The canopy closure must be **25% or more** with at least 67% dominance by xeric oak species, which include bluejack oak, turkey oak and sand post oak. The trees must average over 20 feet in height at the time of photography.

Trees are low in height and are not dense in coverage, in contrast to mesic oak forests. In openings between trees, various xeric herbs and shrubs are present, including wire grass, bluestems, saw palmetto, rusty lyonia and prickly pear cactus.

This forest community is similar to and occupies the same sites as the [4120 Longleaf Pine - Xeric Oak](#) community except that the pines, if present, are not the dominant species. On many sites, longleaf pines may have been prevalent prior to harvesting but have never regenerated, leaving the xeric oak mid-story intact.

KEYS TO PHOTOINTERPRETATION

- Color tones are dull, grayish-green on natural color; medium red to brownish red on CIR photography.
- Bare patches of sandy soil should show through tree canopy in at least a few places.
- Shrubs and herb species give a variable return depending on composition of species and time of year. It is generally greenish magenta or the light, washed out pinks of semi-dormant vegetation on CIR.

CONTEXT

- **Landscape Position** - This land cover type is found on old dunes and sandy ridges in the interior of the state. They grade downslope into more mesic communities such as flatwoods, mesic hammocks and drainages or wetlands.
- **Vegetation** - Several species of xeric oaks such as turkey oak, bluejack oak and sand post oak are found as dominants in this land cover type. Shrubs and herbaceous species found in association may include wire grass, bluestems, saw palmetto, rusty Lyonia and prickly pear cactus.
- **Soils** - The cover type occurs on excessively drained infertile sandy soils of former dunes and ridges.
- **Hydrology** - This land cover type is excessively drained and on slightly higher positions in the landscape. Available water is low and inundation does not occur.

SIMILAR CLASSES

- [3300 Mixed Upland Non-Forested](#) - Will have more varied tree species
- [4120 Longleaf Pine - Xeric Oak](#) - Pine will be the dominant species

SPECIAL MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acres) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acre) and upland (5 acre) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where xeric oak forests occur in association with a mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#) and [1850 Parks and Zoos](#).

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
493569.87 1350938.22

4220 Brazilian Pepper

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: **4220 Brazilian Pepper**

DESCRIPTION

This exotic, pestilent tree species is found on peninsular Florida from the Tampa Bay area southward.

Brazilian pepper grows on a broad range of sites in South Florida, ranging from mangroves to pinelands. It thrives on disturbed soils and in newly created habitats resulting from drainage and farming. It is an early invader of disturbed sites, and it also becomes established in the understory of dense forests, then capturing the site when gaps occur in the canopy.

Brazilian pepper is a potential canopy tree in almost any forest in Florida.

The canopy closure must be **25 % or more** with at least 67% or more dominance by Brazilian pepper for inclusion in this class.

KEYS TO PHOTOINTERPRETATION

- Medium to bright green (bright red on CIR), "fluffy," asymmetrical crowned shrubs of medium height.
- Shrubs are unevenly spaced, tend to clump and are of different ages and heights giving a "cottony" and mottled pattern to the area.

CONTEXT

- **Landscape Position** - This community is disturbance dependent. Accordingly, it can occur anywhere within the landscape where disturbance or man's influence results in acceptable conditions for establishment of this aggressive and invasive exotic shrub. The community can be found along almost every roadway and canal throughout the district. Areas of former agriculture or abandoned development are also prime targets for invasion by this species.
- **Vegetation** - Brazilian pepper is the dominant species. Other shrubs and scattered trees may be interspersed depending on the community type previously occurring at the site prior to disturbance and the level to which that community has been removed. In the case of an invasion of native communities (in the advanced stages), almost any mixture of species may be found. Brazilian pepper must be the dominant species, however, before this classification can be applied.
- **Soils** - Generally disturbed, but can be on almost any soil type in wet to mesic areas.
- **Hydrology** - Variable; may occur from areas experiencing inundation to areas which only experience high water tables. Also found in well drained situations such as spoil areas.

SIMILAR CLASSES

- [3200 Upland Shrub and Brushland](#) - Context should be carefully examined to distinguish this class from Brazilian pepper, which thrives on disturbed soils and in habitats created by drainage and farming.
- [6172 Mixed Shrubs](#) - Hydric Brazilian Pepper has same signature but is coded as 6172

SPECIAL MAPPING CONVENTIONS

Brazilian pepper is considered a Forested class, even though it may appear in shrub form (less than 20 feet tall).

Brazilian pepper wetland communities are coded as [6172 Mixed Shrubs](#) with the Brazilian Pepper modifier applied.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
01/11/07

COORDINATES
906502.19 1088169.60

4240 Melaleuca

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: **4240 Melaleuca**

DESCRIPTION

This exotic tree species occurs in almost pure stands. It is an aggressive competitor, invading and often taking over a site, forming a dense and impenetrable stand.

It grows along roadsides, on ditch banks, in mesic prairies, in sawgrass marshes and on lake shorelines. Melaleuca generally is an indicator of a disturbed site. It becomes established more readily on sand than on marl but can survive on any disturbed soil in southern Florida.

The canopy closure must be 25% or more with at least 67% or more dominance by Melaleuca for inclusion in this class.

KEYS TO PHOTOINTERPRETATION

- Dark grey-green (dark red on CIR) colors with a texture represented by a very narrow spike-like or pin-like appearance and very tightly packed or crowded together.
- Trees are of fairly even age, at least in sections of the community (i.e., younger and shorter trees may be present, especially near edges, but otherwise trees are of approximately same height).

CONTEXT

- **Landscape Position** - This exotic species is very aggressive. It is generally found in conjunction with some form of disturbance, but is also seen in areas which may appear relatively undisturbed. Disturbance in remote, and particularly wetland areas, is often caused by off-road vehicles or logging.
- **Vegetation** - This species forms monotypic stands which are devoid of other vegetation and virtually impenetrable.
- **Soils** - Can be found on a wide variety of soil types including moderately well drained to poorly-drained sands. Disturbed soil types and soils of urban or agricultural areas also support this community.
- **Hydrology** - May occupy sites from dry uplands to lower positions which experience prolonged inundation during the wet season.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - Pines have more rounded, asymmetrical and "feathered" canopies.
- [4370 Australian Pine](#) - These have a fluffy, overlapping crown pattern; they overtower and crowd out other vegetation.

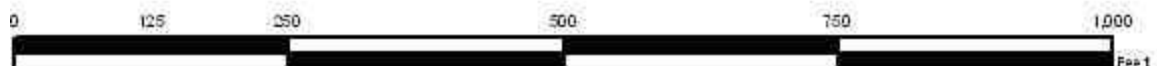
SPECIAL MAPPING CONVENTIONS

NONE

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
03/15/07

COORDINATES
814441.21 997893.22

4270 Live Oak

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: **4270 Live Oak**

DESCRIPTION

This class includes upland hardwood forests where Live Oak is found in pure stands or is dominant. This forest community is often referred to as upland temperate hammock.

The canopy closure must be **25 % or more** with at least 67% or more dominance by Live Oak for inclusion in this class.

KEYS TO PHOTOINTERPRETATION

- Dull, medium-dark green (medium red on CIR) color return with a predominantly fluffy and irregular crown texture in which individual crowns are discernable.
- In some examples of this community, brighter green vines growing among the tree crowns may be evident (bright reds on CIR).
- Some cabbage palm may also be mixed into this community with the typical lollipop textured signature interspersed (pinkish or washed out pink-red on CIR).
- Palms must be only a minor component of this class.

CONTEXT

- **Landscape Position** - This community occurs mainly in the northern portions of the project area and is generally found within [2110 Improved Pastures](#) and [2120 Unimproved Pastures](#). It is also common along the upper banks of lakes and streams.
- **Vegetation** - Live oak is purely dominant in this community with vines (predominantly grape) also occurring and some cabbage palm as minor components. As these communities are generally in pastures, livestock impacts to understory vegetation are severe.
- **Soils** - This community typically occurs on fine sands which are well drained to somewhat poorly drained.
- **Hydrology** - Water tables are typically well below the surface in these communities, but may rise to near surface levels during wet periods. Inundation and surface saturation are rare occurrences.

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Where grazing is evident **within** the Live Oak community, 2130 is used. Evidence of grazing in adjacent pastures may not be sufficient to conclude this is occurring.
- [4200 Upland Hardwood Forest](#) - The canopy is dominated by mixed hardwood species; Live Oak is less than 67% of the canopy.
- [4300 Upland Mixed Forest](#) - Includes coniferous species, but neither hardwoods nor conifers achieve 67% of the canopy.

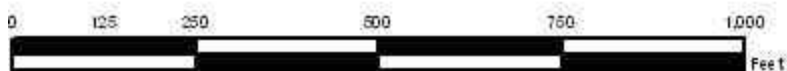
SPECIAL MAPPING CONVENTIONS

None

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
503951.72 1434316.35

4271

Oak - Cabbage Palm Forests

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: [4270 Live Oak](#)

LEVEL 4: **4271 Oak - Cabbage Palm Forests**

DESCRIPTION

This class is characterized by a closed canopy of hardwood species, primarily Live Oak and Cabbage Palm, that are naturally protected from fire by its position on the landscape.

This community has been heavily impacted by human activity, primarily clearing for agriculture and urbanization. Soils and understory vegetation, which are often the only shaded habitat in a landscape of prairie, pasture, pineland or marsh, are often trampled and compacted by cattle.

The canopy closure must be **25 percent or more** with at least 67% or more dominance by the **combination** of Live Oak and Cabbage Palm for inclusion in this class. (NOTE: If either Live Oak or Cabbage Palm individually makes up 67% of an area, it is classified as either [4270 Live Oak](#) or [4280 Cabbage Palm](#).)

KEYS TO PHOTOINTERPRETATION

- A combination of the dull, medium-dark green (medium red on CIR) color return of Live Oak, with its predominantly fluffy and irregular crown texture in which individual crowns are discernible and the lollipop-shaped, lighter colored Cabbage Palms (pinkish-red to washed-out red on CIR).
- In some examples of this community, brighter green (bright red on CIR) vines occurring on the tree crowns may be evident.
- The signature of live oaks and cabbage palm is stable, as they do not go through long dormancy periods. Live oak experiences only brief periods of dormancy.

CONTEXT

- **Landscape Position** - This community is found primarily in four landscape positions: (1) as "islands" in a pine-cypress or pine-graminoid dominated community; (2) as "islands" on elevated areas within floodplain wetlands; (3) on levees of rivers; (4) midslope or ecotonal between xeric communities and low-lying wetland communities.
- **Vegetation** - Live Oak and Cabbage Palm are consistently present and are joined by other temperate hardwoods at many sites.
- **Soils** - Soils are somewhat better drained than surrounding or adjacent wetland communities, although dense litter accumulation and a closed canopy maintain relatively high soil moisture conditions at most times.
- **Hydrology** - Inundation and surface saturation are rare occurrences.

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Where grazing is evident **within** the Oak - Cabbage Palm community, 2130 is used. Evidence of grazing in adjacent pastures may not be sufficient to conclude this is occurring.
- [4200 Upland Hardwood Forests](#) - Less than 67% of canopy is Live Oak and Cabbage Palm.

- [4280 Cabbage Palm](#) - The canopy is 67% or more Cabbage Palm.
- [4340 Upland Mixed Coniferous / Hardwood](#) - Less than 67% of canopy is Live Oak and Cabbage Palm.
- [6180 Cabbage Palm Wetland](#) - signatures may appear similar-refer to soils data.

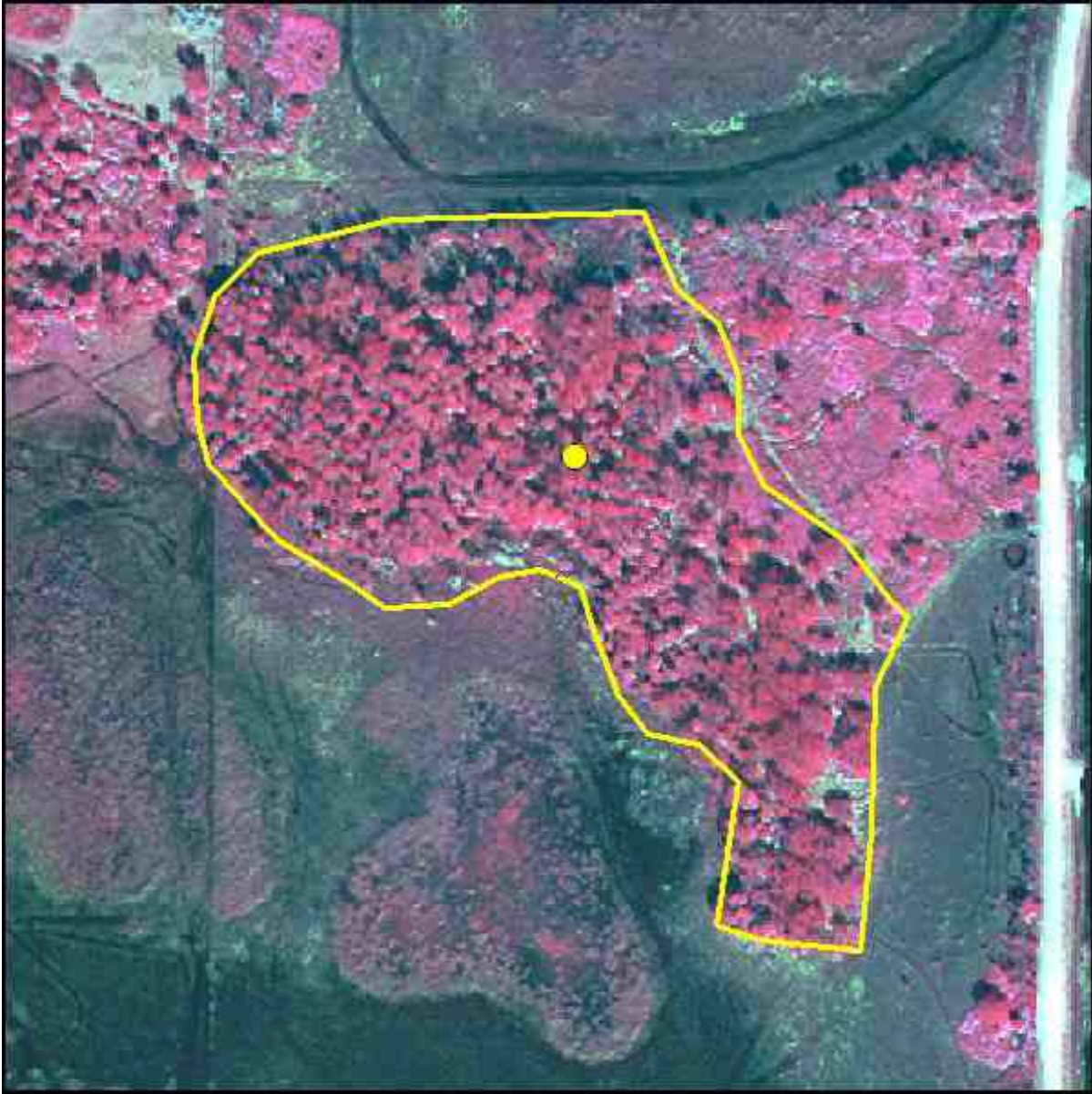
SPECIAL MAPPING CONVENTIONS

NONE

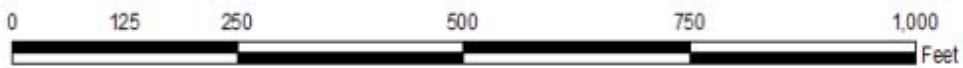
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
10/15/07

COORDINATES
638104.75 1142065.72

4280 Cabbage Palm

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4200 Upland Hardwood Forests](#)

LEVEL 3: **4280 Cabbage Palm**

DESCRIPTION

This forest community is commonly found as hammock communities on shallow rises within prairie communities. They are often intermixed with live oaks and may include a wide variety of large and small hardwoods. Understory vegetation tends to be sparse.

The canopy closure must be **25% or more** with at least 67% or more dominance by cabbage palms for inclusion in this class. The trees must average over 20 feet in height at the time of photography.

Cabbage palms occupy lower mesic positions on the landscape. Cattle grazing may be present on some sites.

KEYS TO PHOTOINTERPRETATION

- Cabbage palm trees on aerial photos have small, round shape. CIR signatures are pinkish-red to washed out red.

CONTEXT

- **Landscape Position** - Islands of cabbage palms are often located within pasture areas or dry prairies. This species grows well in transitional zones between hydric and mesic soils.
- **Vegetation** - This community is comprised of a virtual monoculture of cabbage palm with an occasional live oak possibly mixed in. As with live oak hammocks, livestock use within the cabbage palm hammocks is generally high and understory vegetation is sparse or absent. In South Florida, cabbage palm may be associated with slash and/or longleaf pine.
- **Soils** - The soils are usually alkaline due to underlying calcareous marl or limestone. Also, fine well drained sands will support cabbage palm.
- **Hydrology** - Inundation and surface saturation are rare occurrences.

SIMILAR CLASSES

- [2130 Woodland Pastures](#) - Where grazing is evident **within** the cabbage palm community, 2130 is used. Evidence of grazing in adjacent pastures may not be sufficient to conclude this is occurring.
- [4271 Oak-Cabbage Palm Forest](#) - Less than 67% of canopy is cabbage palm.
- [4340 Upland Mixed Coniferous/Hardwood](#) - Some mixed forests may appear similar if there is a significant presence of cabbage palm.
- [6180 Cabbage Palm Wetland](#) - signatures may appear similar-refer to soils data.

SPECIAL MAPPING CONVENTIONS

None

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
01/11/07

COORDINATES
610729.77 1156787.81

4300

Upland Mixed Forests

This Level 2 class is not active in the map itself. One of the two active subclasses must be selected. The two subclasses are:

[4340 Upland Mixed Coniferous/Hardwood](#)
[4370 Australian Pine](#)

DESCRIPTION

The SFWMD definition of forest requires a tree canopy closure of **25% or more**. Trees are woody plants that are over 20 feet tall in their growth stage at the time of photography. Immature trees that are under 20 feet tall are considered shrubs.

MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acre) patches. If distinct patches of trees or other classes are greater than 5 acres, they are broken out separately.

In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

Minimum mapping units: The minimum mapping unit (MMU) for all upland forest classes is 5 acres.

Differentiating subclasses: The two active subclasses are distinct from each other in appearance. Australian pine grows as a monoculture and has a distinctive signature.

DUAL CODING CONVENTION

These are **Land Cover** classes. They do not normally require a separate **Land Use** code. However, where hardwood forests occur in association with another mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), and possibly [1650 Reclaimed Mine Land](#) and [1670 Abandoned Mine Land](#).

SIMILAR CLASSES

Upland Mixed forests can easily be confused with Upland Hardwood or Upland Conifer forests in cases where the proportion of either is close to 67%. This proportion is difficult to judge, considering the infinite variety of forest expression and similarity of species signatures on aerial photography. The criteria explained above under Mapping Conventions helps to address this problem.

Upland mixed forests can be easily confused with [6170 Mixed Wetland Hardwoods](#). Various species, including pines and cabbage palms, can stretch across the wetlands boundary and canopy signatures do not always indicate a clear hydric/non-hydric boundary. The problem is addressed with experience, ancillary data, magnified stereo viewing and field checking.

Upland mixed forests may also be confused with woodland pastures and non-forested uplands. These classes often border each other, making delineation of transitional zones sometimes inexact.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

4340

Upland Mixed Coniferous / Hardwood

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4300 Upland Mixed Forests](#)

LEVEL 3: **4340 Upland Mixed Coniferous / Hardwood**

DESCRIPTION

This class includes those forested areas in which neither upland conifers nor hardwoods achieve 67% crown canopy dominance. The 4340 code is applied when the area cannot be broken down into individual hardwood or conifer species. This can be due to minimum mapping unit constraints or that the intermixture of species is such that precise delineation would result in overly complex linework.

The canopy closure must be 25% or more and the trees must average over 20 feet tall at the time of photography.

KEYS TO PHOTOINTERPRETATION

- A mixture of crown types is present - both large radial hardwood and smaller compact coniferous crowns with neither one being dominant (67% or more).
- As a result of the mixture of species, signatures are typically a complex blend of colors, textures, and crown shapes.
- On CIR photography conifers will appear as dull brick red to purple-red in color and hardwoods will exhibit bright red returns.
- Texture will be a mixture of smooth, cottony broad-leaved hardwoods, pin-like crowns of broad-leaved evergreens such as bays and rounded to "jagged" crowns of species of pine.
- Color returns will be a variety of green tones on natural color, with CIR returns of greenish, bluish, reds and dark brownish reds of all these varied species.

CONTEXT

- **Landscape Position** - Mixed forests often occur on the upland areas adjacent to streams, waterways or surrounding wetland depressions. They can occur in almost any forested area with mesic soil conditions.
- **Vegetation** - The Uplands hardwoods component may include forest communities such as oak-pine-hickory, Brazilian pepper, live oak, wax myrtle-willow (non-hydric), mixed temperate or tropical hardwoods and beech-magnolia. Upland pine component includes slash, longleaf and sand pines.
- **Soils** - Generally found on mineral soils.
- **Hydrology** - Moist sites should support this community type in non-wetland situations.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - Pines are the dominant species, with at least 67% canopy dominance.
- [4120 Longleaf Pine - Xeric Oak](#) - Crown canopy is dominated by pine with a mid-story of oak and sandy areas are visible.
- [4200 Upland Hardwood Forests](#) - Hardwood species dominate with at least 67% cover.

SPECIAL MAPPING CONVENTIONS

Trees may occur in an herbaceous or shrub matrix which covers up to 75% of the area. The trees may be scattered and dispersed in the matrix as individual trees or small (<5 acres) patches. If distinct patches of trees or other classes are greater than 5 acres, they should be delineated separately.

In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

4340 is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where mixed forests occur in association with a mapped land use, a separate **Land Use** code may be required. Examples: 1180 Rural Residential, 1920 Inactive Land with Street Pattern, 1650 Reclaimed Mine Land, 1670 Abandoned Mine Land and 1850 Parks and Zoos.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
460650.80 604147.00

4370 Australian Pine

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4300 Upland Mixed Forests](#)

LEVEL 3: **4370 Australian Pine**

DESCRIPTION

This class is used for Australian pine communities. The canopy closure is 25% or more with at least 67% dominance by Australian pine trees. Trees average at least 20 feet tall.

This class grows in tall, dense monocultures that preclude other vegetation.

Contrary to its name, this species is actually a hardwood that is also evergreen. Its name is derived from its needle-like leaves and its characteristic cone-shaped crown structure.

Australian pine was introduced to south Florida from Australia and is colonizing northward, where it is most common on disturbed sites and along the coasts. Coastal occurrences can be found on spoil areas and throughout the barrier islands. It tends to invade newly exposed sandy areas and is frequently planted as wind breaks and soil stabilizers.

KEYS TO PHOTOINTERPRETATION

- Australian pine forms dense thickets. The texture is similar to dense broad-leaved canopies, with a fluffy overlapping crown pattern.
- This signature is variable with respect to color return. In some areas, generally inland, this community provides a bright red color while coastal occurrences result in a dark brownish red on CIR return. Natural color ranges from dull darker to medium green.
- The trees overtop and crowd out all other vegetation. Other species generally occur only at the edges of the Australian pine stands.

CONTEXT

- **Landscape Position** -
- This community is another exotic invasive which is replacing native vegetation in areas of disturbance. Coastal occurrences can be found on spoil areas and throughout the barrier islands. Inland, this species has been planted as wind breaks and later escaped into areas of other disturbance such as agriculture and off road vehicle use.
- **Vegetation** - Australian pine is a mono-cultural community which precludes all other vegetation. The only other species occurring are found around the edges as the size of the community expands.
- **Soils** - Soils on which this community are found are highly variable. In coastal areas the substrate is made up of fine sands and shelly sand. Inland communities are found on fine sands of varying permeability and disturbance.
- **Hydrology** - Australian pine communities are an upland habitat type. Inundation and high water tables are infrequent and the exception rather than the rule.

SIMILAR CLASSES

- [4200 Upland Hardwood Forests](#) - Will have more varied tree species, with correspondingly diverse signatures.

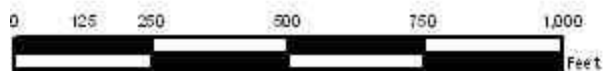
SPECIAL MAPPING CONVENTIONS

NONE

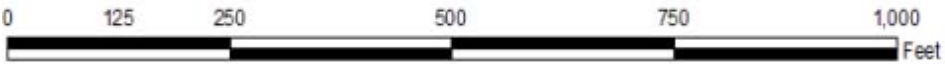
DUAL CODING CONVENTION

4370 is a **Land Cover** class. The LCCODE and LUCODE are usually the same. However, where Australian pine occurs in association with a mapped land use, a separate **Land Use** code may be required. Examples: [1180 Rural Residential](#), [1920 Inactive Land with Street Pattern](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#) and [1850 Parks and Zoos](#).

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
01/08/07

COORDINATES
961117.92 746138.47

4400 Tree Plantations

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: **4400 Tree Plantations**

DESCRIPTION

This Level 2 class includes any tree plantations that do not meet the requirements of a more specific Level 3 subclass. It does not include tree crops such as citrus and pecan groves, which produce food crops, and it does not include tree nurseries. Trees from this class are harvested for lumber, pulp and other wood products, and not for food.

Most of the plantation acreage in the District is classified as [4410 Coniferous Plantation](#) or [4430 Forest Regeneration Areas](#).

Plantations are almost universally planted in rows, which is the primary difference between plantations and "natural" forests. Recognizing the various types of tree plantations is a process of elimination. Plantations in this class do not have the characteristic signatures of pine plantations or orchards, for instance.

KEYS TO PHOTOINTERPRETATION

- Ancillary data may be required to break these plantations out from similar classes.
- Christmas tree plantations have smaller size trees on generally smaller sites, with a patchy appearance due to harvesting patterns. Multiple species are typically present, in contrast to pine plantations.
- Hardwood plantations have a characteristic hardwood signature, but are planted in rows. Mature pecan groves may have an identical signature.
- Trees are usually grown in parallel rows on tracts of land with definite boundaries conforming to land ownership, section lines, etc.

CONTEXT

- **Landscape Position** - Tree plantations can occur anywhere in the District, but are more common in rural areas. Retail Christmas tree operations are often on the outskirts of urban areas for better access to consumers.
- **Vegetation** - Species range from pines and associates to melaleuca and eucalyptus.
- **Soils** - Generally found on sandy, acidic soils.
- **Hydrology** - Often on mesic sites with moderate to poor drainage and a high water table during the wet season.

SIMILAR CLASSES

- [2210 Citrus Groves](#) - A citrus production context will be present.
- [2410 Tree Nurseries](#) - May be container or green houses operations. Numerous varieties are grown in tightly spaced rows.
- [4100 Upland Coniferous Forests](#) - These are not planted in rows.
- [4130 Sand Pine](#) - Has a carpet-like appearance and even-toned signature.

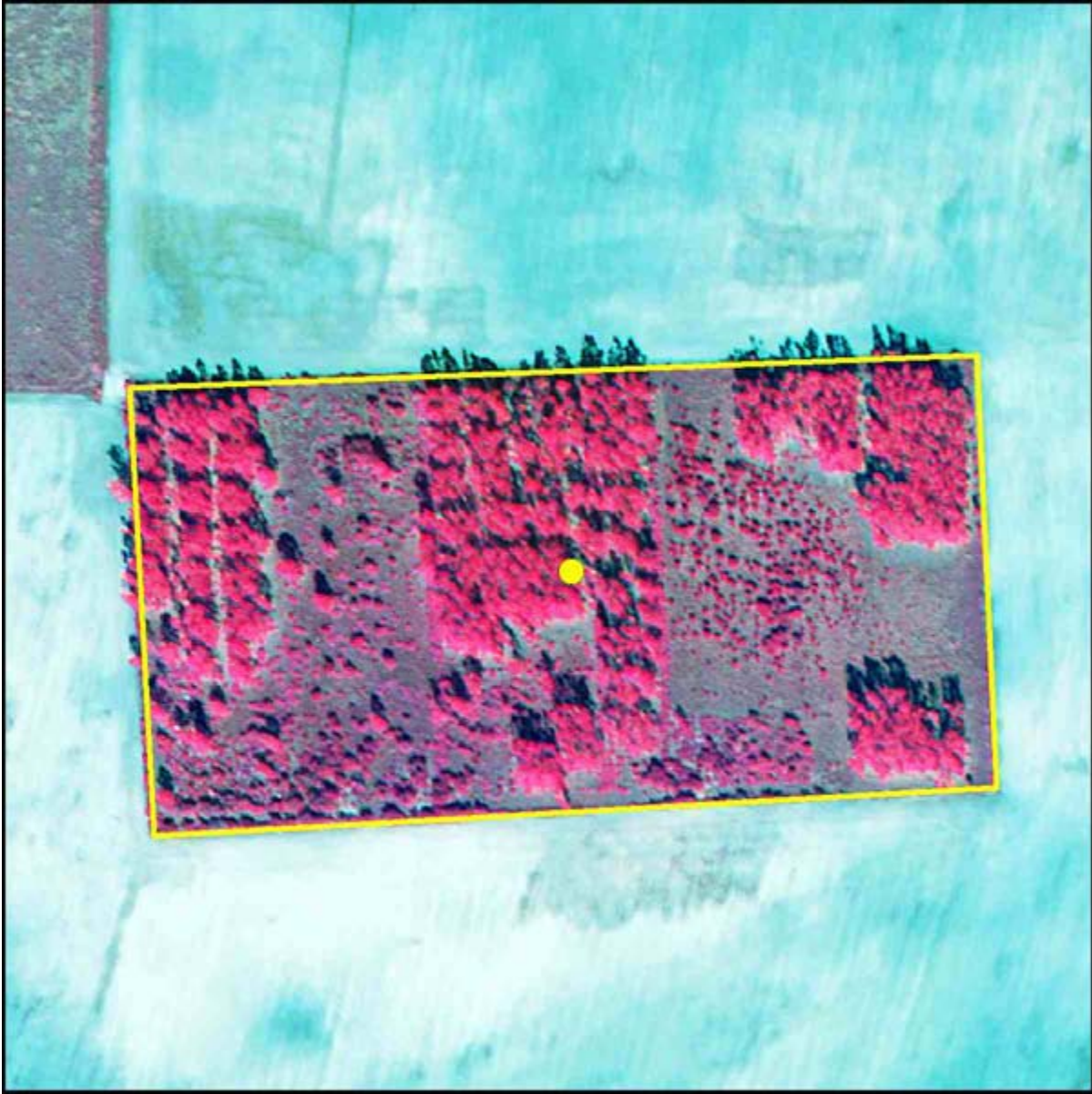
SPECIAL MAPPING CONVENTIONS

In order to be able to dual code tree plantations with wetlands, 4400 is considered a land use class, in contrast to other forest types. Wetland sites that have been planted over with trees are considered both tree plantation (LUCODE = 4400) and wetland (LCCODE = [6250](#) or [6300](#)).

DUAL CODING CONVENTION

4400 is a **Land Use** class. It does not normally require a separate **Land Cover** code. Exceptions are trees planted over wetland sites as noted above.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE



DATE
11/20/07

COORDINATES
515066.34 895743.40

4410

Coniferous Plantations

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4400 Tree Plantations](#)

LEVEL 3: **4410 Coniferous Plantations**

DESCRIPTION

This class is used for pine plantations, which consist of pine species planted for purposes of pulp or wood production. The class is relatively easy to recognize due to the characteristic red brick colors, small crowns and straight rows.

Pine plantations are artificially generated by planting seedling stock or seeds. The stands are characterized by high numbers of trees per acre, characteristic red brick color tones and uniform appearance. Row patterns are almost always apparent. Pine plantations may also occur on wetland sites, requiring dual coding.

Young trees will have very narrow crowns as the growth is concentrated in an upward direction. Older plantations having more mature trees resemble flatwoods signatures, but the row pattern is still discernable separating this type from a native pine flatwoods community.

KEYS TO PHOTOINTERPRETATION

- Straight rows of pine trees exhibit tightly packed crowns of nearly uniform extent.
- The pine canopy has a brick-red signature on CIR return with an even tone, dark green on natural color.
- The understory is visible if trees are not mature. It is generally composed of typical flatwoods species, including saw palmetto and gallberry.
- Pines in wet areas may appear stressed and ragged, but the rows are evident.

CONTEXT

- **Landscape Position** - Pine plantations occur most often on sites formerly occupied by former flatwoods communities. They may occur in any rural area of the District except areas where highly productive agricultural soils make the area better suited for crop production.
- **Vegetation** - Species of pine and associates typically found in the flatwoods.
- **Soils** - Sandy, acidic soils typical of flatwoods sites.
- **Hydrology** - Often on mesic sites with moderate to poor drainage and high water table during the wet season.

SIMILAR CLASSES

- [2210 Citrus Groves](#) - Besides characteristic signatures, citrus has a higher intensity management and a citrus production context.
- [2410 Tree Nurseries](#) - May be container or greenhouse operations. Numerous varieties are grown in tightly spaced rows.
- [4100 Upland Coniferous Forests](#) - These are not planted in rows.
- [4130 Sand Pine](#) - Has a carpet-like appearance and even-toned signature.
- [4430 Forest Regeneration](#) - Trees are seedlings or saplings and barely visible on aerial photos.

SPECIAL MAPPING CONVENTIONS

In order to be able to dual code pine plantations with wetlands, 4410 is considered a land use class, in contrast to the other forest types. Wetland sites that have been planted over with pine are considered both pine plantation (LUCODE = 4410 or 4430) and wetland (LCCODE = 6250 or 6300).

DUAL CODING CONVENTION

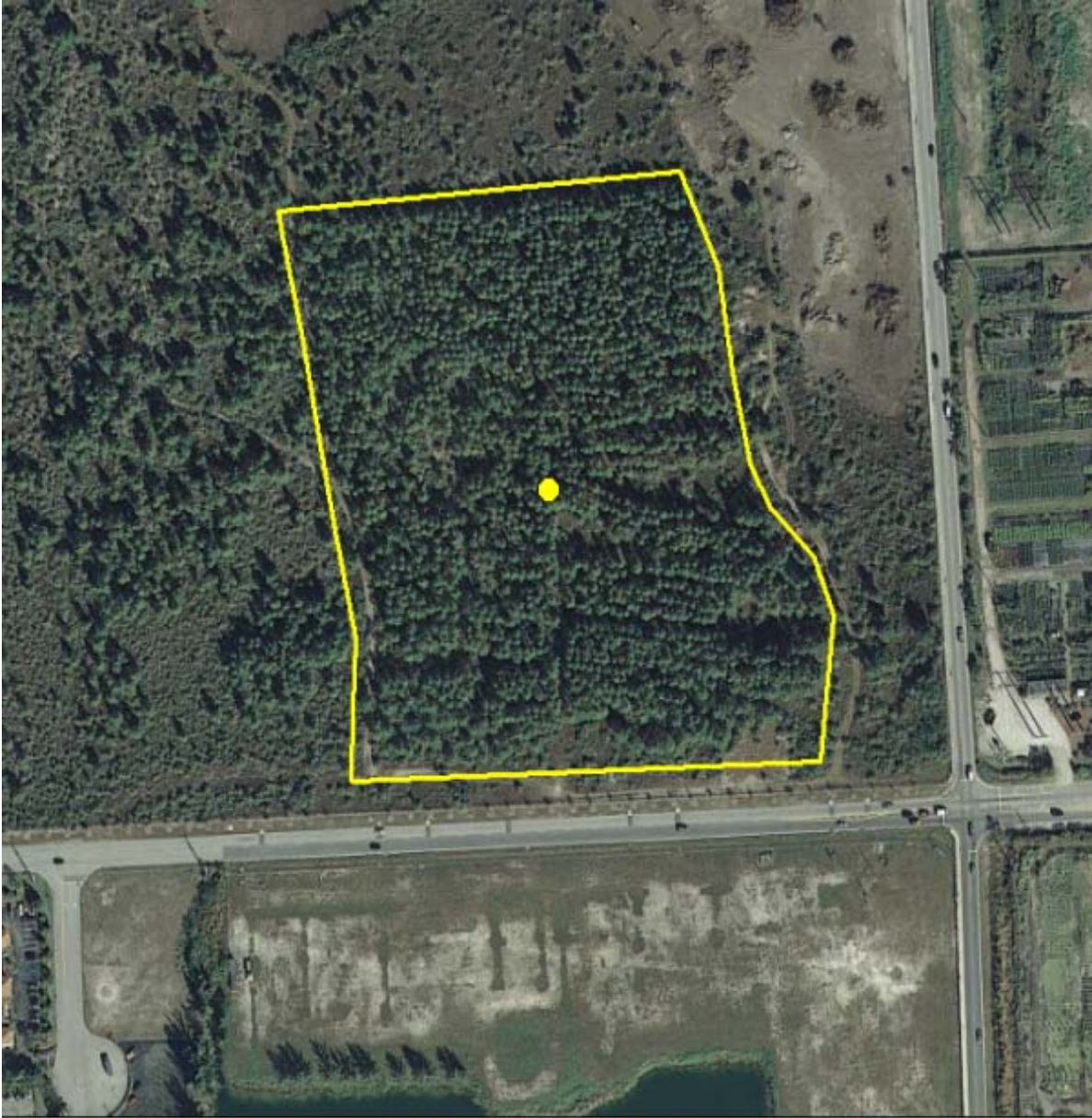
4410 is a **Land Use** class. It normally does not require separate **Land Cover** coding. Exceptions are pine planted over wetland sites, as noted above.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
07/14/07

COORDINATES
853503.61 478946.19

4420

Hardwood Plantations

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4400 Tree Plantations](#)

LEVEL 3: **4420 Hardwood Plantations**

DESCRIPTION

This class includes hardwood forests artificially generated by planting seedling stock or seeds for the purpose of pulp or wood production. The stands are characterized by high numbers of trees per acre and a uniform appearance. Row patterns are almost always apparent.

The typical hardwood species planted in South Florida are melaleuca and eucalyptus. Most other hardwoods are not planted.

Young trees will have very narrow crowns, as the growth is concentrated in an upward direction. Older plantations have more mature trees and more resemble natural forest signatures. However, the row pattern is still discernable, which differentiates this class from a natural forest community.

KEYS TO PHOTOINTERPRETATION

- Straight rows of trees exhibiting tightly packed crowns of nearly uniform extent.
- The understory is visible if trees are not mature.
- Typical signature of hardwoods with broader, fluffy red colored crowns (on CIR), varying in size and shape depending on the age of the stand and species planted.
- When melaleuca has been planted, stands are often very dense with the typical signature return described under its land cover type description.
- Eucalyptus plantations are not as dense and more individual crowns should be visible. Leaf density of eucalyptus is also generally less than on melaleuca and the signature should be more "feathery" in appearance.

CONTEXT

- **Landscape Position** - May occur in any rural area of the project limits except those areas of highly productive agricultural soils which are better used for crop production.
- **Vegetation** - Species typically planted in South Florida are melaleuca and eucalyptus. Most other hardwoods are not planted.
- **Soils** - Generally sandy, acidic soils. Melaleuca may be planted on somewhat wetter sites.
- **Hydrology** - Often on mesic sites with moderate to poor drainage and a high water table during the wet season.

SIMILAR CLASSES

- [2210 Citrus Groves](#) - Besides characteristic signatures, citrus has a higher intensity management and a citrus production context.
- [2410 Tree Nurseries](#) - May be container or green houses operations. Numerous varieties are grown in tightly spaced rows.
- [4100 Upland Coniferous Forests](#) - These are not planted in rows.
- [4130 Sand Pine](#) - Has a carpet-like appearance and even-toned signature.

- [4430 Forest Regeneration](#) - Trees are seedlings or saplings and are barely visible on aerial photos.

SPECIAL MAPPING CONVENTIONS

In order to be able to dual code hardwood plantations with wetlands, 4420 is considered a land use class, in contrast to the other forest types. Wetland sites that have been planted over with hardwood are considered both hardwood plantation (LUCODE = 4420 or [4430](#)) and wetland (LCCODE = [6170](#)).

DUAL CODING CONVENTION

4420 is a **Land Use** class. A separate **Land Cover** code is not normally required. Exceptions are hardwoods planted over wetland sites, as noted above.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/17/07

COORDINATES
4510008.95 1464950.50

4430

Forest Regeneration Areas

LEVEL 1: [4000 Upland Forests](#)

LEVEL 2: [4400 Tree Plantations](#)

LEVEL 3: 4430 Forest Regeneration Areas

DESCRIPTION

These are areas in which it is clear that open areas will be reforested through prescribed silvicultural practices rather than take on another land use or be abandoned. The area may appear disturbed, thus producing a wide variety of photosignatures, depending on the stage of re-growth following timber harvest. The boundaries of this class are somewhat irregular and can meander through an area of existing pine flatwoods.

Windrows of brush may be piled up and visible on the photo, along with bare soil. The soil may show tones ranging from light greys and greens to black, representing standing water. Vehicle ruts and trails from equipment and dragging of trees may also be visible, along with the pink, red and magenta tones (on CIR returns) of herbaceous and shrub re-growth in recently cut over areas.

These areas may be replanted at a later time, but at the time of photography, no positive indication of the intended use of the land is apparent. Surrounding areas of existing plantations and the lack of surrounding development are indicators that forest regeneration is likely to continue, and the 4430 code should be assigned. Signs of site preparation following timber harvest indicate a change in land use to either improved or unimproved pasture. If intensive preparation has been performed and rows of seedlings are not visible, pasture land uses should be considered.

KEYS TO PHOTOINTERPRETATION

- Saplings must be less than 20' tall and may or may not be visible.
- Understory vegetation or bare soils are visible.
- Signs of fire may be evident.
- Recently clear cut areas with lines of piled up slash and debris indicate regeneration.
- Clearing, site preparation and planting activities are usually done in parallel rows. However, sand pine plantations are aerially seeded, not in rows.
- Pines in wet areas may appear stressed but the rows are still evident.

CONTEXT

- **Landscape Position** - Pine plantations occur most often on sites formerly occupied by former flatwoods communities.
- **Vegetation** - Species of pine and associates typically found in the flatwoods.
- **Soils** - Sandy, acidic soils typical of flatwoods sites.
- **Hydrology** - Often on mesic sites with moderate to poor drainage and high water table during the wet season.

SIMILAR CLASSES

- [2210 Citrus Groves](#) - Citrus plots exhibit a higher intensity management and a crop production context.

- [2410 Tree Nurseries](#) - May be container or greenhouse operations. Numerous varieties are grown in tightly spaced rows.
- [4100 Upland Coniferous Forests](#) -These are not planted in rows and are not uniform.
- [4410 Coniferous Plantations](#) - Rows of trees are distinctly visible - trees are over 20 feet tall.

SPECIAL MAPPING CONVENTIONS

Wetland sites that have been planted over with pine are considered both pine plantation (LUCODE = [4410](#) or 4430) and wetland (LCCODE = [6250](#) or [6300](#)). Aids to delineation include 1999 LCLU, SSURGO soil data and NWI wetland maps.

It is assumed that freshly cut over areas where pine has not yet been planted, in the vicinity of established pine plantations, should be coded with LUCODE = 4430 Forest regeneration.

DUAL CODING CONVENTION

4430 is a **Land Use** class. It normally does not require separate **Land Cover** coding. Exceptions are pine planted over wetland sites, as noted above.



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

466466.02 905472.35 (Images)

FIELD PICTURE



DATE
10/04/07

COORDINATES
451769.22 1500910.21 (Field Picture)

5000 Water

This Level 1 class is not active in the map itself - a more specific subclass must be selected. The Level 2 subclasses include:

- 5100 Streams and Waterways
- 5200 Lakes
- 5300 Reservoirs
- 5400 Bays and Estuaries
- 5600 Slough Waters
- 5700 Ocean and Gulf

For details on each subclass (both Level 2 and Level 3) see the respective PI Key pages.

BACKGROUND

Water is the most important feature in the District's LCLU data layer. It is also one of the easiest to map, due to the almost uniformly deep black signature it presents on CIR photography. The District maps water features as small as 2 acres - the same MMU used for wetlands - and as narrow as 50 feet.

Water features can be problematic, especially between similar classes within the general 5000 category. The main problem is change, including slow changes that render lakes into prairies and vice-versa, and beaches into ocean. Seasonal changes may also turn water bodies into dry land or cause the emergence or disappearance of vegetation. On an hourly basis, the changes in tide can turn ocean into broad tidal flats or salt marsh. And human influence to manage water levels can change the boundaries of water features, causing reservoirs to fill or empty and canals to flow one way or the other. To summarize, water is a dynamic and often transient feature on the flat, wet surface of Florida. The standard solution is to delineate the water bodies as they appear at the time of photography.

MAPPING CONVENTIONS

Some bodies of water are not classified in the 5000 class. These include: the portions of water bodies with emergent vegetation or floating islands, which are classified in the [6000 Wetlands](#) class; [1660 Extractive Holding Ponds](#); shoreline areas obscured by [8150 Port Facilities](#); [2540 Aquaculture](#); and permanent bodies of water that are temporarily drained. On the other hand, areas that are only temporarily flooded may appear as water bodies due to recent flooding or other factors.

Minimum mapping units: The MMU for all 5000 Water classes is 2 acres. Waterways as narrow as 50 feet are included in the map and even narrower segments may be mapped to maintain connectivity.

In transitional areas where species-specific wetland (2acre MMU) and upland (5 acre MMU) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

Differentiating subclasses: See **Similar Classes** below and the respective 5000 subclass Key pages.

DUAL CODING CONVENTION

All the subclasses in the 5000 category are **Land Cover** classes. They do not require a separate **Land Use** code. **Land Cover** and **Land Use** (LCCODE and LUCODE) are always the same.

SIMILAR CLASSES

Some of the specific difficulties in mapping subclasses in the 5000 Water and 6000 Wetlands classes include the following:

- Reservoirs vs. lakes vs. lagoons and impoundments
- Transportation canals vs. streams and waterways
- Tidal flats vs. salt marsh vs. water
- Enclosed salt water ponds
- Mapping shorelines in coastal areas
- Wetlands vs. water
- Standing water on other land uses, such as agricultural fields
- Rivers vs. long linear bays and inland waterways

The PI Key pages for each of the water and wetlands subclasses indicate how the above issues are resolved. However, no set of decision rules can take all the subjectivity out of the map. As a result, water boundaries, just as with all other classes, do not agree precisely between one data layer and another.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

Other data layers that delineate water bodies include NWI wetlands, USGS hydrology layers, the National Hydrography Data (NHD) layer, SFWMD Vegetation Data, NRCS soils maps and previous LCLU maps. Each of these has its particular strengths and weaknesses. Imagery and aerial photos can often provide the best confirmation for any given date.

5100 Streams and Waterways

This general Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

5110 Natural River, Stream, Waterway
5120 Channelized River, Stream, Waterway

BACKGROUND

This category includes rivers, creeks, canals and other linear water bodies flowing across the landscape within defined channels. They are delineated where they average 50 feet or greater in width. Where the water course is interrupted by a control structure, the impounded water area will be classified as [5300 Reservoirs](#). The 5100 class includes both natural and modified waterways, as well as man made canals and channels.

MAPPING CONVENTIONS

Minimum mapping units: Waterways are mapped if they are 50 feet or greater in width. Narrower segments are also mapped as needed in order to maintain connectivity. Marine waterways over one mile wide are classified as [5400 Bays and Estuaries](#).

Water lying under bridges, docks, piers, or other structures is mapped as water.

The boundary between streams and lakes, reservoirs or the ocean is the straight line across the mouth of the stream unless the mouth is more than one mile (1.85 kilometers) wide. In that case, the rule given under [5400 Bays and Estuaries](#) is followed.

DUAL CODING CONVENTION

All of the 5100 classes are **Land Cover** classes. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

SIMILAR CLASSES

- [5400 Bays and Estuaries](#) - These are inlets of the sea greater than one mile in width. Marine waterways less than one mile in width are classified as 5100 Streams and Waterways.
- [5600 Slough Waters](#) - These are blocked, stagnant, slow moving channels.

5110

Natural River, Stream, Waterway

LEVEL 1: [5000 Water](#)

LEVEL 2: [5100 Streams and Waterways](#)

LEVEL 3: **5110 Natural River, Stream, Waterway**

DESCRIPTION

This class includes natural rivers, creeks and other linear water bodies flowing across the landscape within defined channels. They are delineated where they average 50 feet or greater in width. Where the water course is interrupted by a control structure, the impounded water area will be classified as [5300 Reservoirs](#).

This class includes only natural waterways and not man-made canals and channels.

There is not one conclusive feature separating natural from channelized waterways. The PI must determine whether a water body is **predominantly** natural or channelized.

KEYS TO PHOTOINTERPRETATION

- Water will generally exhibit a color tone varying from dark blue or black to a medium gray.
- Natural waterways generally follow the landscape and have natural shapes with very few straight edges.

CONTEXT

- **Landscape Position** - Natural streams and waterways may be found throughout the District draining the surrounding lands.

SIMILAR CLASSES

- [5120 Channelized River, Stream, Waterway](#) - These are entirely or substantially man made or substantially modified by man.
- [5410 Embayments Opening Directly to Gulf or Ocean](#) - More than one nautical mile in width and have a direct connection to the open sea
- [5420 Embayments Not Opening Directly to Gulf or Ocean](#) - More than one nautical mile in width
- [5600 Slough Waters](#) - These are blocked, stagnant, slow moving channels.

SPECIAL MAPPING CONVENTIONS

Natural Rivers, Streams and Waterways are mapped if they are 50 feet or greater in width. Narrower segments are also mapped as needed in order to maintain connectivity. Marine waterways over one mile wide are classified as 5400 Bays and Estuaries.

Natural waterways flowing under bridges, docks, piers, or other structures are mapped as water.

The continuity of roads, highways, and other transportation features that meet the criteria for delineation shall be maintained in cases where they actually bisect a water body. Where continuity of the water body is visible on the photo - such as a bridge over a river or canal - the water body will be

delineated and the road or other transportation feature will be broken at the boundary of the water body.

The boundary between natural waterways and lakes, reservoirs or the ocean is the straight line across the mouth of the stream unless the mouth is more than one mile (1.85 kilometers) wide. In that case, the rule given under 5400 Bays and Estuaries is followed.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



02500050000
Feet

NATURAL COLOR IMAGE



0 500,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
374638.73 847526.77

5120

Channelized River, Stream, Waterway

LEVEL 1: [5000 Water](#)

LEVEL 2: [5100 Streams and Waterways](#)

LEVEL 3: **5120 Channelized River, Stream, Waterway**

DESCRIPTION

This class includes artificially improved rivers, creeks, canals and other linear water bodies flowing across the landscape within man-made (or substantially man-made or altered) channels. They are delineated where they average 50 feet or greater in width. Where the water course is interrupted by a control structure, the impounded water area will be classified as [5300 Reservoirs](#).

This class includes only channelized waterways and not natural rivers, streams and waterways.

There is not one conclusive feature separating channelized from natural waterways. The PI must determine whether a water body is **predominantly** channelized or natural.

KEYS TO PHOTOINTERPRETATION

- Water will generally exhibit a color tone varying from dark blue or black to a medium gray.
- Shorelines generally have straight or regular shapes for most of their length and may not appear to follow the surrounding topography.

CONTEXT

- **Landscape Position** - Channelized streams and waterways may be found throughout the District, used for travel, shipping or irrigation.

SIMILAR CLASSES

- [5110 Natural River, Stream, Waterway](#) - These are entirely or substantially natural and generally follow the surrounding topography.
- [5410 Embayments Opening Directly to Gulf or Ocean](#) - More than one nautical mile in width and have a direct connection to the open sea.
- [5420 Embayments Not Opening Directly to Gulf or Ocean](#) - More than one nautical mile in width.
- [5600 Slough Waters](#) - These are blocked, stagnant, slow moving channels.

SPECIAL MAPPING CONVENTIONS

Channelized waterways and canals are mapped if they are 50 feet or greater in width. Narrower segments are also mapped as needed in order to maintain connectivity. Marine waterways over one mile wide are classified as [5400 Bays and Estuaries](#).

Channelized waterways and canals flowing under bridges, docks, piers, or other structures are mapped as water.

The continuity of roads, highways, and other transportation features that meet the criteria for delineation shall be maintained in cases where they actually bisect a water body. Where continuity of

the water body is visible on the photo - such as a bridge over a river or canal - the water body will be delineated and the road or other transportation feature will be broken at the boundary of the water body.

The boundary between this class and other water features such as lakes, reservoirs, or the ocean is the straight line across the mouth of the stream unless the mouth is more than one mile (1.85 kilometers) wide. In that case, the rule given under 5400 Bays and Estuaries is followed.

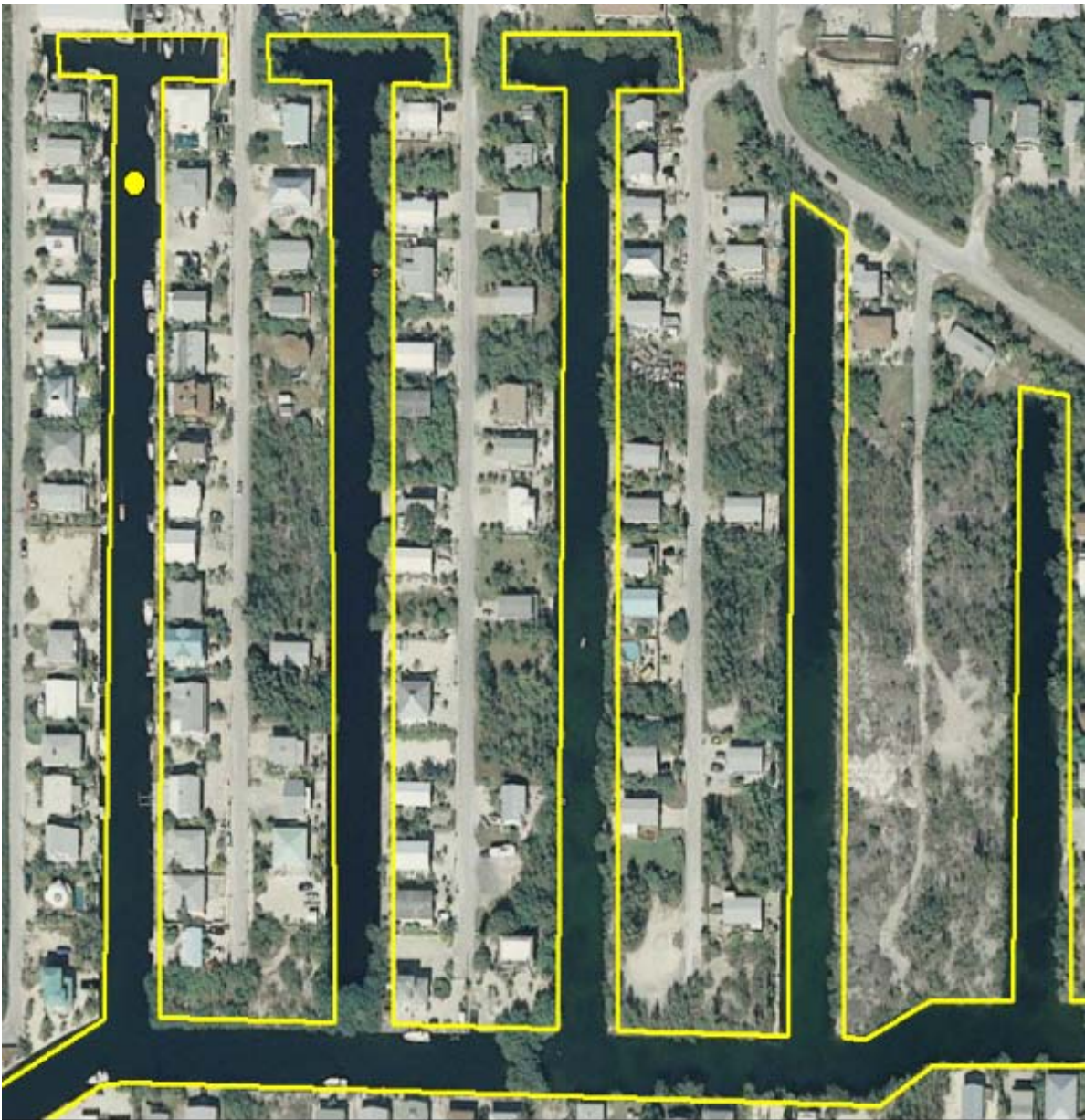
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/07/07

COORDINATES
534047.84 122023.89

5200 Lakes

LEVEL 1: [5000 Water](#)

LEVEL 2: **5200 Lakes**

DESCRIPTION

This class includes freshwater bodies greater than 2 acres in size, that are predominantly natural in origin. It includes all natural bodies of water situated in a depression, excluding reservoirs.

It does not include water bodies that are man-made or extensively modified, which are classed as [5300 Reservoirs](#). This class also does not include major springs, holding ponds or treatment ponds.

In contrast with reservoirs, water bodies in this class have a natural appearance - curved shorelines, normal vegetation, healthy (black) water tones and few if any control structures. However, the presence of some of these indicators does not necessarily make it a reservoir, since most water bodies are subject to human influence and modification.

The PI must determine if the water body is predominantly natural or man-made, based on the water body's context, functions, indicators and general appearance. There is no precise dividing line, and error costs between 5200 and [5300](#) are not necessarily high. For larger lakes and those with apparent natural origins, 5200 is the more appropriate code.

The limits of the water are mapped to that shown on the aerial photo and only represent conditions on the date of photography.

KEYS TO PHOTOINTERPRETATION

- Water will exhibit a varying tone from very dark to medium depending on the turbidity and sediment load of the water.
- Highly turbid waters have a light bluish, greenish or whitish signature due to the reflection from suspended solids in the water (on CIR).
- Shorelines will appear natural and follow the landscape. They may also show evidence of fluctuating water levels on shoreline.

CONTEXT

- **Landscape Position** - Lakes occur throughout the District, in varying concentrations. Water bodies in highly developed areas are much more likely to be reservoirs. The PI should examine undeveloped areas of the surrounding landscape to see if water bodies are a common feature. Otherwise, they are likely to be man-made.

SIMILAR CLASSES

- [5110 Natural River, Stream, Waterway](#) - These are linear features.
- [5120 Channelized River, Stream, Waterway](#) - These are linear features, either man-made or substantially altered by man.
- [5300 Reservoirs](#) - These are man-made or significantly altered by man.
- [5430 Saltwater Ponds](#) - Same signature-field verification and collateral data needed.

SPECIAL MAPPING CONVENTIONS

In urban areas, natural lakes may have water control structures to control lake level or discharge. These are still considered 5200 Lakes, rather than [5300 Reservoirs](#).

Active agricultural areas that are temporarily flooded should be classed as the appropriate agriculture class, not water bodies. The PI should check collateral data to see if these areas are public lands undergoing restoration. Other permanent **land uses** that are temporarily flooded should be given the appropriate land use class, not 5200. An example would be flooded parking lots in a mall or roadways under water. Land covers, in general, that are under water should be classed as open water. Some PI discretion is required to determine whether the flooded condition is typical or highly infrequent and whether it is an appropriate characterization of the mapping unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 250 500 1,000
Feet

FIELD PICTURE



DATE
10/04/07

COORDINATES
488052.05 1515443.09

5300 Reservoirs

LEVEL 1: [5000 Water](#)

LEVEL 2: **5300 Reservoirs**

DESCRIPTION

Reservoirs are artificial impoundments of water or water bodies that have been significantly modified from their natural state. They are used for irrigation, flood control, municipal and rural water supplies, stormwater treatment, recreation and hydro-electric power generation. Dams, levees, other water control structures or the excavation itself usually will be evident to aid in the identification.

There is no fine dividing line or conclusive indicator feature to separate lakes and reservoirs. The PI must determine whether a water body is **predominantly** natural or man-made. In cases where a water body was historically present, the PI should classify the polygon as [5200 Lakes](#).

KEYS TO PHOTOINTERPRETATION

- Reservoirs are artificial impoundments of water which will often contain a man-made structure on at least one side of the water body.
- Generally, all or part of the shorelines are straight or regular shapes and do not appear to follow the surrounding topography. Linear shapes are uncommon.
- Reservoirs are likely to diverge from the black signature of natural water bodies. Signature and tone of the water will be dependent on turbidity and sediments in the water body.

CONTEXT

- **Landscape Position** - Reservoirs occur throughout the District, in varying concentrations. Water bodies in highly developed areas are much more likely to be reservoirs. The PI should examine undeveloped areas of the surrounding landscape to see if water bodies are a common feature. Otherwise, they are likely to be man made.

SIMILAR CLASSES

- [1660 Holding Ponds](#) - Associated with an active mining operation. Holding ponds at abandoned or reclaimed mining sites are considered reservoirs.
- [5200 Lakes](#) - Natural water bodies; shorelines appear natural and tend to follow the landscape.

SPECIAL MAPPING CONVENTIONS

USGS topographic maps can assist in the determination of whether or not a lake is artificial. New reservoirs, such as those created in subdivisions, may not be delineated on topographic maps, or may look radically different from water bodies on older maps.

This class does not include reservoirs that are part of either the [1600 Extractive](#) or [8300 Utilities](#) classes. These ancillary facilities, when clearly identified as belonging to another land use, should be mapped with that land use.

Several emergent marshes exhibit high water conditions at the time the aerial photography was taken. No emergent vegetation visible in these areas. Collateral data may identify these areas as

6410 [Freshwater Marshes](#); however, they are coded as 5200 [Lakes](#) or 5300 [Reservoirs](#) due to their open water signature.

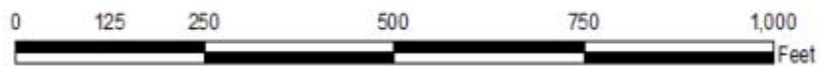
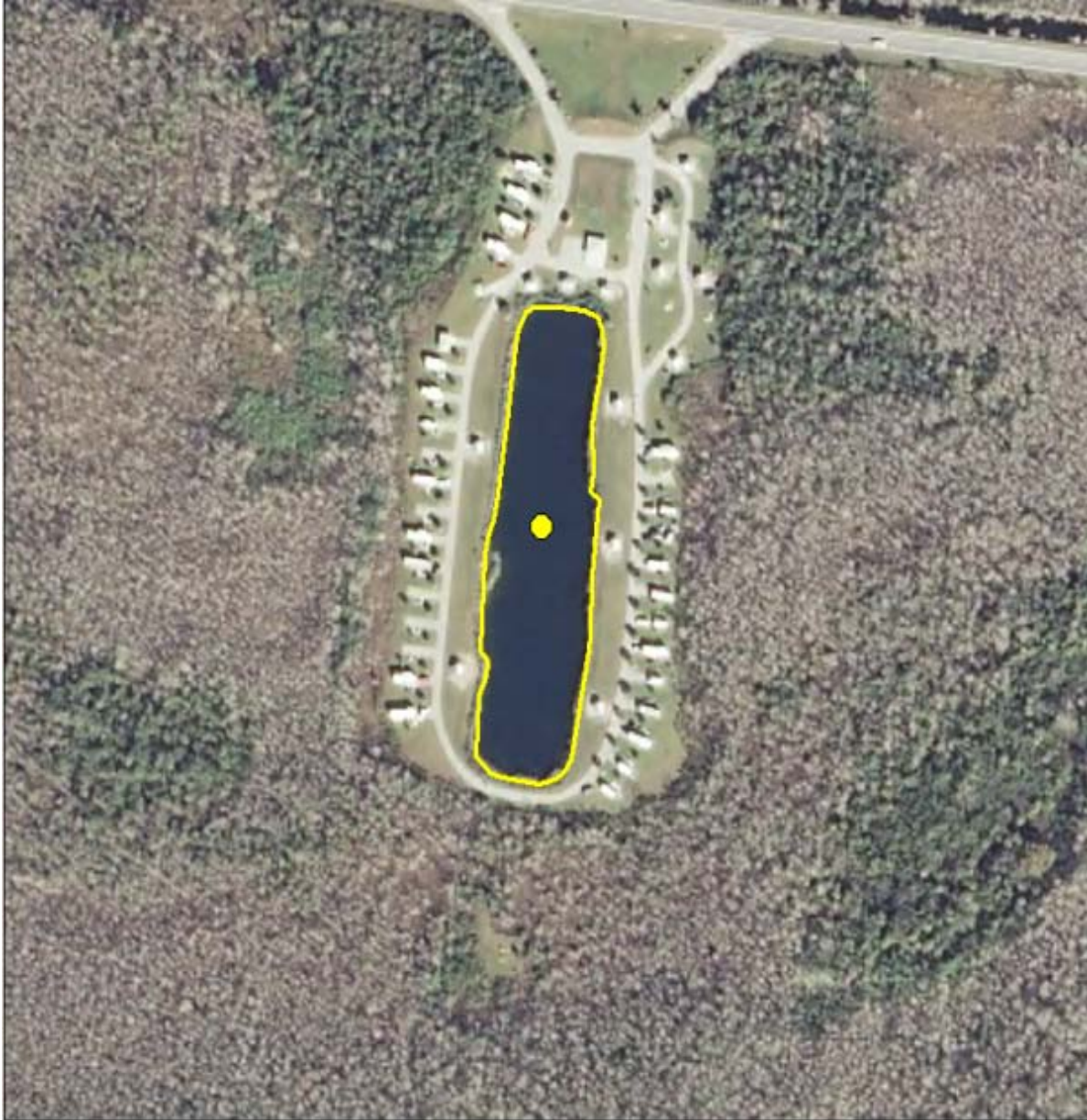
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE



DATE
05/08/07

COORDINATES
659608.65 551380.51

5400 Bays and Estuaries

This general Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

5410 Embayments Opening Directly to Gulf or Ocean
5420 Embayments Not Opening Directly to Gulf or Ocean
5430 Saltwater Ponds

BACKGROUND

This class is defined as inlets or arms of the sea that extend into the land and are between 1 and 10 nautical miles in width (1.85 to 18.5 kilometers). Embayments less than one nautical mile in width are classed as [5100 Streams and Waterways](#). Embayments or portions of embayments more than 10 nautical miles in width are not considered as included within the limits of the United States.

Isolated water bodies that have no visible surface connection to adjacent coastal waters are classified as [5200 Lakes](#). However saltwater ponds are classified as [5430](#).

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit for 5400 classes is 2 acres, except [5430 Saltwater Ponds](#) - the MMU for this class is 5 acres.

Differentiating subclasses: See the Level 3 key pages for guidance on how to distinguish these classes.

DUAL CODING CONVENTION

All of the 5400 classes are **Land Cover** classes. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

SIMILAR CLASSES

- [5100 Streams and Waterways](#) - Less than one nautical mile (1.85 km) in width
- [5200 Lakes](#) - These are independent freshwater bodies
- [5430 Saltwater Ponds](#) - Isolated estuarine water bodies that have no visible connection to adjacent coastal waters
- [5600 Slough Waters](#) - Not connected via open water to any coastal waters
- [6420 Saltwater Marsh](#) - Exhibits emergent estuarine vegetation
- [6510 Tidal Flats](#) - White to whitish grey signature; typically sand or mud, with some scattered vegetation

5410

Embayments Opening Directly to Gulf or Ocean

LEVEL 1: [5000 Water](#)

LEVEL 2: [5400 Bays and Estuaries](#)

LEVEL 3: **5410 Embayments Opening Directly to Gulf or Ocean**

DESCRIPTION

Embayments are inlets or arms of the sea that extend into the land.

Water bodies in this class are those which **have a direct connection to the open Gulf of Mexico or the Atlantic Ocean and do not meander great distances up or down the interior of the coast**. Where the feature does turn sharply north or south, and becomes narrow (less than one nautical mile in width) and travels a long way with a strip of land separating it from the open seas, other land cover codes will be used (such as [5420 Embayments Not Opening Directly to Gulf or Ocean](#), [5110 Natural River, Stream, Waterway](#) or [5120 Channelized River, Stream, Waterway](#)).

They produce a signature typical of water (blackish on CIR photography) unless they contain turbid water, in which case they may appear lighter in color.

The boundary between this class and the open sea will be a straight line connecting the waterward-most headlands drawn across the mouth of the opening, except as noted in Special Mapping Conventions below. In cases where the embayment is so shallowly indented into the land that the area of water enclosed in this manner would be less than that encompassed by a semicircle drawn with the boundary line as its radius, the coastline itself will be the boundary of the coastline and no Bays and Estuaries code will be used.

KEYS TO PHOTOINTERPRETATION

- Located only in coastal areas.
- Levees may be present.
- Surrounding vegetation is characteristic of saltwater marshes and may include spartina, mangroves and borrichia. Levees may support Brazilian pepper.

CONTEXT

- **Landscape Position** - This class is only found in coastal locations. Therefore it will only be used for waters directly along the Gulf of Mexico or Atlantic Ocean that are within the project area.

SIMILAR CLASSES

- [5200 Lakes](#) - These are independent freshwater bodies.
- [5420 Bays and Estuaries Not Opening Directly to Gulf or Ocean](#) - No direct connection to the open Gulf of Mexico or the Atlantic Ocean.
- [5430 Saltwater Ponds](#) - Isolated estuarine water bodies that have no visible connection to adjacent coastal waters.
- [5600 Slough Waters](#) - Channels of slow-moving water in coastal marshland.

SPECIAL MAPPING CONVENTIONS

In the southernmost part of the project area (the Florida Keys), the boundary between this class and the Gulf of Mexico is a straight line drawn from the southwestern corner of Cape Sable southwest through Mallory Square in Key West and extending to the western edge of the project area.

The minimum mapping unit for this class is 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



012850 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
386334.84 707975.19

5420

Embayments Not Opening Directly to Gulf or Ocean

LEVEL 1: [5000 Water](#)

LEVEL 2: [5400 Bays and Estuaries](#)

LEVEL 3: **5420 Embayments Not Opening Directly to Gulf or Ocean**

DESCRIPTION

Embayments are inlets or arms of the sea that extend into the land.

Water bodies in this class are those which **do not have a direct connection to the open Gulf of Mexico or the Atlantic Ocean and may meander up or down the interior of the coast with a strip of land separating the majority of their water surface from the open Gulf of Mexico or Atlantic Ocean.**

They exhibit a signature typical of water (blackish on CIR photography) unless they contain turbid water, in which case they may appear lighter in color.

Where this feature becomes narrow (less than 1 nautical mile) and travels for long distances with a strip of land separating it from the open seas, it should be classified as either [5110 Natural River, Stream, Waterway](#) or [5120 Channelized River, Stream, Waterway](#).

KEYS TO PHOTOINTERPRETATION

- Located only in coastal areas.
- Levees may be present.
- Surrounding vegetation is characteristic of saltwater marshes, and may include spartina, mangroves, borrichia. Levees may support Brazilian pepper.
- The flow to the natural seawater system is not impeded by surrounding vegetation.

CONTEXT

- **Landscape Position** - This class is only found in coastal locations. Therefore it will only be used for waters directly along the Gulf of Mexico or Atlantic Ocean that are within the project area.

SIMILAR CLASSES

- [5200 Lakes](#) - These are independent freshwater bodies.
- [5410 Bays and Estuaries Opening Directly to Gulf or Ocean](#) - Have a direct connection to the open Gulf of Mexico or the Atlantic Ocean
- [5430 Saltwater Ponds](#) - Isolated estuarine water bodies that have no visible connection to adjacent coastal waters.
- [5600 Slough Waters](#) - Channels of slow-moving water in coastal marshland.

SPECIAL MAPPING CONVENTIONS

The minimum mapping unit for this class is 2 acres.

DUAL CODING CONVENTION

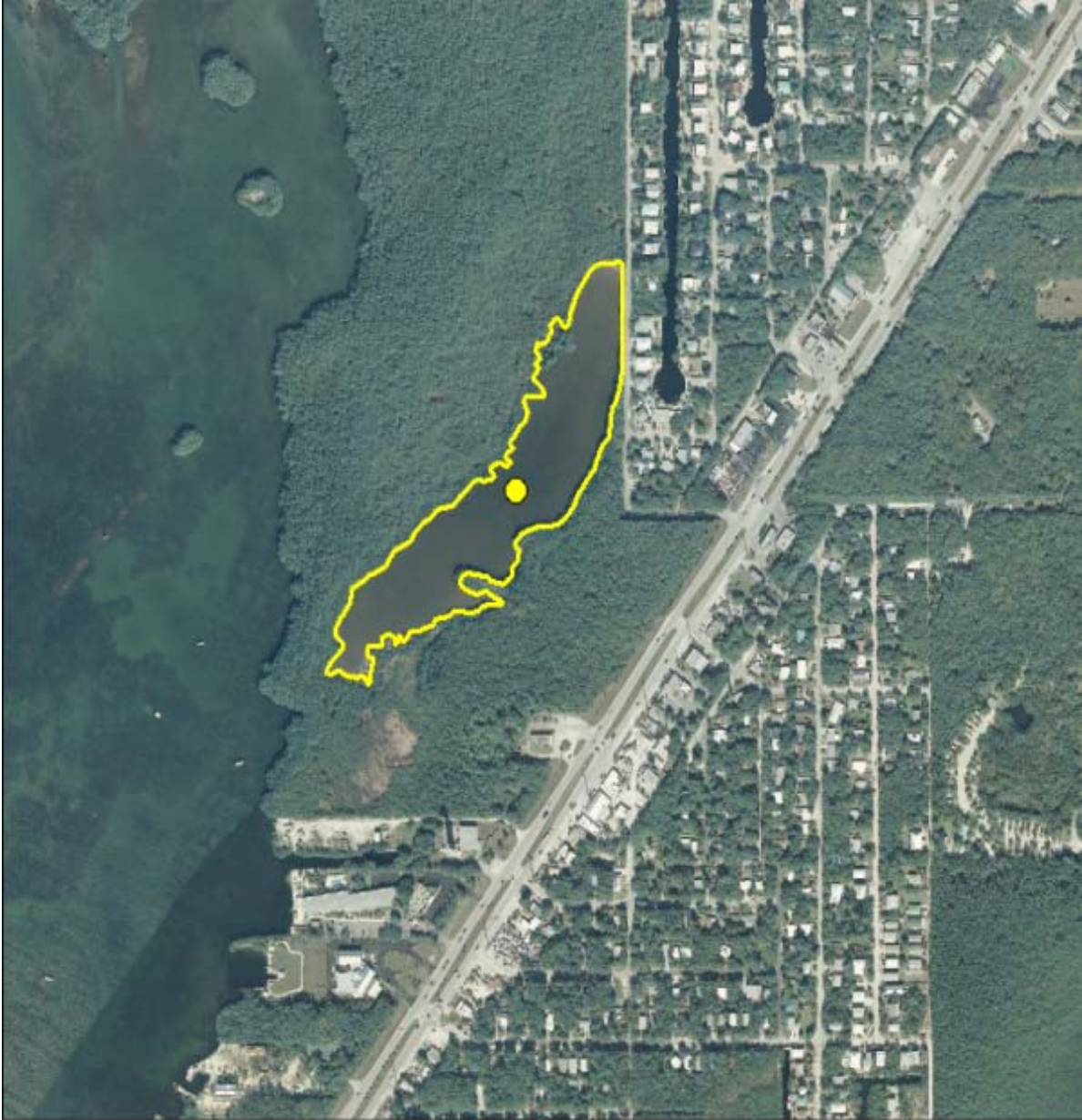
This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
01/16/07

COORDINATES
849642.24 288590.37

5430 Saltwater Ponds

LEVEL 1: [5000 Water](#)

LEVEL 2: [5400 Bays and Estuaries](#)

LEVEL 3: **5430 Saltwater Ponds**

DESCRIPTION

This code was created by SFWMD and is not part of FLUCCS. It includes natural or artificially enclosed areas of open water within estuarine areas. Groupings of closely-spaced, smaller ponds can be aggregated together to form one polygon five acres in size or greater.

Included are isolated open water areas within estuarine areas that have no visible connection to adjacent coastal waters.

KEYS TO PHOTOINTERPRETATION

- Located in estuarine areas.
- Levees may be present.
- Surrounding area is dominated by saltwater marsh vegetation and tidal flats. Levees may support Brazilian pepper.

CONTEXT

- **Landscape Position** - This class occurs only in estuarine areas.

SIMILAR CLASSES

- [5200 Lakes](#) - Independent freshwater bodies
- [5410 Embayments Opening Directly to Gulf or Ocean](#) - Not impounded
- [5420 Embayments Not Opening Directly to Gulf or Ocean](#) - Not impounded
- [5600 Slough Waters](#) - Not connected via open water to any coastal waters
- [6420 Saltwater Marsh](#) - Exhibits emergent estuarine vegetation

SPECIAL MAPPING CONVENTIONS

The minimum mapping unit for this class is 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000 Feet

NATURAL COLOR IMAGE



COORDINATES

340447.82 786046.09 (Images)

FIELD PICTURE



DATE

05/08/07

COORDINATES

456127.88 602772.33 (Field Picture)

5600 Slough Waters

LEVEL 1: [5000 Water](#)

LEVEL 2: **5600 Slough Waters**

DESCRIPTION

Sloughs are generally channels of slow moving water in the coastal marshland. The term also refers to "backwater sloughs" - narrow, often stagnant bodies of water found near inland rivers. Slough waters are made up of extremely slow-moving or stagnant water at the time of photography and ancillary data does not indicate a substantial connection to the main hydrologic system.

Grasses are the most common vegetation in sloughs. Sedges and rushes also occur, with scattered shrubs in some locations.

This class is common in South Florida flatwoods.

KEYS TO PHOTOINTERPRETATION

- Channels of slow-moving water found in coastal marshland
- Typically appears as dark black ribbons which meander through wetland areas
- Not connected via open water to the river system or estuary
- Water and vegetation may be intermixed in patchy patterns with indistinct boundaries that are difficult to delineate.

CONTEXT

- **Landscape Position** - Slough waters are found in the context of a flowing system, as opposed to a closed basin. They have minimal elevation drop. They tend to be relatively long and narrow and slightly lower in elevation than surrounding flatwoods and hammocks.
- **Vegetation** - Grasses are the most common vegetation in sloughs. Sedges and rushes also occur.
- **Hydrology** - They are blocked by vegetation, control structures or deposition to the extent that the flow is stagnant. Most sloughs serve as drainageways for water during periods of heavy and prolonged rainfall.

SIMILAR CLASSES

- [5100 Streams and Waterways](#) - Part of a main hydrologic system
- [5410 Embayments Opening Directly to Gulf or Ocean](#) - Have a direct hydrologic connection to the Gulf of Mexico or the Atlantic Ocean within the project area
- [5420 Embayments Not Opening Directly to Gulf or Ocean](#) - Used only for waters directly along the Gulf of Mexico or Atlantic Ocean within the project area

SPECIAL MAPPING CONVENTIONS

Large homogeneous inclusions of either water or emergent vegetation must be broken out separately if these features appear as **solid** inclusions with **distinct** boundaries.

The classification is based on the water levels visible at the date of photography. Ancillary data may show other patterns of vegetation and water, due to changes in hydrology.

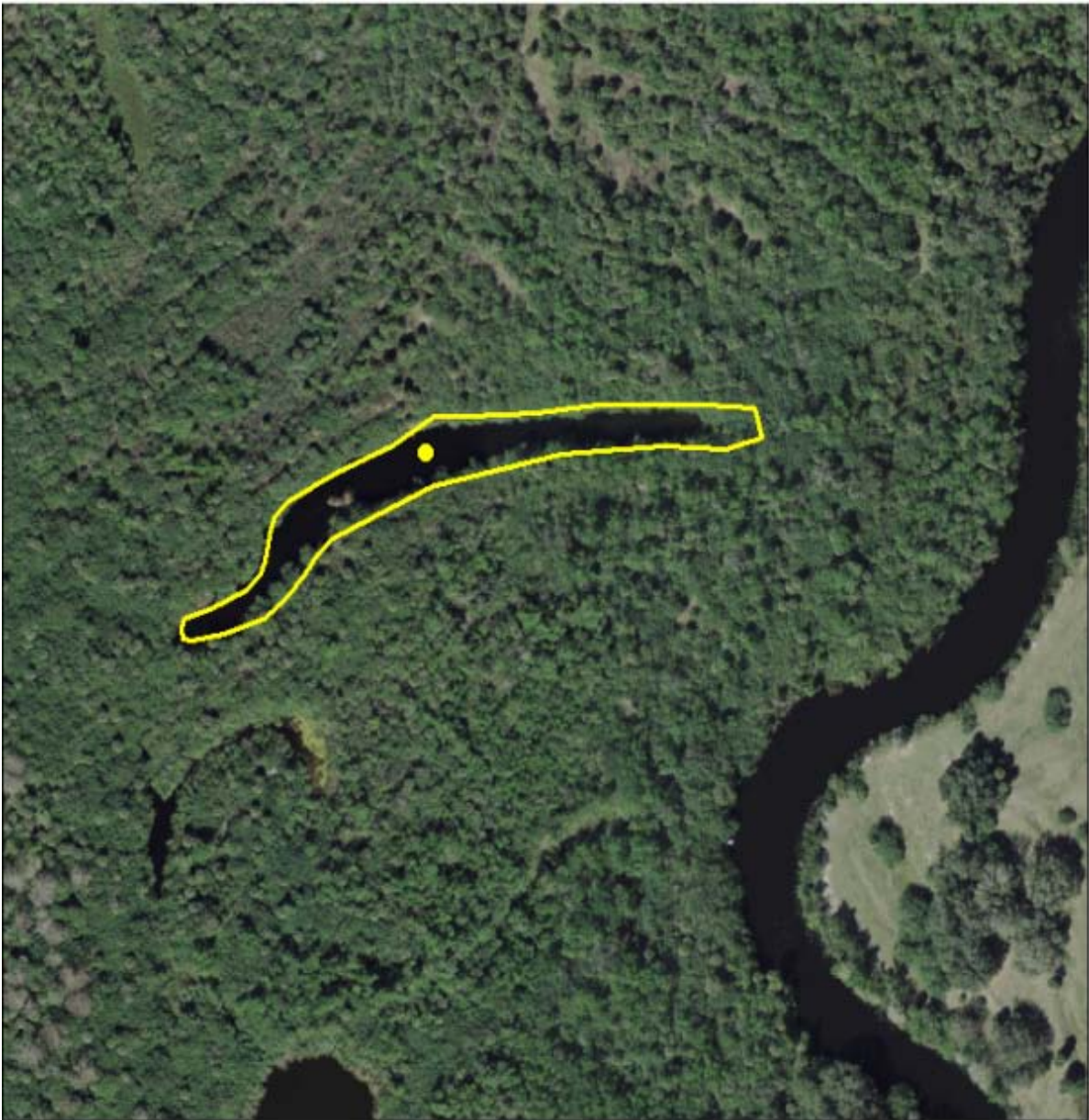
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

656141.24 1075642.81 (Images)

FIELD PICTURE



DATE
01/17/07

COORDINATES
449097.55 598681.38 (Field Picture)

5700 Ocean and Gulf

This Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

5710 Atlantic Ocean
5720 Gulf of Mexico

BACKGROUND

This class is a SFWMD modification of the FLUCCS class 5700 Major Bodies of Water.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit for all water classes is 2 acres.

Differentiating subclasses: The Atlantic Ocean and the Gulf of Mexico are separated by Florida Bay.

DUAL CODING CONVENTION

All of the 5700 classes are **Land Cover** classes. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

SIMILAR CLASSES

The Atlantic Ocean and Gulf of Mexico have the same open water signature as other water features. They are distinguished by their large size and position on the coastlines of the District.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

5710 Atlantic Ocean

LEVEL 1: [5000 Water](#)

LEVEL 2: [5700 Ocean and Gulf](#)

LEVEL 3: **5710 Atlantic Ocean**

DESCRIPTION

This code was created by SFWMD and is not part of FLUCCS.

The Atlantic Ocean is the second largest ocean in the world and it is adjacent to the east coast of the District. It covers the coastline from St. Lucie County in the north to Monroe County in the south.

KEYS TO PHOTOINTERPRETATION

- The Atlantic Ocean has the typical open water signature.
- It is distinguished by its size and location off the east coast of the District

CONTEXT

- **Landscape Position** - The Atlantic Ocean is located off the east coast of the District, ranging from St. Lucie County southward to Monroe County.

SIMILAR CLASSES

- [5720 Gulf of Mexico](#) - This is the only similar class, located off the west coast of the District.

SPECIAL MAPPING CONVENTIONS

This is an SFWMD modification to the FLUCCS system.

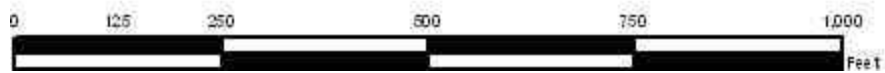
The classification is based on the water levels visible at the date of photography. Ancillary data may show other patterns of vegetation and water, due to changes in hydrology.

In the southernmost part of the project area (the Florida Keys), the boundary between this class and Florida Bay (classified as [5410 Embayments Opening Directly to Gulf or Ocean](#)) is US 1.

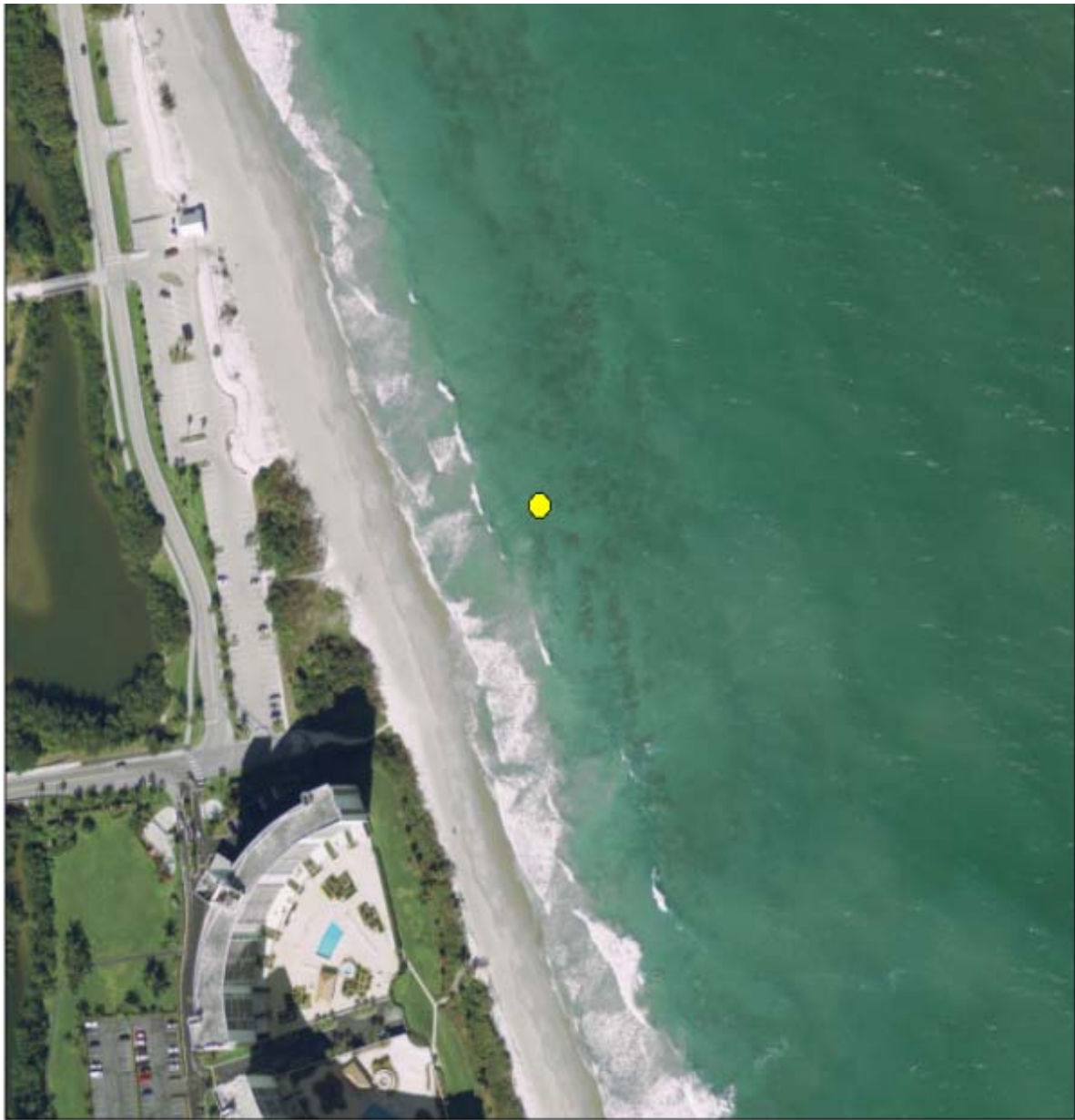
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
01/11/07

COORDINATES
959193.59 948278.56

5720 Gulf of Mexico

LEVEL 1: [5000 Water](#)

LEVEL 2: [5700 Ocean and Gulf](#)

LEVEL 3: **5720 Gulf of Mexico**

DESCRIPTION

This code was created by SFWMD and is not part of FLUCCS.

The Gulf of Mexico is an arm of the Atlantic Ocean bordering on eastern Mexico, the southeast United States and Cuba. It connects with the Atlantic Ocean through the Straits of Florida.

KEYS TO PHOTOINTERPRETATION

- The Gulf of Mexico has the typical open water signature.
- It is distinguished by its size and location off the west coast of the District.

CONTEXT

- **Landscape Position** - The Gulf of Mexico is located off the west coast of the District, ranging from Monroe County northward to Lee County.

SIMILAR CLASSES

- [5710 Atlantic Ocean](#) - This is the only similar class, located off the east coast of the District.

SPECIAL MAPPING CONVENTIONS

This is an SFWMD modification to the FLUCCS system.

The classification is based on the water levels visible at the date of photography. Ancillary data may show other patterns of vegetation and water, due to changes in hydrology.

In the southernmost part of the project area (the Florida Keys), the boundary between this class and Florida Bay (classified as [5410 Embayments Opening Directly to Gulf or Ocean](#)) is a straight line drawn from the southwestern corner of Cape Sable southwest through Mallory Square in Key West and extending to the western edge of the project area.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 250 500 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
382708.57 711553.34

6000 Wetlands

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level 2 subclasses are:

- 6100 Wetland Hardwood Forests
- 6200 Wetland Coniferous Forests
- 6300 Wetland Forested Mixed
- 6400 Vegetated Non-Forested Wetlands
- 6500 Non-Vegetated Wetlands

For details on each subclass (Level 2, Level 3, and Level 4) see the respective PI Key pages.

BACKGROUND

Wetlands are a high priority feature to the District, as they perform so many critical functions related to water resources management. In particular, the wetlands/uplands boundary is critical to many types of decision making. The subclasses of wetlands are relatively general, representing broad vegetation communities. However, as with the other natural land cover classes, consistently high accuracy is often difficult to achieve due to the project imagery, time frame, budget and other constraints. For higher resolution maps of natural vegetation, users should obtain data layers scaled to smaller project areas, such as the major watershed basins of the District.

Wetlands are those areas where the water table is at, near or above the land surface for a significant portion of most years. The hydrologic regime is such that aquatic or hydrophytic vegetation usually is established, although alluvial and tidal flats may be non-vegetated. Examples of wetlands include marshes, mudflats, emergent vegetation areas and swamps. Shallow water areas with submerged aquatic vegetation are usually classed as water and not included in the Wetlands category.

Extensive parts of some river floodplains qualify as Wetlands. These do not include agricultural land where seasonal wetness or short term flooding may provide much of the soil moisture necessary for crop production. But uncultivated wetlands used as pine plantation or pastures are retained in the Wetlands category.

Wetlands that are currently drained for any purposes belong to other land use categories, such as Agriculture, Rangeland, Forested Uplands or Urban and Built-Up. When the drainage is discontinued and the pre-existing hydrologic regime re-established, the classification reverts to Wetlands. Wetlands managed for wildlife purposes may show short-term changes in vegetation and hydrology under different management practices, but they are still classified as Wetlands.

The above definitions are tailored to the limitations imposed by the project methodology, which relies primarily on aerial photography to delineate wetland communities. In absence of extensive fieldwork, imposing a more definitive description of wetlands is not feasible. The official definition of a wetland as adopted by the State of Florida is discussed in detail under Florida Session Law 84-79 (HB 1187). Strict adherence to this definition using remotely sensed images, however, cannot be achieved.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all 6000 Wetlands classes is 2 acres.

Wetland systems can range from large monocultures to complex intermixtures of different classes. Individual plants or trees may be dispersed evenly throughout a matrix or grouped in patches. If

distinct patches of any class are greater than 2 acres, they are broken out separately. In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit. PIs must use discretion to avoid excessive line work while adding useful information.

Upland areas that occur as "islands" within wetlands systems are also broken out down to 2 acres. Adjacent uplands obey the standard MMU of 5 acres, unless otherwise defined.

Differentiating subclasses: See the PI keys for each of the subclasses for indicators that assist in differentiation.

Differentiating between natural communities requires expertise in photo interpretation. The communities are recognized by the signatures of individual species, rather than by the general color, texture and patterns of the mixture or community. It is generally accepted that PI's can not recognize these species unless they have extensive experience in the field comparing features on the ground against the exact same feature on recent photography. Also required is an understanding of the system's ecology. These skills are difficult to obtain, which accounts for the high levels of error sometimes found in mapping plant communities.

DUAL CODING CONVENTION

All of the wetlands classes are **Land Cover** classes that do not normally require a separate dual code - LCCODE and LUCODE are normally the same. However, in rare cases, a separate **Land Use** code is required. The most common example is for pine plantations on hydric soils; reclaimed and abandoned mining areas may also require separate dual coding.

SIMILAR CLASSES

The District places a high priority on establishing a wetland boundary, but it is sometimes easy to confuse upland and wetlands communities based on photosignature alone. Vegetation is usually the only visible indicator of the hydrologic boundary on aerial photography. Unfortunately, many species and communities stretch across this boundary, which ranges from being distinct to being virtually invisible.

Many of the wetland classes have similar upland counterparts that occur in wetland margins or in adjacent uplands. Notable examples are hardwood forests, flatwoods, cabbage palms, wet and dry prairies and pastures and even pine plantations. In addition, the hydrologic regimes can change due to unpredictable, long or short-term climatic fluctuations and human interventions. These factors often make the delineation of a wetland / upland boundary problematic. The problem is addressed with experience, ancillary data, magnified stereo viewing of imagery, field checking and tolerance of an acceptable level of error.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

6100

Wetland Hardwood Forests

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: 6100 Wetland Hardwood Forests

DESCRIPTION

This is an active Level 2 class that should be applied only when one of the more specific Level 3 or Level 4 subclasses does not apply.

Wetland Hardwood Forests are wetlands whose canopy is at least 67% dominated by wetland hardwood species and are the result of natural generation.

KEYS TO PHOTOINTERPRETATION

- Over 67% of the canopy is composed of hardwood species adapted to grow in hydric soils.
- NRCS soils maps indicate hydric soils.
- See the Level 3 and Level 4 class pages for keys to interpreting these classes.

CONTEXT

- **Landscape Position** - Wetland hardwood forests can be found almost anywhere in the project area where hydric conditions exist and trees have not been cleared.
- **Vegetation** - See respective subclasses.
- **Soils** - See respective subclasses.
- **Hydrology** - See respective subclasses.

SIMILAR CLASSES

Wetland hardwood forests can appear similar to many of the Level 3 and Level 4 subclasses, depending on the species composition. See the respective key pages for more information on how to differentiate these classes.

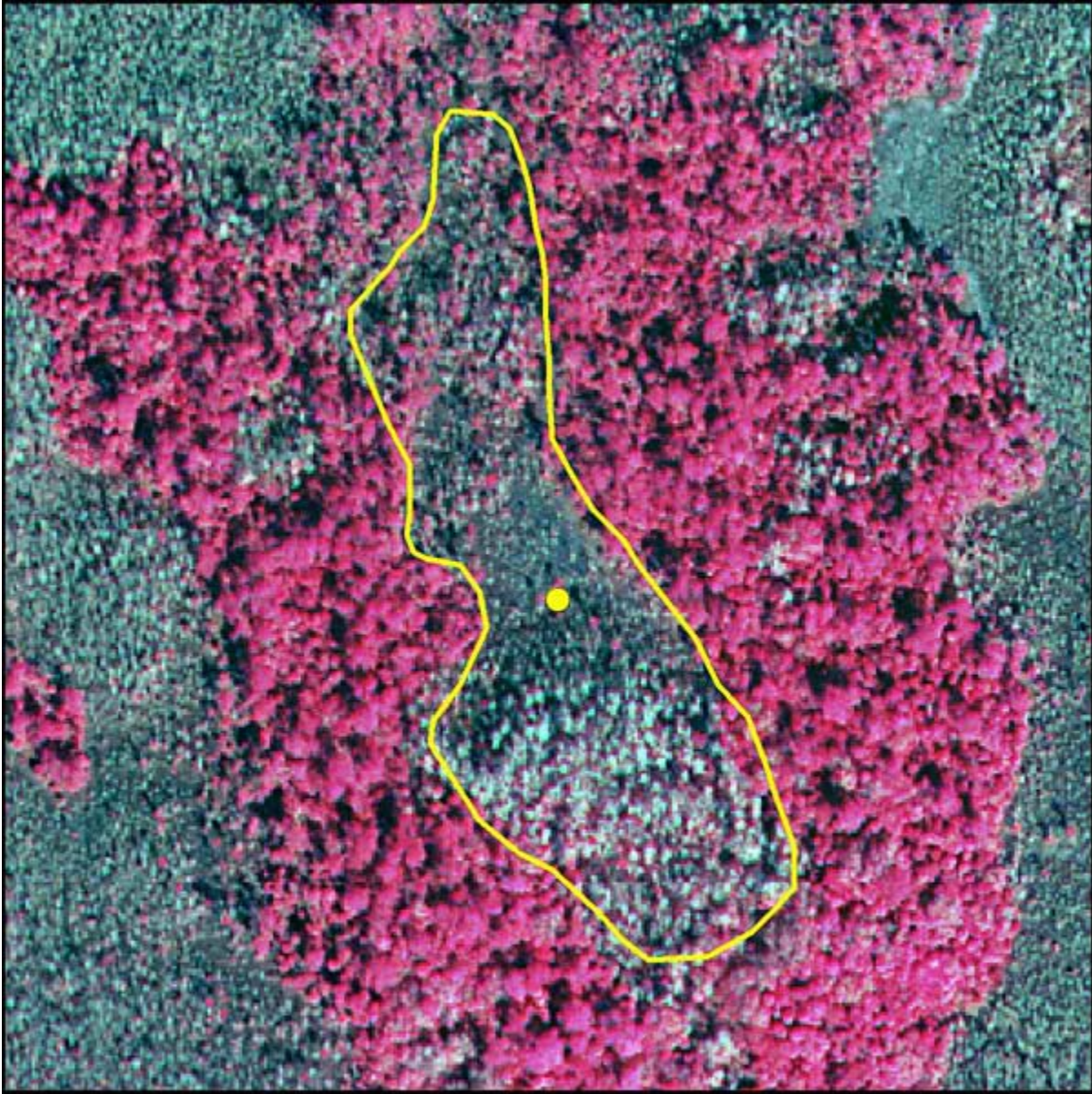
SPECIAL MAPPING CONVENTIONS

None

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE

(Original 1999 field picture)



DATE

n/a

COORDINATES

n/a

6110 Bay Swamps

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: **6110 Bay Swamps**

DESCRIPTION

Bay Swamps occur throughout Florida as relatively small communities. This community can be found on hillsides, in depressions in pine flatwoods, in ravines or as strips along edges of creeks. These swamps are characterized by dense, low vegetation and are believed to be fed by groundwater and run-off from higher land.

A crown canopy closure of **at least 67% but less than 90%** evergreen bay species is required for inclusion in this class.

Dominant species include one or more species of broadleaved, evergreen bay trees, such as loblolly bay, sweet bay, red bay and swamp bay. The upper canopy of some sites may be dominated by pines, especially slash pine, but bays and other indicators will be prevalent in the subcanopy and understory. Understory species include large gallberry, fetterbush, wax myrtle and titi.

Round, oval or "teardrop" shaped bay swamps should be classified as [6111 Bayhead](#).

KEYS TO PHOTOINTERPRETATION

- There is a stippled texture of medium to tall closely packed narrow tree canopies.
- Colors are usually bright scarlet red (CIR) or green (natural color) year round.

CONTEXT

- **Landscape Position** - Occurs on hillsides, in depressions, in ravine areas and in poorly defined drainages.
- **Vegetation** - Dominant trees include loblolly bay, sweet bay, red bay or swamp bay. May have pines or other hardwoods intermixed as associates.
- **Soils** - Typically poorly to very poorly drained and usually high in organic matter content.
- **Hydrology** - Bay swamps are usually saturated or less often seasonally flooded.

SIMILAR CLASSES

- [4200 Upland Hardwood Forests](#) - Canopy signatures may be very similar if evergreens are dominant, but understories reflect drier conditions.
- [6111 Bayhead](#) - Circular, oval, or teardrop-shaped areas of bay trees.
- [6170 Mixed Wetland Hardwoods](#) - Evergreen bays and other associated species are not as prevalent and inundation is not sustained. Red maples and other deciduous species may be prominent.

SPECIAL MAPPING CONVENTIONS

The canopy closure must be **25 percent or more** and the trees must average over 20 feet tall at the time of photography.

In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/13/07

COORDINATES
753711.54 1093863.45

6111 Bayhead

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: [6110 Bay Swamps](#)

LEVEL 4: 6111 Bayhead

DESCRIPTION

Bayheads are dense evergreen forests found in peat-filled depressions or at the upstream ends of Everglades tree islands. They have distinct circular, oval or "teardrop" shapes.

They are scattered throughout the landscape, but are most abundant in areas with numerous cypress domes, where they represent an advanced stage of dome succession with peat accumulation in the absence of severe fire. They are also abundant in the Everglades, where they characteristically grow on organic soil built up upstream of limestone-based hardwood hammocks.

A crown canopy closure of **90% or more bay species** is required for inclusion in this class.

Bayheads are fed by groundwater and run-off from higher ground. They show very little evidence of other species within the bayhead itself, but frequently are surrounded by other species groups.

KEYS TO PHOTOINTERPRETATION

- There is a stippled texture of medium to tall closely packed narrow tree canopies.
- Colors are usually bright scarlet red year round.

CONTEXT

- **Landscape Position** - Typically found in depressions or at the upstream ends of Everglades "tree islands".
- **Vegetation** - Dominated by loblolly bay, sweet bay, red bay or swamp bay.
- **Soils** - Typically poorly to very poorly drained and usually high in organic matter content.
- **Hydrology** - Areas usually saturated or seasonally flooded.

SIMILAR CLASSES

- [4200 Upland Hardwood Forests](#) - Canopy signatures may be very similar if evergreens are dominant, but understories reflect drier conditions.
- [6110 Bay Swamps](#) - Swamps do not show the typical circular, oval or "teardrop" shape of bayheads.
- [6170 Mixed Wetland Hardwoods](#) - Evergreen bays are not as prevalent and inundation is not sustained. Red maples and other deciduous species may be prominent.

SPECIAL MAPPING CONVENTIONS

The canopy composition must be **90 percent or more bay trees** and the trees must average over 20 feet tall at the time of photography for inclusion in this class.

In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

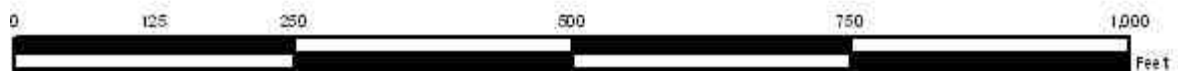
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE



DATE
10/15/07

COORDINATES
485478.39 1338165.80

6120

Mangrove Swamps

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: **6120 Mangrove Swamps**

DESCRIPTION

This class is used for communities in which mangrove species are pure or predominant. Mangroves appear as a medium height (10 to 20 feet) thicket of fleshy leaved woody plants in coastal areas subject to periodic or continual inundation by salt or brackish water. In many sites, mangroves are prevented from reaching tree stature (20 feet) by natural processes, including climate, nutrients and wave action.

The communities are dominated by one or more mangrove species, including red, black and white mangroves (*Rhizophora mangle*, *Avicennia germinans*, or *Laguncularia racemosa*). Associate species that may also be present include buttonwood, cabbage palm and sea grape. Herbaceous associates include sea grape and sea oxeye (borrichia).

KEYS TO PHOTOINTERPRETATION

- Primarily found in, but not limited to, coastal areas subject to periodic or continual inundation by salt or brackish water
- Plants may be shrubs or trees and occur in pure or predominant stands.
- Broad crowns and bright red color return (on CIR).
- In areas where water levels have been artificially altered (mosquito impoundments) and held too high for too long, plants (especially black mangroves) become stressed and may drop their leaves resulting in a bright greenish color (on CIR) and a rough or stippled texture.
- Red mangroves extend to the open water, with black mangroves towards the landward edge, and white mangrove in the most landward, least inundated.
- Available District vegetation maps should be consulted as collateral data, taking into account temporal changes.

CONTEXT

- **Landscape Position** - Broad expanses of mangrove swamps are found on the west coast of South Florida. Back bays and estuaries with mild wave actions create favorable conditions for this community. Mangroves may extend well inland in the southern and southwestern Everglades.
- **Vegetation** - Dominant vegetation is red, white or black mangrove. Buttonwood may also be present or co-dominant. Sea grape and palms may occur, as well as Brazilian pepper on disturbed sites.
- **Soils** - Very poorly drained organics and/or marl or saline sands.
- **Hydrology** - Permanently flooded to regularly flooded by tidal waters.

SIMILAR CLASSES

- [6110 Bay Swamps](#) - Trees will be over 20' tall.
- [6170 Mixed Wetland Hardwoods](#) - A wider range of signatures, including blue-grays and light pinks

SPECIAL MAPPING CONVENTIONS

This is considered a forested class, even though it is found in shrub form, no taller than 20 feet.

Fringes of mangrove community as narrow as 30 feet wide should be mapped. Mangrove species must be dominant in the species mixture.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
455161.5 602633.23

6170

Mixed Wetland Hardwoods

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: **6170 Mixed Wetland Hardwoods**

DESCRIPTION

This class is a general class for any wetland hardwood forests that do not fall in to one of the other [6100](#) subclasses (bay swamps, mangroves, cabbage palms or exotic species). Examples of this class include bottomland and floodplain communities dominated by hardwoods, willow swamps and mixed hardwoods found in other landscape positions.

Defined as a very broad class, 6170 may have species mixtures ranging from relatively homogeneous stands, such as those dominated by red maple or willows, to a wide diversity of different species. Species in the mixtures may include red maple, black gum, water oak, sweet gum, willows, cabbage palm, water hickory, water tupelo, water ash and bays. Cypress is often present but not dominant (under 25%).

KEYS TO PHOTOINTERPRETATION

- A number of different types of communities are included in this class, with a broad range of signatures depending on species composition.
- CIR signatures range from blue-gray, bright red to light pink, indicating a diversity of different species.
- Tree crowns are typically broad, except for inclusions of cypress, cabbage palms, and other narrower species.

CONTEXT

- **Landscape Position** - Wetland hardwood forests can occur on a range of different landforms and hydrologic regimes, including floodplains and bottomlands, basins and depressions, lake and coastal fringes, and disturbed wet areas. Broad extents occur on wide floodplains along the Kissimmee River and other major drainageways.
- **Vegetation** - This community is comprised of a mixture of shrubs and trees which either do not fit within any other category due to species composition (i.e., either willow or titi) or else has an unidentifiable mix of species where none are predominant.
- **Soils** - These communities occur in depressions which collect silty sediments and are generally high in organics or on a variety of mineral soils. Some organic layers are thick enough to qualify as a histic epipedon.
- **Hydrology** - Wetness varies in these communities from temporary inundation through long-term semi-permanent to permanent flooding.

SIMILAR CLASSES

- [6110 Bay Swamps](#) - Scarlet red signature year round
- [6210 Cypress](#) - Usually a grayish, or grayish-green CIR signature
- [6300 Wetland Forested Mixed](#) - Pine species achieve at least 33% crown canopy cover.

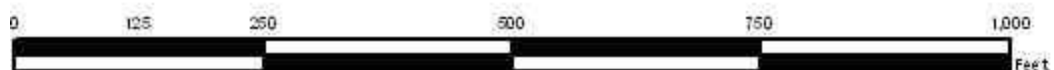
SPECIAL MAPPING CONVENTIONS

In transitional areas where species specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



FIELD PICTURE



DATE

10/15/07

COORDINATES

396287.34 719546.10

6172

Mixed Shrubs

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: [6170 Mixed Wetland Hardwoods](#)

LEVEL 4: **6172 - Mixed Shrubs**

DESCRIPTION

This class is used for wetland areas that are dominated by woody vegetation less than 20 feet in height.

Wetland shrub communities may proliferate when forested communities are regenerating after natural or induced die-offs; or they may form when water tables are lowered in marshes or swamps; or when upland or free flowing areas are flooded or impounded. Many types of disturbance or change can alter vegetation and result in a phase of shrubby growth.

KEYS TO PHOTOINTERPRETATION

- Often associated with areas of transitional hydrology or regenerating swamps, but found in a wide variety of community types and locations.
- Small crowns, 20 feet or less in height, are visible. An understory of grasses may be visible.
- The CIR signatures are often bright, patchy, with a mottled texture. Shrubs tend to be bright compared to wet areas and understory herbs. Monocultures of willows may be smooth, bright and uniform.

CONTEXT

- **Landscape Position** - Mixed wetland shrubs are typically found in shallow depressions and the upper edges of poorly defined drainages (sloughs), rivers, creeks or streams. They also occur in seasonally or temporarily wet situations near man-induced disturbances such as an impoundment, road, railroad or powerline/pipeline corridor.
- **Vegetation** - This community is comprised of a mixture of various shrubs, most commonly wax myrtle, saltbush, buttonbush and elderberry with some aquatic and herbaceous vegetation or primrose willows intermixed.
- **Soils** - Generally in mineral soils or in silty sediments, high in organics, accumulated over mineral soils.
- **Hydrology** - This land cover type frequently occurs in areas which do not remain wet for excessive lengths of time. Seasonal flooding or temporary inundation at regular intervals throughout the growing season typically provides the proper hydrologic regime for this community.

SIMILAR CLASSES

- [3200 Upland Shrub and Brush Land](#) - Signatures and even species may be very similar. Ancillary data may be required to differentiate.
- [4220 Brazilian Pepper](#) - Upland Brazilian Pepper has same signature but is coded as 4220

SPECIAL MAPPING CONVENTIONS

This is a SFWMD modification to the FLUCCS system, which assigns the FLUCCS code 6310 to Wetland Scrub. (Note: the SFWMD does not use 6310.)

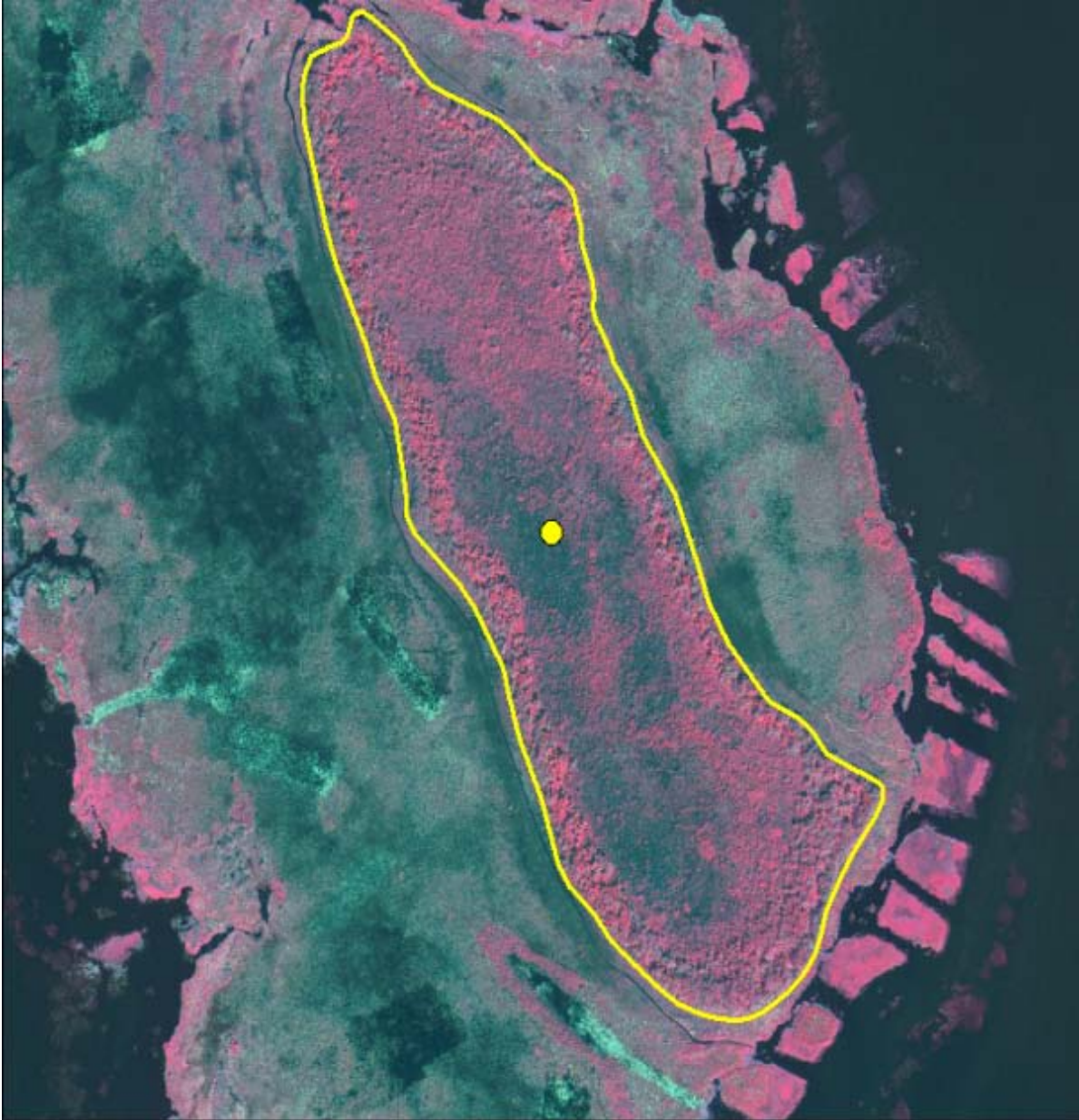
NOTE: This code is an addition to identify scrub-shrub wetlands where shrub height does not exceed 20 feet. Although the code description is Mixed Shrubs, this class also includes shrub wetlands that do not have a mixture of species. For example, if cypress or bays are dominant, but they are of shrub height, they are coded as 6172 Mixed Shrubs.

Brazilian Pepper upland communities are coded as [4220 Brazilian Pepper](#).

If shrubby vegetation is clearly part of a forested system in the process of regenerating, it may be so intermixed that precise delineation would result in overly complex linework or polygons that are below the MMU. Where shrubs are close to this size cutoff, PI's should avoid excessive line work and err on the side of identifying the community type rather than growth stage.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

COORDINATES

573204.58 1104058.29 (Images)

FIELD PICTURE



DATE
03/16/07

COORDINATES
748389.46 867446.02 (Field Picture)

6180 Cabbage Palm Wetland

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: **6180 Cabbage Palm Wetland**

DESCRIPTION

Cabbage palm wetlands are found in varying habitats from the sparse canopy of a seasonally flooded "savannah" to the denser temporarily flooded hammocks containing a diverse mix of species.

KEYS TO PHOTOINTERPRETATION

- Canopy composition is greater than 10% cabbage palm (sabal palmetto). See Special Mapping Conventions below.
- Signatures include uniformly round, compact, ball like tree crowns with a characteristic pinkish-red color on CIR film.
- A combination of the dull, medium red color of other species, with its predominantly fluffy and irregular crown texture in which individual crowns are discernible and the lollipop-shaped, pinkish-red to washed-out color of Cabbage Palms.
- In some examples of this community, bright reds from vines occurring on the tree crowns may be evident.

CONTEXT

- **Landscape Position** - Usually found on relatively flat, poorly drained terrain. Cabbage palms are susceptible to fire and inundation and persist best where these are controlled.
- **Vegetation** - Consists of a sparse seasonally flooded understory of wetland grasses dominated by palms or a mix of palms, laurel oak, live oak, water oak, hackberry, red maple, other temperate hardwoods, vines and ferns. Saw palmetto is not typically present.
- **Soils** - Commonly circumneutral sands underlain by marl or shell beds.
- **Hydrology** - Cabbage Palm wetlands are situated where inundation and soil saturation are affected by seasonally high water tables. Some saturation may occur but inundation, other than for brief periods, is uncommon.

SIMILAR CLASSES

- [4280 Cabbage Palm](#) - Found in upland areas, they have a canopy closure of at least 25% cabbage palm with a 67% dominance. Signatures may appear similar-refer to soils data.
- [4271 Oak-Cabbage Palm Forest](#) - Found in upland areas, signatures may appear similar-refer to soils data.

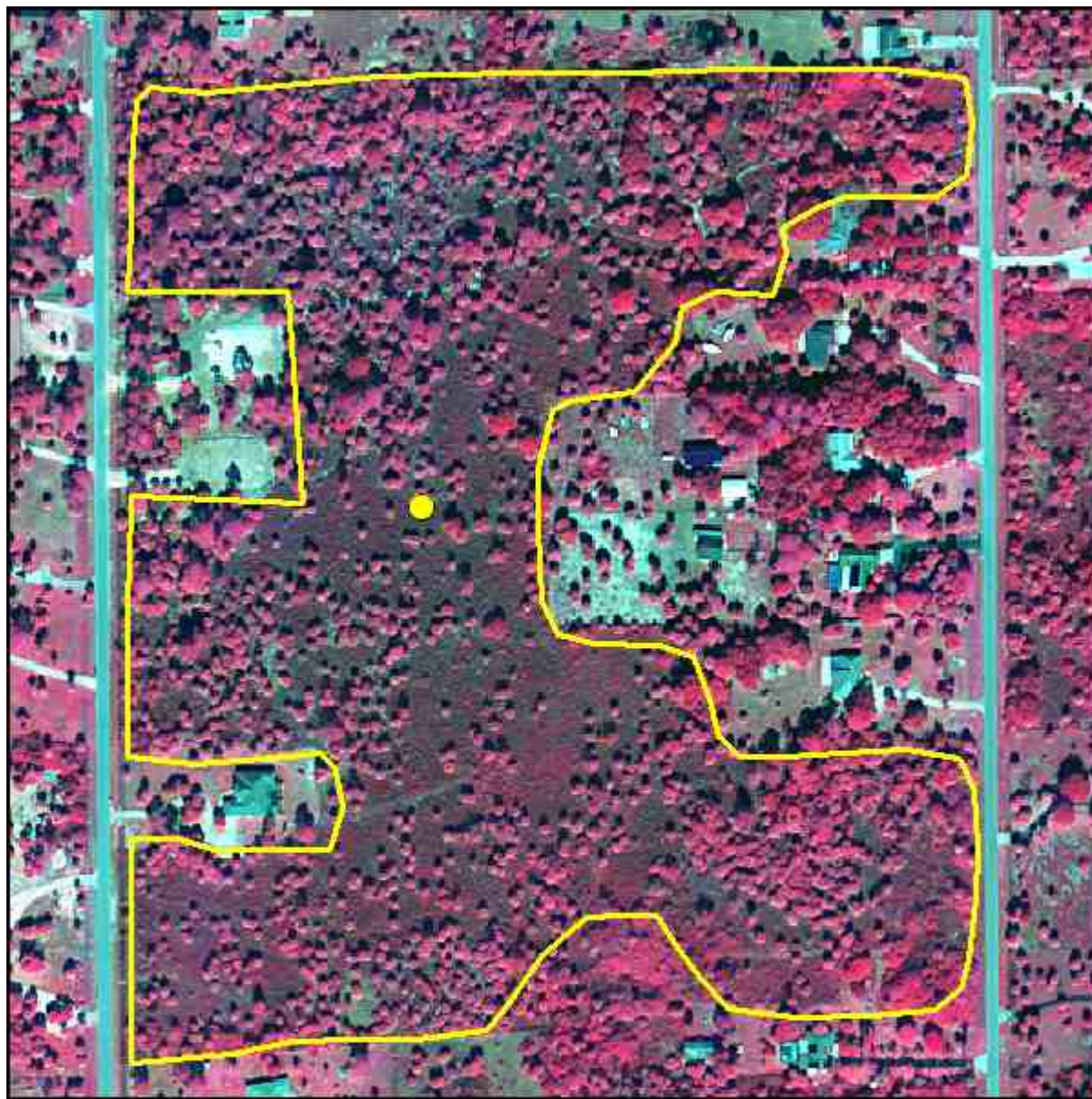
SPECIAL MAPPING CONVENTIONS

NOTE: This class is an exception to the general crown canopy requirements for Forest classes - (25% for inclusion in a Forest class, and 67% dominance of a particular species to be assigned to that species class).

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE



DATE

10/15/07

COORDINATES

443843.53 693574.59

6190 Exotic Wetlands Hardwoods

This Level 3 class is not used in the map itself - the only exotic wetland hardwood species mapped in this data layer is classified at Level 4 as:

[6191 Wet Melaleucas](#)

BACKGROUND

This Level 3 class consists of forested wetlands with a dominant exotic species such as Brazilian pepper, melaleuca or other exotic species.

As noted above, Wet Melaleuca is mapped at Level 4. Brazilian pepper found on wetland sites is mapped at Level 4 as [6172 Mixed Shrubs](#). Other exotic species will be mapped at Level 2 as [6100 Wetland Hardwood Forests](#).

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for all 6190 Exotic Wetland Hardwoods classes is 2 acres.

Differentiating subclasses: The only subclass mapped in this data layer is [6191 Wet Melaleuca](#).

DUAL CODING CONVENTION

All of the 6190 classes are **Land Cover** classes. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

SIMILAR CLASSES

For more information:

See the PI key page for [6191 Wet Melaleuca](#) for more information.

6191 Wet Melaleuca

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6100 Wetland Hardwood Forests](#)

LEVEL 3: [6110 Bay Swamps](#)

LEVEL 4: **6191 Wet Melaleuca**

DESCRIPTION

This class includes Melaleuca found growing in wetland environments such as marshes and wet savannahs. It is also found in low areas and also can invade cypress swamps.

Melaleuca is capable of invading the zone between pine and cypress forests in southern Florida and of displacing the cypress trees.

KEYS TO PHOTOINTERPRETATION

- Melaleuca mainly invades sparsely-vegetated ecotones, prairies, marshes and fire-damaged forests.
- CIR signature is dark red, with narrow spike-like crowns, packed tightly together.
- Natural color is a dull grayish-green.
- Forms monotypic stands which are devoid of other vegetation and often impenetrable
- Context should be examined to distinguish this class from Melaleuca in upland situations.

CONTEXT

- **Landscape Position** - Melaleuca tolerates most subtropical ecosystems, preferring wet to intermittently wet sites and can survive extended flooding, moderate drought and some salinity.
- **Vegetation** - Melaleuca is the only species, to the exclusion of virtually all other species.
- **Soils** - Can be found on any disturbed soil in southern Florida.
- **Hydrology** - Ranges from areas with a seasonally low ground water level to those subject to seasonal flooding.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - Pines have more rounded, asymmetrical and "feathered" canopies.
- [4240 Melaleuca](#) - Occurs in upland areas.
- [4370 Australian Pine](#) - These have a fluffy, overlapping crown pattern; they overtower and crowd out other vegetation.

SPECIAL MAPPING CONVENTIONS

None

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/09/07

COORDINATES
403104.26 766365.55

6200

Wetland Coniferous Forests

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: **6200 Wetland Coniferous Forests**

DESCRIPTION

This is an active Level 2 class that should be applied only when one of the more specific Level 3 or Level 4 subclasses does not apply.

Wetland Coniferous Forests are wetlands whose canopy is at least 67% dominated by wetland coniferous species and are the result of natural generation.

KEYS TO PHOTOINTERPRETATION

- Over 67% of the canopy is composed of coniferous species adapted to grow in hydric soils.
- NRCS soils maps indicate hydric soils.
- See the Level 3 and Level 4 class pages for keys to interpreting these classes.

CONTEXT

- **Landscape Position** - Wetland coniferous forests can be found almost anywhere in the project area where hydric conditions exist and trees have not been cleared.
- **Vegetation** - Cypress and pines (both longleaf and slash pine) are the dominant coniferous species. Slash pine is the dominant pine in the southern portion of the District, where it is the only common pine. Water-tolerant hardwoods such as black gum, swamp tupelo and red maple may be seen in association with cypress. Cabbage palm may also be included in some areas.
- **Soils** - Soils range from the semi-permanent to permanent hydroperiods of cypress swamps to the sandy and acidic soils of pine flatwoods, which are subject to brief seasonal inundation or saturation.
- **Hydrology** - Hydrology ranges from semi-permanent flooding to brief seasonal inundation.

SIMILAR CLASSES

Wetland coniferous forests can appear similar to many of the Level 3 and Level 4 subclasses, depending on the species composition. See the respective key pages for more information on how to differentiate these classes.

SPECIAL MAPPING CONVENTIONS

Wetland sites that have been planted over with pine are considered both pine plantation (LUCODE = [4410](#) or [4430](#)) and wetland (LCCODE = [6250](#) or [6300](#)). The 1999 land cover maps, the District's wetlands vegetation maps and NRCS soils are useful as collateral data.

DUAL CODING CONVENTION

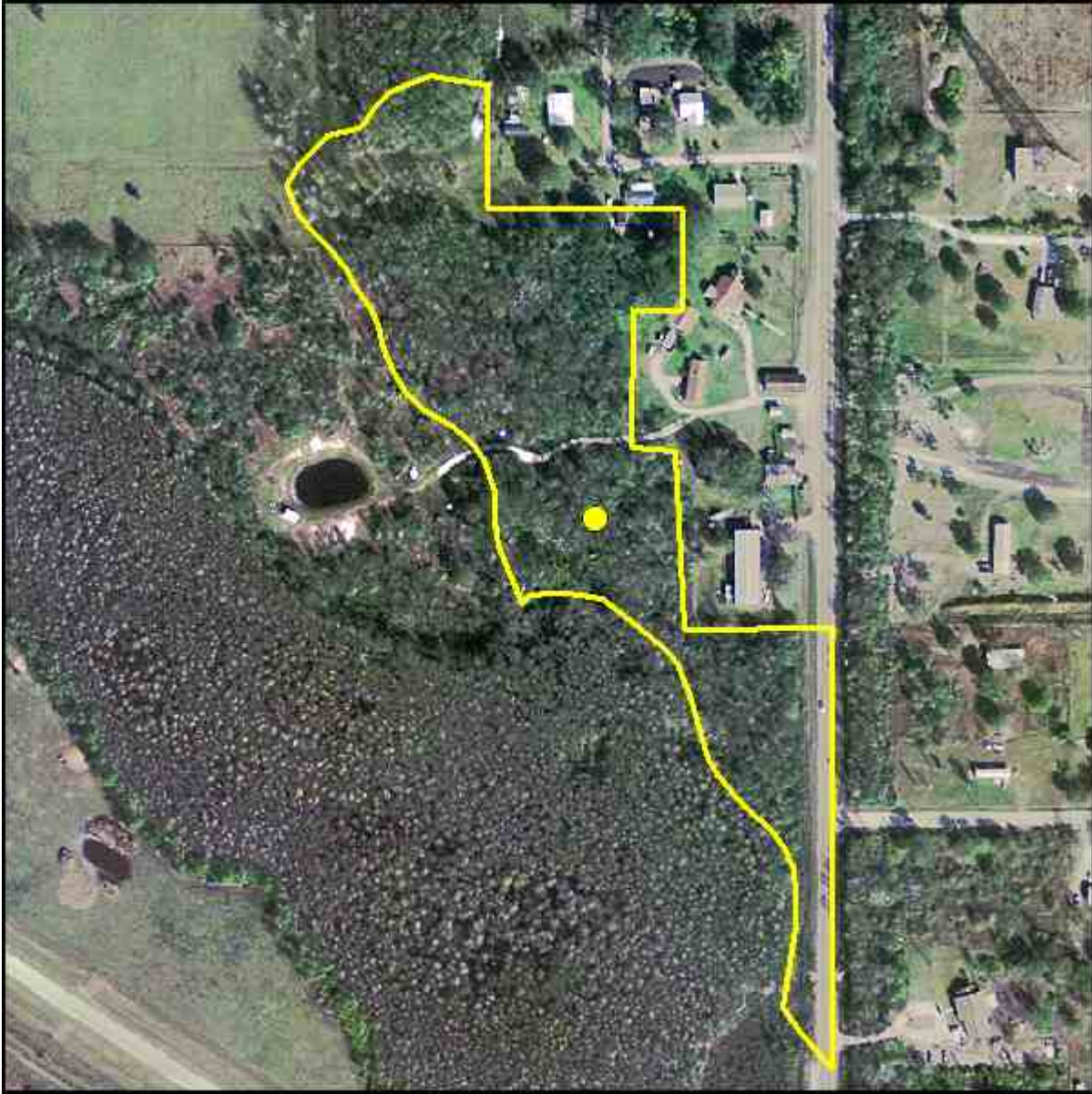
This is a **Land Cover** class. The LCCODE and LUCODE are usually the same. A separate **Land Use** code is not generally required. However, if the community is also a pine plantation then the LUCODE may be separately coded as [4410 Coniferous Plantation](#) or [4430 Forest Regeneration](#).

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

COLOR DOQQ IMAGE



FIELD PICTURE



DATE

10/17/07

COORDINATES

631190.76 1381577.83

6210 Cypress

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: **6210 Cypress**

DESCRIPTION

This class is for forested wetland communities in which pond cypress or bald cypress comprises over 67% of the forest canopy. In the case of pond cypress, common associates are swamp tupelo, slash pine and black titi. In the case of bald cypress, common associates are water tupelo, swamp cottonwood, red maple, American elm, pumpkin ash, Carolina ash, overcup oak and water hickory. Bald cypress may be associated with laurel and water oaks, sweet gum and sweet bay on drier sites.

Cypress trees are deciduous conifers with a long leaf-off cold period, making them relatively easy to identify with winter photography. Crowns are densely packed and pin-like, although some larger, broader individuals may protrude above the rest or in isolation. In domes and heads, the larger trees are towards the center and the center itself may be open water.

KEYS TO PHOTOINTERPRETATION

- Cypress species maintain at least a 67% dominance in the canopy. Tree crowns are usually tightly packed.
- Sites are flooded for long periods - typically 4 to 8 months in any given year.
- Usually grayish, or grayish-green (CIR), puffy signature - classic "Q-Tip" appearance.
- Spring CIR signature is often pink due to the regeneration of the cypress needles.
- Natural color is either green or brown depending on the season.
- Pine has a larger crown signature than cypress. Therefore, if an area appears to be evenly split between pine and cypress, there is actually more cypress than pine, and the polygon should be classified as 6210.

CONTEXT

- **Landscape Position** - Cypress is found in a variety of situations, but typically requires prolonged inundation and periodic dry spells. It occurs as cypress "domes" in depressions or in long linear drainages as cypress "strands". It may be present as a distinct community along the fringes of lakes or in bottomlands and floodplains associated with rivers. Cypress "heads" may also occur at the beginning of drainage ways. It can also be part of the mix of hardwood swamps or bay swamps wherever they occur.
Note: Cypress occurring in "domes" or "heads" is classified at Level 4 as [6215](#).
- **Vegetation** - Clearly dominated by cypress, either pond or bald. Other species (water tolerant hardwoods) such as black gum, swamp tupelo, red maple, American elm, pumpkin ash, Carolina ash, overcup oak and water hickory may be present as associates but these must not comprise more than 33% of the system. Drier sites may include laurel and water oaks, sweet gum and bays.
- **Soils** - Variable but generally poorly or very poorly drained. Soils are very poorly drained and high in organics with a peat layer of varying thickness on the surface.
- **Hydrology** - Hydroperiods are semi-permanent to permanent in the center of domes and swamps. There are also deep, prolonged seasonal hydro-periods (e.g. next to rivers).

SIMILAR CLASSES

- [6170 Mixed Wetland Hardwoods](#) - Signatures range from blue-gray to light pink with a variety of crown types.
- [6215 Cypress-Domes/Heads](#) - Similar signatures but are isolated as round or 'teardrop' domes rather than part of a drainage.
- [6216 Cypress-Mixed hardwoods](#) - Cypress comprises less than 33% of the canopy.
- [6300 Wetland Forested Mixed](#) - A wide variety of textures and crown types, depending on species.

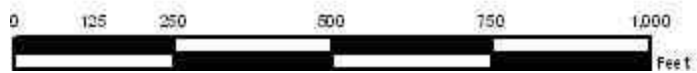
SPECIAL MAPPING CONVENTIONS

Fringes of cypress community as narrow as 30 feet wide should be mapped, if they meet minimum mapping units.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE

10/15/07

COORDINATES

452604.89 704694.40

6215

Cypress - Domes/Heads

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: [6210 Cypress](#)

LEVEL 4: **6215 Cypress - Domes/Heads**

DESCRIPTION

Cypress Domes are circular cypress swamps that have developed around a sinkhole. Frequently situated in an open marsh or pineland, the characteristic dome-shaped appearance of this type of cypress swamp is apparent. These areas are generally small - about 2 to 10 acres.

Shape is very important in recognizing domes; they are oval-shaped in the Everglades and round on floodplains or in pinelands.

This class also includes cypress heads, which are those cypress ponds (or domes) that typically occur at the head of long linear drainages, sometimes referred to as "strands".

KEYS TO PHOTOINTERPRETATION

- Cypress Domes have a distinct dome-shaped appearance.
- Cypress Heads are at the beginning or at the end of drainageways.
- Cypress species maintain at least a 67% dominance in the canopy. Crowns are not typically tight; their nature is to have dense stems and a loose canopy.
- Sites are often flooded for long periods.
- Usually grayish or grayish-green (CIR), puffy signature - classic "Q-Tip" appearance.
- Natural color either green or brown depending on the season.
- Spring CIR signature is often pink due to the regeneration of the cypress needles.

CONTEXT

- **Landscape Position** - Cypress domes are generally isolated on the landscape, even if located inside a larger drainage system. Cypress heads occur at the beginning or end of drainage ways.
- **Vegetation** - Clearly dominated by cypress, either pond or bald. Other species (water tolerant hardwoods) such as black gum, swamp tupelo, red maple, American elm, pumpkin ash, Carolina ash, overcup oak and water hickory may be present as associates but these must not comprise more than 33% of the system. Drier sites may include laurel and water oaks, sweet gum and bays.
- **Soils** - Variable but generally poorly or very poorly drained. Soils are very poorly drained and high in organics with a peat layer of varying thickness on the surface.
- **Hydrology** - Hydroperiods are semi-permanent to permanent in the center of domes and swamps.

SIMILAR CLASSES

- [6210 Cypress](#) - Cypress swamps consist of a larger drainage system which may have cypress domes within its boundaries.

- [6250 Wet Pinelands-Hydric Pine](#) - Generally brick-red signature; understory of grasses and at times, shrubs
- [6300 Wetland Forested Mixed](#) - A wide variety of textures and crown types, depending on species

SPECIAL MAPPING CONVENTIONS

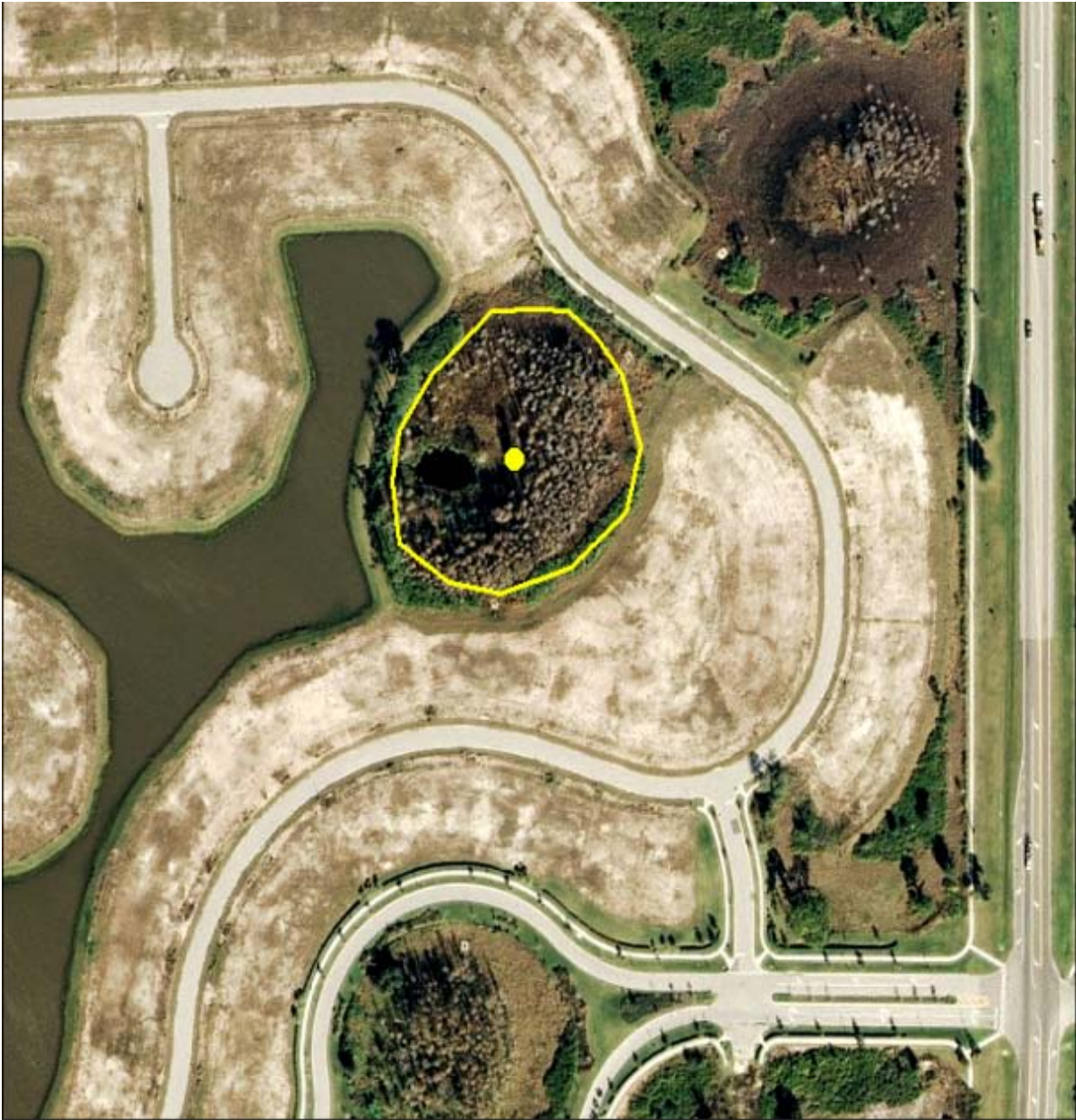
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/07/07

COORDINATES
503759.08 1389524.56

6216

Cypress - Mixed Hardwoods

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: [6210 Cypress](#)

LEVEL 4: **6216 Cypress - Mixed Hardwoods**

DESCRIPTION

This class is for forested wetland communities in which neither cypress nor hardwood species achieve a 67% dominance of the crown canopy composition.

Cypress must comprise 25% or more of the crown canopy composition for use of this class.

KEYS TO PHOTOINTERPRETATION

- Cypress crowns are usually tightly packed.
- Cypress has grayish or grayish-green (CIR), puffy signature - classic "Q-Tip" appearance.
- Spring CIR signature is often pink due to the regeneration of the cypress needles.
- Cypress natural color is either green or brown depending on the season.
- Hardwood CIR signatures range from blue-gray, bright red to light pink, indicating a wide variety of species.
- A number of different hardwood types are included in this class, with a broad range of signatures depending on species composition.

CONTEXT

- **Landscape Position** - Cypress is found in a variety of situations, but typically requires prolonged inundation and periodic dry spells. It occurs as cypress "domes" in depressions or in long linear drainages as cypress "strands". It may be present as a distinct community along the fringes of lakes or in bottomlands and floodplains associated with rivers. Cypress "heads" may also occur at the beginning of drainage ways. It can also be part of the mix of hardwood swamps or bay swamps wherever they occur. **Note:** Cypress occurring in "domes" or "heads" is classified at Level 4 as 6215. Hardwood forests can occur on a range of different landforms, including floodplains, basins, depressions, lake and coastal fringes, and disturbed wet sites.
- **Vegetation** - A mixture of cypress, either pond or bald, and water tolerant hardwoods such as black gum, swamp tupelo, red maple, American elm, pumpkin ash, Carolina ash, overcup oak and water hickory. These hardwood species must not comprise more than 67% of the system. Drier sites may include laurel and water oaks, sweet gum and bays.
- **Soils** - Variable but generally poorly or very poorly drained. Soils are very poorly drained and high in organics with a peat layer of varying thickness on the surface.
- **Hydrology** - Wetness in these communities ranges from temporary inundation through long term semi-permanent to permanent flooding.

SIMILAR CLASSES

- [6170 Mixed Wetland Hardwoods](#) - Hardwoods are dominant and cypress comprises less than 25% of the canopy.
- [6210 Cypress](#) - Cypress is dominant and hardwoods or other species comprise less than 33% of the canopy.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

COLOR DOQQ IMAGE



FIELD PICTURE



DATE
10/15/07

COORDINATES
453867.53 699055.00

6240 Cypress - Pine - Cabbage Palm

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: **6240 Cypress - Pine - Cabbage Palm**

DESCRIPTION

This class includes cypress and/or pine found with cabbage palm in combinations where none of the three species achieves dominance.

Although not strictly a wetlands community, it forms a transition between moist upland and hydric sites.

NOTE: See Special Mapping Conventions for this class.

KEYS TO PHOTOINTERPRETATION

- Cypress is characterized by narrow, densely-packed crowns producing a "pin like" look and grayish or grayish-green color (CIR) due to its deciduous nature.
- Pines are characterized by rounded asymmetrical and "feathered" brick-red canopies (CIR). Individual trees are visible.
- Cabbage Palm is characterized by "lollipop" shaped tree crowns of pinkish-red to washed-out red color (on CIR).

CONTEXT

- **Landscape Position** - This class is transitional between pine flatwoods, marshes and cypress in the Big Cypress Area and between pine rocklands and marshes in the Everglades. It also occupies upper floodplains of South Florida rivers and streams.
- **Vegetation** - This community includes cypress, pine and/or cabbage palms in combinations in which neither species achieves dominance.
- **Soils** - These communities occur on poorly drained fine sands. Some have high amounts of organic material present in the surface layer.
- **Hydrology** - Although not strictly a wetland community, it forms a transition between moist upland and hydric sites.

SIMILAR CLASSES

- [6300 Wetland Forest Mixed](#) - Conifers are not predominant.

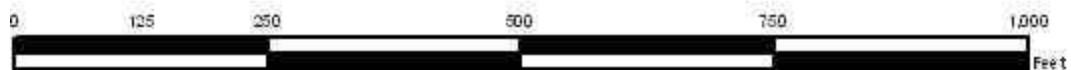
SPECIAL MAPPING CONVENTIONS

Cabbage palm is the indicator species for use of this class. All three species need not be present; however, Cabbage palm must be present for use of this class.

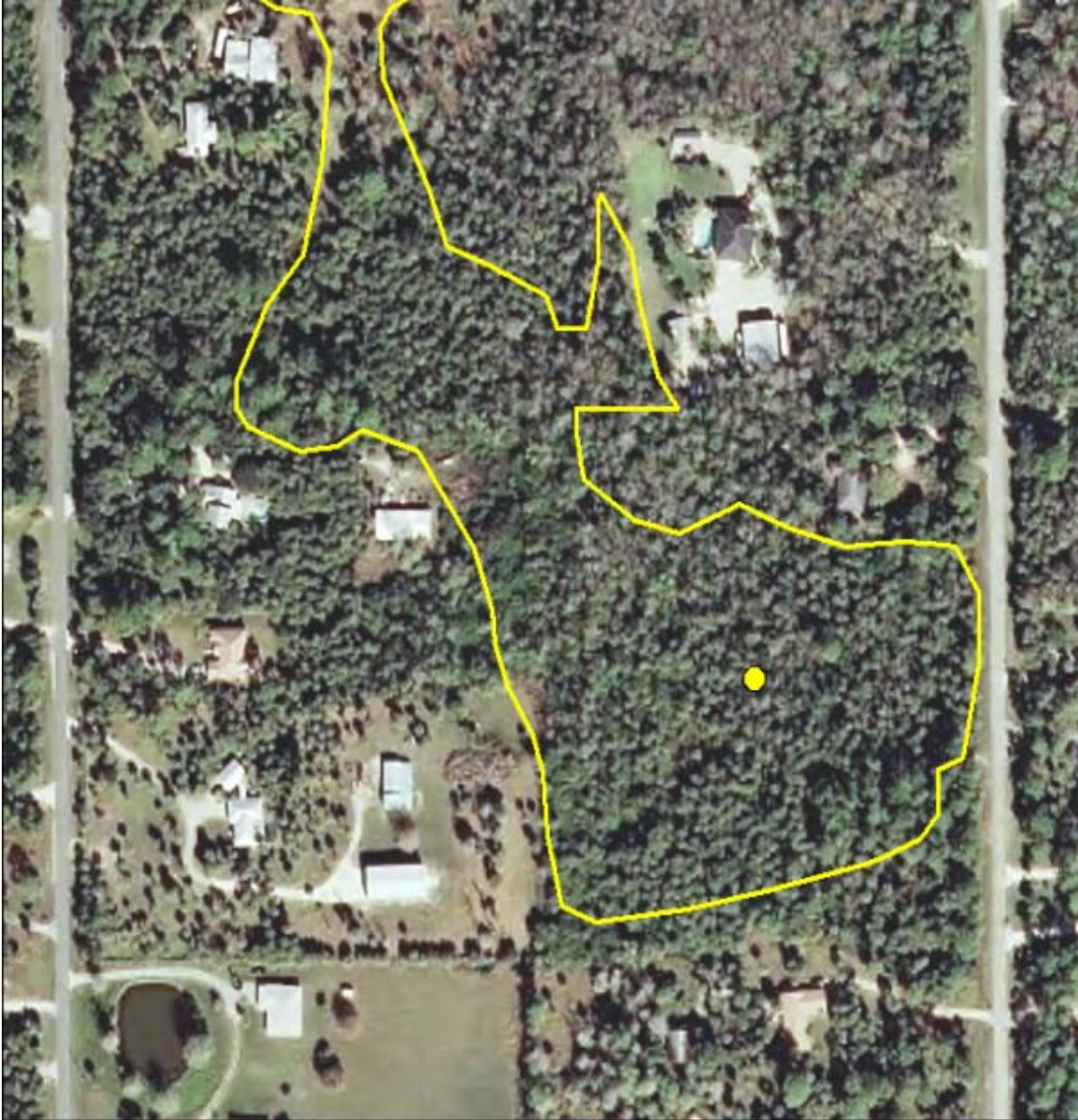
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
450950.97 692976.77

6250

Wet Pinelands - Hydric Pine

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: **6240 Wet Pinelands - Hydric Pine**

DESCRIPTION

This class is for wetland coniferous forests with a **sparse to moderate** canopy of longleaf and/or slash pine.

The "sparse to moderate" tree canopy of this class is defined as a crown canopy closure of 25% or more.

It may be naturally generated or the result of pine plantations that are planted in rows through flatwoods depressions. The understory is grasses, wiregrass, forbs and sometimes sparse saw palmetto. If the wetland pine community is part of a pine plantation (with rows evident), a land use code of either [4410 Coniferous Plantation](#) or [4430 Forest Regeneration](#) is required, in addition to the 6250 land cover code.

Hydric pinelands appear similar to mesic pine communities, but on careful inspection show decreased vigor and height. The high water table favors hydrophytic shrubs, grasses and herbs, and inhibits the establishment of saw palmetto, gallberry and other typical upland species. Understories are comprised mostly of grasses, with subdued color tones and surface water is sometimes visible. In the absence of fire, species such as loblolly bay may be visible in the understory, imparting a bright reddish tone.

KEYS TO PHOTOINTERPRETATION

- Over 67% of the canopy is composed of coniferous pine species adapted to grow in hydric soils.
- NRCS soils maps indicate hydric soils.
- Color tones on CIR are brick-red, similar to uplands pine, but lack brightness due to decreased vigor. In wetlands the trees tend to be more widely spaced and appear somewhat stunted or ragged.

CONTEXT

- **Landscape Position** - This community can be found almost anywhere in the project area where hydric conditions exist and trees have not been cleared.
- **Vegetation** - Slash pine is the dominant tree species, especially in the southern part of the District, where it is the only common pine; understory consists of grasses, wiregrass, forbs and sometimes sparse saw palmetto.
- **Soils** - Soils are usually sandy and acidic, underlain by hardpan and subject to brief seasonal inundation or prolonged soil saturation.
- **Hydrology** - Surface water may be visible following heavy rains.

SIMILAR CLASSES

- [4110 Pine Flatwoods](#) - Usually a lighter understory with saw palmetto and other upland shrubs.

- [6260 Pine Savannah](#) - The crown canopy closure is less than 25%.
- [6300 Wetland Forest Mixed](#) - Conifers are not predominant.

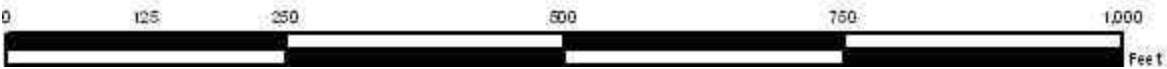
SPECIAL MAPPING CONVENTIONS

Wetland sites that have been planted over with pine are considered both pine plantation (LUCODE = [4410](#) or [4430](#)) and wetland (LCCODE = 6250). The 1999 land cover maps and NRCS soils are useful as collateral data.

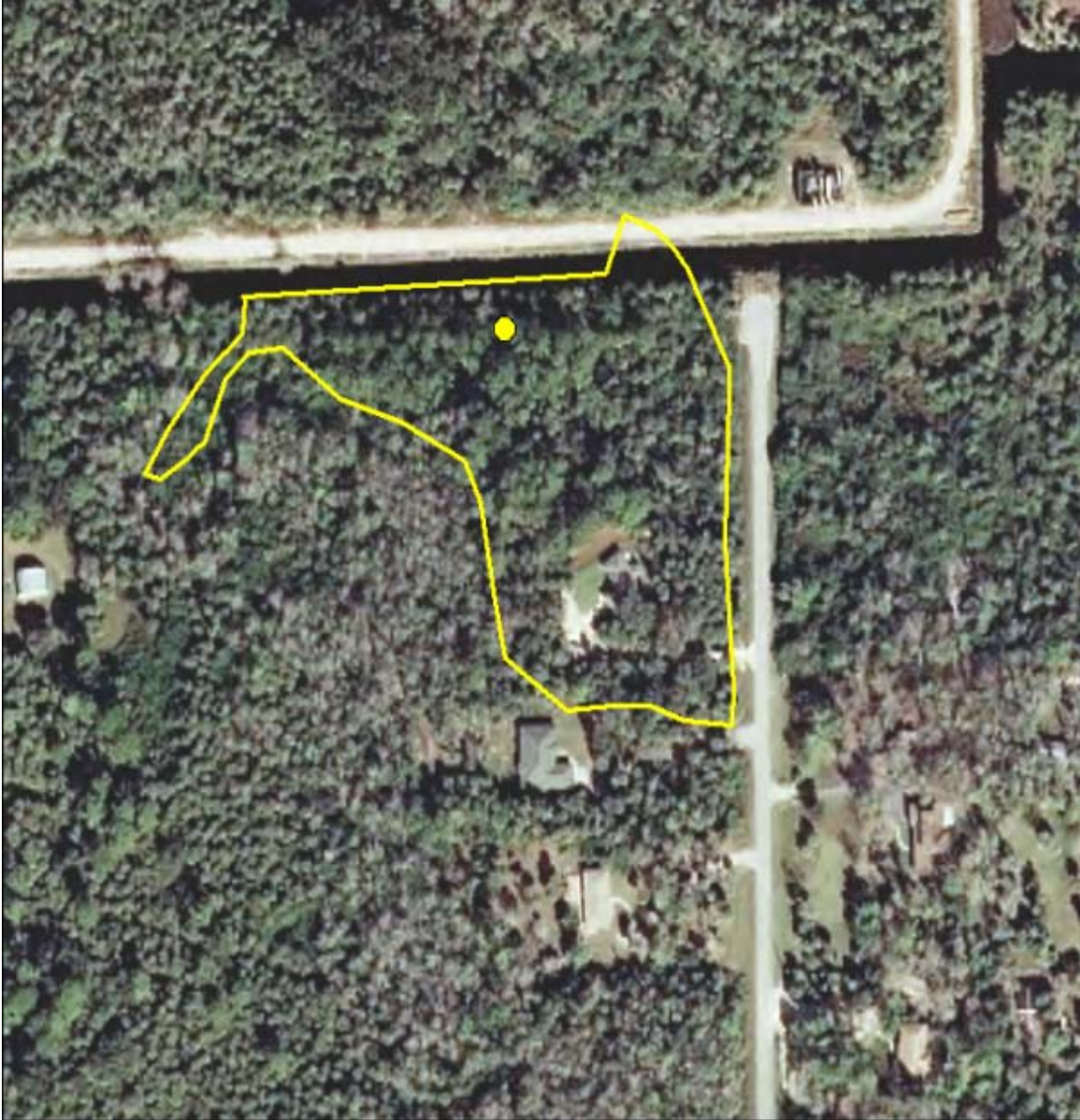
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required, except in the case of plantations, as noted above.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
450952.48 695326.70

6260 Pine Savannah

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6200 Wetland Coniferous Forests](#)

LEVEL 3: **6260 Pine Savannah**

DESCRIPTION

This class includes wetland coniferous forests with a **sparse** canopy of longleaf and/or slash pine. The understory is grasses, wiregrass, forbs and wetland shrubs.

Pine savannahs are a community intermediate between grassland and forest. They are used extensively for cattle grazing.

The "sparse" tree canopy of this class is defined as a crown canopy closure of 10% or more, but not more than 25%.

KEYS TO PHOTOINTERPRETATION

- At least 10% (but less than 25%) of the canopy is composed of coniferous pine species adapted to grow in hydric soils.
- NRCS soils maps indicate hydric soils.
- Color tones on CIR are brick-red, similar to uplands pine, but lack brightness due to decreased vigor. In wetlands the trees tend to be more widely spaced and appear somewhat stunted or ragged.

CONTEXT

- **Landscape Position** - This community can be found almost anywhere in the project area where hydric conditions exist and trees have not been cleared.
- **Vegetation** - Slash pine is the dominant tree species, especially in the southern portion of the District, where it is the only common pine; understory consists of grasses, wiregrass, forbs and sometimes sparse saw palmetto.
- **Soils** - Soils are usually sandy and acidic, underlain by hardpan and subject to brief seasonal inundation or prolonged soil saturation.
- **Hydrology** - Surface water may be visible following heavy rains.

SIMILAR CLASSES

- [2130 Woodland Pasture](#) - Evidence of cattle grazing within Pine Flatwoods.
- [4110 Pine Flatwoods](#) - Usually a lighter understory with saw palmetto and other upland shrubs.
- [6250 Wet Pinelands](#) - Hydric Pine - The crown canopy closure is greater than 25%.
- [6300 Wetland Forest Mixed](#) - Neither hardwoods nor evergreen conifers achieve a 67% crown canopy dominance.

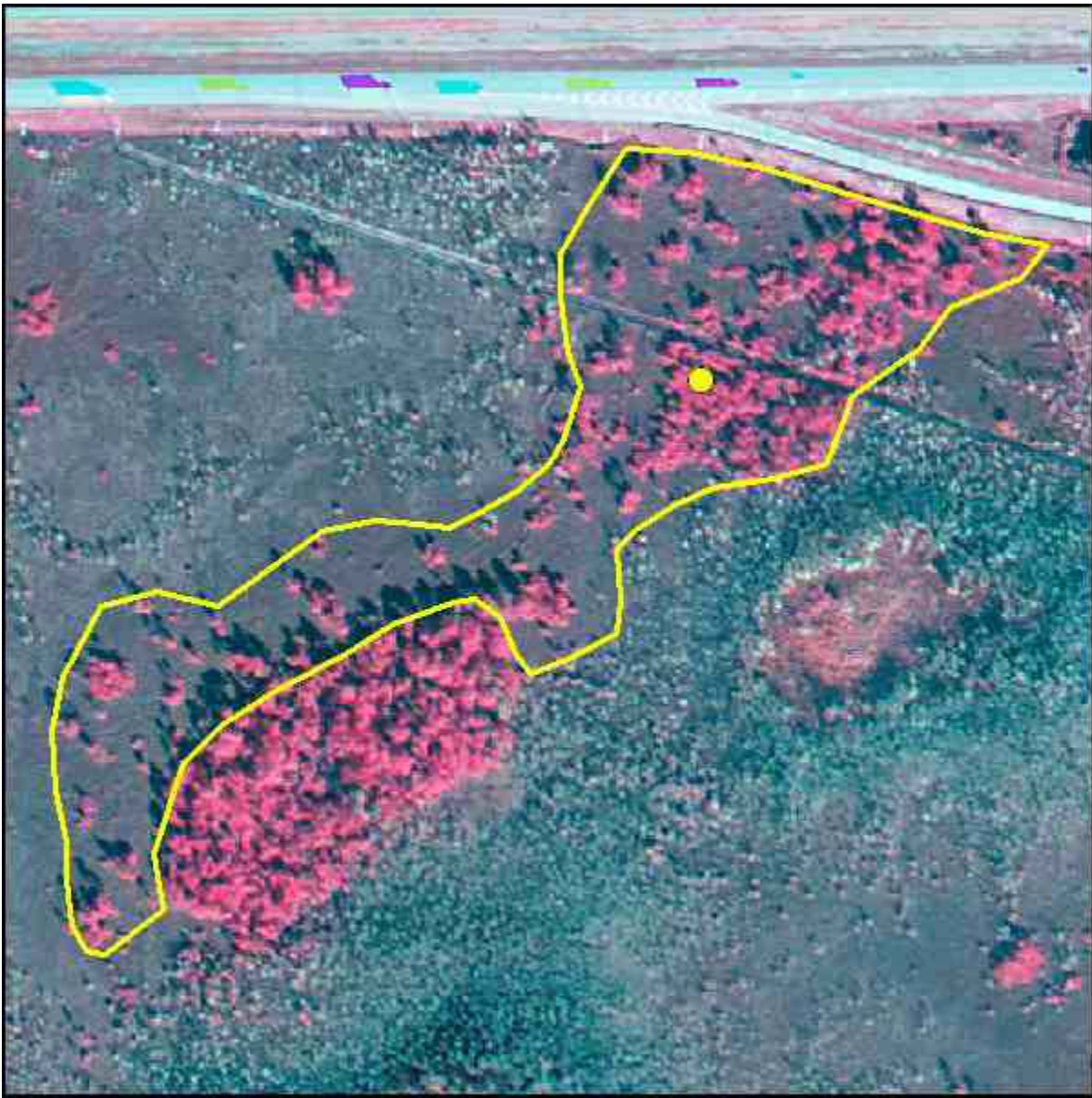
SPECIAL MAPPING CONVENTIONS

Note: This class is an exception to the general crown canopy requirements for Forest classes - (25% for inclusion in a Forest class and 67% dominance of a particular species to be assigned to that species class). Only 10% crown canopy closure is required for inclusion in this class, since a sparse tree canopy is a defining feature of this class.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
591065.01 665993.95

6300

Wetland Forested Mixed

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: **6300 Wetland Forested Mixed**

DESCRIPTION

This class is used for wetland forested communities in which neither hardwoods nor evergreen conifers achieve a 67% dominance of the crown canopy composition, and where no other more specific [6100 Wetland Hardwood Forests](#) or [6200 Wetland Coniferous Forests](#) class applies.

Mixed wetland forests occur on a wide variety of soil moisture conditions, from permanently wet to seasonally or infrequently wet.

A combination of hardwoods and evergreen conifers can occur in nearly all the foregoing forested wetlands communities, including cypress, bay swamps, hardwood swamps, hammocks, depressions, floodplains and bottomlands. It is not possible to describe a context that is representative.

The signatures will vary widely depending on which combination of trees and understory species make up the mixture.

KEYS TO PHOTOINTERPRETATION

- Forested systems composed of a mixture of hardwoods and evergreen conifers in which neither species achieves greater than 67% dominance.
- Species may include a mixture of deciduous and evergreen tree species such as black gum, red maple, water oak, cabbage palm, bay trees and evergreen conifers adapted to wet environments.
- Will usually exhibit a variety of textures and crown types depending on species present.
- Open water or water staining may be evident where canopy is open.
- Seasonality is an influence on photo signature, as hardwoods reflect dormancy in winter months.

CONTEXT

- **Landscape Position** - This community could occur in almost any slightly lowered position of the landscape where sufficient moisture exists to support hydrophytic vegetation.
- **Vegetation** - Dominated by an "even" mixture of hardwoods and cypress. Neither cypress nor the hardwoods achieve 67% cover.
- **Soils** - Generally found on mineral soils.
- **Hydrology** - Hydroperiod is variable in this type due to the wide range of species mixtures which can occur within this land cover type. Typical conditions will likely be temporary to seasonal inundation, however.

SIMILAR CLASSES

- [4340 Upland Mixed Coniferous/Hardwood](#) - These forests occur in upland environments, without the conditions to support wetland species.

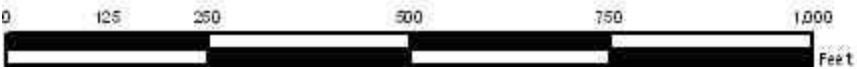
- [6100 Wetland Hardwood Forests](#) (except mangroves) - These forests are dominated by hardwood species and while conifers may be present, they do not achieve more than a 33% crown canopy closure.
- [6200 Wetland Coniferous Forests](#) - These forests are dominated by coniferous species and while hardwoods may be present, they do not achieve more than a 33% crown canopy closure.

SPECIAL MAPPING CONVENTIONS

These communities are likely to be complex mixtures of different species. Individual plants or trees may be dispersed in a matrix or grouped in patches. If distinct patches of any class are greater than 2 acres, they are broken out separately. In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit. PI's must use discretion to accurately characterize the communities but avoid excessive linework.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
509824.85 1262507.15

6400

Vegetated Non-Forested Wetlands

This Level 2 class is not used in the map itself - a more specific subclass must be selected. The Level 3 subclasses are:

6410 Freshwater Marshes/Graminoid Prairie-Marsh
6420 Saltwater Marshes/Halophytic Herbaceous Prairie
6440 Emergent Aquatic Vegetation

BACKGROUND

Vegetated, non-forested wetlands include marshes and seasonably flooded basins and meadows. These communities usually occur on level, low-lying areas. Sawgrass and cattail are the predominant species in freshwater marshes while spartina and needlerush are the predominant species in the saltwater marsh communities.

To be non-forested, the tree canopy closure must be less than 25%. Trees are defined as woody plants that are over 20 feet in height.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit (MMU) for wetlands and water bodies is 2 acres. Upland areas that occur as "islands" within wetlands systems are broken out down to 2 acres. Adjacent uplands obey the standard MMU of 5 acres, unless otherwise defined.

Differentiating subclasses: The 4 subclasses are defined by their respective characteristic plant species. The communities can only be identified by the signatures of individual species, rather than by the general colors, textures and patterns. This generally requires extensive experience in the field comparing features against the photography. There is substantial room for confusion based on the similar signatures that these subclasses present. The problem is addressed with experience, ancillary data, magnified stereo viewing of imagery and field checking.

See the PI keys for each of the subclasses for indicators that assist in differentiation.

DUAL CODING CONVENTION

All of the 6400 classes are **Land Cover** classes that do not normally require a separate dual code - LCCODE and LUCODE are normally the same. However, in rare cases, a separate **Land Use** code is required. Relevant examples are marshes on reclaimed and abandoned mining areas, which may require separate dual coding. Wetlands that are also pine plantations or forest regeneration areas are dual coded accordingly, with the wetland code always assigned to the LCCODE field.

SIMILAR CLASSES

The most common source of confusion with this class is between non-forested wetlands and water bodies. In general, the PI is required to map the area as it appears on the source photography. If there is a black return without sign of emergent vegetation a water class would be applied. Since the conditions can change rapidly in flat terrains, this causes some inconsistencies between different maps and can only be considered a "snapshot" of the hydrologic regime in many cases.

In view of the ephemeral nature of water bodies and the complex intermixtures of signature, it is not always cost effective to delineate every minute boundary. Some aggregation often presents a more accurate and more useful model for users.

Another source of confusion is that between wet prairies and uplands pastures. These may be difficult to determine on photography and collateral data such as NRCS soils is likely to be helpful.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

6410

Freshwater Marshes/Graminoid Prairie-Marsh

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6400 Vegetated Non-Forested Wetlands](#)

LEVEL 3: **6410 Freshwater Marshes/Graminoid Prairie-Marsh**

DESCRIPTION

This class is used for wetlands communities characterized by herbaceous plant species that occur on sites where surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years.

Freshwater marshes tend to be open expanses of grasses, sedges, rushes and other types of herbaceous plants. Periods of inundation are intermediate between deep marshes ([6440 Emergent Aquatic Vegetation](#)) and wet prairies - sites are usually covered with water at least two months of the year and undergo prolonged periods of soil saturation.

This category also includes marl prairies of the Everglades.

Due to the scale of photography and similarity of code definitions, it has been determined that Wet Prairies (6430) and Freshwater Marshes / Graminoid Prairie-Marsh (6410) be combined into one class as 6410.

KEYS TO PHOTOINTERPRETATION

- Signatures are very diverse, as a result of the variety of plant assemblages and land forms that make up freshwater marshes. Mono-cultures of sawgrass or cattail have smooth, uniform signatures. More diverse, non-graminoid communities may have more patchy and irregular signatures with a variety of height, colors and textures.
- Scattered shrubs and trees may be present, especially on drier sites and in the absence of fires.
- The sites typically have a coarse textured organic surface soil over soft organic muck substrates. NRCS soils maps indicate muck soils.

CONTEXT

- **Landscape Position** - Marshes are usually encountered along rivers, streams or lakes in floodplain situations. They also occur in depressional situations with water supplied by rainfall or groundwater. Basin marshes are often former lake or pond systems which are progressing along the ecological process to a drier community. Many of these communities are found within pasture settings. This category also includes marl prairies of the Everglades which are vegetated by beak rush, spike rush, periphytons and algal mats in shallow water.
- **Vegetation** - Dominated by herbaceous vegetation including pickerelweed, arrowhead, maidencane, common reed, arrowroot, switch grass, cordgrass and bulrush.
- **Soils** - Very poorly drained, mineral or organic.
- **Hydrology** - These communities are seasonally to permanently flooded and many only dry out during extended droughts.

SIMILAR CLASSES

- **4430 Forest Regeneration** - Wet areas with marsh-like signatures are often observed where land has been cleared for pine plantations. These areas are not identified as 6410 unless the natural vegetation is still present.
- **5000 Water** - High water conditions at the time of photography may cover over the emergent vegetation in some marsh systems. These areas are coded as water bodies, even though collateral data may identify them as 6410 Freshwater Marshes, due to their open water signature at the time of photography.
- **6440 Emergent Aquatic Vegetation** - Signatures are variable, including bright pinks or mottled reds and grays, depending on species

SPECIAL MAPPING CONVENTIONS

Areas dominated by sawgrass are included in this class, unless they are 10 acres in size or greater, in which case they are mapped at Level 4 as **6411 Freshwater Marsh - Sawgrass**.

Where other freshwater marsh species are observed in a larger sawgrass community, the freshwater marsh portion is not delineated separately unless it is greater than 10 acres.

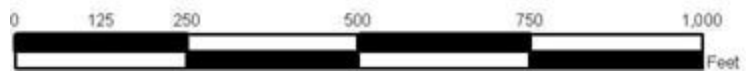
Marshes may have a complex, patchy distribution of different species groups, open water and other communities. In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit. The map should accurately characterize the communities but avoid excessive linework.

To avoid excessively complex delineation where other freshwater marsh species are intermixed with sawgrass, specifically in the Everglades sawgrass and marl prairie communities, vegetation dominance for the area will be determined and the appropriate code applied. Where the sawgrass component of the mixed community is less than 67% cover, the polygon will be coded **6410 Freshwater Marshes/Graminoid Prairie Marsh**.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
01/09/07

COORDINATES
561699.32 840197.79

6411

Freshwater Marshes - Sawgrass

LEVEL 1: 6000 Wetlands

LEVEL 2: 6400 Vegetated Non-Forested Wetlands

LEVEL 3: 6410 - Freshwater Marshes/Graminoid Prairie - Marsh

LEVEL 4: 6411 - Freshwater Marshes - Sawgrass

DESCRIPTION

Sawgrass marsh is widespread in Florida and is the predominant species in the Everglades, accounting for 70% of the landscape. The nearly total dominance of this species over such a large area is one of the distinguishing features of the Everglades.

It grows equally well in water several feet deep and on moist ground several feet above the water table.

Sawgrass may exceed 10 feet in height and form an impenetrable mass. Two categories of sawgrass are recognizable: dense and sparse. The dense type occurs on higher ground, and although it appears monotypic, it may include small areas of other tall emergents such as cattail, ferns, and small shrubs.

The transition between dense sawgrass and adjacent marsh communities is often sharply defined, probably owing to fire effects. Sparse sawgrass usually occurs at lower elevations.

KEYS TO PHOTOINTERPRETATION

- Produces a smooth pinkish-beige CIR signature, often in a circular pattern with a whitish ring around the edges.
- In larger marshes the circular pattern is usually absent and patches of open water, floating aquatic vegetation or other marsh vegetation may be visible as white, whitish-pink, pinks and reds on CIR.
- The pinkish-beige sawgrass CIR signature must predominate for this code to be applied.

CONTEXT

- **Landscape Position** - Sawgrass marshes may be found in either freshwater coastal or inland situations. Unlike cattail, sawgrass is seldom found in highly disturbed situations. More natural marshes and the centers of deeper wet prairies in more remote areas often contain sawgrass. Large expanses of sawgrass are found in the Everglades.
- **Vegetation** - Sawgrass is the dominant species in this community to the virtual exclusion of all other vegetation.
- **Soils** - Very poorly drained, mineral or organic; sometimes over limestone outcrops as in the Everglades.
- **Hydrology** - These communities are typically inundated on a seasonal basis, but may even be permanently flooded. Most examples will be either dry or saturated by the end of the growing season, but some only dry out during extended droughts. In larger marshes, slowly flowing water may be present over very large areas. The flow rate in such situations is usually so slow as to be imperceptible.

SIMILAR CLASSES

- [6410 Freshwater Marshes/Graminoid Prairie-Marsh](#) - Signatures are more diverse, reflecting a greater variety of species.
- [6440 Emergent Aquatic Vegetation](#) - Bright pink or mottled red, gray or purple signatures, often with a "shiny" appearance on the photo.

SPECIAL MAPPING CONVENTIONS

Areas dominated by other freshwater marsh species are included in this class, unless they are 10 acres in size or greater, in which case they are mapped at Level 3 as [6410 Freshwater Marshes/Graminoid Prairie](#).

Where sawgrass is observed in a larger freshwater marsh of mixed species, the sawgrass portion is not delineated separately **unless it is greater than 10 acres**.

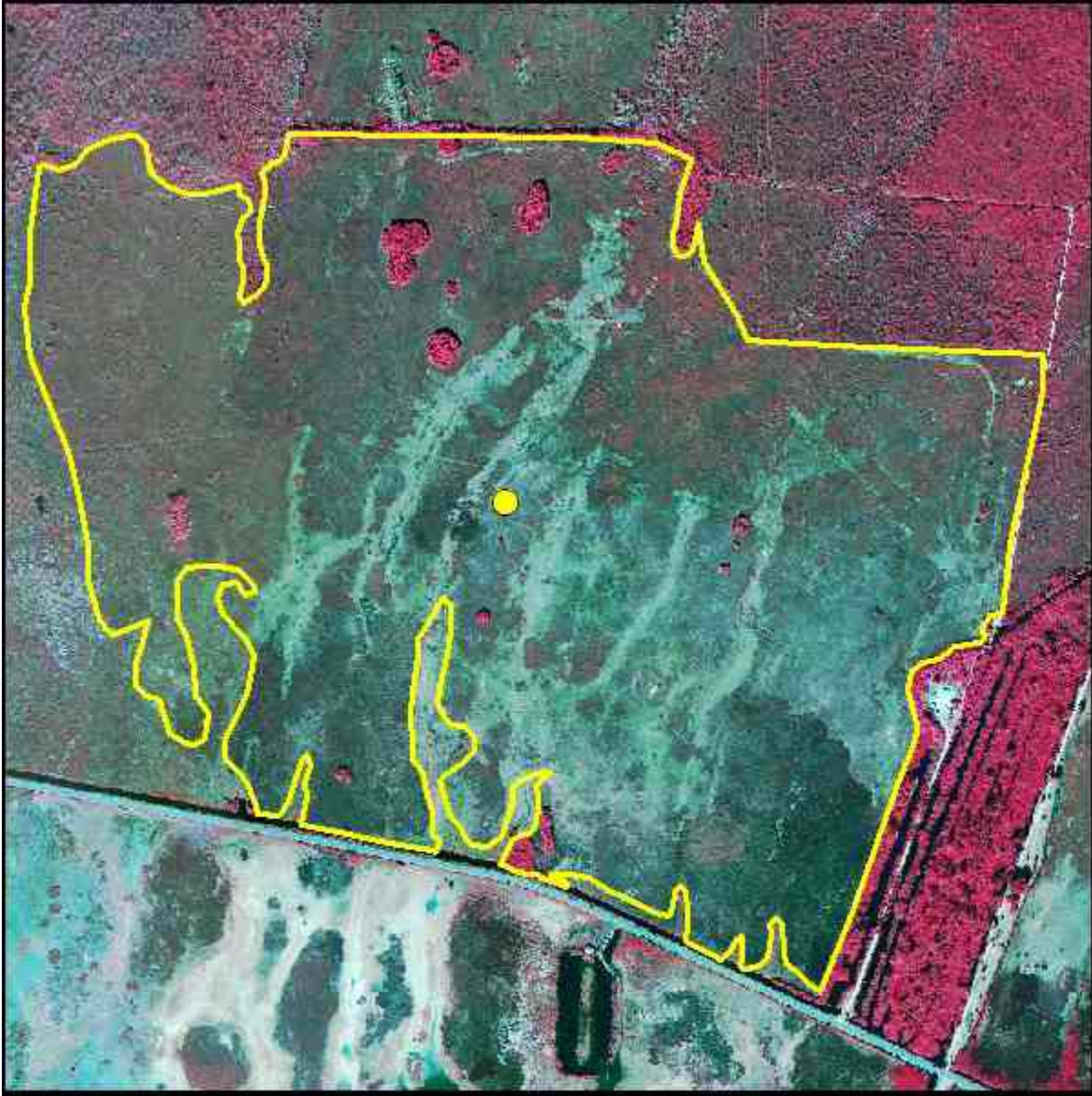
Sawgrass communities within the Everglades may be intermixed with marl prairie, which is addressed within the [6410 Freshwater Marshes/Graminoid Prairie-Marsh](#) class. In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases, intermixed community classes will be assigned and mapped at a larger unit. The map should accurately characterize the communities but avoid excessive linework.

To avoid excessively complex delineation where sawgrass is intermixed with other freshwater marsh species, specifically in the Everglades sawgrass and marl prairie communities, vegetation dominance for the area will be determined and the appropriate code applied. Sawgrass equal to 67% or greater cover will be coded 6411 Freshwater Marshes - Sawgrass.

DUAL CODING CONVENTION

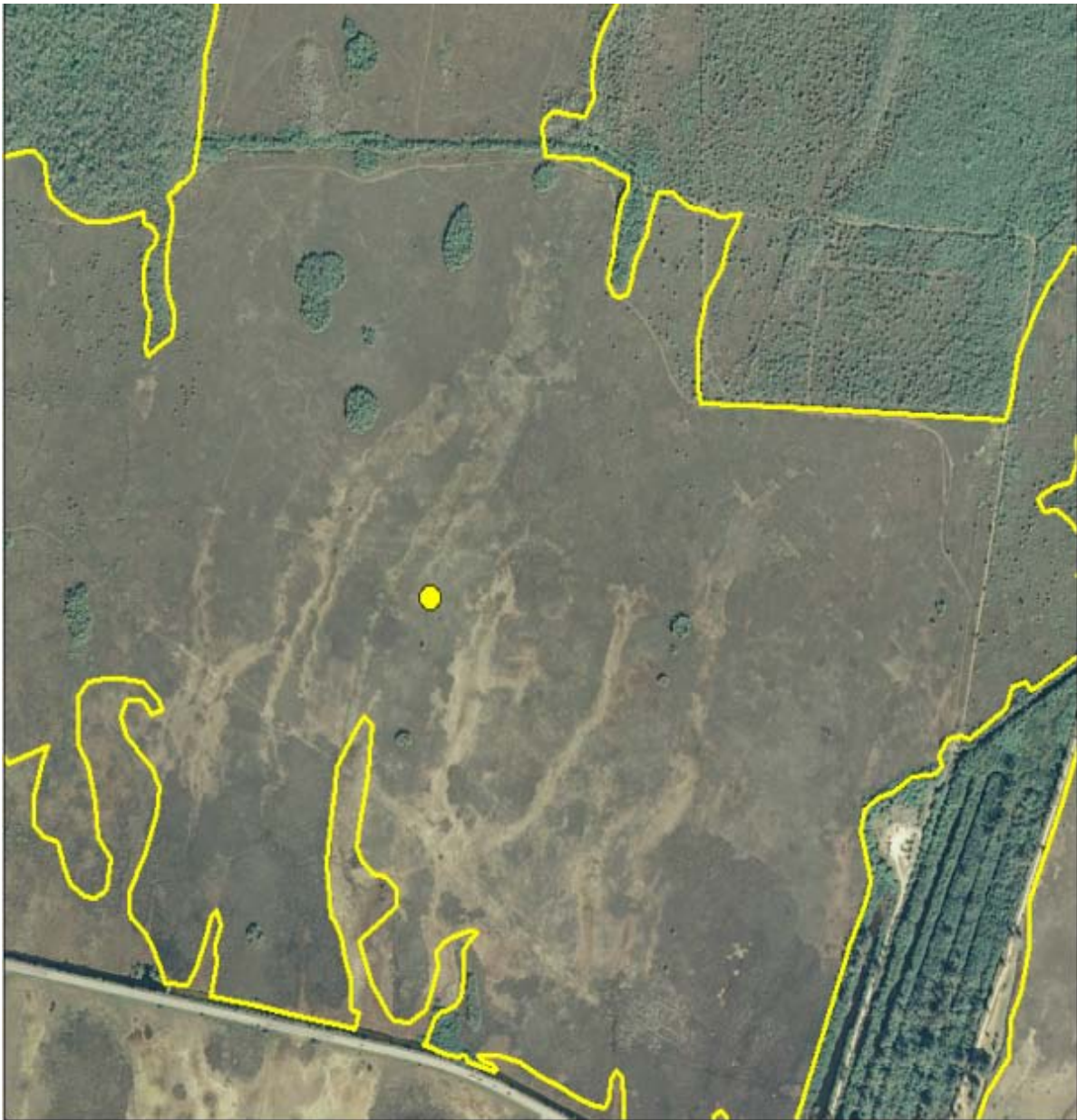
This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
531537.90 577786.99

6420

Saltwater Marshes/Halophytic Herbaceous Prairie

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6400 Vegetated Non-Forested Wetlands](#)

LEVEL 3: **6420 Saltwater Marshes/Halophytic Herbaceous Prairie**

DESCRIPTION

This class is used for wetlands communities of non-woody, salt-tolerant plants occupying intertidal zones that are at least occasionally inundated with salt water. They exist at the interface of land and marine waters, wherever wave energy is sufficiently low to allow their development and where mangrove trees are not dense enough to shade out the characteristic vegetation.

Within these constraints, the areal extent of saltwater marshes is determined in large part by the size of the intertidal zone. Regions of low relief and high tidal range are likely to have extensive salt marshes.

Note: The saltwater marsh is an early successional community in South Florida. These areas are generally taken over by mangroves, especially within mosquito impoundments.

KEYS TO PHOTOINTERPRETATION

- Marshes present a smooth textured appearance with vegetation generally below 3 feet. Color tones are greenish to whitish-green (CIR), varying with predominant species.
- A distinct watershed and network of drainage creeks (tidal channels) is often present.
- A bare, whitish area, or "salt pan" may be visible in flatter areas near the landward limit of salt marshes.
- Some dikes may be visible. Large areas have been impounded for mosquito control.
- Vast expanses of vegetation are separated into distinctive zones, often with abrupt boundaries.
- Light pinkish-red CIR signature of young mangroves may be visible in these communities, but are not dominant.

CONTEXT

- **Landscape Position** - This community occurs in low energy coastal and estuarine environments with sufficiently high salinities to support these salt community species. Generally found near the northern ends of the District (Atlantic Ocean side) in mosquito impoundments. Coastal areas of the Gulf of Mexico will have more extensive examples of this class.
- **Vegetation** - Dominant species include: cordgrasses, needlerush, seashore salt grass, saltwort, sea oxeye daisy, glassworts and fringerush. These species are generally short - less than three feet tall.
- **Soils** - Very poorly drained and usually mucky, sandy clay loams or saline sands.
- **Hydrology** - Tidal fluctuations directly influence the hydrology.

SIMILAR CLASSES

- [5430 Saltwater Ponds](#) - Isolated estuarine water bodies that have no visible connection to adjacent coastal waters

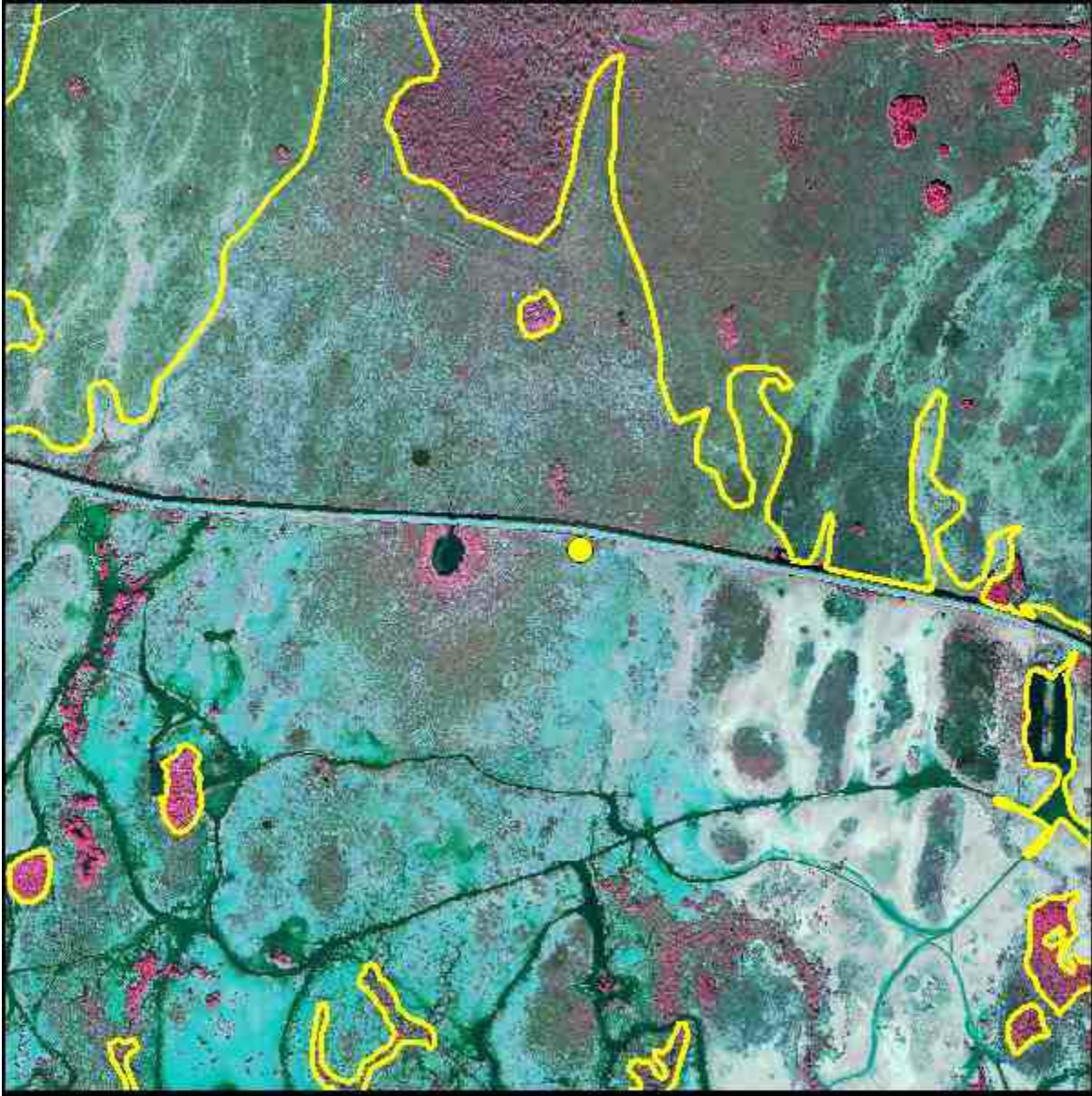
- [6500 Non-Vegetated Wetlands](#) - See decision rules used to differentiate tidal flats. Tidal flats under 5 acres found within saltwater marshes are mapped as open water or saltwater marsh depending on context.
- [6510 Tidal Flats](#) - These are non-vegetated, or with only sparse vegetation.

SPECIAL MAPPING CONVENTIONS

Marshes may have a complex, patchy distribution of different species groups, open water and other communities. In transitional areas where species-specific wetland (2 acres) and upland (5 acres) polygons are below the appropriate MMU, some aggregation may be justified. In these cases intermixed community classes will be assigned and mapped at a larger unit.

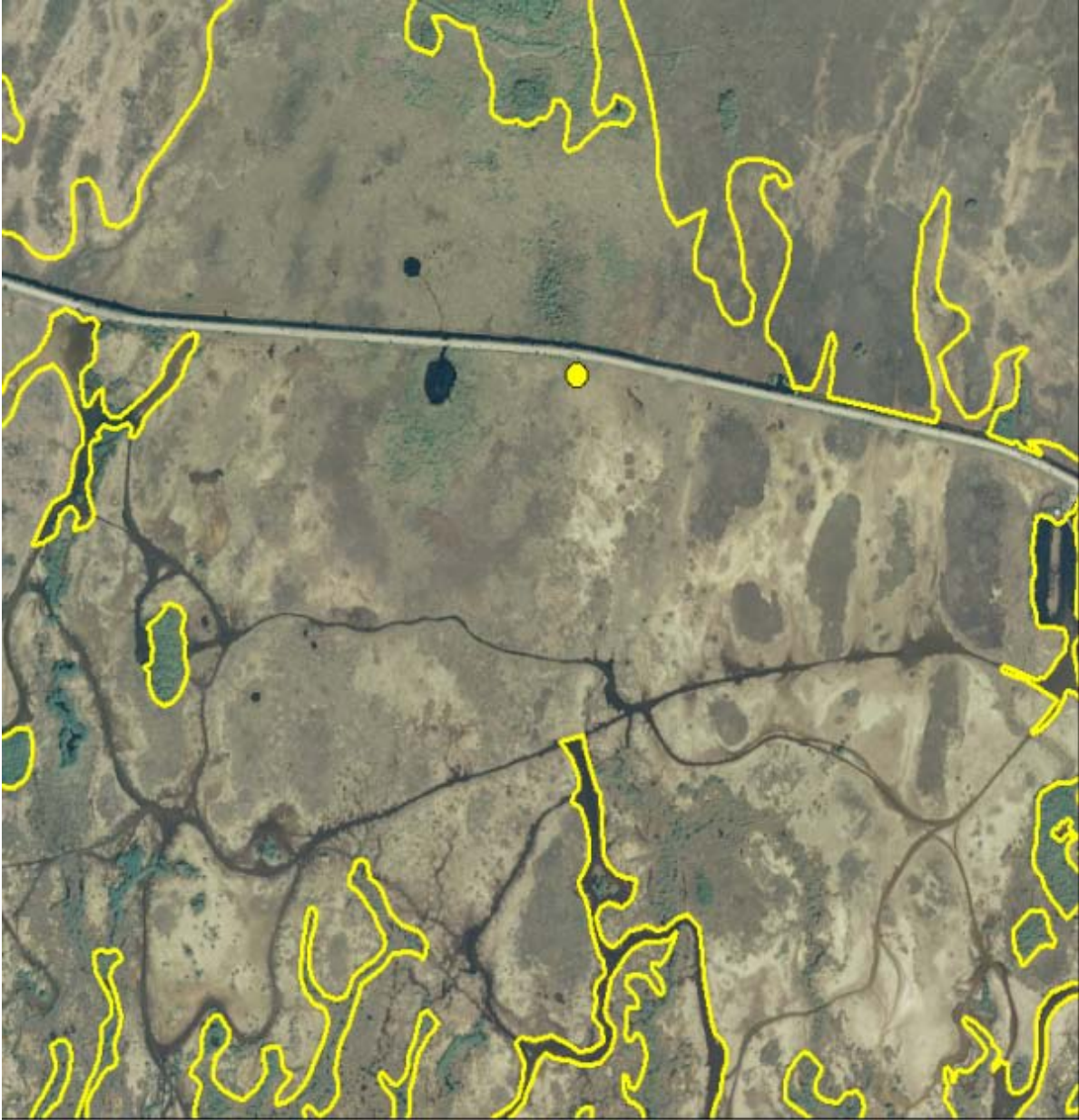
DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.



0 1250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 250 500 1,000
Feet

FIELD PICTURE



DATE
05/08/07

COORDINATES
528578.09 576074.78

6440

Emergent Aquatic Vegetation

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6400 Vegetated Non-Forested Wetlands](#)

LEVEL 3: **6440 Emergent Aquatic Vegetation**

DESCRIPTION

This class is for flooded (aquatic) areas with emergent or floating vegetation. It includes communities otherwise known as deep marsh or floating marsh. In the absence of vegetation these areas would be classed as water bodies, which indeed they are. Submerged aquatic vegetation (SAV) is not included in this class or in the land cover data layer. It is generally included with open water.

Four of the most common emergent aquatic communities are described below:

Deep Marsh - Deep water wetlands dominated by a mixture of water lilies and deep water emergent species. Semi-permanently to permanently flooded.

Lakeshore Emergents - Emergent vegetation growing along lake shores and usually semi-permanently flooded. *Panicum hemitomon* and species of *Scirpus* are most common.

Water Lilies - Floating-leaved species in the genera *Nymphaea*, *Nuphar*, *Nelumbo*, *Brasenia* and *Nymphoides*. Usually semi-permanently to permanently flooded.

Floating Marshes - Communities of free-floating plants (such as water hyacinth, water lettuce, or *Lemna*) or floating mats of rhizomatous species (such as alligator weed or various grasses and sedges).

The FLUCCS system includes five subclasses of emergent aquatic species: Water lettuce, Spatterdock, Water hyacinth, duck weed and water lily. These subclasses are not active in this data layer.

KEYS TO PHOTOINTERPRETATION

- Deep water wetlands dominated by free-floating plants, such as water lilies, water hyacinth, water lettuce, or lemna, or floating mats of rhizomatous species, such as alligator weed or various grasses and sedges.
- Signatures are variable, including bright pinks or mottled reds and grays on CIR, depending on species. Distinct smooth bright green signatures on natural color, or bright red CIR signatures caused by floating plants are strong indicators of deep marsh.

CONTEXT

- **Landscape Position** - Emergent aquatics are found in depressed areas, solution holes, ponds, lakes, canals, rivers, streams and other areas where persistent water prevents the growth of other plants. These areas are permanently inundated and only dry out during extended droughts or artificial drawdowns.
- **Vegetation** - Community dominated by floating or emersed aquatic plants including spatterdock, water lily, water lettuce, water hyacinth, duckweed and salvinia.
- **Soils** - Substrates for this community will be highly organic silts accumulated over otherwise sandy or sandy loam soils which are very poorly drained.

- **Hydrology** - These areas are permanently inundated and only dry up during extended droughts.

SIMILAR CLASSES

- [5000 Water](#) - Including areas of submergent aquatic vegetation
- [6410 Freshwater Marshes](#) - The context is not aquatic. Plants are typically taller and less open water is visible.

SPECIAL MAPPING CONVENTIONS

Where emergent aquatic vegetation is observed in a larger freshwater marsh of mixed species, the emergent aquatic portion is not delineated separately **unless it is greater than 10 acres**.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
01/09/07

COORDINATES
535405.02 920108.03

6500 Non-Vegetated Wetlands

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: **6500 Non-Vegetated Wetlands**

DESCRIPTION

Non-Vegetated Wetlands are hydric surfaces that lack vegetation due to reasons such as those below:

- The erosional effects of wind and water may transport surface materials so rapidly that the establishment of plant communities is hindered.
- The fluctuation of the water surface level is such that vegetation cannot become established.
- Submerged or saturated substrates may develop toxic conditions of extreme acidity or salinity.

Tidal flats, shorelines and intermittent ponds are the most common examples of this class. Also included are barren salt flats on higher grounds resulting from surface evaporation.

NOTE: Tidal Flats are classified at Level 3 as [6510 Tidal Flats](#).

KEYS TO PHOTOINTERPRETATION

- Hydrologic changes or toxic conditions (salinity, acidity, chemical or thermal pollution) prevent plant growth.
- White signatures are characteristic of dry or sandy areas.
- Examples are tidal mud flats, tidal sand flats, shorelines, intermittent ponds, salt flats.

CONTEXT

- **Landscape Position** - This class usually occurs on areas where water fluctuations are too rapid to permit establishment of plant communities.
- **Vegetation** - These areas are generally unvegetated.
- **Soils** - Substrate can range from mud and sand to rocks.
- **Hydrology** - Water fluctuation is a distinguishing characteristic.

SIMILAR CLASSES

- [6420 Saltwater Marshes](#) - These have at least 25% vegetative cover.
- [7200 Sand Other Than Beaches](#) - These have no influence by fluctuating water levels.

SPECIAL MAPPING CONVENTIONS

This class is one of the most problematic of the FLUCCS land cover classes to map, for the following reasons:

- The ability to recognize tidal flats depends on tide stage - during high tides this feature is submerged. Therefore the resulting maps may only provide a "snapshot" varying with tidal stage.

- Tidal channels occurring within salt marshes are often too narrow and complex to allow complete delineation within this project's scope. For this reason a 5 acre MMU is used.
- The actual coastline should technically be drawn at the mid point of tidal stage. That requires information resources beyond the scope of the mapping project. For more accurate coastlines other maps, such as those of USGS or NOAA, should be consulted.
- Barren salt flats may pop up in surprising locations and look like dry, sandy areas. Collateral data is required.

The minimum mapping unit for this class is 2 acres.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000 Feet

NATURAL COLOR IMAGE



COORDINATES

886587.87 1131936.13 (Images)

FIELD PICTURE



DATE
03/16/07

COORDINATES
745674.80 865379.79 (Field Picture)

6510 Tidal Flats

LEVEL 1: [6000 Wetlands](#)

LEVEL 2: [6500 Non-Vegetated Wetlands](#)

LEVEL 3: **6510 Tidal Flats**

DESCRIPTION

Tidal Flats are non-vegetated, shallow-water habitats situated between the low and high tide limits. Their substrate is soft to semi-soft sand or mud. They are found where sediments accumulate and are usually bordered landward by *Spartina alterniflora* marshes and seaward by tidal channels or sub-tidal seagrass beds.

An important characteristic of this class is its alternating tidal cycle of submergence and exposure to the atmosphere.

KEYS TO PHOTOINTERPRETATION

- Signatures are very wet sand or mud with a dark gray or greenish-gray CIR tone, whitish natural color and very smooth texture.
- If the tide is not completely out and substrates are somewhat sandy, the return may be a light or whitish blue on CIR.
- Examples are tidal mud flats, tidal sand flats, shorelines, intermittent ponds, salt flats.

CONTEXT

- **Landscape Position** - Tidal flats occur in the shallower portions of estuaries and bays which are protected from intense wave action. They are found along the shorelines and in tidal channels or openings in the salt marsh and mangrove communities.
- **Vegetation** - This category is unvegetated by definition. Tidal marl flats of the southeastern Everglades may be vegetated by sparse and stunted red mangroves and sawgrass.
- **Soils** - Substrates are saline sands and muds.
- **Hydrology** - Intermittently exposed or regularly flooded (and exposed) by daily tidal action.

SIMILAR CLASSES

- [5100 Streams and Waterways](#) - Dark blue or black signature, indicating deeper water
- [5410 Embayments Opening Directly to Gulf or Ocean](#) - Will have a more open water signature than tidal flats
- [5420 Embayments Not Opening Directly to Gulf or Ocean](#) - Will have a more open water signature than tidal flats
- [5430 Saltwater Ponds](#) - Isolated estuarine water bodies that have no visible connection to adjacent coastal water
- [6420 Saltwater Marshes](#) - Characterized by expanses of grasses, sedges, rushes, and other herbaceous plants
- [7200 Sand Other Than Beaches](#) - Not associated with water; usually wind deposited

SPECIAL MAPPING CONVENTIONS

This class is one of the most problematic of the FLUCCS land cover classes to map, for the following reasons:

- The ability to recognize tidal flats depends on tide stage - during high tides this feature is submerged. Therefore the resulting maps may only provide a "snapshot" which will vary depending on tidal stage.
- Tidal channels occurring within salt marshes are often too narrow and complex to allow complete delineation. For this reason, they may sometimes be aggregated into the surrounding marsh in order to avoid overly complex linework.
- The actual coastline should technically be drawn at the mid point of tidal stage. This requires information resources beyond the scope of the mapping project. For more accurate coastline determination other maps, such as those of USGS or NOAA, should be consulted.
- Barren salt flats may appear in locations which can be mistaken for dry, sandy areas. Collateral data is required.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
385667.90 712293.22

7000 Barren Land

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level2 subclasses include:

[7200 Sand Other Than Beaches](#)
[7300 Exposed Rock](#)
[7400 Disturbed Land](#)

For details on each subclass (both Level 2 and Level 3) see the respective PI Key pages.

BACKGROUND

Barren land has very little or no vegetation and limited potential to support vegetative communities. In general, it is an area of bare soil or rock. Vegetation, when present, is very sparse and scrubby. Not all barren areas will be coded as such - barren land may temporarily exist due to human activity. In such cases the mapping unit may be coded with the specific land use or dual coded with both the land cover and a separate land use code.

Barren land classes are all **Land Cover** classes, except [7470 Dikes and Levees](#), that are frequently used together with a Land Use code, such as [1180 Rural Residential](#) or [1670 Abandoned Mining Land](#). Possible dual coding combinations are listed below under Dual Coding Conventions. However, in most cases of disturbed areas, the land cover type is not required - examples are industrial areas, land fills, active mining operations and others listed below under Similar Classes.

The Barren classes apply only to upland areas. Non-vegetated wetlands, such as tidal flats and salt flats, are assigned the appropriate [6500](#) code. Borrow areas that are saturated or inundated are mapped as either Wetlands or Water.

MAPPING CONVENTIONS

Minimum mapping units: The minimum mapping unit for all 7000 Barren Land classes is 5 acres.

Differentiating subclasses: Subclasses are not difficult to differentiate. Note that the class [7200 Sand Other Than Beaches](#) applies to undisturbed areas, in contrast with the [7400](#) classes.

DUAL CODING CONVENTION

All of the 7000 classes are **Land Cover** classes. The LCCODE and LUCODE are usually the same. However some subclasses may be used to describe the **Land Cover** for various **Land Use** classes such as [1180 Rural Residential](#), [1650 Reclaimed Mine Land](#), [1670 Abandoned Mine Land](#), [1900 Open Land](#), [1920 Inactive Land With Street Pattern](#), [7470 Dikes and Levees](#), and others.

SIMILAR CLASSES

- [1190](#), [1290](#), [1390](#), etc. - Any of the 'Residential Under Construction' classes can be disturbed, but are not dual coded with 7000s.
- [1500 Industrial](#) - Industrial areas, particularly heavy industry, are often disturbed and unvegetated.

- [1600 Extractive](#) - Active mining areas will appear disturbed, but are not classed as 7000. Use a 7000 class only for reclaimed or abandoned areas, with dual coding to show both land cover and land use.
- [2000 Agriculture](#) - Fields that are unvegetated because they are fallow or under preparation and cultivation may be confused with Barren Land. The context should be considered.
- [3000 Upland Non-Forested](#) - These areas will have vegetation.; There may be inclusions of Barren Land, which should be broken out if large and distinct.
- [4430 Forest Regeneration](#) - These may appear unvegetated when trees are small. PIs should look carefully at the forestry context.
- [6500 Non-Vegetated Wetlands](#) - These will be in areas where water levels fluctuate.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

7200

Sand Other Than Beaches

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: 7200 Sand Other Than Beaches

DESCRIPTION

Sand Other Than Beaches refers to natural, sandy, unvegetated areas - usually dune sands. Dunes are of aeolian (wind transported) origin and are composed of sand grains deposited downwind from a natural source of sand. Dune sizes vary greatly with diameters ranging from a few feet to more than several hundred feet. Their heights also vary and their shapes display considerable variety. Where the dunes are the major feature, shore and strand lines, coastal plains, river flood plains and deltas are secondary.

This class is not restricted to dune sands as bare sands exist in other forms, such as other unvegetated areas of open sand, which do not fit within the other land use categories of "Under Construction".

Use of this class requires presence of less than 10 percent vegetative cover within the polygon.

KEYS TO PHOTOINTERPRETATION

- Characteristic bright white outcropping occurring in areas of sand deposition or historic dunes
- May be of various sizes and often occur as ridges or on slopes where vegetation cannot grow due to lack of soil accumulation
- Not associated with water (at present time); may be wind deposited

CONTEXT

- **Landscape Position** - This land use may occur anywhere within the project area. Where it occurs away from the coast or a water body, it generally is the result of some form of disturbance. The interpreter is therefore cautioned to look for other land use activities occurring in the area to determine if this code is correct or if another code should be applied.
- **Vegetation** - Dune features in inland areas are usually vegetated, not barren.
- **Soils** - Sand is generally the only soil type present.

SIMILAR CLASSES

- [1810 Swimming Beach](#) - Generally linear features accessible for recreation; parking lots may be visible.
- [6500 Non-Vegetated Wetland](#) - Influenced by water level fluctuations

Also, see "Similar Classes" in the [7000](#) General Description

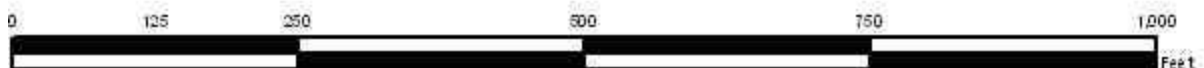
SPECIAL MAPPING CONVENTIONS

The minimum mapping unit for this class is 5 acres. Linear features as narrow as 30 feet are mapped.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LUCODE and LCCODE are generally the same. A separate **Land Use** code may be required in rare exceptions - for instance, if dunes occur in conjunction with uses such as [1180 Rural Residential](#) or [1920 Inactive Land With Street Patterns](#).

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
11/20/07

COORDINATES
666988.75 151771.20

7300 Exposed Rock

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: **7300 Exposed Rock**

DESCRIPTION

This class consists of exposed bedrock and other accumulations of rock materials lacking vegetative cover. Exposed bedrock, when weathered, may be lacking vegetation due to the fine soil materials being removed by the actions of wind and water.

Use of this category requires presence of less than 10 percent vegetative cover within the polygon.

KEYS TO PHOTOINTERPRETATION

- Rough textured, light colored appearance
- A sprinkling of magenta or reddish tones on CIR indicating scattered vegetation

CONTEXT

- **Landscape Position** - It may be found anywhere in the District, and also in abandoned quarry areas which have reverted to native vegetative types. (Also see Special Mapping Conventions)

SIMILAR CLASSES

- [1500 Industrial](#) - Some Industrial operations are often disturbed and unvegetated.
- [1600 Extractive](#) - Parts of some of the Extractive classes may appear as rock, but are included in their Extractive class.
- [7400 Disturbed Land](#) - The soil or substrate has been altered by human activity.

SPECIAL MAPPING CONVENTIONS

This class is found interspersed with marsh grass in the Everglades area.

DUAL CODING CONVENTION

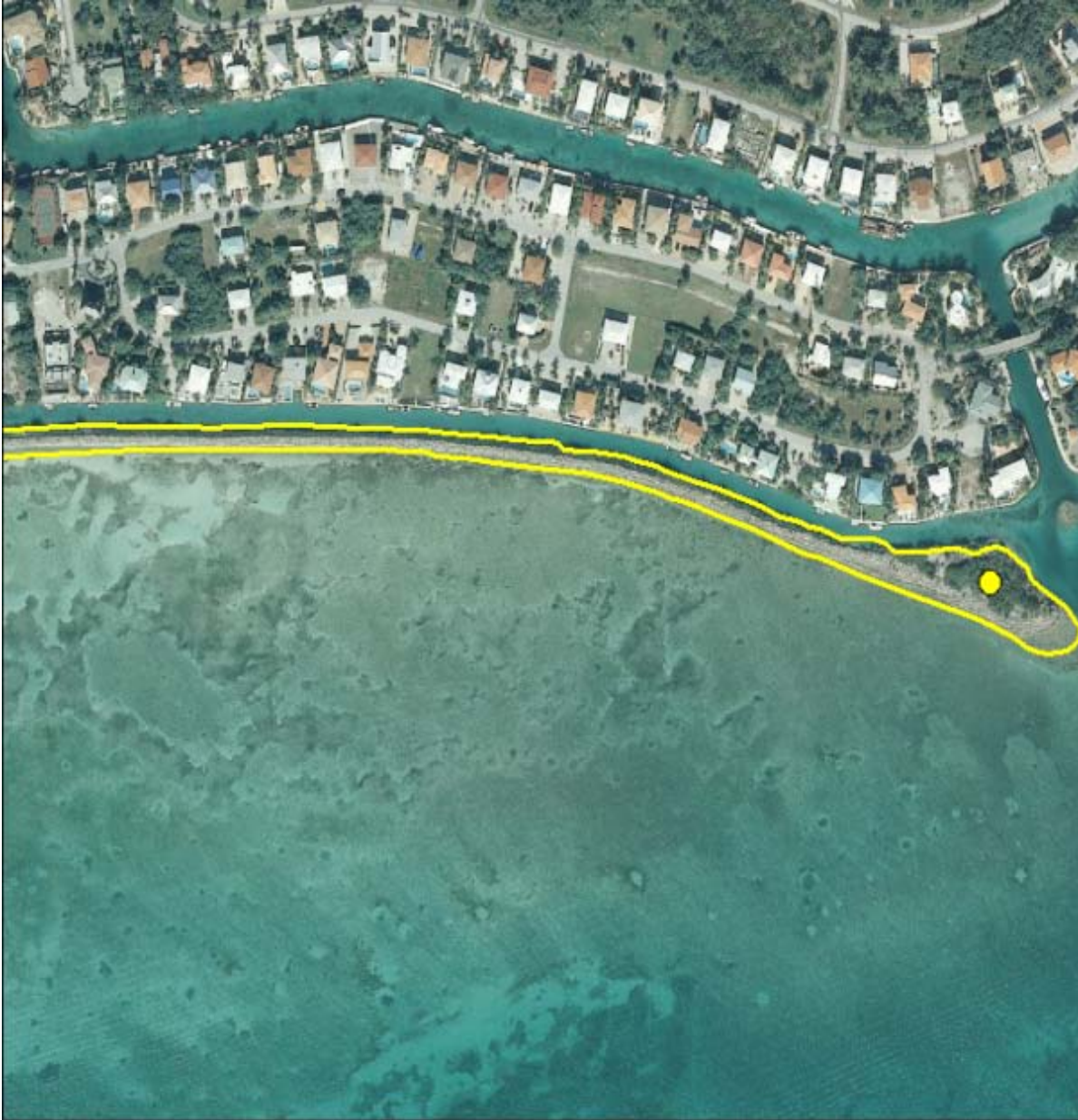
This is a **Land Cover** class. The LUCODE and LCCODE are the same. A separate **Land Use** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE

Original 1999 field picture

COORDINATES

685250.77 157072.51

7400 Disturbed Land

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: **7400 Disturbed Land**

DESCRIPTION

This is the general Level 2 class for barren and/or disturbed lands. **It is only used where the more specific Level 3 classes ([7420](#), [7430](#) or [7470](#)) do not apply.**

These are areas where soil and/or substrate has been altered or removed by human activity. The cause of disturbance is not always known - for example, this code may be used with the land use class [1900 Open Land](#), which may be land in transition and without a recognizable intended use.

The barren classes apply only to upland areas. Non-vegetated wetlands, such as tidal flats and salt flats, are classified in the appropriate wetlands class. Borrow areas that are saturated or inundated are mapped as wetlands or water.

KEYS TO PHOTOINTERPRETATION

- Soil and/or substrate has been altered or removed by human activity.
- Signatures are typically white or white with mottling due to regenerating vegetation.
- The ground may appear scraped and worked, usually with angular or geometric boundaries.
- There may be evidence of old machinery, possibly abandoned without visible cause.
- The lack of vegetation cannot be attributed simply to fire damage.

CONTEXT

- **Landscape Position** - These areas can be found in any part of the District, and may be extensive in size. They are more common in former mining areas and in transitional urban areas.
- **Vegetation** - Barren land has very little or no vegetation and limited potential to support vegetative communities. In general, it is an area dominated by bare soil, but may have some very sparse vegetation.
- **Soils** - A variety of soil types may be found in this class.

SIMILAR CLASSES

- [1190](#), [1290](#), [1390](#), etc. - Any of the Residential Under Construction classes can be disturbed, but are not dual coded with 7400 as a land cover code.
- [1500 Industrial](#) - Industrial areas, particularly heavy industrial, are often disturbed and unvegetated.
- [1600 Extractive](#) - Active mining areas will appear disturbed, but are not classed as 7000s. Use 7000s only for reclaimed or abandoned areas.
- [2000 Agriculture](#) - Fields that are unvegetated because they are fallow or under preparation and cultivation may be confused with Barren Land. The context should be examined to properly classify these areas.
- [3000 Upland Non-Forested](#) - These areas will have vegetation. There may be inclusions of barren land, which should be broken out if large and distinct.

- [4430 Forest Regeneration](#) - These may appear unvegetated when trees are small.
- [6500 Non-Vegetated Wetlands](#) - These are influenced by water fluctuations.

SPECIAL MAPPING CONVENTIONS

This code should be used very sparingly and only when other classes are not applicable.

The standard 5 acre MMU applies without exception.

Do not use this code for burned areas if the permanent land cover can be identified. For example, pine flatwoods where the underbrush has been cleared by a controlled burn but the pines remain should be coded as [4110 Pine Flatwoods](#).

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are usually the same, but often 7400 is used as the **Land Cover** code for land uses such as [1180 Rural Residential](#), [1650 Reclaimed Lands](#), [1670 Abandoned Lands](#), [1900 Open land](#), [1920 Inactive Land with Street Pattern](#) and others.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



COORDINATES

945034.39 617663.75 (Images)

FIELD PICTURE



DATE
07/21/06

COORDINATES
953416.75 964410.69 (Field Picture)

7420 Borrow Areas

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: [7400 Disturbed Land](#)

LEVEL 3: **7420 Borrow Areas**

DESCRIPTION

Borrow areas are depressions caused by the removal of earth that is intended to be used as fill material. The types of material include top soil, clean fill and other mixed substrates that can be used to raise the grade at construction sites, road projects or for landscaping. It does not include commercial grade sand, clay, limestone, peat or other mining materials, which are classified in the [1600 Extractive](#) classes.

After the disturbance is over, these sites may fill with water or start to re-vegetate, in which cases other codes will apply. Active sites will show signs of heavy machinery traffic and earth moving equipment is usually present.

These areas may not be reliably identifiable from aerial photography and collateral data is typically not available. Active sites will show obvious signs of vehicular use and earth moving equipment should be present along with an office type trailer.

KEYS TO PHOTOINTERPRETATION

- There is evidence of excavation such as pits, trenches, etc.
- Excavation equipment and transportation access may be visible.
- Using stereo photography, PIs can identify depressions with regular, often rectangular shapes. Depressions may be large or small in extent.
- Some parts of the depressions tend to fill with water. The water signature is often an unusual tone (blues, greens on CIR photos, rather than the typical black tone) due to turbidity.
- Varying amounts of magenta and greenish tones on CIR will be present within the pit as vegetation returns to the site.

CONTEXT

- **Landscape Position** - Borrow areas are often located near highways, railroads, and other major projects. They also support urban construction by being located at the fringes of developing areas.

SIMILAR CLASSES

- [1190](#), [1290](#), [1390](#), etc. - Residential Under Construction - These classes are not dual coded with [7000](#) codes. Borrow areas are depressional and usually off-site from the construction.
- [1500 Industrial](#) - Industrial areas, particularly heavy industrial, are often disturbed and unvegetated.
- [1600 Extractive](#) - Active mining areas will appear disturbed, but are not given [7000](#) codes. Use [7000](#)s only for reclaimed or abandoned areas. Borrow areas may look very similar to strip mines, sand and gravel pits, and quarries.
- [3000 Upland Non-Forested](#), and [4430 Forest Regeneration](#) - There may be inclusions of barren land, but they will not appear as depressions on aerial photography.

- [5300 Reservoirs](#) - Borrow pits or other artificial depressions that contain water should be classed as reservoirs. See the [5300](#) key page for exceptions.
- [7430 Spoil Areas](#) - These may look the same initially. Stereo viewing will show that they are mounds rather than depressions.

SPECIAL MAPPING CONVENTIONS

The standard 5 acre minimum mapping unit applies without exception.

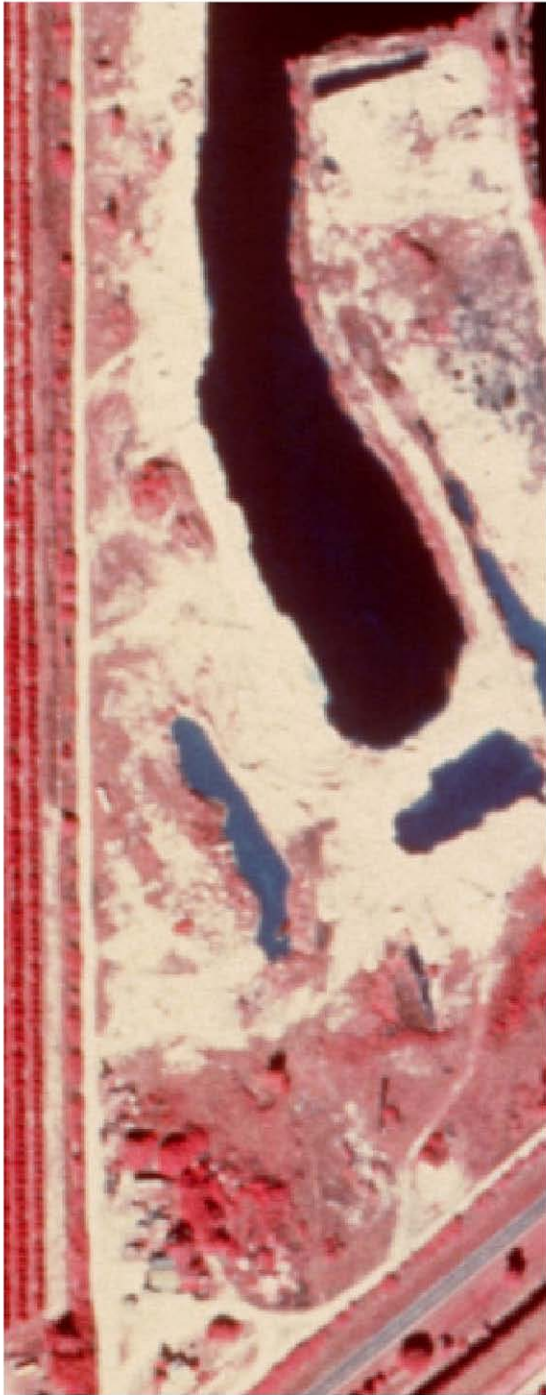
If there are a number of smaller (< 5 acre MMU) borrow pits in the same area they should be aggregated together into a single mapping unit. More than 50% of the total area should be barren and/or excavated in this case.

Borrow pits that contain water should be classed as 5300 Reservoirs, with a 2 acre MMU.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are usually the same, but in rare cases, 7420 could be used as the **Land Cover** for land uses such as [1650 Reclaimed Mine Lands](#) or [1670 Abandoned Mine Lands](#).

CIR DOQQ IMAGE



0 100 200 300 Feet



FIELD PICTURE



DATE

Original 1999 field picture

COORDINATES

n/a

7430 Spoil Areas

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: [7400 Disturbed Land](#)

LEVEL 3: **7430 Spoil Areas**

DESCRIPTION

Spoil areas are elevated mounds created by artificial deposition of excavated or dredged materials. The material is natural soils, sediments and rocks.

Spoil islands are created from sediments dredged out of bays and estuaries.

The mounds appear as elevated areas when viewed in stereo. Compared to borrow areas, mounds tend to have regular shapes due to the way they were created. The most common shape is circular. The mounds also tend to appear in regular patterns on the landscape.

This class does not include spoil areas at active mining operations composed of overburden, waste or processed sediments. A number of other exceptions are listed below under "Similar Classes".

Spoil mounds are included in this class as long as they remain barren. Once vegetated or developed, they are treated like any other area and the appropriate land cover/land use codes apply.

The flat topography of the project area will aid in the identification of this land use type as any mound or regular raised feature should be suspect as spoil if of substantial size.

KEYS TO PHOTOINTERPRETATION

- The mounds show up as elevated areas when viewed in stereo.
- Mounds tend to have regular shapes, usually circular or linear.
- On former mining sites, spoil areas are usually large mounds with artificial shapes (symmetrical shapes, straight edges, sharp angles, etc).
- The movements of mining or dredging machines may create a series of mounds in regular, straight or curved patterns, or a series of wavy hills.

CONTEXT

- **Landscape Position** - Spoil areas may be encountered throughout the project area outside urban centers.

SIMILAR CLASSES

- [1190](#), [1290](#), [1390](#) - Residential Under Construction - These classes are not dual coded with 7430. Spoil areas are elevated and usually detached from the construction.
- [1500 Industrial](#) - Industrial areas may have spoil mounds, but they are not coded 7430
- [1600 Extractive](#) - Active mining areas have spoil mounds, but they are not classed as 7430. Use 7430 only for reclaimed or abandoned areas.
- [7420 Borrow Areas](#) - These may look the same initially. Stereo viewing will show that they are depressions rather than mounds.
- [7470 Dikes and Levees](#) - These are linear in shape as opposed to circular or irregular.

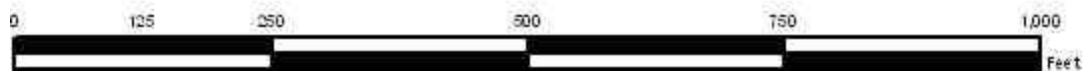
SPECIAL MAPPING CONVENTIONS

If there are a number of smaller (< 5 acre MMU) spoil mounds in the same area they should be aggregated together into a single mapping unit. More than 50% of the total area should be barren and/or mounded in this case.

DUAL CODING CONVENTION

This is a **Land Cover** class. The LCCODE and LUCODE are usually the same, but in rare cases, 7430 could be used as the **Land Cover** for land uses such as [1650 Reclaimed Mine Lands](#) and [1670 Abandoned Mine Land](#).

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



FIELD PICTURE



DATE
01/12/07

COORDINATES
482291.23 105129.03

7470 Dikes and Levees

LEVEL 1: [7000 Barren Land](#)

LEVEL 2: [7400 Disturbed Land](#)

LEVEL 3: **7470 Dikes and Levees**

DESCRIPTION

Levees are natural or artificial embankments or dikes, usually earthen, which parallel the course of a river or canal. The main purpose of an artificial levee is to prevent flooding of the adjoining areas; however, they also confine the flow of the river resulting in higher and faster water flow.

Levees, or spoil areas functioning as levees, are classified as 7470. In the SFWMD, Levees are frequently seen formed along canals used for drainage or transportation.

KEYS TO PHOTOINTERPRETATION

- Levees show up as elevated areas when viewed in stereo.

CONTEXT

- **Landscape Position** - Levees occur in strips along the sides of man-made canals, channels, lakes and streams. In this context, levees may be encountered throughout the project area outside urban centers.

SIMILAR CLASSES

- [7430 Spoil Areas](#) - These may look circular or irregular in shape as opposed to linear

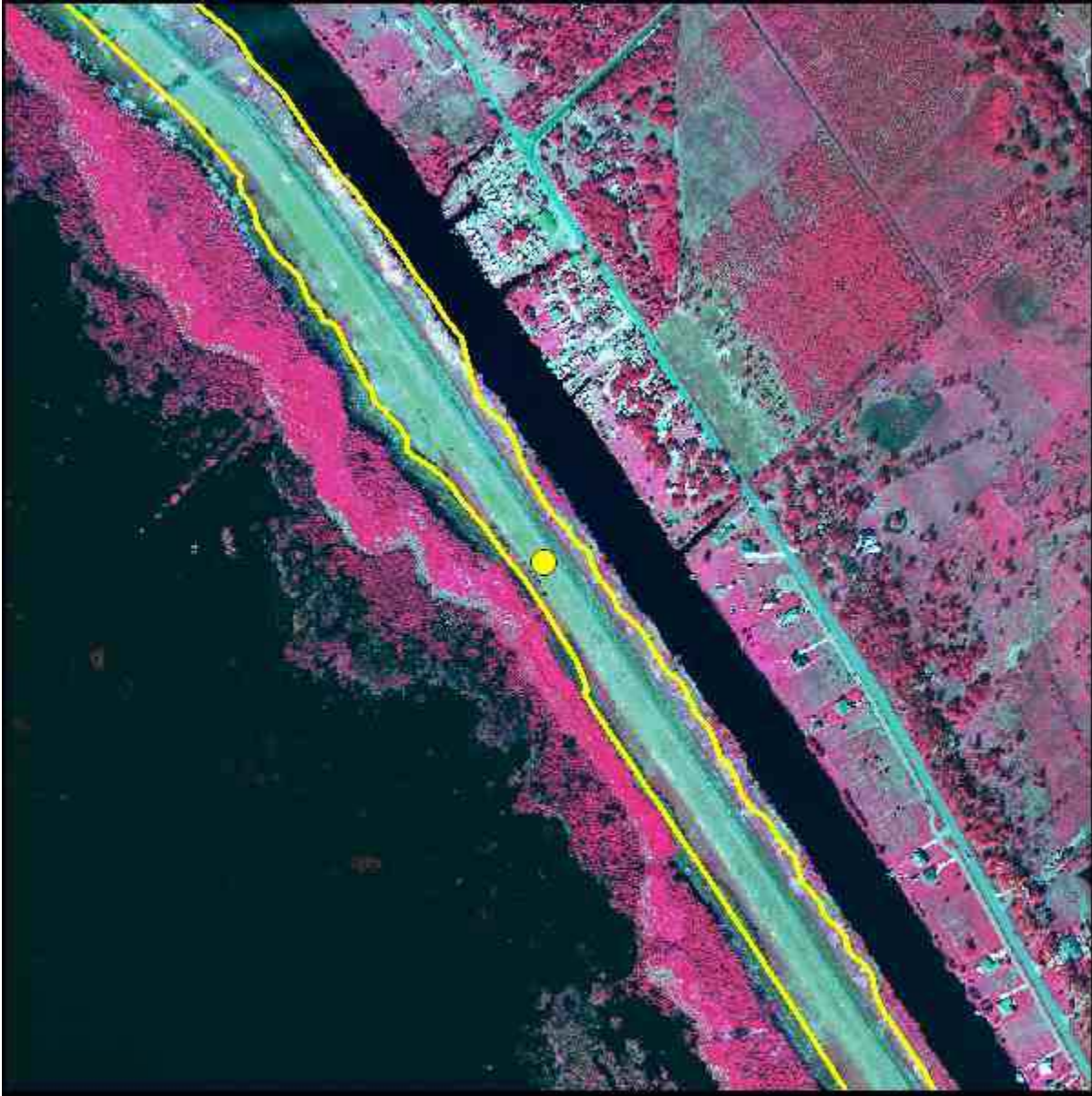
SPECIAL MAPPING CONVENTIONS

Levees are mapped if they average 40 feet wide or greater.

DUAL CODING CONVENTION

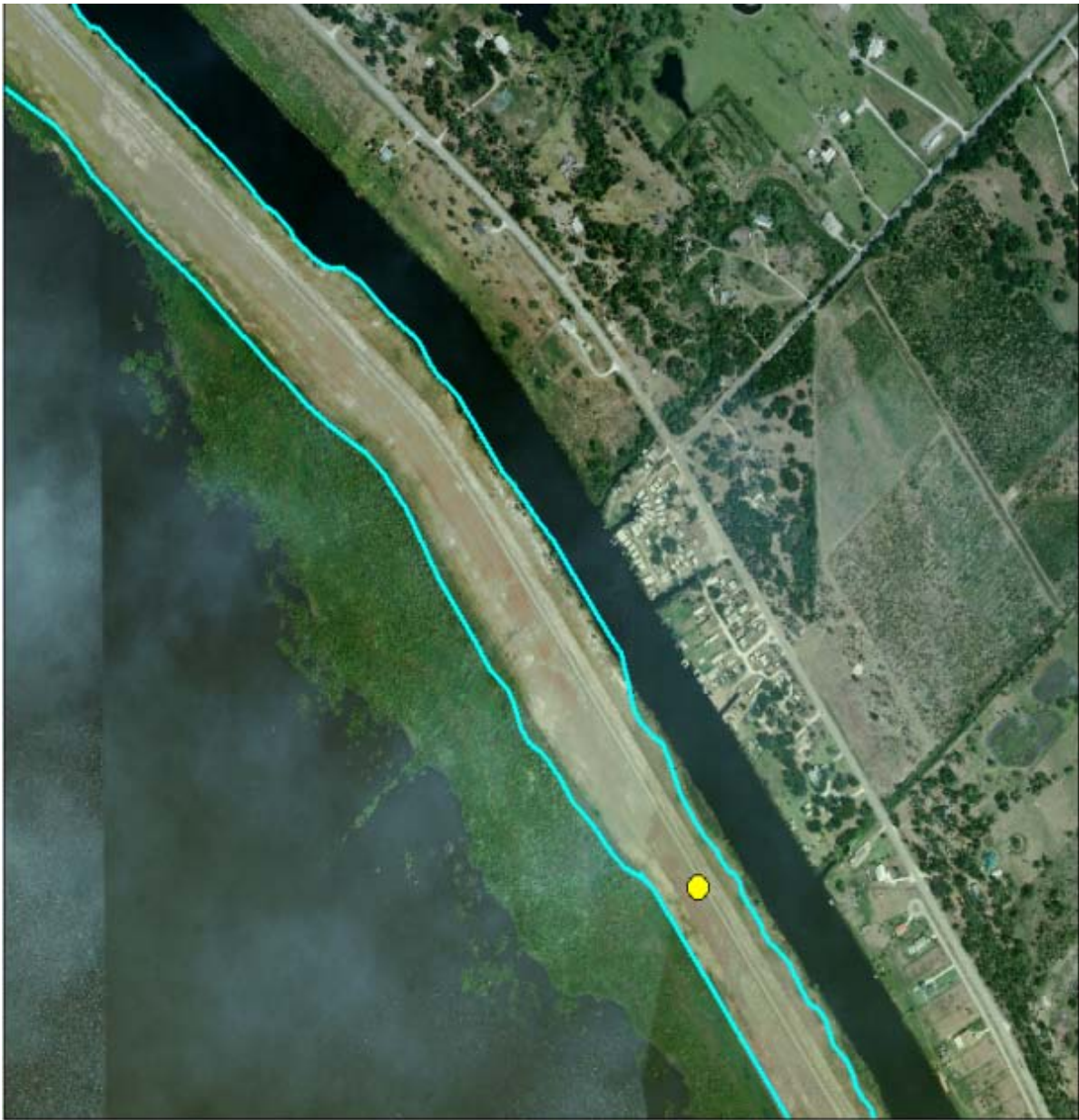
This is a **Land Cover** class. It does not normally require a separate **Land Use** code. However, where this class occurs in association with a mapped land use, a separate **Land Use** code may be required. Examples: [8140 Roads and Levees](#).

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
n/a

COORDINATES
755074.78 1021139.96

8000

Transportation, Communications and Utilities

This Level 1 class is not used in the map itself - a more specific subclass must be selected. The Level 2 subclasses include:

[8100 Transportation](#)
[8200 Communications](#)
[8300 Utilities](#)

For details on each subclass (both Level 2 and Level 3) see the respective PI Key pages.

BACKGROUND

This broad class includes not only Transportation classes, but also Communications and Utilities.

Transportation facilities are used for the movement of people and goods; therefore, they are major influences on land and many land use boundaries are outlined by them.

Highways are easily identifiable on medium altitude photography. Highways include areas used for interchanges, limited access rights-of-way and service facilities. The center median, pavement and sizable buffer zone should be included even if exact boundaries cannot be detected.

The Transportation category includes rail-oriented facilities including stations, round-houses, repair and switching yards and related areas. It also includes airport facilities such as runways, intervening land, terminals, service buildings, navigational aids, fuel storage, parking lots and a limited buffer zone.

Transportation areas also include ports, docks, shipyards, dry docks, locks and water course control structures designed for transportation purposes. The docks and ports include buildings, piers, parking lots and adjacent water utilized by ships in the loading and unloading of cargo or passengers. Locks, in addition to the actual structures, include the control buildings, power supply buildings, docks and surrounding supporting land use (i.e., parking lots and vegetated areas).

Communications classes include airwave communications, radar and television antennas with associated structures. When stations are associated with a commercial or governmental facility, they will be included in those specific categories ([1400 Commercial and Services](#) or [1700 Institutional](#)) rather than [8200 Communication](#).

Utilities include power generating facilities and water treatment plants and related facilities such as transmission lines for electric generation plants and aeration fields for sewage treatment sites. Small facilities or those associated with an industrial, commercial or extractive land use are included within these larger respective categories.

MAPPING CONVENTIONS

Minimum mapping units: There is a minimum width criteria for linear features in the 8000 classes. Non-linear features have a minimum area criteria. They will be mapped as generally indicated below. Individual key pages will describe these criteria in more detail:

- [8120 Railroads and Railyards](#) - Must exceed an average width of 100 feet over long segments.
- [8140 Roads and Highways](#) - Must exceed 100 feet in width over long segments and have four lanes and a substantial median.

- [8320 Electrical Power Transmission Lines](#) - Must be at least 150 feet in width and have a different land cover than the surrounding landscape.
- [8340 Wastewater Treatment Facilities](#) - Must be 5 acres or more.
- [8350 Solid Waste Disposal](#) - Must be 5 acres or more.

Differentiating subclasses: Some of the subclasses may be difficult to differentiate without ancillary data. Electrical power transmission lines may look very similar to other utility corridors and may in fact occur together. Communications facilities are difficult to identify.

DUAL CODING CONVENTION

The 8000 classes are **Land Use** classes that do not normally require a separate **Land Cover** class. Some exceptions are noted above. Additional exceptions include [8340 Sewage Treatment](#) and [8350 Solid Waste Disposal](#), which require dual coding under certain defined situations. For more details see each subclass PI key.

SIMILAR CLASSES

With minor exceptions, the 8000 classes are relatively distinctive and are readily differentiated from other categories. For details and exceptions see the PI keys for each subclass.

For more information:

See the PI keys for each of the subclasses for more details and graphic examples.

8100 Transportation

LEVEL 1: [8000 Transportation, Communications and Utilities](#)

LEVEL 2: 8100 Transportation

DESCRIPTION

This general Level 2 class is used where more specific Level 3 classes do not apply.

It is also used where roads and railroads are directly adjacent to each other where one or both individually does not meet the minimum width criteria, but their **combined** width is greater than 100 feet. They are delineated as one polygon and coded 8100 Transportation.

Transportation facilities are used for the movement of people and goods; therefore, they are major influences on the land and many land use boundaries are outlined by them.

Highways include areas used for interchanges, limited access right-of-ways and service facilities. The center median, pavement and a sizable buffer zone are included even if exact boundaries cannot be determined. Highways are easily identified on project photography.

Rail-oriented facilities include stations, round-houses, repair and switching yards, and related areas.

Airport facilities include runways, intervening land, terminals, service buildings, navigational aids, fuel storage, parking lots and a limited buffer zone.

Transportation areas also include ports, docks, shipyards, dry docks, locks and water course control structures designed for transportation purposes. The docks and ports include buildings, piers, parking lots and adjacent waters utilized by ships in the loading and unloading of cargo or passengers. Locks, in addition to the actual structure, include the control buildings, power supply buildings, docks and surrounding supporting land uses (i.e. parking lots and green areas).

KEYS TO PHOTOINTERPRETATION

- See the respective Level 3 key pages for more details.

CONTEXT

- **Landscape Position** - Transportation features can be found throughout the District.

SIMILAR CLASSES

The Transportation classes are distinctive and are readily differentiated from other classes. For details and exceptions, see the PI keys for each of the Level 3 subclasses.

SPECIAL MAPPING CONVENTIONS

There are minimum width criteria for linear features in the 8100 class. The following criteria apply:

- [8120 Railroads](#) - These must be multi-track railroads to be delineated and must exceed 100 feet in width over long segments.

- [8140 Roads and Highways](#) - They must have 4 lanes and a median and must exceed 100 feet in width over long segments. (See the 8140 key page for more details.)
- [8320 Electrical Power Transmission Lines](#) - These must exceed 150 feet in width and have a different land cover than the surrounding landscape.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



COLOR DOQQ IMAGE



FIELD PICTURE



DATE
10/16/07

COORDINATES
379458.31 834061.88

8110 Airports

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8100 Transportation

LEVEL 3: 8110 Airports

DESCRIPTION

This class includes airports and airfields of various sizes, along with their associated facilities. It includes fixed-base commercial, and major airline operations. Heliports and seaplane bases are included if they meet size criteria (5 acres). It does not include single owner private air strips, nor does it include aviation facilities on military bases where the aviation is clearly subsidiary to the other functions of the base.

Included within the mapping unit are all buildings, grounds, parking lots, hangers, passenger terminals, fuel storage, control towers, maintenance areas and other features that are involved in the operation.

Private airports and grass airports are classified at Level 4 and not included in this class.

KEYS TO PHOTOINTERPRETATION

- Aircraft are usually recognizable on the aerial photos.
- There is a distinctive pattern of runways, taxiways and terminal buildings with associated markings.
- Commercial airfields and buildings are usually identified on topographic maps.
- At abandoned airfields, the runways and aprons may show deterioration and/or obstructions. The ends of abandoned runways are painted with a large white "X".
- Helipads have white circles painted on the landing pads, often marked with the letter "H".

CONTEXT

- **Landscape Position** - Aviation facilities are found throughout the District. Major airports are along transportation corridors and usually do not abut residential neighborhoods.

SIMILAR CLASSES

Airports have a unique appearance on aerial photos. Military airports may look similar to commercial airports - in these cases, where aviation is the predominant use, the 8110 coding is appropriate.

SPECIAL MAPPING CONVENTIONS

Included within the mapping unit are all buildings, grounds, parking lots, hangers, passenger terminals, fuel storage, control towers and other features that are involved in the operation.

Those areas that are not clearly related to the functions of the facility or inside the operational boundaries are not included. Adjacent open areas are assigned the appropriate land cover value.

Priority classes such as water bodies, wetlands, land fills or waste treatment sites are exceptions to the above. If these features meet their minimum size criteria they are always broken out.

Off-site parking areas are coded 8100 Transportation, unless they are adjacent to the airport and exclusively used for airport parking.

Airports under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



012350 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 250 500 1,000
Feet

FIELD PICTURE



DATE
n/a

COORDINATES
639089.59 142630.49

8113 Private Airports

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8100 Transportation

LEVEL 3: 8110 Airports

LEVEL 4: 8113 Private Airports

DESCRIPTION

This class includes private paved airstrips. They are not always immediately evident; they may not be marked on aeronautical charts or topographic maps. They may be detected by the presence of light aircraft near the airstrip. The paved airstrip is typically 1000 to 1500 feet in length with a smoother texture than the surrounding land cover.

Single owner private strips (such as on large ranches) are to be included in the surrounding land use and not mapped under this class.

KEYS TO PHOTOINTERPRETATION

- Aircraft may be recognizable on the aerial photos.
- The landing strip will appear as a long rectangular strip.

CONTEXT

- **Landscape Position** - Private airports may be found throughout the District, in almost any context.

SIMILAR CLASSES

- [8115 Grass Airports](#) - These will have a grass landing strip, as opposed to a paved one.

SPECIAL MAPPING CONVENTIONS

Single owner private strips (such as on large ranches) are to be included in the surrounding land use and not mapped under this class.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 500 750 1,000
Feet

FIELD PICTURE



DATE
10/16/07

COORDINATES
362009.59 873452.45

8115 Grass Airports

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8100 Transportation](#)

LEVEL 3: [8110 Airports](#)

LEVEL 4: 8115 Grass Airports

DESCRIPTION

This class includes private grass airstrips. These tend to be smaller and not immediately evident; they may not be marked on aeronautical charts or topographic maps. They may be detected by the presence of light aircraft near the airstrip. The grass airstrip is typically about 1000 to 1500 feet in length with a smoother texture than the surrounding land cover.

Single owner private strips (such as on large ranches) are to be included in the surrounding land use and not mapped under this class.

KEYS TO PHOTOINTERPRETATION

- Aircraft may be recognizable on the aerial photos.
- The landing strip will appear as a long rectangular strip.

CONTEXT

- **Landscape Position** - Grass airports may be found throughout the District, in almost any context.

SIMILAR CLASSES

- [8113 Private Airports](#) - These will have a paved landing strip.

SPECIAL MAPPING CONVENTIONS

Single owner private strips (such as on large ranches) are to be included in the surrounding land use and not mapped under this class.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE

10/15/07

COORDINATES

457684.45 768273.82

8120 Railroads and Railyards

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8100 Transportation

LEVEL 3: 8120 Railroads and Railyards

DESCRIPTION

This includes all railroad tracks greater than 100 feet wide and all facilities related to the rail operations. Only multi-track railroads are included. Related facilities include:

- **Classification yards** (marshaling yards) are used to sort freight cars and are identified by a large group of parallel tracks with a restricted (one or two track) entrance and exit called a chokepoint. In an active yard, numerous freight cars and small switch engines will be found.
- **Servicing yards** are normally found in or near marshaling yards and are identified by the presence of roundhouses (for light repair and storage of locomotives) and turntables for turning the engines around.
- **Car repair shops** appear as long, low buildings straddling one or more tracks, with cars awaiting repairs on sidings adjacent to the buildings.
- **Freight or loading yards** are identified by loading platforms, freight stations, warehouses and access to other means of transportation. Special loading stations are identified by grain elevators, coal and ore bins, oil storage tanks and livestock pens with loading ramps.
- **Storage yards**, used to store rolling stock, are recognized by dead end trackage not adjacent to any loading facility.
- **Station yards** are for storage of passenger cars, are found near passenger terminals and are identified by the presence of a variety of passenger cars not connected to a train.

Freight stations may be identified by loading docks along railroad tracks on one side of a building and loading docks along a road or street on the opposite side. Freight stations are smaller than warehouses and are designed only for the temporary storage of goods received. Freight stations usually occur as single structures near passenger stations.

Passenger stations vary in size from the small rural depot or suburban station to the large stations and terminals of major cities. Small stations usually do not have loading docks and may not have parking areas for vehicles in the vicinity. The large stations located in cities are identified by a large number of tracks leading into or past a large building which houses the waiting rooms, ticket offices and other passenger facilities. The track or boarding area is normally covered.

Railroads that are abandoned or inactive are included, unless the tracks have been removed. Abandoned rail facilities may be identified by adding the "abandoned" modifier to the land use code.

KEYS TO PHOTOINTERPRETATION

- Tracks are generally straight linear features of varying width. They most often appear as a thin, straight line.
- Freight stations appear as long, small warehouses with loading docks on both sides. One side is along the railroad tracks, and the other is along a roadway, pier, or other form of transportation.
- Passenger stations may be small rural depots or large city terminals, characterized by auto parking, buildings and covered tracks and boarding areas.

CONTEXT

- **Landscape Position** - Rail facilities are located throughout the District. Railroad tracks are always present or nearby.

SIMILAR CLASSES

- [8140 Roads and Highways](#) - Road surface and traffic lane markings visible

SPECIAL MAPPING CONVENTIONS

Included within the mapping unit are all buildings, grounds, parking lots, passenger terminals, fuel storage, and other related features. Those areas that are not clearly related to the railroad or inside the operational boundaries are not included.

Priority classes such as water bodies, wetlands, land fills or waste treatment sites are always broken out if they meet minimum size criteria.

Railroads under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
538163.56 1495911.12

8140 Roads and Highways

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8100 Transportation](#)

LEVEL 3: **8140 Roads and Highways**

DESCRIPTION

This class includes those highways exceeding 100 ft. in width, with 4 or more lanes and median strips. The intent of this data layer is to include only the major transportation corridors.

Roads and highways will be delineated where they meet **ALL** of the following conditions:

- They exceed 100 feet in width.
- They are a **divided highway** and possess a median along most segments.
- They possess at least 4 lanes (two lanes in each direction).

Also included in the mapping unit are all interchanges, right-of-ways, highway patrol facilities, maintenance and service facilities and associated parking areas. Highway maintenance facilities may include local highway departments and roadside depots - these may not be located along major routes and may require supplemental data to identify.

However, parking lots along transportation routes that are used only for parking are not included in this class and are classified as [8100 Transportation](#).

KEYS TO PHOTOINTERPRETATION

- The right-of-way boundary forms the edge of the mapping unit. It is usually fenced, and the boundary is usually distinct from adjacent land use. The ROW usually follows along the top of a highway cut or the along the base of a highway fill area.

CONTEXT

- **Landscape Position** - Major highways are located throughout the District.

SIMILAR CLASSES

- [8120 Railroads](#) - Railroads tend to be straight or have long, smooth curves. They also have few houses or commercial establishments along them.

SPECIAL MAPPING CONVENTIONS

Any median strips exceeding 150 ft. in width will be delineated and classified with the appropriate land cover class.

Priority classes such as water bodies and wetlands are always broken out if they meet minimum size criteria.

The continuity of roads, highways, and other transportation features that meet the criteria for delineation shall be maintained in cases where they actually bisect a water body. Where continuity of

the water body is visible on the photo - such as a bridge over a river or canal - the water body will be delineated and the road or other transportation feature will be broken at the boundary of the water body.

Highways under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE values are the same, except in the case of medians, as noted in Special Mapping Conventions.

CIR DOQQ IMAGE



0 125 250 500 750 1000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
388246.91 868948.65

8150 Port Facilities

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8100 Transportation](#)

LEVEL 3: **8150 Port Facilities**

DESCRIPTION

This class is used for marine freight and passenger terminals and ferry slips. It is for dockside facilities that are directly related to transportation, including structures, subsidiary parking areas, docks and mooring areas, warehouses and open storage areas, port administration and passenger terminals, and on-site roads, rail spurs and other conveyance facilities.

This class does not include other commercial and industrial activities present at ports, including those that provide supporting services to the port facilities. Also not included are shipyards employed in ship building and repair. Only uses that are directly involved in transportation are included.

Marine freight terminals are identified by characteristic long loading/off-loading piers with associated warehouses and open storage areas. Open storage may range from rows of automobiles to stacked containers. Cargo vessels and lighters tied to the docks or moored nearby confirm commercial freight activities.

Modern marine terminals have heavy cranes for loading and unloading container ships, similar to the portal and hammerhead cranes used for fitting out floating hulls at a shipyard; their presence requires a detailed examination of the surrounding area for shipyard facilities, which are classified as [1560 Heavy Industrial](#).

KEYS TO PHOTOINTERPRETATION

- Heavy cranes for loading and unloading container ships may be present.
- Ships will usually be visible alongside docks, not blocking each other.
- Ferry slips are identified by tall pilings that enclose the slip. Ferry routes are often shown on highway maps as dashed lines.
- Roads and rail spurs serve the terminal.
- Open storage may include uniform rows of automobiles or stacked containers.

CONTEXT

- **Landscape Position** - Port facilities can be found in any shoreline area. The boundaries with adjacent commercial and industrial land uses may be poorly defined.

SIMILAR CLASSES

- [1560 Other Heavy Industrial](#) - Shipyards have heavy cranes similar to port facilities. Careful inspection or supplemental data is needed to differentiate them.

SPECIAL MAPPING CONVENTIONS

Included within the mapping unit are all structures, parking areas, docks and mooring areas, warehouses and open storage areas, port administration and passenger terminals, and on-site roads,

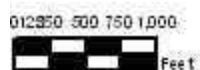
rail spurs and other conveyance facilities. Those areas that are not directly related to transportation functions are not included.

Port Facilities under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
n/a

COORDINATES
933746.13 522660.87

8200 Communications

LEVEL 1: [8000 Transportation, Communications and Utilities](#)

LEVEL 2: **8200 Communications**

DESCRIPTION

This class refers to communications facilities larger than 5 acres that are not attached to another land use. When the stations are part of a commercial or governmental facility, they will be included in those categories rather than classified separately.

This class is predominantly for airwave communications facilities composed of antennae or transmission towers and all associated structures. It includes transmission towers and antenna for radio transmission or for microwave transmission of television and telephone communications.

Transmission towers may be detectable, but antenna are difficult to see on photography except perhaps by their shadows.

Communications facilities are not a high priority class to the District. They are often below minimum size criteria (5 acres). The primary reason to map them is their distinct appearance in rural areas and to avoid confusing them with more important classes, such as treatment facilities.

KEYS TO PHOTOINTERPRETATION

- Usually small facilities with towers, radars and antenna present
- These often occur as small open spaces in isolated rural areas - usually fenced and with a small building. The boundaries with adjacent land cover are usually distinct.
- In urban areas the antennas and towers may be roof mounted.
- Stereo enlargement is often necessary for proper identification. Long, thin shadows may be present.
- These structures are usually very tall and are sometimes placed on the tops of tall buildings.

CONTEXT

- **Landscape Position** - They can be located anywhere, including rural areas, but are preferably sited at high points in the landscape.

SIMILAR CLASSES

- [1900 Open Land](#) - may appear heavily vegetated or have a disturbed, scoured, white appearance
- [3100 Herbaceous \(Dry Prairie\)](#) - vegetation is diverse in type, texture, and pattern
- [8320 Electrical Power Transmission Lines](#) - appear as long, linear strips that transect the landscape

SPECIAL MAPPING CONVENTIONS

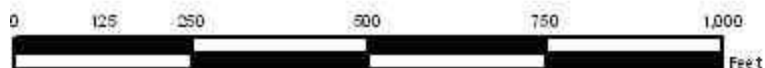
When Communications facilities are subsidiary to another mapped land use, they will be included in that land use rather than classified separately. Included within the mapping unit are any buildings,

grounds, parking lots, storage and other related features. Those areas that are not inside the operational boundaries are not included.

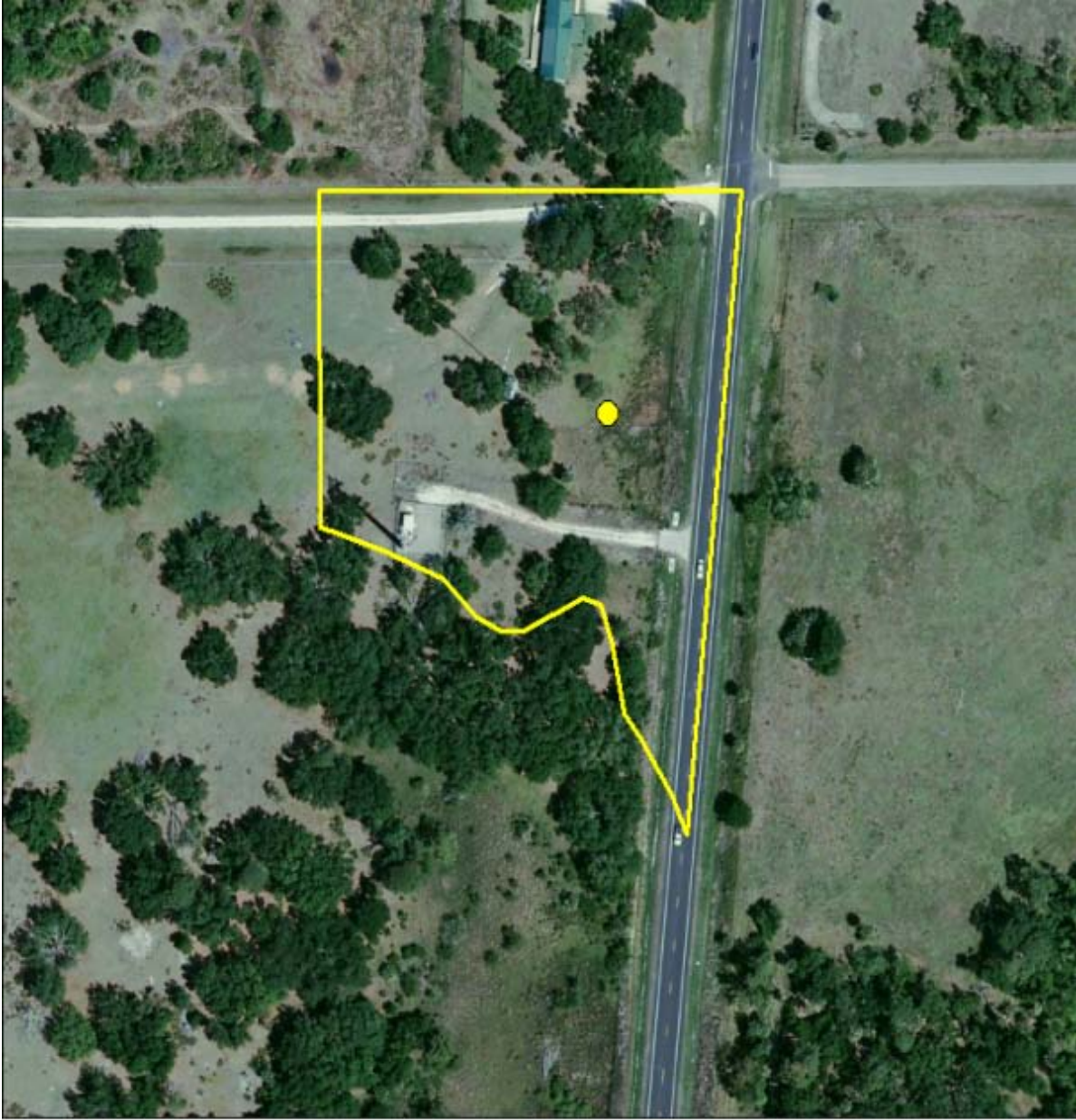
DUAL CODING CONVENTION

This is a **Land Use** class.; The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
03/13/07

COORDINATES
713292.56 1089321.85

8300 Utilities

LEVEL 1: [8000 Transportation, Communications and Utilities](#)

LEVEL 2: 8300 Utilities

DESCRIPTION

This general Level 2 class is only to be used where more specific Level 3 classes do not apply.

Utilities include power generating facilities and water treatment plants and their related facilities such as transmission lines for electric generation plants and aeration fields for sewage treatment sites.

Utilities associated with an Industrial, Commercial or Extractive land use are included within those other classes and are not classified as 8300 Utilities.

Many of the Utilities are priority classes, in view of their importance to water resources.

KEYS TO PHOTOINTERPRETATION

- See the respective Level 3 key pages for more details.

CONTEXT

- **Landscape Position** - Utility features can be found throughout the District.

SIMILAR CLASSES

The Utilities classes are distinctive and are readily differentiated from other classes. For details and exceptions, see the PI keys for each of the Level 3 subclasses.

SPECIAL MAPPING CONVENTIONS

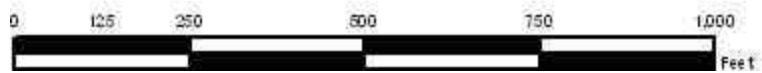
There are Minimum Mapping Units for the 8300 Utilities classes as outlined below. The following criteria apply:

- [8310 Electrical Power Facilities](#) - These must be 5 acres or more.
- [8320 Electrical Power Transmission Lines](#) - These must exceed 150 feet in width and have a different land cover than the surrounding landscape.
- [8330 Water Supply Plants](#) - These must be 5 acres or more.
- [8340 Sewage Treatment](#) - These must be 5 acres or more.
- [8350 Solid Waste Disposal](#) - These must be 5 acres or more.
- [8360 Other Treatment Ponds](#) - These must be 5 acres or more.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
510029.04 1485385.11

8310

Electrical Power Facilities

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8300 Utilities

LEVEL 3: 8310 Electrical Power Facilities

DESCRIPTION

Electric power plants include fossil fuel and nuclear plants. Subsidiary facilities included are cooling ponds or towers, canals and facilities for receiving and storing fuel (coal, oil), parking areas and transformer yards.

Electricity generating plants are indicated by transformer yards, which look like intricate wire cages supported by a heavier open steel frame; they are often easier identified by their shadows. High-voltage lines often can be seen running from the transformer yards. Fossil fuel plants and nuclear plants use water for cooling the condensers (which condense the steam used to drive the turbines connected to the generators).

Intake and discharge canals, and cooling ponds or cooling towers are evident. The nuclear plant at Turkey Point is conspicuous by having six square miles of linear, parallel cooling ponds. The fossil plant at Barley Barber Swamp in western Martin County is easily identified by the plant facilities adjacent to a very large cooling pond system. These cooling ponds should be mapped as part of the Electrical Power Facilities when directly adjacent to the plant and identifiable as part of the facility.

Fossil fueled plants are common in Florida. They are distinguished from nuclear plants by the lack of a large monolithic reactor building, the presence of two or more tall chimney stacks, and the presence of either coal stockpiles or oil storage tanks.

The presence of the large boiler house and large transformer yards next to the relatively small main building (the generator hall) distinguishes the thermal power plant from a heavy manufacturing or processing plant, which would not require two large sources of power for the same building.

Substations, which have transformer yards with the same complex appearance as those at power plants, occur at the ends of high-voltage transmission lines near built-up areas.

KEYS TO PHOTOINTERPRETATION

- The power plants require water for cooling and are always located next to natural or artificial water bodies. Intake and discharge canals are present.
- Cooling towers or chimney stacks are present and steam may be visible.
- Transformer yards look like intricate wire cages supported by a heavy open steel frame. They are present at the power plants and at substations at the ends of the transmission lines near built-up areas.
- Fossil fueled plants have piles of coal and/or large oil storage tank farms. Rail spurs, pipe lines or dock facilities are needed to deliver the fuels.

CONTEXT

- **Landscape Position** - Power plants are located next to water bodies used for cooling, often near other industrial areas. Transformer yards and substations are found throughout the District, usually adjacent to built-up areas.

SIMILAR CLASSES

- **1560 Other Heavy Industry** - These have large manufacturing facilities and do not require extensive transformer yards, cooling towers, etc.

SPECIAL MAPPING CONVENTIONS

Only those features that are inside the facility boundaries and involved in its operation are included in the 8310 mapping unit. These may include parking and transportation areas, treatment facilities, fuel storage, office buildings and open areas within the operational boundary.

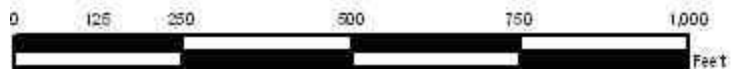
Priority classes such as water bodies and wetlands are exceptions to the above. If these features meet their minimum size criteria they are always broken out.

All utilities under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
03/17/07

COORDINATES
402140.51 867841.14

8320

Electrical Power Transmission Lines

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8300 Utilities](#)

LEVEL 3: **8320 Electrical Power Transmission Lines**

DESCRIPTION

This class includes only high-voltage power transmission lines. The right-of-ways (ROWs) are not usually shared with any other utilities and have a distinct appearance due to design considerations. The ROWs appear as long, linear strips that transect the landscape.

High-voltage lines must be at least 30 feet above the ground or vegetation, so they are carried on high insulated towers above cleared swaths of land. The cleared swaths may be over 500 feet wide and may be used for other purposes, including agricultural and recreational uses.

KEYS TO PHOTOINTERPRETATION

- The (ROWs) are not shared with other utilities, due to the corrosive effects of the electrical currents and other factors.
- The lines and ROWs are typically very straight. Bends in the lines are sharp, not gradual or curved. The lines do not need to conform to topography, as do most other utilities.
- Vegetation in the strip is usually cleared of trees and shrubs and maintained as an open, accessible area.
- Support towers and their shadows are often visible. They are spaced at an even distance apart in a generally straight line.
- Actual transmission lines are sometimes visible, if over a dark background such as water.
- Trails usually wind along the ROWs, from tower to tower.

CONTEXT

- **Landscape Position** - Electrical Power Transmission Lines can occur anywhere within the project area, in any context. The transmission line ROWs begin in transformer yards at power generating stations and end at transformer yards at substations in built-up areas.

SIMILAR CLASSES

- [8120 Railroads](#) - Tracks are visible, ROWs have gradual curves, and the lines follow topography.

SPECIAL MAPPING CONVENTIONS

Utility corridors are delineated only where they are 150 feet or greater in width and their land cover is different from the surrounding landscape.

In those corridor segments where the land cover is identical to adjacent areas, such as through pastures or rangeland, the utility feature will not be mapped.

The above applies as follows:

- LU=8320/LC=8320 where they are 150 to 300 feet in width.
- LU=8320 **and dual coded with the appropriate Land Cover code** where they exceed 300 feet in width.

Continuity of the strip across the landscape is not required.

Transmission lines under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. **A separate Land Cover code is only required as indicated above.**



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
03/14/07

COORDINATES
808944.62 1018654.60

8330

Water Supply Plants - Including Pumping Stations

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8300 Utilities](#)

LEVEL 3: **8330 Water Supply Plants - Including Pumping Stations**

DESCRIPTION

This class includes water treatment plants, settling basins, water storage towers, wells and pumping facilities that serve municipalities or residential subdivisions. It does not include water treatment facilities attached to [1400 Commercial](#), [1500 Industrial](#), [1600 Extractive](#) or [1700 Institutional](#) classes. It does not include water transmission pipelines, which are classified as [8100 Transportation](#).

Nearly all water supply plants in the District use ground water. Well fields are not mapped unless the boundaries of the well field are distinct on the photography. Wells, pipelines and storage towers often do not meet minimum size criteria.

The treatment plants are identified by a number of low, open sedimentation tanks. The tanks are circular or rectangular and about 100 to 200 feet across. The plants vary greatly in size. Each plant may contain buildings, storage areas, sludge disposal sites, pumping facilities, parking and other features.

KEYS TO PHOTOINTERPRETATION

- Mixing tanks and settling basins are rectangular and contain a series of baffles or mechanical agitators.
- "Dorr" clarifiers are circular settling tanks that may have rotating scrapers and a single narrow walkway running from the rim to the center of the tank.
- Ground water wells can be at varying distances and elevations from the plant and each other and may not be identifiable without ancillary data.

CONTEXT

- **Landscape Position** - Water treatment plants are located in or near built-up areas. The plants may be separate from well fields and storage towers. Plants that use surface water are usually located near the water body.

SIMILAR CLASSES

Water treatment plants may appear similar to treatment facilities that use similar equipment at industrial sites, or with water treatment operations at commercial or institutional facilities.

- [8340 Sewage Treatment](#) - Sewage treatment plants (STPs) use much of the same equipment. STP trickling filters look like Dorr clarifiers - low circular tanks. But they are distinguished by having four narrow booms that revolve around the center of the tank, sprinkling effluent over the filter bed. STPs may also have sludge digestion tanks and large sand filter beds (see [8360 Other Treatment Ponds](#)).

SPECIAL MAPPING CONVENTIONS

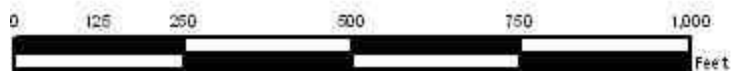
Well fields are not mapped unless the boundaries are distinct on the photography. Wells, pipelines and storage towers often do not meet minimum size criteria. If well fields are mapped, a separate land cover code is required for the well field polygon.

Treatment plants under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Use** class. The LUCODE and LCCODE are the same. A separate **Land Cover** code is not required.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000
Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
425944.19 774623.77

8340 Sewage Treatment

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8300 Utilities

LEVEL 3: 8340 Sewage Treatment

DESCRIPTION

There are at least three different types of facilities included in this class and they have nothing in common except wastewater. In order to tell them apart, 8340 is designated a land use class and a separate land cover class is assigned to LCCODE. The land cover code identifies what kind of sewage treatment facility it is. Typical land **cover** codes associated with wastewater treatment plants (WTPs) include 2150 Field Crops (hay), 3100 Herbaceous - Dry Prairie, 6000 Wetlands or 8360 Other Treatment Ponds, as described below.

The three types of facilities (and there may be more) are:

- Wastewater Treatment Plants
- Spray Fields
- Percolation Beds - also known as rapid infiltration basins (RIBs)
- Wetlands used for wastewater treatment and discharge

The treatment plants themselves are characterized by round digesters, about 100 to 200 feet in diameter. Aerobic digesters are open on top and have visible booms that pivot from the center and spray the effluent on the digester beds. Anaerobic digesters are smaller in size and covered. Treatment plants may also have settling basins, drying beds, settling ponds or lagoons and enclosed buildings. They tend to be near (but not too near) urban areas and may also be located near discharge features (such as streams, wetlands or the coast). WTPs are coded 8340/8340, for LCCODE/LUCODE.

Spray fields tend to be hay fields located near the WTP. They are associated with the WTPs rather than private farm operations, so typical farming features (barns, homesteads, etc.) may be absent. Since spray fields get a large dose of nutrient and water, they tend to have an exaggerated red or pink CIR signature, indicating vegetative growth. Patterns of fertilization may be uneven, since disposal is the main objective, not crops. *Land cover code is from 2000s and 3000s.*

Wetlands used for wastewater treatment may be hard to identify. Ancillary data such as District or DEP maps are the best source. Also, look for conveyance systems (pipes, pump houses, canals) or other artificial features, such as dikes, levies, straight edges and partitioning of the wetlands. Accelerated growth may result in exaggerated reddish CIR tones. *Land cover code is from the 6000s.*

Percolation beds are also called rapid infiltration beds (RIBs). The appearance of these basins suggests aquaculture, except they are larger and may be spaced farther apart (spacing allows more infiltration without raising the water table). They are located in rural areas separated from development, for obvious reasons. Look for road access and some minor utilities (sheds, fences, gates, valves); there may be few other features to assist interpretation. *Land cover code for RIBs is 8360 (Other Treatment Ponds).* The basins and connecting uplands are delineated together as a single polygon.

KEYS TO PHOTOINTERPRETATION

Treatment Plants:

- Primary, secondary and tertiary cylindrical treatment tanks appearing as small circles (round from above).
- Large processing/office buildings and smaller structures for storing equipment, supplies.
- Visible settling ponds, often have aquatic vegetation in them with a bright pink signature.

Spray Fields:

- Lack of typical agricultural indicators (barns, homesteads).
- Reddish CIR tones due to increased fertilizer and water.
- Irregular growth patterns.

Treatment Wetlands:

- Conveyance systems, such as pipes, pumping facilities, canals may be visible.
- Artificial features, such as dikes, levies, partitioning into sub-areas.
- Reddish CIR tones from increased nutrient.

Percolation Beds:

- Large, rectangular-shaped basins, uniformly spaced, sometimes far apart.
- Located in rural areas away from development.
- Beds are mostly dry, but some show standing or surface moisture.

CONTEXT

- **Landscape Position** - Sewage treatment plants are located near municipalities (often near large water bodies) throughout the project area. Boundaries with adjacent land uses are regular and well defined.

SIMILAR CLASSES

- [2540 Aquaculture](#) - May look like percolation beds, or RIB's. Aquaculture ponds tend to be smaller, closer together, in farming context. Also, RIBs are mostly dry.
- [8330 Water Supply Plants](#) - Have fewer treatment structures and are usually closer to residential areas

SPECIAL MAPPING CONVENTIONS

Priority classes such as water bodies and wetlands are always broken out if they meet minimum size criteria.

All utilities under construction are classified as if they were complete.

DUAL CODING CONVENTION

The **Land Cover** code for each 8340 variant is as follows:

- For Treatment Facilities, the land cover code defaults to 8340
- For Spray Fields, use [2150](#) or [3100](#) for land cover
- For Treatment Wetlands, use appropriate wetlands class

- For Percolation Beds, use [8360](#) - Other Treatment Ponds

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
495949.14 1449405.22

8350

Solid Waste Disposal

LEVEL 1: 8000 Transportation, Communication, and Utilities

LEVEL 2: 8300 Utilities

LEVEL 3: 8350 Solid Waste Disposal

DESCRIPTION

This class includes sanitary landfills, dumps and other waste disposal areas. The sites may be publicly or privately operated, and may or may not be permitted. It does include dumps and landfills that are found at private operations such as farms, institutions, industrial and commercial sites, if they meet size criteria. However, it does not include storage of uniform wastes and residuals that are part of a normal process stream, such as mine tailings and treatment plant sludges. These are treated as subsidiary to the operation and included with the applicable land use.

Sanitary landfill operations are identified by supervisor's buildings, bulldozer and truck tracks, and a small white fringe of debris that has not been covered by the fill. Despite buffer zone requirements for wetlands and water bodies, landfills may still be seen adjacent to wetlands and water bodies. This is partly because so many parts of the project area have a very high water table. The high water table (and thin soils) interfere with the proper operation of sanitary landfills and often results in above ground mounded disposal appearing as a truncated pyramid.

Incinerators are often present, either rough conical structures with ground entrances or structures having elevated loading, platforms and truck ramps. These features, and the tracks made by trucks removing the remaining material, may be visible if the incinerator is active.

Landfills and dumps may be fenced. A junk yard may also be fenced and contain a small building. It is distinguished from a dump only by the arrangement of the junked equipment, emphasized by patterns of vegetation and trails around the equipment. Mine dumps and ore dressing tailings areas may also be mistaken for solid waste dumps. They are often depicted on topographic maps.

KEYS TO PHOTOINTERPRETATION

- Landfills are characterized by large elevated mounds. Leachate seeps may be visible at the base of the mounds. At legal sites only the small active areas are not covered with a uniform fill material.
- Heavy equipment, treatment ponds, offices and warehouses, storage bins and other facilities may be present.
- The appearance of landfills can vary from very regular and organized to very messy and disordered. Boundaries with adjacent land uses can be distinct or irregular.
- Large parts of the site have little or no vegetation. The sites tend to be heavily modified by earth moving activities, with or without a clear pattern or intent.
- Un-permitted dumps lack the regular shapes and smooth textured earth fill of sanitary landfills. Open pits, trash and junked vehicles and appliances are often visible.

CONTEXT

- **Landscape Position** - Found throughout the project area, in any context except for densely built-up areas. Solid waste disposal sites are often adjacent to an Open Land class. Boundaries with adjacent land uses are usually not well defined.

Land fills are located at the closest acceptable distance from the built-up areas that generate

the solid wastes. Disposal sites are difficult to approve in urban areas due to public reaction. Un-permitted dumps are often located in the least conspicuous locations, such as a remote back corner of a property or at the end of a remote dirt road in a forested area.

SIMILAR CLASSES

- **1500 Industrial** - Areas that are disturbed, under construction, or used for storage of raw or residual materials may look like dumps. Sites that store uniform wastes and residuals as part of a normal process stream are subsidiary to the industrial site and not included in this class.
- **1600 Extractive** - Excavating equipment such as bulldozers, shovels, dredges and drag lines are visible.
- **7400 Disturbed Land** - Soil and/or substrate has been altered by human activity; white or whitish, mottled signature due to regenerating vegetation.
- **7420 Borrow Areas** - Excavation equipment may be visible; appear as depressions with regular, often rectangular shapes.
- **7430 Spoil Areas** - These will lack many of the above 8350 indicators, but may otherwise look like dumps.

SPECIAL MAPPING CONVENTIONS

The minimum mapping unit (MMU) for this class is 5 acres. Landfills are considered a very high priority feature in water resource management.

Landfills under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

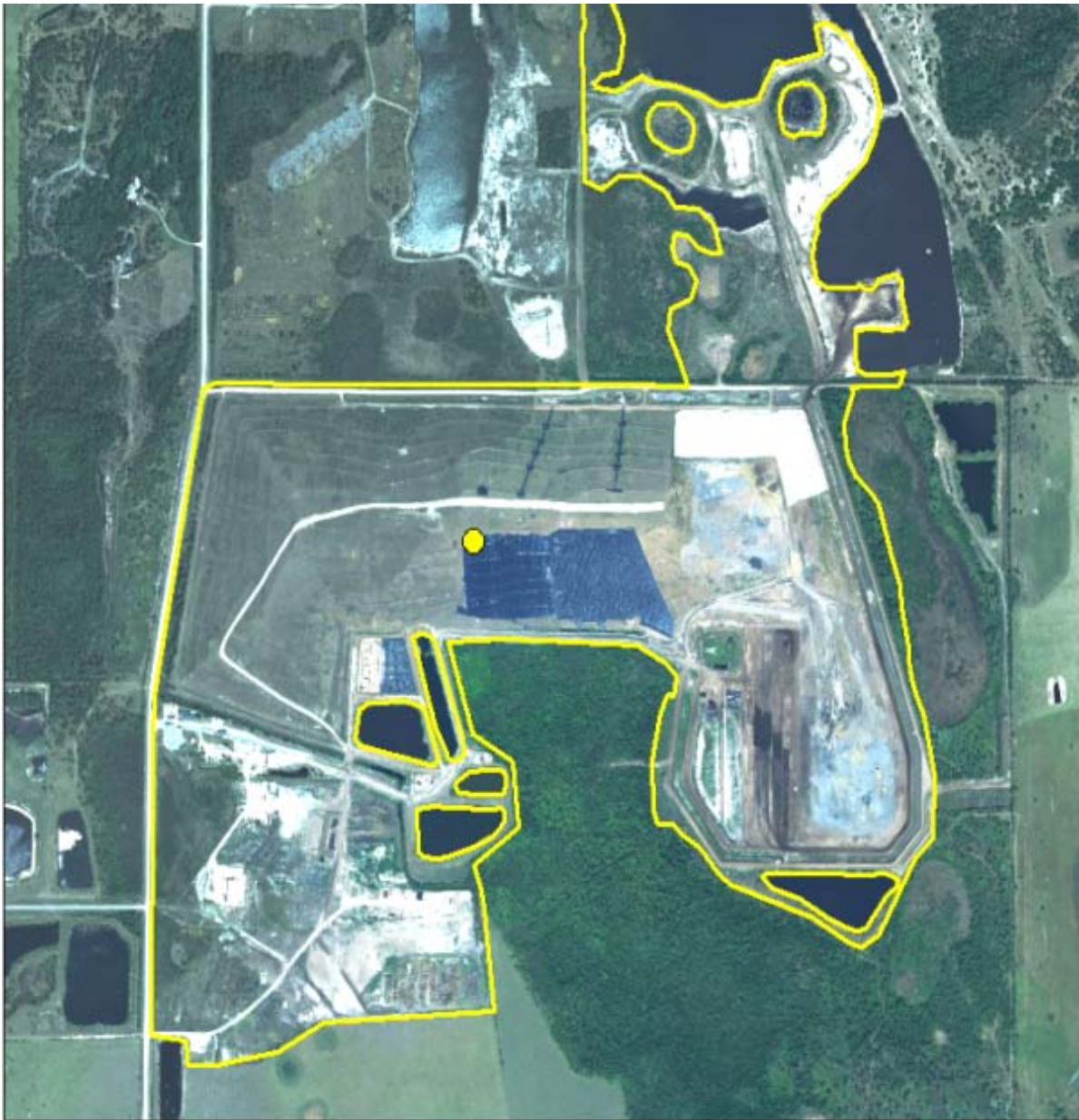
This is a **Land Use** class. The LUCODE and LCCODE are generally the same. However, treatment ponds at a landfill are dual coded with **8360** Other Treatment Ponds as the LCCODE along with 8350 as the LUCODE.

CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

NATURAL COLOR IMAGE



012850 500 7501,000
Feet

FIELD PICTURE



DATE
03/13/07

COORDINATES
756890.39 1093873.57

8360

Other Treatment Ponds

LEVEL 1: [8000 Transportation, Communication, and Utilities](#)

LEVEL 2: [8300 Utilities](#)

LEVEL 3: **8360 Other Treatment Ponds**

DESCRIPTION

This code was created by the SFWMD to classify those lagoons, holding ponds, impoundments and infiltration ponds which are utilized for agricultural or industrial treatment purposes.

This 8360 code is used for facilities that are **designed and utilized for specific treatment or infiltration functions**, including percolation beds used for sewage treatment/disposal.

It is not used for typical farm ponds, stormwater treatment ponds and other "reservoirs" that generally function as normal water bodies. It is not used for holding ponds in mining applications, which are classified as [1660 Holding Ponds](#).

KEYS TO PHOTOINTERPRETATION

- The interpreter needs to recognize the type of facility that the impoundment is associated with and, if possible, its function.
- It is generally located in or adjacent to the operation it serves. Percolation beds (RIBs) may be isolated in rural areas.
- Inflow/outflow structures, plumes or aerial spray, pumps and other buildings or equipment are often visible.
- Levees and access roads are generally present.
- The water color may deviate from the typical black color seen on CIR photography, due to altered chemistry or biota. Colors may be blues or greens, and contrast distinctly with surrounding natural water bodies.
- Shape of the impoundment appears artificial, with straight lines, angles, geometric curves or symmetrical shapes.

CONTEXT

- **Landscape Position** - Treatment ponds can be associated with industrial, agricultural and municipal facilities. They are not associated with mining operations or with residential areas.

SIMILAR CLASSES

- [1660 Holding Ponds](#)- associated with extraction (mining)
- [5300 Reservoirs](#) - Reservoirs do not have a treatment or infiltration function.
- [6000 Wetlands](#) and [7000 Barren Land](#) - Treatment ponds may be confused with wetlands or barren categories if vegetated or in a dry state.

SPECIAL MAPPING CONVENTIONS

This is a SFWMD modification to the FLUCCS system, which does not have this class.

Treatment Ponds in this class are given the Land Cover code 8360 whether they are vegetated or empty.

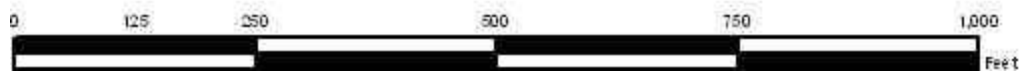
Priority classes such as water bodies, wetlands, golf courses, land fills or waste treatment site are always broken out if they meet minimum size criteria.

Treatment facilities under construction are classified as if the construction were complete.

DUAL CODING CONVENTION

This is a **Land Cover** class. **Dual coding is always required. A Land Use class must always be assigned** in addition to the 8360 code. The **Land Use** code is determined by the type of facility the treatment pond is associated with, if identifiable. An example is [2520 Dairies](#). If the type of facility is unidentifiable, the PI should use his best judgment based on context, ancillary data or field checking.

CIR DOQQ IMAGE



NATURAL COLOR IMAGE



0 125 250 500 750 1,000 Feet

FIELD PICTURE



DATE
10/15/07

COORDINATES
457645.18 1473901.21

MODIFIERS

Modifiers are used in this dataset to denote conditions which are not described by a Land Cover or Land Use code, or to add more descriptive detail for polygons which are already classified by a Land Cover or Land Use code.

They are divided into the three classes below:

[IMPACT](#)
[VEGETATION](#)
[SPECIES](#)

DESCRIPTION

See the respective Modifier Key pages for descriptions of these modifiers and information on their use in this data layer.

MAPPING CONVENTIONS

Minimum Mapping Units: There is no minimum mapping unit for the application of these modifiers.

Impact Modifiers

The impact modifiers used in this map are the following:

- Burned
- Off-Road Vehicles (ORV)

DESCRIPTION

These modifiers are added to land cover or land use codes to indicate the presence of these two conditions wherever they are identified on the aerial photograph.

- **Burned** - Burned areas are those affected by fire, either through natural means such as wildfire, or through the controlled use of fire to achieve land management goals. Fire is used to achieve a variety of objectives, such as enhancing forage for cattle, restoring a fire-dependent ecosystem, improving wildlife habitat or preparing sites for reforestation. Burned areas usually appear as a flat, bluish, or blue-green signature on the aerial photo.
- **Off-Road Vehicles** - Off-Road Vehicles (ORV) include a variety of land and water craft, ranging from all-terrain vehicles such as four-wheel motorbikes, swamp and dune buggies, and motorcycles, to personal watercraft such as jet and air boats. Evidence of ORV use usually appears as irregular, random trails through areas not accessible by roads. They can be found either on upland areas or through wetland areas such as prairies and marshes. They are particularly evident in the Big Cypress National Preserve in Collier County.

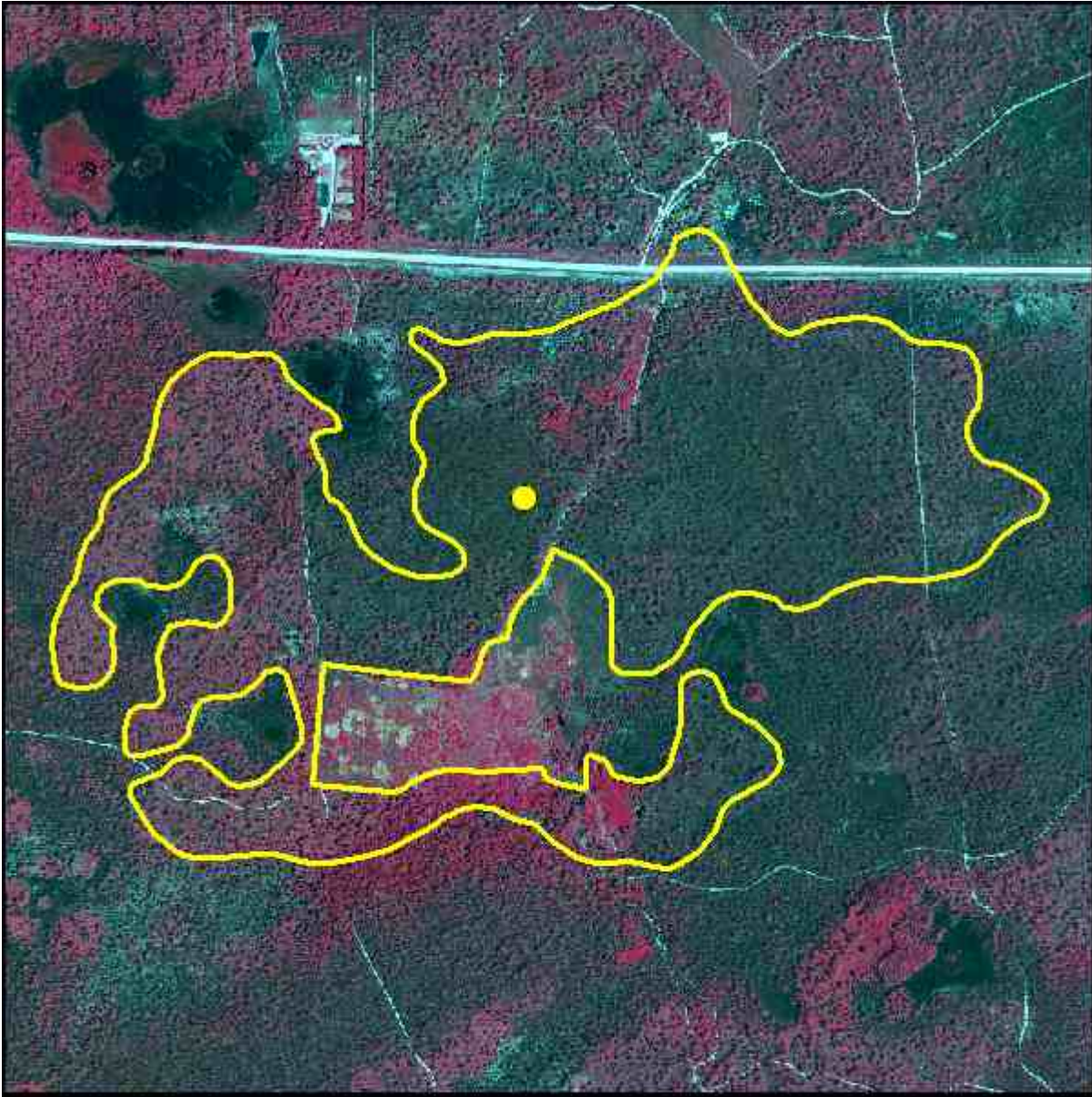
MAPPING CONVENTIONS

Minimum Mapping Units:

There is no minimum mapping unit for the application of these modifiers.

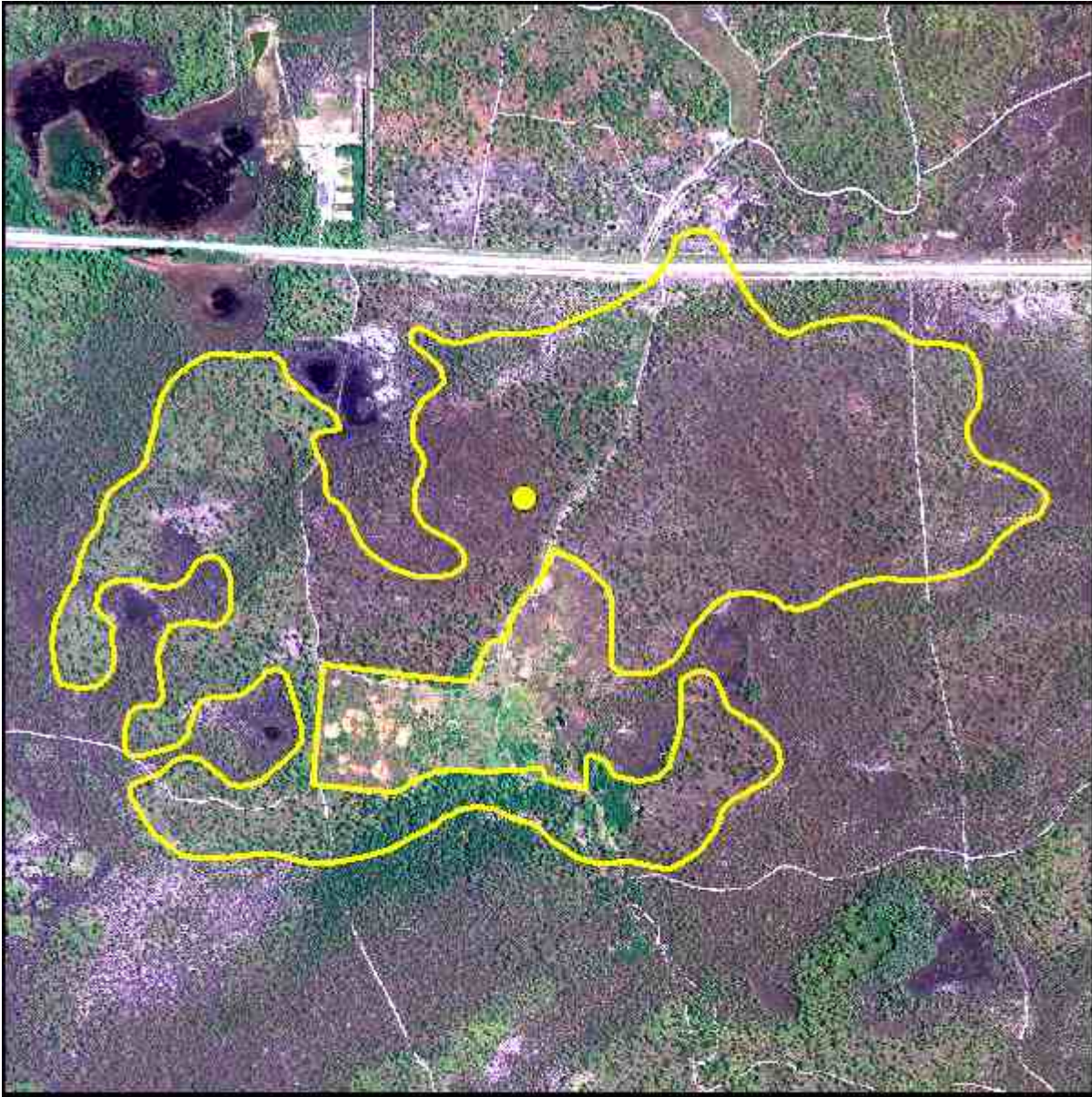
They will be applied to LCLU polygons as observed to reflect their influence on the landscape.

BURNED - CIR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

BURNED - COLOR DOQQ IMAGE



0 125 250 500 750 1,000
Feet

BURNED - FIELD PICTURE



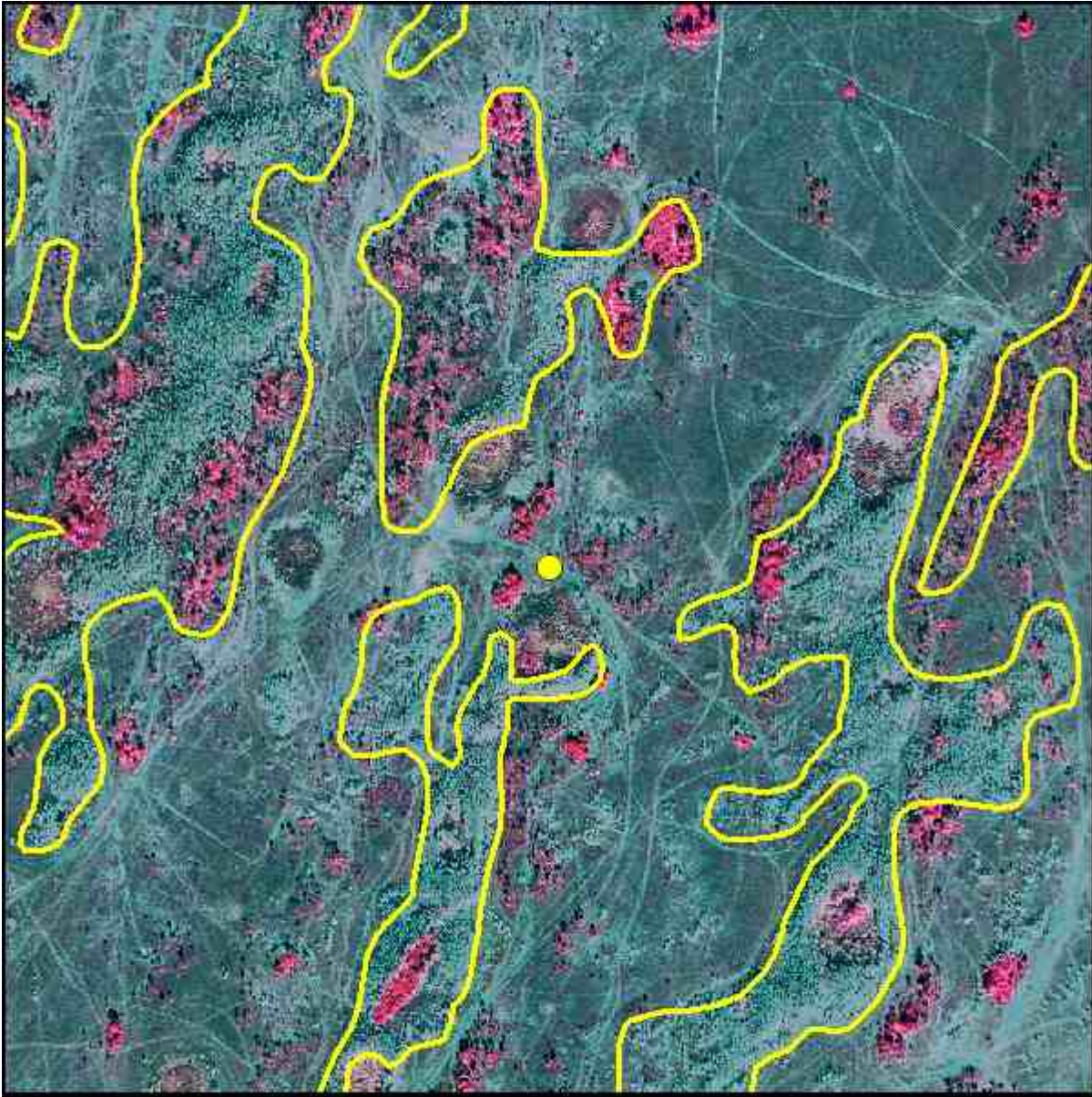
DATE

10/15/07

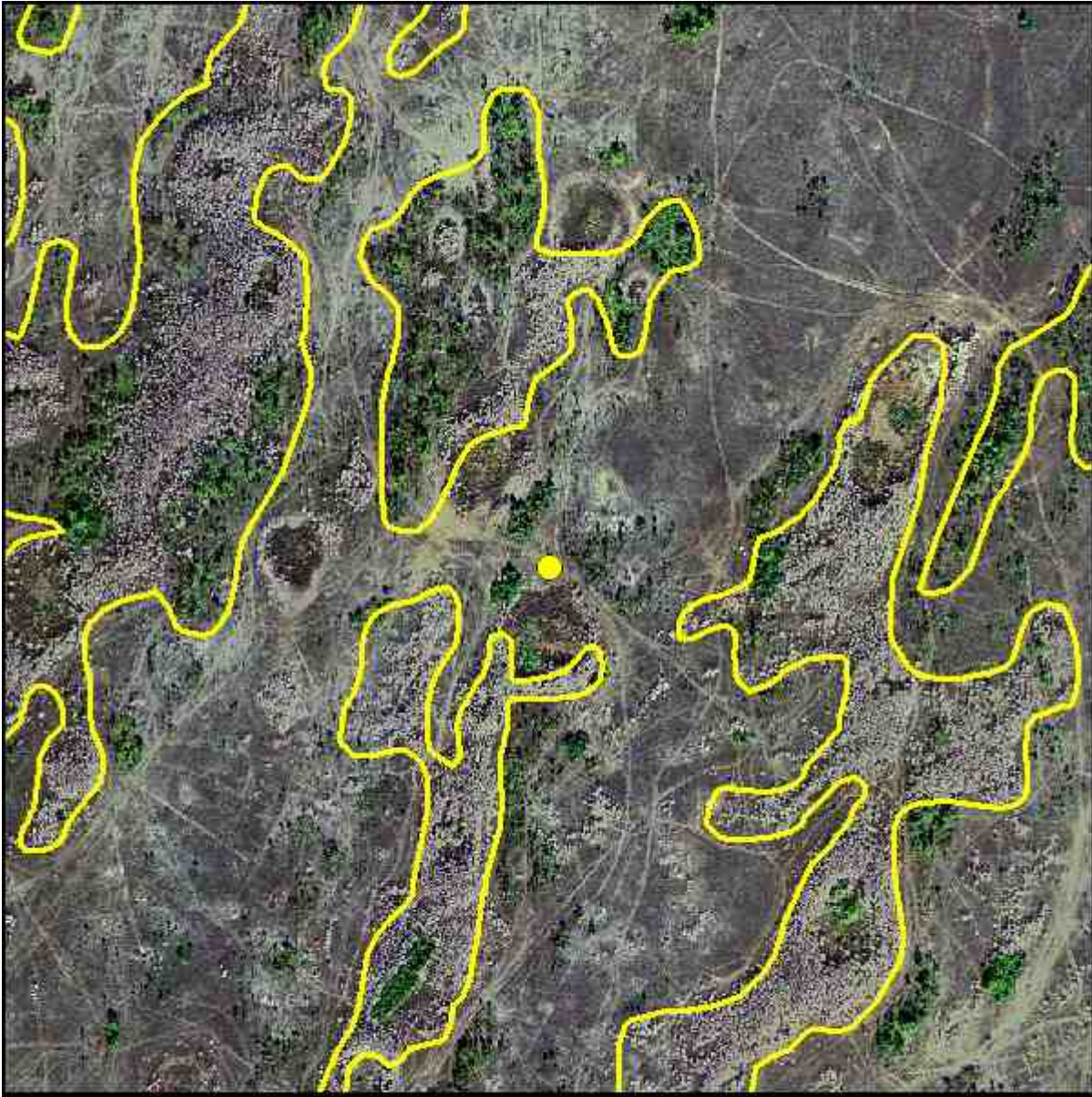
COORDINATES

333197.49 896343.43

ORV - CIR DOQQ IMAGE



ORV - COLOR DOQQ IMAGE



DATE
n/a

COORDINATES
591964.66 585630.80

SFWMD 2009 Land Cover / Land Use

Species Modifiers

The species modifiers used in this map are the following:

- Brazilian pepper
- Melaleuca

DESCRIPTION

These modifiers are added to all LCLU polygons to indicate the presence of these conditions or species as identifiable on the aerial photograph to a degree that does not meet the criteria for classification as the dominant land cover.

- **Brazilian pepper** - See the PI Key page for [4220 Brazilian pepper](#) for a description of this species and its typical photo-signature and habitat.
- **Melaleuca** - See the PI Key page for [4240 Melaleuca](#) for a description of this species and its typical photo-signature and habitat.
- Domain=Present conditions of Melaleuca:

Code	Description
------	-------------

0	No
1	Yes
2	Dead
3	Cleared
4	Multiple

- **Dead Melaleuca** - Dead Melaleuca are normally found in areas where they have been treated for eradication mainly within the Everglades. They usually have a sparse, whitish gray signature.
- **Cleared Melaleuca** - Collateral data such as the previous studies will be needed. These areas may be seen adjacent to dead Melaleuca within the Everglades.

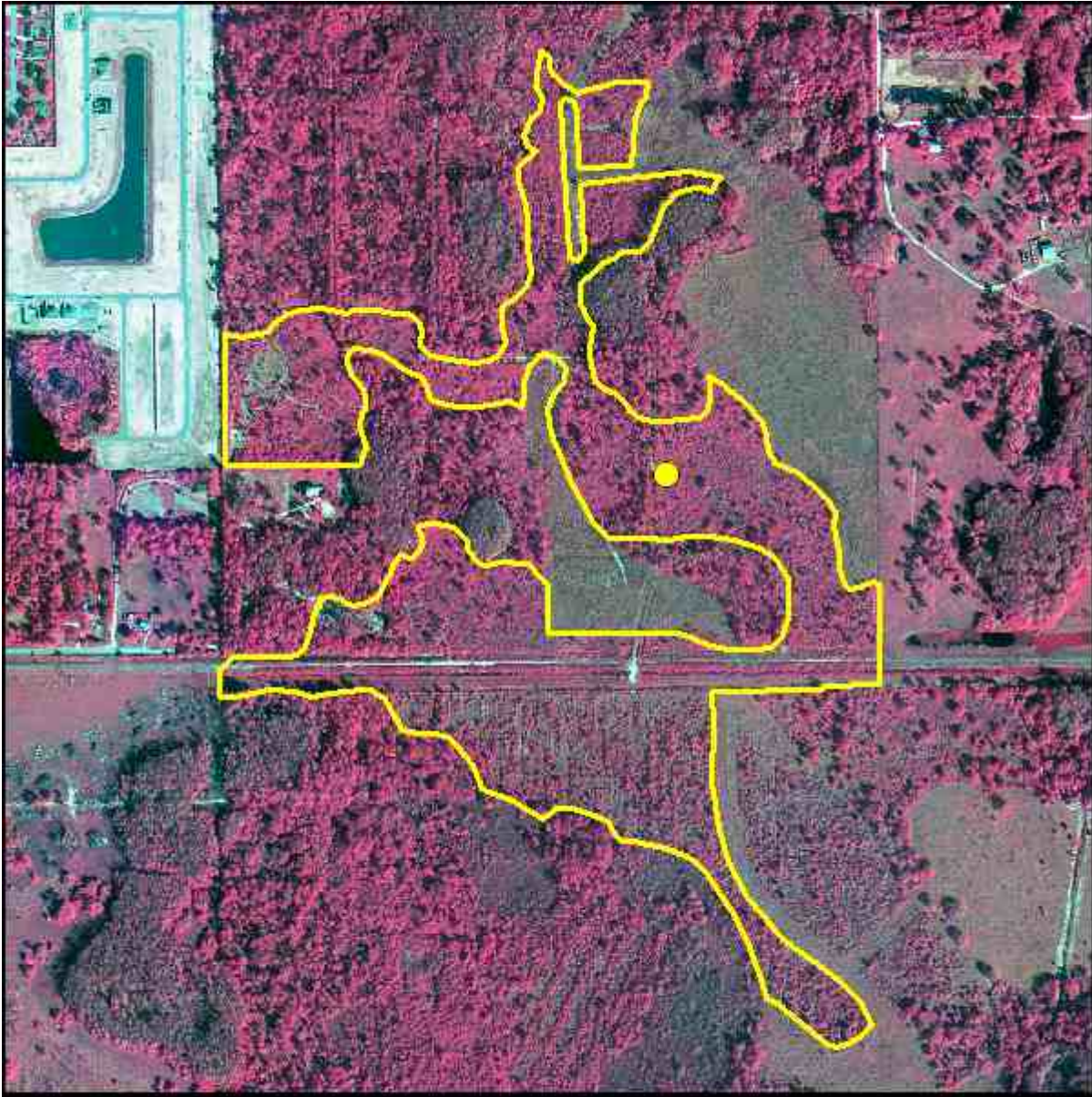
MAPPING CONVENTIONS

Minimum Mapping Units:

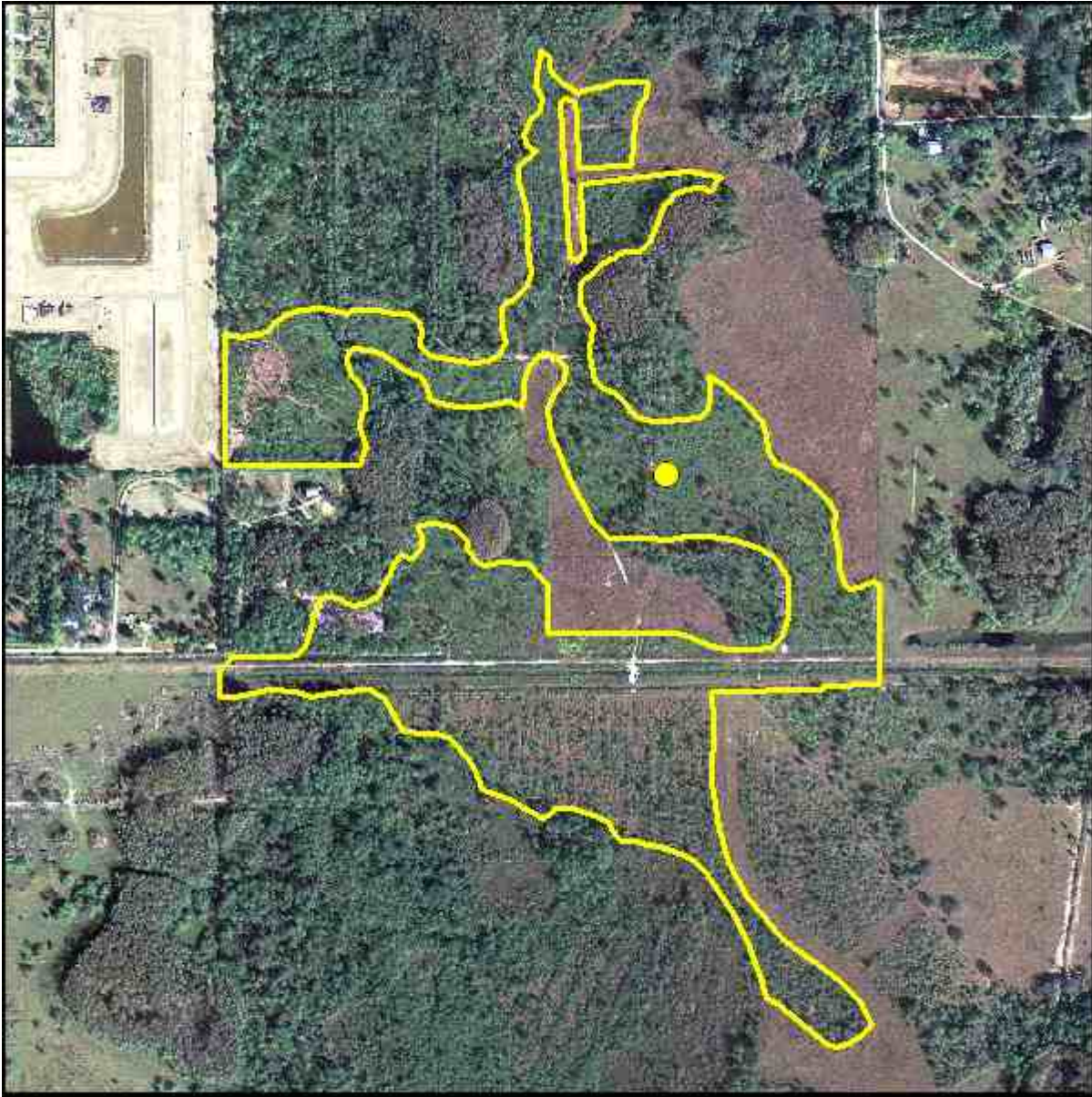
There is no minimum mapping unit for the application of these modifiers.

They will be applied to all LCLU polygons as observed on the aerial photograph.

BRAZILIAN PEPPER - CIR DOQQ IMAGE



BRAZILIAN PEPPER - COLOR DOQQ IMAGE



BRAZILIAN PEPPER - FIELD PICTURE

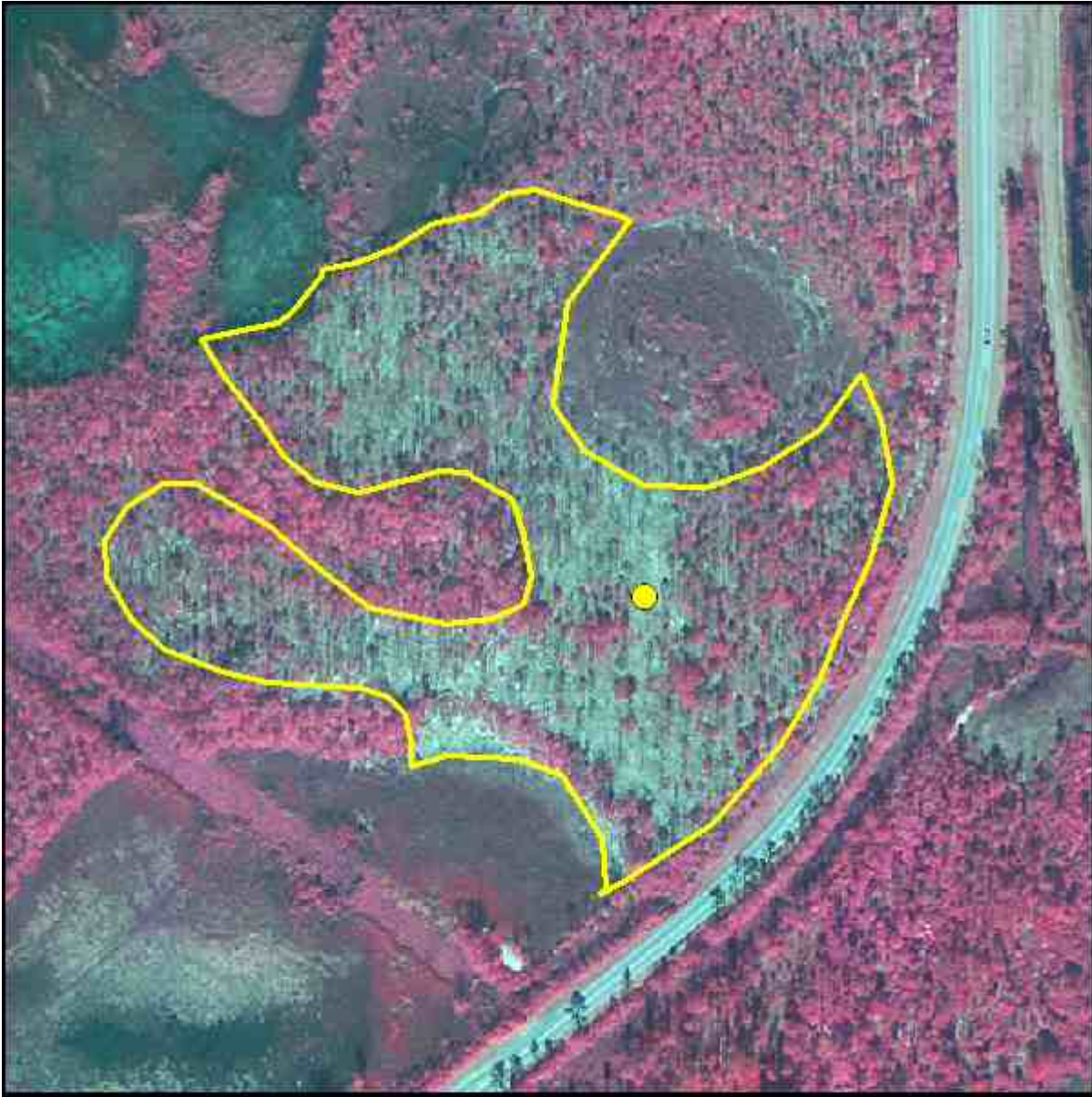
**DATE**

10/16/07

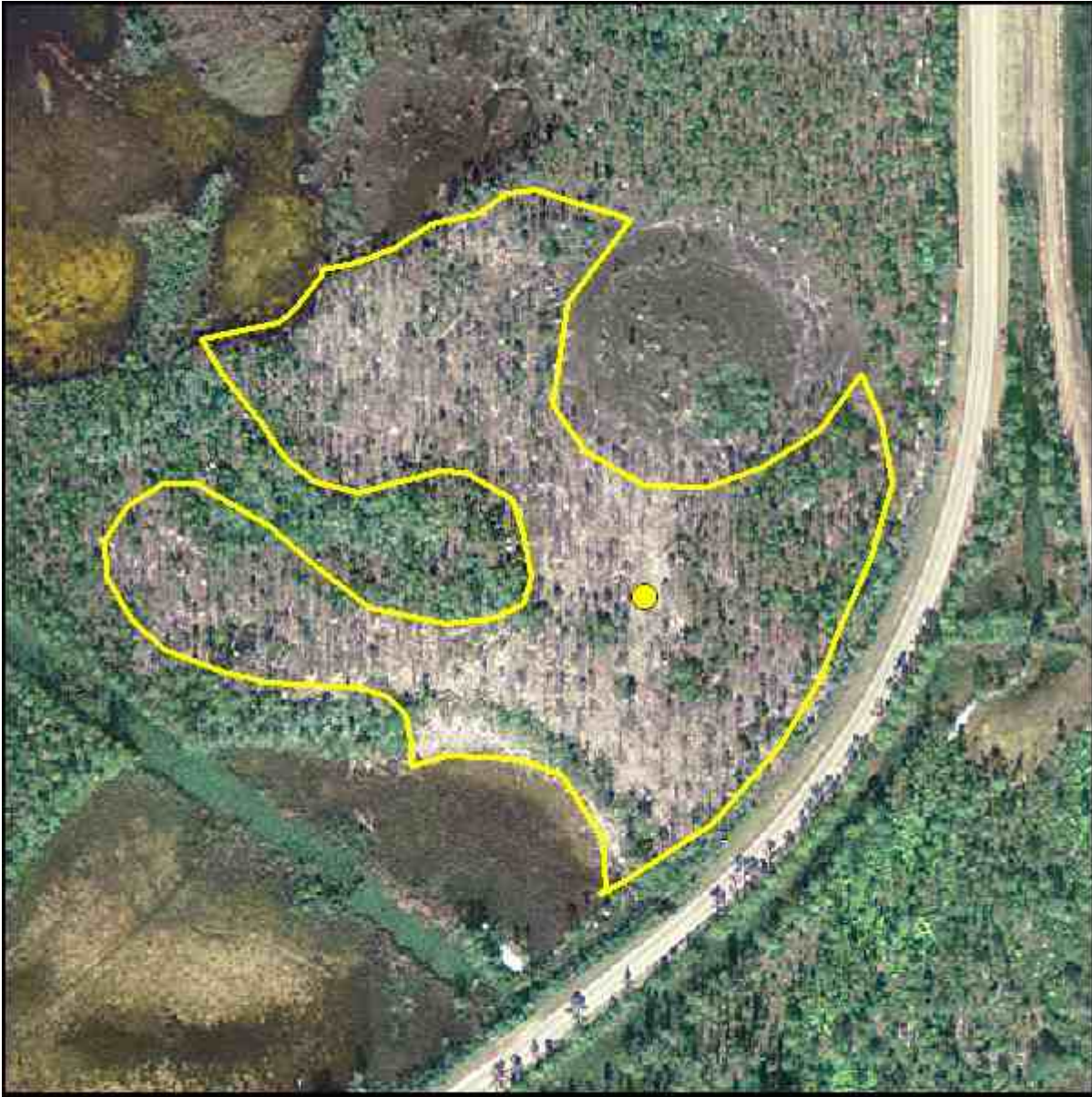
COORDINATES

425429.15 862247.00

MELALEUCA (DEAD) - CIR DOQQ IMAGE



MELALEUCA (DEAD) - COLOR DOQQ IMAGE



MELALEUCA (DEAD) - FIELD PICTURE

**DATE**

01/15/07

COORDINATES

887853.09 935561.79

SFWMD 2009 Land Cover / Land Use

Vegetation Modifiers

The vegetation modifiers used in this map are the following:

- Dead Trees
- Exotics
- Tree Islands

DESCRIPTION

These modifiers are added to all LCLU polygons to indicate the presence of these conditions or species as identifiable on the aerial photograph.

- **Dead Trees** - Dead trees, also known as "snags", can be found in areas where normal water flow has been impounded, either naturally or through the building of dams. Trees killed by these methods commonly appear denuded, with whitish or grayish signatures.
- **Exotics** - Exotics are species introduced to Florida, either purposefully or by accident, from a natural range outside Florida. This modifier will be used for species such as Australian pine, kudzu and Old World climbing fern (*Lygodium microphyllum*).
- **Tree Islands** - Tree islands are the most distinct plant communities in the Everglades. In general, they consist of low trees, which are situated on slight elevations above the surrounding marsh areas. They range in size from small circular islands of one half to 5 or 6 acres, to larger, tear-drop shaped "strands", which can grow to over 300 acres in size. These are wetland communities in which species composition varies, and they may be classified variously as bay heads, hammocks, willows or cypress islands.

MAPPING CONVENTIONS

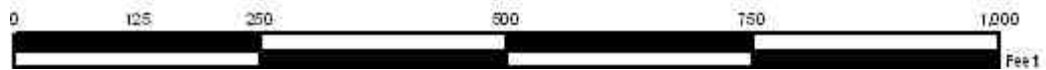
- **Tree Islands** - The "tree islands" modifier is applied to both the forested and shrub portions of tree islands that contain both, and also to tree islands that are made up of only forest or only shrubs. The modifier is not applied to any surrounding marsh areas.

Minimum Mapping Units:

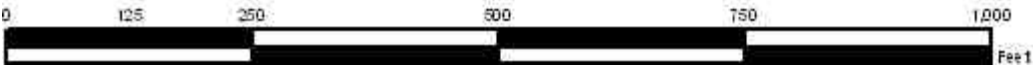
There is no minimum mapping unit for the application of these modifiers.

They will be applied to all LCLU polygons as observed on the aerial photograph.

DEAD TREES - CIR DOQQ IMAGE



DEAD TREES - COLOR DOQQ IMAGE



DEAD TREES - FIELD PICTURE



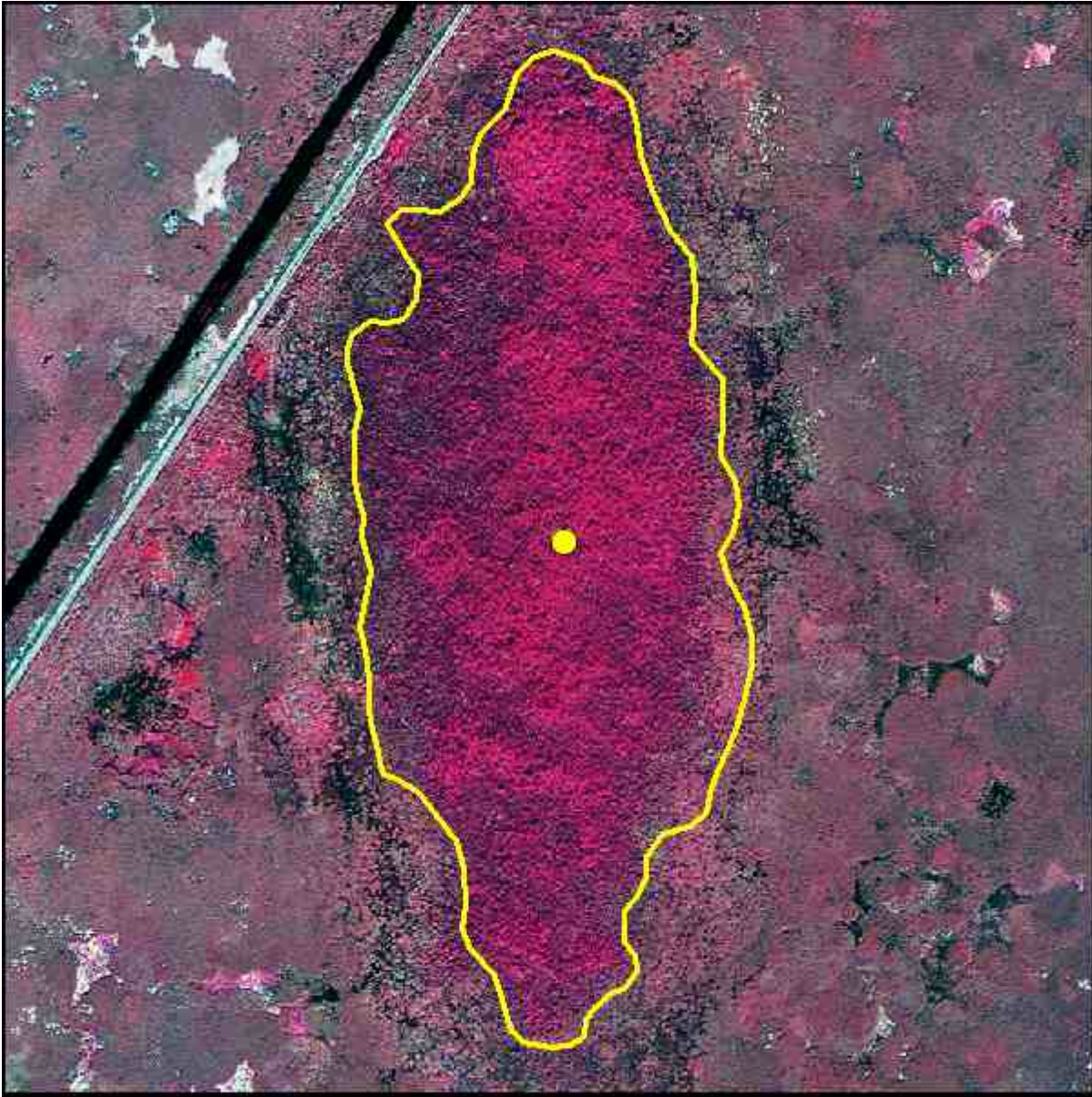
DATE

03/13/07

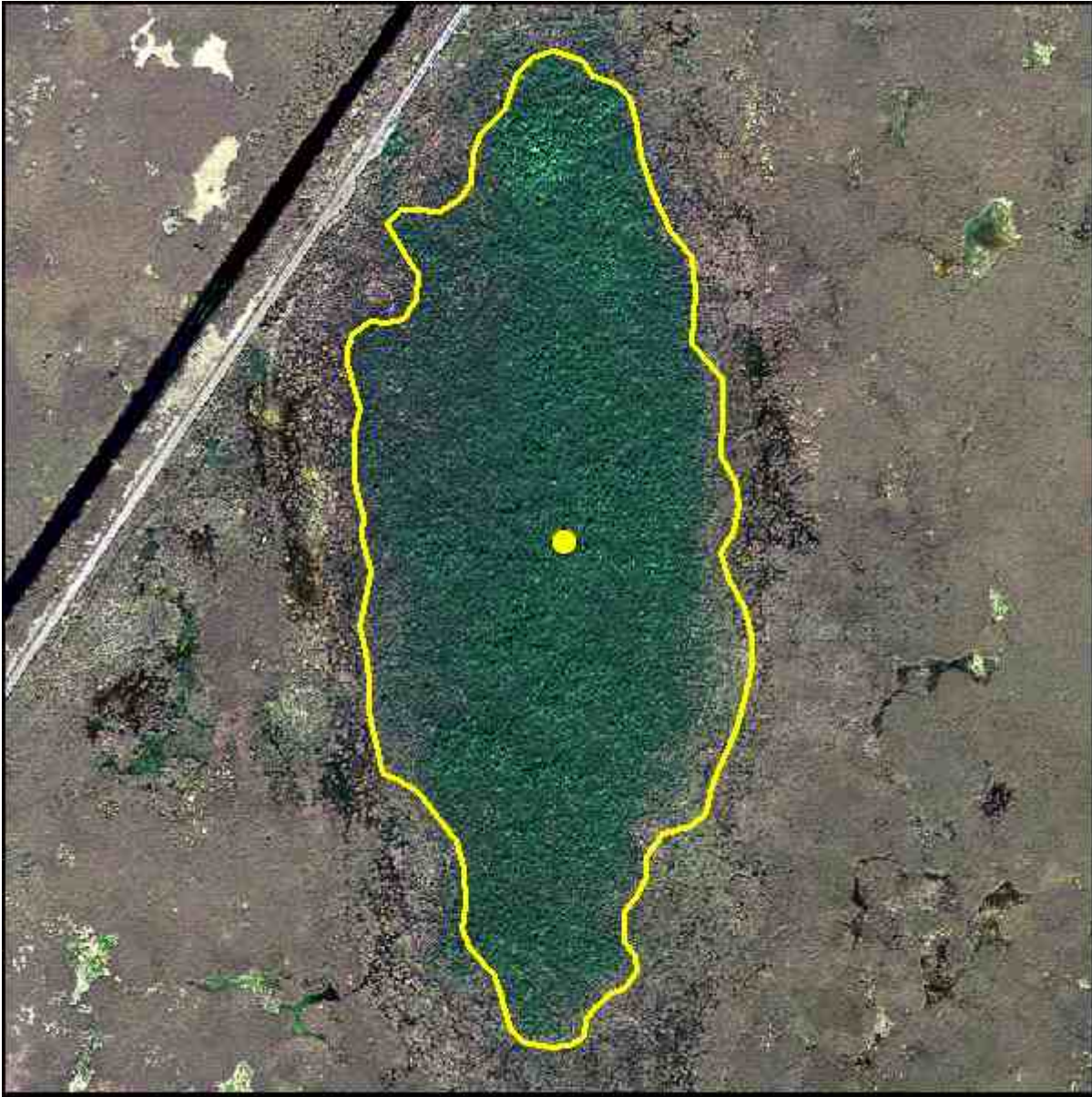
COORDINATES

754414.65 1092262.61

EXOTICS - CIR DOQQ IMAGE



EXOTICS - COLOR DOQQ IMAGE



EXOTICS - FIELD PICTURE



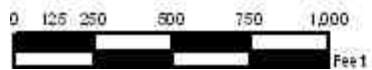
DATE
n/a

COORDINATES
788177.41 554605.32

TREE ISLANDS - CIR DOQQ IMAGE



TREE ISLANDS - COLOR DOQQ IMAGE



TREE ISLANDS - FIELD PICTURE



DATE

05/13/04

COORDINATES

744154.41 508080.41

SFWMD 2009 Land Cover / Land Use

High-Density Residential Modification

Review of Residential Density for LUCODE

Some of the high-density residential land use codes in the 2004 - 05 dataset may have been attributed improperly based on the empirical experience of LCLU Subject Matter Experts (SME). Since the 2008-09 dataset is being updated, based on the 2004-05, the assigned residential LU codes needed to be re-evaluated based on the acreage of each parcel property within a 1310 polygon (i.e., High-Density Residential, Fixed Single Family Unit). In other words, some of the high-density residential polygons need to be re-classed to medium-density residential as shown in the table below.

Adjustments of Residential Classes

2004-05	2008-09	LU Description
0.00 – 0.20	0.00 – 0.15	High
> 0.20 – 0.50	>0.15 - 0.50	Medium
> 0.50 - 2.00	>0.50 - 2.00	Low

Unit: Acres/Parcel

LU Code adjustment for LUCODE = 1310

The process workflow is described below:

1. **Query** polygon attribute records with LUCODE = 1310 (High Density Residential)
2. **Export** the selected features to a new featureclass
3. **Create** a new field called **iAcres** (floating)
4. **Populate** the polygon area (acres) in **iAcres** using the syntax
$$iAcres = \text{SHAPE_Area (sq. ft}^2) * 43560 \text{ (Acres} * \text{sq.ft}^{-2})$$
5. **Clip** the parcel data for the area of interest using the boundary of the Priority Area to reduce process time
6. **Create** a point featureclass of parcel centroids from step #5
7. **Intersect** the featureclass from step#2 with point centroids (step #6) with "Join Attribute", which results in a point featureclass
8. **Create** a frequency table based on FID
9. **Join** the frequency table with the featureclass from step #2
10. **Create** a table field called **iDensity**
11. **Populate** iDensity with iAcres / [frequency field]
12. **Select** records that are attributed with $0.15 < iDensity \leq 0.5$
13. **Reassign** LUCODE to 1210 of LCLU dataset¹
14. **Save** the dataset and complete the edits

¹ In the event that the parcel data for a specific polygon is incomplete, a representative area within the polygon is measured and the houses are counted by hand.