

# **A Standard Classification System for the Mapping of Land Use and Land Cover**

**State of North Carolina  
Governor's Office of State Planning  
Center for Geographic Information and Analysis**

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## **Preface**

In response to a requirement to map land cover in the State, the North Carolina Center for Geographic Information and Analysis (CGIA) has organized and completed an assessment of land use and land cover classification needs with the assistance of PlanGraphics, Inc., an independent consulting firm based in Frankfort, Kentucky. CGIA conducted surveys and regional workshops, interviewed technical experts, and evaluated similar projects in other states to develop this standard for classification of land use and land cover mapping in North Carolina.

Information about land use and cover types is increasingly needed to effectively manage our environment and living conditions. These data continue to be the most frequently requested categories of geographic information. The data are used by planners, resource managers, scientists, and decision-makers from federal, state, regional, local government, and private corporations for a variety of purposes. More and more of their studies now involve assessment of more specific conditions in broader regions such as multi-county economic zones, river basins, and protected watershed zones. The development, use, and collection of data from multiple sources require that each mapping cooperator utilize standard mapping conventions and classification schemes.

Development of this standard for mapping land use and land cover involved the solicitation and input from individuals representing more than 200 organizations. To the participants we extend our appreciation, for their efforts significantly contributed to this product. We are also grateful to the North Carolina Department of Transportation for its financial support of this effort.

Indeed, the level of intergovernmental cooperation is increasing. The level of joint development, use, and sharing of information between municipalities, counties, regional, state, federal, and private organizations is at an all time high. We encourage all organizations initiating, planning, or refining land use or land cover mapping programs to use this standard. If, at any time, you have comments or questions about the use of the schemes, please contact us at CGIA. The collective development and use of standards such as these bring us one step closer to forming true partnerships within the framework of North Carolina's information infrastructure.

Karen Siderelis  
Director, CGIA

Zsolt Nagy  
Database Administrator, CGIA

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  - 2.03 Confined Animal Operations
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- 3 Active Forest Management and Harvesting
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- 4 Water Bodies

- 4.01 Reservoirs and Artificial Lakes
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- 4.98 Other Water Bodies in Active Use
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## PART 1 INTRODUCTION

### Project Background and Objectives

The North Carolina Center for Geographic Information and Analysis (CGIA) has initiated a land use and land cover project with two major goals: 1) development of a statewide classification scheme to serve as a standard for land use and land cover mapping useful to many organizations in the state, and 2) completion of a statewide mapping of land cover. The impetus for this project has come directly from ongoing projects being carried out by CGIA that are dependent on up-to-date information about land use and land cover information and the great amount of interest among a wide set of user groups in North Carolina. With its mission as coordinator, collector, and distributor of geographic information for the state, CGIA has accepted responsibility for this project with an objective of completing a statewide mapping of land cover by the end of 1995. CGIA has no plans to carry out detailed land use mapping, but the classification scheme presented in this document will provide a basis for organizations to initiate their own land use and mapping efforts. CGIA is a proponent of individual organizations developing land use mapping within the framework of a statewide geographic information infrastructure.

This document concerns the first major goal--development of classification schemes on which to base land use and land cover mapping and analysis applications. Several key issues were defined early in the evaluation of classification approaches:

The classification scheme should be consistently applied statewide (although not all classes will be applicable for all regions of the state).

To the extent possible, the classification should be consistent with existing schemes used by agencies in the state and classification schemes used by other states and the federal government.

The classification scheme should allow land use and land cover mapping at varying levels of detail and therefore should be hierarchical in nature with general classes desegregated into more detailed classes.

The classification scheme should be usable by a wide range of government agencies and private organizations with different programmatic responsibilities and different areas of jurisdiction (statewide, multi-county regions, counties, urban areas).

The logical difference between "land use" and "land cover" should be taken into account in developing the schemes.

With these tenets in mind, CGIA began an evaluation process that included communication with a broad user community in North Carolina and an examination of existing land use and land cover schemes.

## **Development of the Classification Scheme**

### **Defining Land Use and Land Cover**

One confusing issue that has not been effectively resolved in existing classification schemes is the distinction between "land use" and "land cover." Most existing schemes group these two geographic variables together since they are closely related. There are, however, key differences that create confusion when they are blended together in a single classification scheme and map. "Land cover" refers to the vegetative or non-vegetative characteristics of a portion of the Earth's surface. "Land use" describes some human activity on the surface. The concept of land cover is best understood when applied to natural surfaces where no activity has occurred (e.g., unharvested forest land).

The type of **land cover** present is determined directly by observation. This observation may use satellite imagery or aerial photography for certain levels of classification detail and positional accuracy. For very detailed levels of mapping, however, on-site inspection may be required.

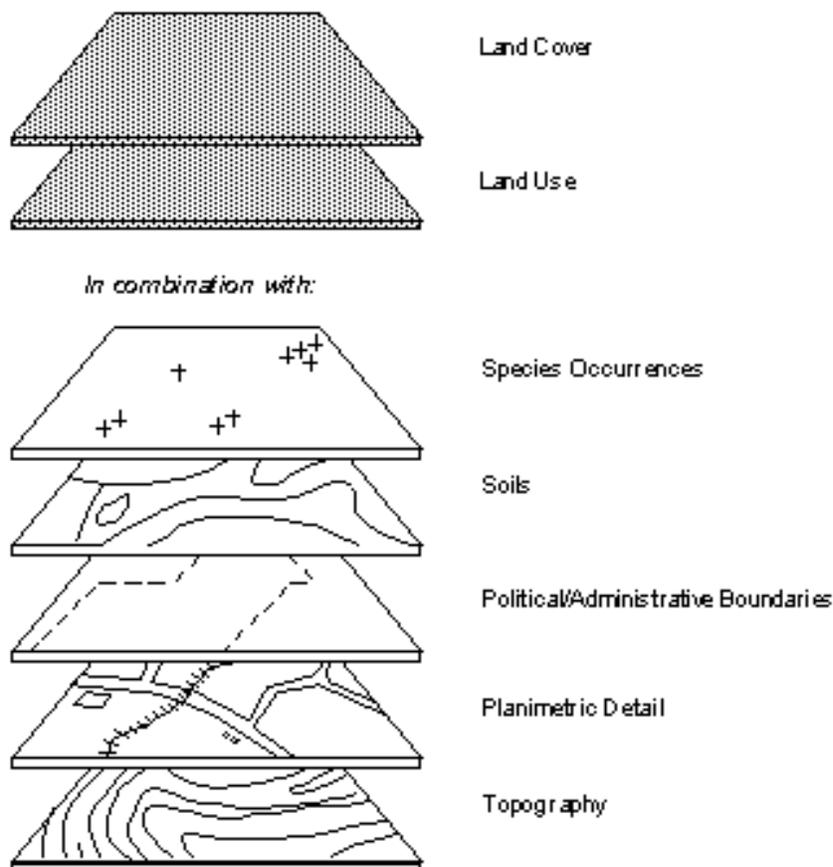
**Land use** types may also be determined through observation by deducing human activity or disturbance based on the appearance of the landscape. As in the case of land cover, land use classes may also be determined, in many cases from satellite imagery or aerial photographs. For detailed land use information (Levels 3, 4, and below in the hierarchy), on-site analysis is often required. In many cases, supplemental information gathered from business licenses or questionnaires is needed to reliably assign a land use class since the use is not always apparent through observation.

It has been noted that as the scale of mapping increases (more detailed mapping), applications using a map become more dependent on land use information. While the difference between land use and land cover is not always obvious in specific instances, a fundamental distinction does exist. For this reason, CGIA has decided to create separate (but logically related) classification schemes distinguishing land use and land cover. Some overlap between land use and land cover

is hard to eliminate entirely, but the scheme presented in this document provides a practical approach to distinguishing between these two geographic variables. These schemes will be presented later in this document.

In some cases, there is also confusion between land use, land cover, and other types of geographic information. CGIA views land use and land cover as "layers" among a series of other layers that can be displayed or analyzed together. This concept, portrayed in Figure 1-1, is consistent with a basic concept of geographic information systems in which multiple digital map layers are geographically registered. Soils, topography, political and administrative boundaries, and other layers can be accessed and used together with land use and land cover to answer questions and address specific problems. CGIA now maintains and is actively building a GIS database with many layers of information. The information can be accessed and analyzed in combination to produce new derived layers meaningful to specific users or applications. Table 1-1 lists the geographic data layers now included in the state's corporate database managed by CGIA.

**Figure 1-1  
Map Data Layers**



## **Table 1-1**

### **North Carolina Corporate Database Status**

1970 Census Boundaries/Population  
1980 Census Boundaries/Population  
1990 Census Boundaries/Demographics  
1990 Census - Census of Population and Housing, Summary Tape File 1B  
1990 TIGER/Line Census Files  
Ambient Water Quality Monitoring Sites  
Anadromous Fish Spawning Areas  
Archaeological Sites (Approved Use)  
Artificial Marine Reefs  
Bottom Sediment Sampling Sites  
Coastal Area Management Act (CAMA), Major Development Permits  
Citizen Water Quality Monitoring Sites  
Coastal Marinas  
Coastal Reserves  
County Boundaries  
Detailed Soils  
Digital Elevation Models (DEMs)  
Federal Land Ownership  
Fisheries Nursery Areas  
General Geology  
General Soils - NC  
General Soils - VA  
Geodetic Control  
Groundwater Recharge/Discharge  
Hazardous Waste Facilities  
Historic Sites and Districts (Approved Use)  
Hurricane Storm Surge Inundation Areas - 1987  
Hydrography  
Hydrologic Units NC - Albemarle/Pamlico Study Area  
Hydrologic Units VA - Albemarle/Pamlico Study Area (Licensed Use)  
Land Use/Land Cover - Thematic Maps  
Military Airspace  
National Wetlands Inventory (NWI)  
Natural Areas (Approved Use)  
Natural Heritage Element Occurrence Sites (NHEO, Approved Use)  
National Pollutant Discharge Elimination System Sites (NPDES)  
Outstanding Resource Waters  
Peat Resources  
Solid Waste Facilities  
State Parks  
State Owned Complexes & Land Assets  
Stream Gauging Stations  
Superfund Sites (National Priority List)  
Surface Water Intakes

Transportation-1:24,000  
Transportation-1:100,000  
Water Supply Watersheds  
Wildlife Resource Commission (WRC) Gamelands

### **Pending Database Layers**

1990 Census Population and Housing Data, Summary Tape File 3A (STF 3A)  
Ambient Air  
Groundwater Incidents  
Groundwater Supplies  
Heavy Metals and Organic-Rich Mud Pollutant Sample Sites  
High Quality Water Zones  
Hurricane Storm Surge Inundation Areas - 1993  
Hydrologic Units - NC  
Jurisdictional Boundaries  
Non Discharge Permits  
Oyster Cultch Plant Sites  
Parcel Boundaries  
Recreation Projects  
Shellfish Closures  
Spiny Mussels

The following points below are presented to clarify the distinction between land use, land cover, and other geographic map layers:

Land use and land cover layers are not meant to define political or administrative boundaries, although in some cases, these layers may be helpful in supplemental sources in defining land use. For instance, a state park boundary may imply certain uses of the land within the boundary.

The land use and land cover layers will not replace planimetric feature layers of the GIS. Certain "base map" layers of the GIS will contain point and line features delineating the road network; natural and artificial drainage lines; towers, wells, and other structures; transmission lines; etc. Land use and land cover layers will map areas exhibiting common land use or land cover. Points and lines representing physical features and infrastructure will not be included as part of the land use and land cover classification systems. These planimetric feature layers, however, may often be displayed or plotted with the land cover or land use information to provide a geographic reference.

The land use and land cover categories are not meant to duplicate or replace schemes for classifying plant or animal habitats or natural communities, although the land cover classes described in this document have taken into account existing approaches for categorizing natural communities in North Carolina.

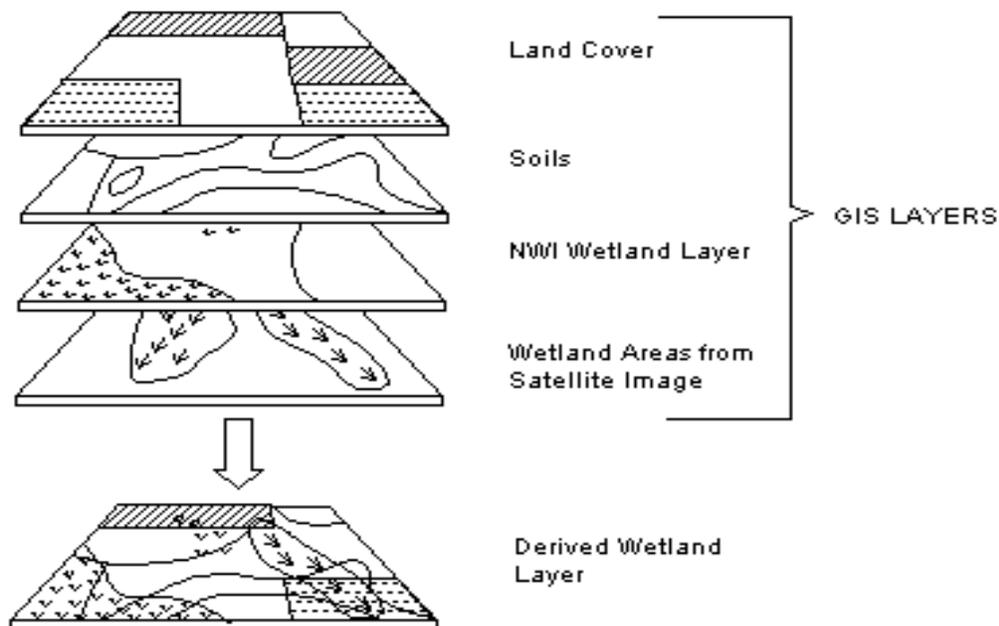
Readers will note that the classification schemes omit any implicit definition of wetland categories which are included on most existing land cover classification schemes. This decision addresses the confusion and significant difference of opinion that exists on how to classify wetlands. It also removes the logical classification confusion for land that may clearly be a

"wetland" but also supports a vegetative cover that could easily be grouped into another category. For expediency, many existing classification schemes have classes for "forest land" and "forested wetland." Is a wetland area with significant tree cover a "forest" or a "wetland?" It is both, resulting in ambiguity in classification and some confusion when both are dealt with in a single scheme with mutually exclusive classes. The proposed land cover classification scheme would place a forested wetland in an appropriate "forest" class.

Wetlands will be treated in another GIS layer or layers. In conjunction with the U.S. Environmental Protection Agency, CGIA is making plans to derive a new wetlands layer from satellite imagery, and to maintain this separately from the land use and land cover layer. GIS users can access this wetlands layer which can be combined with the land cover layer or other layers to create a derived layer useful for wetland analysis. CGIA is also preparing a GIS layer from wetland maps produced under the U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) program. This inventory and mapping work is planned for completion by 1998. These maps contain valuable wetland information on a statewide level, but the classification scheme and mapping guidelines used in this program do not suit all the needs of some groups of users. As shown on Figure 1-2, these NWI maps will become a layer in the GIS which, like other layers, can be combined with the satellite-generated wetland maps and other layers to either update or produce derived layers that meet users' needs.

**Figure 1-2  
Derived Wetland Layers**

Figure 1-2  
Derived Wetland Layers



The classification schemes presented in this document are meant to be a tool for mapping land use and land cover. The statewide land cover mapping effort being initiated by CGIA will focus on a level of detail that can be supported mainly by satellite imagery. The classification schemes provided in this document are at a greater level of detail beyond that which can be mapped

directly by satellite imagery. The detailed nature of these schemes, however, provides a basis for any organization in the state to carry out mapping at more detailed scales using a common set of classes which can be consistently aggregated to more general classes.

After these classification schemes are finalized, CGIA will be developing mapping specifications for the statewide land cover mapping project that provide, among other things, map compilation scale, a definition of the classification detail to be achieved, minimum mapping resolutions, and other map specifications.

## **Methodology and Approach for Developing Classification Scheme**

### **Communication with the User Community**

The project began with a Forum held on May 1, 1992, in Raleigh. In this Forum, CGIA presented some background to the project and then conducted a two-hour comment and discussion period to gain feedback from participants about needs for land use and land cover information and approaches for developing a classification scheme and conducting the statewide mapping. A total of 105 people attended this meeting representing 90 organizations, including local government, regional planning agencies, state government, federal government, universities, and research institutions.

At this Forum, survey forms were distributed with questions seeking elaboration on topics discussed in the Forum. A high percentage of these forms (43 percent) were completed and returned to CGIA, and they were used as a resource in this planning process.

During the week of June 21, 1992, CGIA conducted a series of two-hour small group workshops to review results of the user survey and to explore land use and land cover issues in more detail. A total of seven workshops were held at the following locations: Triangle J Council of Governments (TJ COG) at Research Triangle Park, North Carolina Division of Community Assistance office at Asheville and the Albemarle-Pamlico Estuarine Study office in Washington. These workshops were attended by a total of 93 persons from a wide range of organizations. Important topics were discussed, and valuable information was received which helped form the basis for the classification scheme presented in this document. During 1993, two drafts of this document were prepared and widely distributed to reviewers. Comments and additional information received from these reviewers formed the basis for preparation of this final document. A full listing of the organizations that participated in the Forum, the workshops, and the review of draft classification schemes is presented in Table 1-2.

**Table 1-2**

**Organizations that Participated in the Forum and Workshops**

Alamance County  
Albemarle/Pamlico Estuarine Study  
Bertie County  
Buncombe County Planning  
Cabarrus County  
Carteret County Tax Office

Catawba County  
Chowan County Planning Department  
Cleveland County  
Council of Government's - Centralina  
Council of Government's - Isothermal Planning Development Commission  
Council of Government's - Lumber River  
Council of Government's - Mid-East Commission  
Council of Government's - Piedmont Trail  
Council of Government's - Region D  
Craven County Assessor's Office  
Craven County Assessor's Planning Department  
Crime Control Public Safety/Emergency Management  
Cumberland County - Planning Board  
Division of Community Assistance  
Division of Parks and Recreation - Natural Heritage  
Duplin County Tax Office  
Durham City/County Planning  
East Carolina University - Department of Geography & Planning  
Economic and Community Development  
Economic/Industry Development  
Franklin County  
Guilford County - Geographic Information Systems  
Harnett County  
Haywood County Planning Department  
Jackson County Planning/Economic Division  
Lenoir County - Department of Planning  
Macon County Planning Office  
Mecklenburg County  
Moore County Planning Department  
North Carolina Center for Geographic Information & Analysis  
North Carolina Center for Geographic Information & Analysis - Asheville Field Office  
North Carolina Department of Administration - Outer Continental Shelf Office  
North Carolina Department of Agriculture - Agronomic Division  
North Carolina Department of Agriculture - Museum of Natural Sciences  
North Carolina Department of Agriculture - Plant Industry Division  
North Carolina Department of Agriculture - Plant Industry/Plant Protection Section  
North Carolina Department of Agriculture - Research Stations  
North Carolina Department of Agriculture - Statistics  
North Carolina Department of Commerce - Division of Community Assistance  
North Carolina Department of Commerce - Business Industry  
North Carolina Department of Environment, Health & Natural Resources - Planning & Assessment  
North Carolina Department of Environment, Health, & Natural Resources - Administration  
North Carolina Department of Environment, Health, & Natural Resources - Division of Soil & Water  
North Carolina Department of Environment, Health, & Natural Resources - Environmental

## Management

North Carolina Department of Environment, Health, & Natural Resources - Division of Forest Resources

North Carolina Department of Transportation

North Carolina Department of Transportation - GIS Branch

North Carolina Department of Transportation - Planning & Environment

North Carolina Department of Transportation - Traffic Engineering

North Carolina Division of Coastal Management

North Carolina Division of Marine Fisheries

North Carolina Division of Water Resources

North Carolina Division of Soil & Water Conservation

North Carolina Secretary of State's Office - Land Records Management Program

North Carolina State Property Office

North Carolina State University - Computer Graphic Center

North Carolina Superfund Section

North Carolina Wildlife Resources Commission

PlanGraphics, Inc.

Randolph County

Research Triangle Institute

Scotland County

Tennessee Valley Authority

Triangle J Council of Governments

Triangle Transit Authority

U.S. Department of Agriculture - Soil Conservation Service

U.S. Environmental Protection Agency

U.S. Environmental Protection Agency - Region 4

U.S. Fish and Wildlife Service

U.S. Forest Service

U.S. Geological Survey

U.S. Marine Corps Air Station - Cherry Point

U.S. Marine Corps, Camp LeJeune

University of North Carolina-Department of City and Regional Planning

Wake County - Geographic Information Systems

Water Resources Research Institute

## Approach and Sources for Preparing Classification Scheme

The classification schemes presented in this document were prepared after an in-depth evaluation of user needs and existing classification schemes, and many other documents that provided background information. Principal land use schemes and documents examined during the process included:

The USGS Level II land use and land cover classification scheme as described in Professional Paper 964 (Anderson, et al)

State land use and land cover classification schemes from the states of Florida, Georgia, Maryland, Michigan, Minnesota, and Vermont

"Standard Land Use Coding Manual," U.S. Urban Renewal Administration and Department of Commerce (used SIC codes as a source)  
"Land Use and Land Cover Classification of the North Carolina Barrier Islands," North Carolina Sea Grant publication UNC-SG-85-03  
"Mapping and GIS Development of Land Use and Land Cover Categories for the Albemarle-Pamlico Drainage Basin," Albemarle-Pamlico Estuarine Study, North Carolina, Department of Health and Natural Resources  
"NOAA Coastwatch Change Analysis Program Wetland and Land Cover Classification System (draft)"  
"Classification of the Natural Communities of North Carolina-Third Approximation," North Carolina Natural Heritage Program  
"Forest Statistics for North Carolina," U.S. Forest Service.

## **Description of Content and Format**

The basic characteristics of the classification schemes are summarized below:

1. Dual classification schemes are presented distinguishing between land cover and land use. The land cover classification scheme seeks to describe the physical qualities of the vegetated or non-vegetated surface and does not explicitly take into account any detailed use of the land. The land use classification scheme describes types of human activity or modification of the land surface.
2. Both of the classification schemes are designed to take into account 100 percent of the land area and internal water bodies of the state.
3. The classification schemes are hierarchical. Level 1 of the hierarchy presents high-level or aggregated classes which describe land cover or land use at the most general level of detail.
4. Explanations for land cover or land use categories are given where they are necessary to distinguish them from other categories.
5. Land cover or land use is subcategorized down to Level 2, Level 3, or Level 4, depending on the major category. In all cases, users may apply their own sub-categorization scheme to subdivide categories to lower levels when needed for a particular application.
6. Where appropriate, an "other" subcategory is provided for the classification of land areas that cannot be grouped into defined subcategories.

## **Summary of Classification Schemes**

A summary of the land cover and land use classification schemes is presented in Tables 1-3 and 1-4, respectively. These tables provide a brief overview of major categories that are presented in more detail in Parts 2 and 3.

**Table 1-3**  
**Summary of Land Cover Categories**

**1 Heavily Developed or Disturbed Land**

**2 Cultivated Land**

**3 Herbaceous Cover and Shrubland**

31 Herbaceous Cover

32 Shrubland

**4 Forest Land**

41 Broadleaf Deciduous Forest Land

42 Needleleaf Coniferous Forest Land

43 Non-Deciduous Broadleaf

44 Mixed Deciduous-Coniferous Forest Land

48 Orchards and Tree Farms

49 Other Forest Land

**5 Water Bodies**

51 Coastal/Marine Water Bodies

52 Inland Water Bodies

54 Linear Drainage

59 Other Water Bodies

**6 Bare land**

61 Beaches, Bare Coastal Land, and Upland Sand Areas

62 Riverbanks and Bars

63 Exposed Rock<

64 Other Barren Land

**9 Other Unclassified land Cover**

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**Table 1-4**

**Summary of Land Use Categories**

**1 Urban and developed land**

1.01 Residential

1.02 Commercial and Services

1.03 Institutional

1.04 Manufacturing and Raw Material Processing

1.05 Transportation

1.06 Communication and Utilities

1.07 Industrial and Commercial Complexes

1.08 Mixed Urban or Developed Land

1.09 Public Assembly, Recreational, Cultural, and Entertainment

1.10 Mining and Resource Extraction

1.99 Other Urban or Developed Land

**2 Agricultural land**

2.01 Cropland and Pasture

2.02 Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas

2.03 Confined Animal Operations

2.99 Other Agricultural Land

**3 Active forest Management and Harvesting**

**4 Water Bodies**

- 4.01 Reservoirs and Artificial Lakes
- 4.02 Retention or Sediment Ponds
- 4.03 Artificial Drainage Lines
- 4.98 Other Water Bodies in Active Use
- 4.99 Non-used or Passively Used Water Bodies

**5 Human-induced Bare Land**

- 5.01 Altered Lands
- 5.02 Burn Areas
- 5.99 Other Human-induced Barren Land

**6 Passive use on undisturbed land**

**7 Unused, Unknown use, and unmodified land**

**Part 2**

**Land Cover and Land Use Categories**

This part contains a full list of all land cover and land use categories in Tables 2-1 and 2-2.

**Table 2-1**

**Land Cover Categories**

1 Heavily Developed or disturbed Land

2 Cultivated Land

3 Herbaceous Cover and Shrubland

31 Herbaceous Cover

311 Managed Herbaceous Cover

312 Unmanaged Herbaceous Cover

3121 Unmanaged Upland Herbaceous Cover

3122 Tidal Marshes

3123 Non-tidal Marshes and Bogs

3199 Other Unmanaged Herbaceous Cover

32 Shrubland

321 Managed Shrublands

322 Young Pine Plantations

323 Unmanaged Evergreen Shrubland

3231 Pocosin and Bog Evergreen Shrubland

3232 Unmanaged Upland Evergreen Shrublands

324 Unmanaged Deciduous Shrubland

3241 Unmanaged Deciduous Lowland Shrubland and Pocosin

3242 Unmanaged Deciduous Upland Shrublands

329 Other Shrubland

4 Forest Land

41 Broadleaf Deciduous Forest Land

411 Oak-Hickory and Oak-Chestnut Forests

412 Mixed Mesophytic Upland Hardwoods

- 4121 Maple-Beech-Birch
- 4122 Yellow Poplar-Eastern Hemlock
- 413 Bottomland and Wet Hardwood
- 414 Hardwood Swamps
- 419 Other Deciduous Broadleaf Forest Land
- 42 Needleleaf Coniferous Forest Land
  - 421 White Pine Forests
  - 422 Hemlock Forests
  - 423 Spruce-Fir Forests
  - 424 Longleaf Pine Forests
  - 425 Loblolly-Slash Pine Forests
  - 426 Other Yellow Pine Forests
  - 427 Pond Pine Forests
  - 428 Atlantic White Cedar Forests
  - 429 Other Needleleaf Coniferous Forest Land
- 43 Non-deciduous Broadleaf
  - 431 Maritime Non-deciduous Broadleaf Forests
  - 432 Bay Forests
  - 438 Artificial Broadleaf Evergreen Plantings
  - 439 Other Non-deciduous Broadleaf
- 44 Mixed Deciduous-Coniferous Forest Land
  - 441 Oak-Pine
  - 442 Oak-Gum-Cypress
  - 449 Other Mixed Deciduous-Coniferous Forest Land
- 48 Orchards and Tree Farms
- 49 Other Forest Land
- 5 Water BODIES
  - 51 Coastal/Marine Water Bodies
  - 52 Inland Water Bodies
  - 53 Linear Drainage
  - 59 Other Water Bodies
- 6 Bare Land
  - 61 Beaches, Bare Coastal Land, and Upland Sand Areas
  - 62 Riverbanks and Bars
  - 63 Exposed Rock
  - 69 Other Bare Land
- 9 Other Unclassified Land Cover

**Table 2-2**  
**Land Use Categories**

1 Urban and Developed Land

## 1.01 Residential

### 1.01.01 Single Family Detached or Duplex

1.01.01.01 Very Low-density Detached Dwellings

1.01.01.02 Low-density Detached Dwellings

1.01.01.03 Medium Density Detached Dwellings

1.01.01.04 High-density Detached Dwellings

### 1.01.02 Mobile Homes

1.01.02.01 Very Low-density Mobile Homes

1.01.02.02 Low-density Mobile Homes

### 1.01.03 Multi-family Dwellings

1.01.03.01 Low-density Multi-family

1.01.03.02 Medium-density Multi-family

1.01.03.03 High-density Multi-family

1.01.03.04 Very High-density Multi-family

### 1.01.04 Mobile Home Parks

1.01.04.01 Low-density Mobile Home Park

1.01.04.02 Medium-density Mobile Home Park

1.01.04.03 High-density Mobile Home Park

### 1.01.05 Group and Transient Quarters

1.01.05.01 Rooming Houses, Boarding Houses, and Residential Hotels

1.01.05.02 Membership Lodging

1.01.05.03 Student Residences

1.01.05.04 Retirement Homes and Orphanages

1.01.05.05 Religious Quarters

1.01.05.06 Migrant Quarters

1.01.05.07 Shelters

1.01.05.08 Military Barracks and Group Residence

1.01.05.99 Other Group or Transient Quarters

### 1.01.99 Other Residential Land

## 1.02 Commercial and Services

### 1.02.01 Commercial Retail

1.02.01.01 Building Materials, Hardware, and Farm Equipment

1.02.01.02 General Merchandise and Department Stores

1.02.01.03 Food, Groceries, and Beverages

1.02.01.04 Automotive, Marine Craft, Aircraft, and Accessories

1.02.01.05 Gasoline Stations

1.02.01.06 Apparel and Accessories

1.02.01.07 Furniture, Home Furnishings, and Home Electronic Equipment

1.02.01.08 Eating and Drinking Establishments

1.02.01.09 Liquor and Spirits

1.02.01.99 Other Retail Establishments

### 1.02.02 Commercial Wholesale

1.02.02.01 Motor Vehicles and Automotive Equipment

1.02.02.02 Marine and Aviation Supplies

1.02.02.03 Drugs, Chemicals, and Allied Products

1.02.02.04 Dry Goods and Apparel

- 1.02.02.05 Groceries and Related Products
- 1.02.02.06 Hardware, Plumbing, Heating Equipment, and Electrical Goods
- 1.02.02.07 Machinery and Equipment
- 1.02.02.99 Other Wholesale
- 1.02.03 Commercial Services
  - 1.02.03.01 Business Support Services
  - 1.02.03.02 Finance, Real Estate, Insurance
  - 1.02.03.03 Self-storage and Warehouses (not directly associated with manufacturing)
  - 1.02.03.04 Repair and Automotive Services
  - 1.02.03.05 Medical, Legal, Consulting, and Other Professional Services
  - 1.02.03.06 Contract Construction Services
  - 1.02.03.07 Landscaping, Lawn, and Garden Services
  - 1.02.03.08 Personal Services
  - 1.02.03.99 Other Business and Professional Services
- 1.02.04 Hotels and Lodging
  - 1.02.04.01 Hotel/Motel
  - 1.02.04.02 Bed and Breakfast
  - 1.02.04.99 Other Hotel or Lodging
- 1.02.99 Other Commercial Services
- 1.03 Institutional
  - 1.03.01 Governmental Services and Institutions
    - 1.03.01.01 Correctional Institutions
    - 1.03.01.02 Social Service and Public Assistance Facilities
    - 1.03.01.03 Postal Service
    - 1.03.01.04 Government Administrative Offices
    - 1.03.01.05 Public Protection and Public Works Facilities
    - 1.03.05.99 Other Government Services or Institutions
  - 1.03.02 Educational
    - 1.03.02.01 Preschools and Day Care
    - 1.03.02.02 Primary, Elementary, and Secondary Schools
    - 1.03.02.03 College/University
    - 1.03.02.04 Vocational/Trade
    - 1.03.02.99 Other Educational Institutions
  - 1.03.03 Religious Institutions
  - 1.03.04 Medical and Health Care Facilities
    - 1.03.04.01 Hospitals
    - 1.03.04.02 Health Clinics and Physicians Offices
    - 1.03.04.03 Nursing Homes and Residential Rehabilitation
    - 1.03.04.99 Other Medical and Health Care Facilities
  - 1.03.05 Membership Organizations
  - 1.03.06 Military Installations
  - 1.03.99 Other Institutional
- 1.04 Manufacturing and Raw Material Processing
  - 1.04.01 Light Manufacturing

- 1.04.01.01 Food and Kindred Products Processing and Preparation
- 1.04.01.02 Apparel Manufacturing
- 1.04.01.03 Furniture and Fixture Manufacturing
- 1.04.01.04 Printing, Publishing, and Allied Industries
- 1.04.01.05 Professional and Scientific Instruments
- 1.04.01.06 Textile Mill Product Manufacturing
- 1.04.01.07 Craft Industries
- 1.04.01.99 Other Light Manufacturing
- 1.04.02 Heavy Manufacturing
  - 1.04.02.01 Lumber and Wood Products (except furniture)
  - 1.04.02.02 Paper and Allied Product Manufacturing
  - 1.04.02.03 Chemicals, Rubber, and Plastic Production
  - 1.04.02.04 Stone, Clay, and Glass Manufacturing
  - 1.04.02.05 Fabricated Metal Product Manufacturing
  - 1.04.02.99 Other Heavy Industry
- 1.04.03 Raw Material Refinement and Preparation
  - 1.04.03.01 Primary Metal Refining, Production, and Preparation
  - 1.04.03.02 Petroleum Refining and Related Industries
  - 1.04.03.03 Coal Preparation
  - 1.04.03.04 Stone, Gravel, and Sand Preparation
  - 1.04.03.99 Other Raw Material Refinement and Preparation
- 1.04.99 Other Manufacturing and Processing
- 1.05 Transportation
  - 1.05.01 Rail Transportation Facilities
    - 1.05.01.01 Active Railyard
    - 1.05.01.02 Rail Station or Terminal
    - 1.05.01.03 Abandoned Railroad Right-of-Way
    - 1.05.01.04 Active Railroad Track
    - 1.05.01.99 Other Rail Transportation
  - 1.05.02 Road Transportation Facilities
    - 1.05.02.01 Limited or Non-limited Roads and Highways
    - 1.05.02.02 Truck Terminal
    - 1.05.02.03 Bus Terminal
    - 1.05.02.04 Auto/Bus Parking
    - 1.05.02.99 Other Road Transportation
  - 1.05.03 Air Transportation Facilities
    - 1.05.03.01 Non-military Airports and Airfields
    - 1.05.03.02 Non-military Heliports
    - 1.05.03.03 Military Airfields
    - 1.05.03.99 Other Air Transportation
  - 1.05.04 Water Transportation Facilities
    - 1.05.04.01 Non-military Marine Terminals and Port Facilities
    - 1.05.04.02 Lock and Dam Facilities
    - 1.05.04.03 Military Port and Repair Facilities
    - 1.05.04.99 Other Water Transportation
  - 1.05.99 Other Transportation

- 1.06 Communication and Utilities
  - 1.06.01 Communication Facilities
    - 1.06.01.01 Telephone Facilities
    - 1.06.01.02 Telegraph Facilities
    - 1.06.01.03 Radio Facilities
    - 1.06.01.04 Television/Cable TV Facilities
    - 1.06.01.98 Combined Communication Facilities
    - 1.06.01.99 Other Communication Facilities
  - 1.06.02 Electric and Gas Utilities
    - 1.06.02.01 Electric Generation and Transmission
    - 1.06.02.02 Gas Storage and Transmission
    - 1.06.02.99 Other Electric and Gas Utility Facilities
  - 1.06.03 Water and Wastewater Utilities
    - 1.06.03.01 Water Storage, Treatment, and Distribution
    - 1.06.03.02 Sewage Collection and Treatment
    - 1.06.03.99 Other Water and Wastewater Facilities
  - 1.06.04 Solid or Hazardous Waste Disposal, Storage, and Treatment
    - 1.06.04.01 Solid Waste Disposal and Transfer
    - 1.06.04.02 Hazardous Waste Storage, Disposal, and Treatment
    - 1.06.04.99 Other Waste Disposal and Treatment
  - 1.06.99 Other Communication and Utilities
- 1.07 Industrial and Commercial Complexes
  - 1.07.01 Industrial Park
  - 1.07.02 Office Park
  - 1.07.03 Shopping Center/Mall
  - 1.07.99 Other Industrial or Commercial Complexes
- 1.08 Mixed Urban or Developed Land
- 1.09 Public Assembly, Recreational, Cultural, and Entertainment
  - 1.09.01 Indoor Cultural, Public Assembly, and Recreation
    - 1.09.01.01 Museums and Other Indoor Cultural
    - 1.09.01.02 Theaters and Exhibition Halls
    - 1.09.01.03 Indoor Recreational and Sporting Facilities
    - 1.09.01.99 Other Indoor Cultural, Public Assembly, and Recreation
  - 1.09.02 Outdoor Cultural, Public Assembly, and Recreation
    - 1.09.02.01 Outdoor Cultural
    - 1.09.02.02 Outdoor Public Assembly
    - 1.09.02.03 Developed Outdoor Recreational and Sporting
    - 1.09.02.99 Other Outdoor Cultural, Public Assembly, and Recreation
  - 1.09.99 Other Public Assembly, Recreational, Cultural, Entertainment
- 1.10 Mining and Resource Extraction
  - 1.10.01 Mining and Excavation Areas
    - 1.10.01.01 Metal Ore Mining
    - 1.10.01.02 Hard Rock Quarrying
    - 1.10.01.03 Sand, Gravel, and Crushed Stone Quarrying
    - 1.10.01.04 Industrial Mineral Extraction
    - 1.10.01.05 Oil and Gas Extraction

- 1.10.01.06 Coal Mining
- 1.10.01.99 Other Mining and Extraction Areas
- 1.10.02 Mining and Extraction Support Land
- 1.10.99 Other Mining and Resource Extraction
- 1.99 Other Urban or Developed Land
  - 1.99.01 Cemeteries
- 2 Agricultural Land
  - 2.01 Cropland and Pasture
    - 2.01.01 Row Crops
      - 2.01.01.01 Corn
      - 2.01.01.02 Soybeans
      - 2.01.01.03 Cotton and Fiber
      - 2.01.01.04 Tobacco
      - 2.01.01.05 Peanuts
      - 2.01.01.06 Root Row Crops
      - 2.01.01.07 Annual Row Crop Rotation
      - 2.01.01.99 Other Non-root Row Crops
    - 2.01.02 Non-row Grain Crops
      - 2.01.02.01 Wheat
      - 2.01.02.02 Oats
      - 2.01.02.03 Barley
      - 2.01.02.04 Rice
      - 2.01.02.99 Other Grain Crops
    - 2.01.03 Hay and Pasture Land
      - 2.01.03.01 Hay
      - 2.01.03.02 Rotation or Permanent Pasture
      - 2.01.03.99 Other Hay, Rotation, or Pasture
    - 2.01.99 Other Cropland and Pasture
  - 2.02 Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas
    - 2.02.01 Tree Fruits
      - 2.02.01.01 Apples
      - 2.02.01.02 Cherries
      - 2.02.01.03 Peaches
      - 2.02.01.04 Pears
      - 2.02.01.05 Plums and Prunes
      - 2.02.01.99 Other Tree Fruits
    - 2.02.02 Tree Nuts
    - 2.02.03 Bush-fruits and Vineyards
      - 2.02.03.01 Strawberries
      - 2.02.03.02 Raspberries
      - 2.02.03.03 Blueberries
      - 2.02.03.0 Grapes
      - 2.02.03.05 Melons
      - 2.02.03.99 Other Bush and Vine Fruits
    - 2.02.04 Ornamental Horticulture

- 2.02.04.01 Sod and Grass Seed
      - 2.02.04.02 Floriculture
      - 2.02.04.03 Nurseries
      - 2.02.04.04 Christmas Tree Farms
      - 2.02.04.99 Other Ornamental Horticulture
    - 2.02.99 Other Tree Crops or Horticultural Uses
  - 2.03 Confined Animal Operations
    - 2.03.01 Livestock
      - 2.03.01.01 Beef
      - 2.03.01.02 Dairy
      - 2.03.01.03 Swine
      - 2.03.01.99 Other Livestock Operations
    - 2.03.02 Poultry
      - 2.03.02.01 Chickens
      - 2.03.02.02 Turkeys
      - 2.03.02.99 Other Poultry Operations
    - 2.03.03 Aquaculture and Fish Hatcheries
    - 2.03.99 Other Confined Animal Operations
  - 2.99 Other Agricultural Land
    - 2.99.01 Farmsteads
    - 2.99.02 Greenhouses and Mushroom Houses
      - 2.99.02.01 Vegetables
      - 2.99.02.02 Flowers
      - 2.99.02.03 Mushrooms
    - 2.99.03 Private Stables and Horse Training
    - 2.99.04 Agricultural Research Facilities
    - 2.99.05 Farm Ponds and Agricultural Treatment Lagoons
- 3 Active forest management and harvesting
  - 3.01 Actively Managed Forest Stands
  - 3.02 Passively Managed Forest Stands
- 4 Water Bodies
  - 4.01 Reservoirs and Artificial Lakes
  - 4.02 Retention or Sediment Ponds
  - 4.03 Artificial Drainage Lines
    - 4.03.01 Canal
    - 4.03.02 Drainage Ditch
    - 4.03.99 Other Artificial Drainage
  - 4.98 Other Water Bodies in Active Use
  - 4.99 Non-used or Passively Used Water Bodies
- 5 Human-Induced Bare Land
  - 5.01 Altered Lands
  - 5.02 Burn Areas
  - 5.99 Other Human-induced Barren Land
- 6 Passive Use on Undisturbed Land
- 7 Unused, Unknown Use, and Unmodified Land

## **PART 3**

### **DESCRIPTION OF LAND COVER CATEGORIES**

#### **1 Heavily Developed or disturbed LAND**

This category includes all land covered by urban development, including residential, commercial, industrial, transportation and utility infrastructure, and other developed land exclusive of agricultural land. In general, this category includes all areas where the land is covered predominantly by human structures, including buildings and pavement with minimal vegetation. This includes densely populated urban and suburban areas, as well as developed land in more rural areas (e.g., paved runways at airports or industrial complexes surrounded by rural land). Scraped or excavated bare land which is in transition to a developed state is included in this category. Isolated structures such as farmsteads and low density residential areas are generally not included in this category but are included within the surrounding land cover category (e.g., 2, 3, or 4).

#### **2 Cultivated Land**

While this land cover category has an implied "use," it is included here to account for large areas of land that are occupied by row and root crops that are cultivated in distinguishable rows and patterns and which cannot be categorized within another land cover category. This category includes land used principally for row and root crops such as corn, soybeans, tobacco, peanuts, potatoes, and beets cultivated on a permanent basis or in rotation. Land used for orchards and tree plantations meets the definition of Forest Land and is generally included in subcategory 49. Pasture land, grain crops, and significant coverage of bush crops (berries) are normally assigned to land cover Category 3.

#### **3 Herbaceous Cover and Shrubland**

This category includes land predominantly covered by communities of grasses, grasslike plants, and forbs, including small flowering and non-flowering plants, and mixtures thereof. It includes unmanaged land as well as significant managed areas of herbaceous cover such as pasture, non-row grain crops, golf courses, cemeteries, and the like.

#### **31 Herbaceous Cover**

This category includes areas dominated by native or introduced grasses and forbs, including grasslike plants such as sedges and rushes, and small flowering and non-flowering plants occurring on upland and lowland areas. To be placed in this subcategory, the area should have roughly a 50-50 mix of plant cover versus bare land. Areas with a greater percentage of bare land (e.g., some natural glades, cliffs, dunes) should be placed in Category 6. This subcategory includes agricultural pasture land and land used for the production of grass and grain crops such as wheat or oats. Also included are areas of intensive human use such as golf courses and cemeteries which exhibit a predominantly herbaceous cover. Unmanaged areas of herbaceous

cover may include sparsely occurring trees or shrubs. Herbaceous cover areas may be maintained in this state by natural conditions, or they may be subjected to continuous management practices and disturbances such as mowing, grazing, or burning to maintain the herbaceous character. Areas of herbaceous cover sometimes occur on the upland margin of inland or coastal wetlands and may be periodically inundated by water after storm events.

### 311 Managed Herbaceous Cover

This subcategory includes agricultural areas in pasture or used for the production of non-row grain or forage crops and other managed areas of herbaceous cover, including golf courses, cemeteries, etc. While this subcategory has an implied "use", it is included here because it provides an important breakdown of the Herbaceous Cover Category.

### 312 Unmanaged Herbaceous Cover

#### *3121 Unmanaged Upland Herbaceous Cover*

Herbaceous cover occurs on well-drained areas throughout the state, including mountain balds, grassy clearcuts, stable maritime grasslands, and other upland areas predominated by grasses and forbs. Included in this subcategory are abandoned pasture lands that are in transition to shrubland or forest. Typical plants which predominate include oatgrass, sedges, bent grass, cinquefoil, goldenrod, and other herbaceous plants.

#### *3122 Tidal Marshes*

Areas of herbaceous cover occur on salt, brackish, and tidal freshwater marshes. This subcategory includes areas that are in transition to shrubland or forest. Typical plants which dominate these areas include sea oats, beach grass, panic grass, sand grass, rushes, and other herbaceous plants. These areas may be periodically inundated by water, or they may represent permanent wetlands.

#### *3123 Non-tidal Marshes and Bogs*

This subcategory also includes areas of predominantly herbaceous cover occurring in floodplain areas, bogs, fens, and swamps throughout all regions of the state. Mountain bogs, river bars, depression meadows, and other permanently or seasonally wet non-tidal areas with herbaceous cover are included in this subcategory.

#### *3199 Other Unmanaged Herbaceous Cover*

This subcategory is used to classify unmanaged herbaceous land cover which cannot be assigned to subcategories 3121, 3122, or 3123.

## **32 Shrubland**

Shrublands are dominated by shrubs and low woody plants generally below 3 meters in height. Shrubland is differentiated from herbaceous cover when roughly 50 percent or more of the area is covered in shrubs or low woody vegetation. Included are areas of immature trees that may be in transition to forest. Cultivated areas with shrub-like crops, including berries and vine crops, are part of this subcategory. Low-lying shrub and brushlands may be periodically inundated by water following storm events.

### 321 Managed Shrubland

These include areas with cultivated shrub-like crops, including blueberry orchards, vineyards, and other bush or vine crops.

### 322 Young Pine Plantations

Clearcut areas planted in pine that are at an immature growth level where immature trees at heights below 3 meters predominate. Pine plantations at a more mature state should be placed in subcategory 42.

### 323 Unmanaged Evergreen Shrubland

#### *3231 Pocosin and Bog Evergreen Shrubland*

Areas dominated by evergreen shrubs and low woody vegetation ordinarily in the coastal plain with some mountain bogs dominated by evergreen shrubs included. Some wet clearcut areas may be included as well. Plants that characterize these areas include fetterbush, ti-ti, inkberry with scattered pond pine, and loblolly bay in pocosins. Mountain bogs include such shrubs as long stalked holly, mountain laurel, and rhododendron, with some tag alder.

#### *3232 Unmanaged Upland Evergreen Shrubland*

Includes mountain heath balds, maritime scrublands, and heath-dominated bluffs in the Piedmont. These areas may be separated reliably by location in the state.

### 324 Unmanaged Deciduous Shrubland

This subcategory includes areas throughout the state that are not being actively managed or used and which are dominated by deciduous shrubs and low woody vegetation that lose their leaves seasonally.

#### *3241 Unmanaged Deciduous Lowland Shrubland and Pocosin*

Areas dominated by deciduous shrubs and low woody vegetation, including low pocosins dominated by honeysuckle and deciduous shrubland on river bars, river banks, and other poorly drained areas. Some wet clearcut areas dominated by deciduous shrubs and small trees may be included as well.

### *3242 Unmanaged Deciduous Upland Shrubland*

Areas dominated by deciduous shrubs and low woody vegetation in upland areas such as shrubby glades and regenerating clearcut areas. Typical shrubs include blackberry, blueberry, huckleberry, plum, sumac, and hawthornes. Areas dominated by small trees transitioning into forest are also included in this subcategory.

### 329 Other Shrubland

Other areas dominated by shrubland that cannot be classified in subcategories 321 through 324.

## **4 Forest Land**

Forest lands are covered with deciduous or coniferous woody vegetation about 3 meters or more in height. Forest lands exhibit a tree-crown area density of at least 10 percent. Lands from which trees have been removed to less than 10 percent crown density should be included in Category 3 or another land cover category if appropriate. This category includes upland forests and forest land on seasonally or permanently wet or inundated areas often called "forested wetlands" in other classification schemes. For lands on which there is forest rotation involving clear-cutting and block planting, the clear-cut or plantation areas are not included in this subcategory until planted trees reach a growth stage to meet the criteria for 10 percent crown density coverage. Otherwise, these areas are classified under Category 3. This category includes managed areas of tree growth such as orchards or Christmas tree farms that meet the basic criteria for forest areas. Where applicable, subcategory definitions include a reference to physiographic classes accepted by the Forest Resources Division of the North Carolina Department of Environment, Health and Natural Resources on which the forest stands most commonly occur.

### **41 Broadleaf Deciduous Forest Land**

Forested areas covered predominantly by broadleaf trees that lose their leaves at the end of the growing season. This subcategory includes typical upland and lowland hardwood stands, including such species as oak, hickory, elm, ash, poplar, maple, beech, cottonwood, and other deciduous species. Areas dominated by needleleaf deciduous varieties in the cypress family (e.g., bald cypress and pond cypress) are included in subcategory 429.

#### 411 Oak-Hickory and Oak-Chestnut Forests

Forests occurring in Piedmont and mountain areas in which oaks, hickory, or chestnut, singly or in combination, constitute a plurality of stocking (where pines account for 25 to 50 percent, in which case, the stand would be classified as Oak-Pine, Category 441). In most areas of the state, these areas are dominated by oak with minor amounts of hickory and chestnut. Common associates include yellow poplar and maple. This forest community typically occurs in the following physiographic classes: Flatwoods (04); Rolling Uplands (05).

#### 412 Mixed Mesophytic Upland Hardwoods

This subcategory includes mixed hardwood forests occurring in mountain coves, and moist mountain slopes on the Piedmont and coastal plain. In the Piedmont and coastal plain, these areas are small in extent and are dominated by a mixture of beech, oaks, and other hardwoods. Mountain examples include both the extensive northern hardwood forests of beech, birch, maple and buckeye; and the lower elevation cove forests consisting of these species plus yellow poplar, basswood, hemlock, and other species.

#### *4121 Maple-Beech-Birch*

Forests commonly occurring in mountain areas in which maple, beech, or yellow birch, singly or in combination, constitute a plurality of the stocking. Common associates include hemlock, elm, basswood, and white pine. This forest community typically occurs in the following physiographic classes: Moist Mountain Slopes and Coves (06); Other Mesic (09).

#### *4122 Yellow Poplar-Eastern Hemlock*

Low to moderate elevation sites in coves predominated by yellow poplar, eastern hemlock with minor stocking of birch, red maple, and red oak. Narrow Floodplains (07); Broad Floodplains (08). This forest community typically occurs in the following physiographic classes: Moist Mountain Slopes and Coves (06); Other Mesic (09).

#### 413 Bottomland and Wet Hardwood

This category includes forests with a predominance of hardwoods commonly occurring in lowland and wet areas. It includes elm-ash-cottonwood forests in which elm, ash, or cottonwood, singly or in combination, constitute a plurality of the stocking. In some bottomland areas, oaks may dominate, but ash sweetgum, elm, and pine may dominate or co-dominate. Natural levees tend to be dominated by ash, elm, box elder, sycamore, birch, or oaks. Along small streams, cypress and gum and mesic species such as beech may be mixed in as well. This forest community most often occurs in the following physiographic classes: Narrow Floodplains (07); Broad Floodplains (08); Small Drains (10). This subcategory also includes non-riverine wet hardwood forests on the coastal plain that are dominated by wetland oaks, cottonwood, and other hardwood species and rare upland depression swamp forests not associated with streams that are dominated by willow oak or overcup oak.

#### 414 Hardwood Swamps

This subcategory includes riverine cypress-gum swamps that do not have enough cypress (less than 25 percent) to be included in subcategory 442. Also included are areas of predominantly hardwood species in swamps and bogs of the mountains and Piedmont that are usually dominated by maple or birch; gum and maple swamps on the coastal plain; maritime swamp forests on barrier islands dominated by hardwoods such as ash, sweetgum, and blackgum; and maritime shrub swamps dominated by swamp dogwood or red bay (above 3 meters in height). This forest community typically occurs in the following physiographic classes: Narrow Floodplains (07); Broad Floodplains (08), Bays and Wet Pocosins (11); Other Hydric (13).

#### 419 Other Deciduous Broadleaf Forest Land

Other forest areas dominated by deciduous species that cannot be classified in subcategories 411 through 414 are included here.

#### **42 Needleleaf Coniferous Forest Land**

Forested areas covered predominantly (approximately 75 percent or more) by coniferous tree species (non-flowering with needlelike, awl-like, or scalelike leaves) that generally do not seasonally lose their leaves. This subcategory includes upland and lowland species of pine, spruce, hemlock, fir, and cypress. Stands of bald cypress and pond cypress are included in this category.

##### 421 White Pine Forests

Forests commonly occurring in mountain areas in which eastern white pine, red pine, or jack pine, singly or in combination, constitute a plurality of the stocking. Common associates include hemlock, birch, and maple. This forest community typically occurs in the following physiographic classes: Moist Mountain Slopes and Coves (06); Other Mesic (09).

##### 422 Hemlock Forests

Forests commonly occurring in mountain areas in which eastern Canada hemlock and some Carolina hemlock constitute a plurality of the stocking. Common associates include birch, maple, and white pine. This forest community typically occurs in the following physiographic classes: Moist Mountain Slopes and Coves (06); Other Mesic (09).

##### 423 Spruce-Fir Forests

Forests commonly occurring in high-elevation mountain areas in which spruce or true firs, singly or in combination, constitute a plurality of the stocking. Common associates include maple, birch, and hemlock. This forest community typically occurs in the following physiographic class: Dry Mountain Tops and Slopes (01).

##### 424 Longleaf Pine Forests

Forests commonly occurring on the coastal plain in which longleaf constitutes a plurality of the stocking. Common associates include oak, hickory, and gum. This forest community typically occurs in the following physiographic class: Flatwoods (04).

##### 425 Loblolly-Slash Pine Forests

Forests that may occur throughout the state from the coastal plain to mountain areas in which loblolly pine, and slash pine, singly or in combination, constitute a plurality of the stocking. Common associates include oak, hickory, and gum. This forest community typically occurs in the following physiographic classes: Flatwoods (04); Rolling Uplands (05); Other Mesic (09).

#### 426 Other Yellow Pine Forests

Forests that occur mainly on ridgetops and other upland areas in which shortleaf, Virginia, pitch and Table Mountain pines, singly or in combination, constitute a plurality of the stocking. Common associates include oak, hickory, and gum. These forest stands typically occur in the following physiographic classes: Dry Mountaintops and Slopes (01); Flatwoods (04); Rolling Uplands (05); Other Mesic (09).

#### 427 Pond Pine Forests

Forests commonly occurring on the coastal plain in which pond pine constitutes a plurality of the stocking. This forest community typically occurs in the following physiographic classes: Bays and Wet Pocosins (11); Other Hydric (13).

#### 428 Atlantic White Cedar Forests

Forests commonly occurring on the coastal plain in which pond pine constitutes a plurality of the stocking. This forest community typically occurs in the following physiographic class: Small Drains (10); Bays and Wet Pocosins (11); and Other Hydric (13).

#### 429 Other Needleleaf Coniferous Forest Land

This subcategory includes other distinguishable needleleaf coniferous forest stands, throughout the state, that cannot be classified in subcategories 421 through 428. Candidates for this subcategory may include scattered stands dominated by red cedar and cypress-dominated stands in ponds and swamps.

### **43 Non-deciduous Broadleaf**

This subcategory includes forest stands characteristic of Carolina Bays and pocosins stocked predominantly by broadleaf trees that do not seasonally lose their leaves. Dominant trees in these stands normally include sweetbay, loblolly bay, red bay, wax myrtle, magnolia, live oak, and laurel oak. This forest community typically occurs in the following physiographic class: Bays and Wet Pocosins (11). Also included in this subcategory are significant areas, mainly in low-density residential areas, where non-deciduous broadleaf varieties have been planted.

#### 431 Maritime Non-deciduous Broadleaf Forests

Includes maritime evergreen forests on barrier islands and coastal fringe evergreen forests on the mainland coast that are dominated by live oak and laurel oak with some pine.

#### 432 Bay Forests

Includes wetland broadleaf evergreen forests dominated by red bay, loblolly bay, and/or sweetbay magnolia, generally mixed with white cedar, pond pine, or maple.

#### 438 Artificial Broadleaf Evergreen Plantings

Includes significant areas, mainly in low-density residential areas, where non-deciduous broadleaf species such as live oak have been planted.

#### 439 Other Non-deciduous Broadleaf

Includes stands dominated by broadleaf evergreen trees that cannot be classified in subcategories 431, 432, or 438.

### **44 Mixed Deciduous-Coniferous Forest Land**

Forested areas which exhibit mixtures of broadleaf deciduous and coniferous species where neither predominates. Generally, where there is at least a 25 percent intermixture of deciduous and coniferous, it will be placed in this subcategory. Otherwise, it will be included in subcategory 41 or 42, whichever predominates.

#### 441 Oak-Pine

Forests commonly occurring in Piedmont and mountain areas in which hardwoods (mainly oak) constitute a plurality of the stocking but pines also account for 25 to 50 percent of the stocking. Common associates include gum, hickory, and yellow poplar. This forest community typically occurs in the following physiographic classes: Flatwoods (04); Rolling Uplands (05); Narrow Floodplains (07).

#### 442 Oak-Gum-Cypress

Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, constitute a plurality of the stocking. These stands are classified in this subcategory when southern cypress constitutes at least 25 percent of the stockings otherwise, these stands will be included in subcategory 414. Common associates include willow, sycamore, beech, and maple. Maritime swamp forests dominated by cypress with an intermixture of sweetgum, blackgum, and ash are also included in this subcategory. This forest community typically occurs in the following physiographic classes: Narrow Floodplains (07); Broad Floodplains (08); Deep Swamps (10); Small Drains (11); Other Hydric (13).

#### 449 Other Mixed Deciduous-Coniferous Forest Land

Includes other stands with at least a 25 percent inter-mixture of deciduous and coniferous species which cannot be classified in subcategories 441 or 442.

### **48 Orchards and Tree Farms**

This subcategory includes areas occupied by orchards and other tree farming operations where tree size and coverage meet the basic definition of the Forest Land Category. Fruit tree orchards and managed nut groves are included when they can be distinguished from other subcategories in

the Forest Land Category. Christmas tree farms and horticultural tree plantations are also included when they can be distinguished from other subcategories.

#### **49 Other Forest Land**

This subcategory is used to classify land that does not fall into any of the previous Forest Land subcategories.

### **5 Water BODIES**

This category includes all areas of surface water with no, or minimal, emergent vegetation. Areas with significant tree, shrub, or herbaceous cover which that are permanently, seasonally, or periodically inundated should be included in appropriate subcategories of Category 3 or 4. All lakes, ponds, rivers, and streams, that cover an area large enough to be delineated as area features, are included in this category.

#### **51 Coastal/Marine Water Bodies**

This subcategory includes areas of open ocean, bays, estuaries, and other saltwater bodies in direct contact with the ocean where water is saline or brackish. The delineation between water bodies in this subcategory and subcategory 53 is somewhat arbitrary but is usually defined where channelized flow of rivers or streams meets bays or estuaries where water movement is influenced by tidal patterns.

#### **52 Inland Water Bodies**

Areas covered by natural or impounded inland freshwater lakes, ponds, or other inland impoundments covered by water. Farm ponds, sediment ponds, large water treatment lagoons, and other artificially impounded water bodies of appreciable size are included in this subcategory.

#### **53 Linear Drainage**

This subcategory includes areas covered by natural drainage lines, including inland creeks, streams, rivers or manmade channels, canals, or irrigation ditches that cover an area large enough to be delineated as area features. The distinction between these linear drainage lines that drain into marine water bodies (Category 51) is somewhat arbitrary but is delineated where water movement becomes more influenced by tidal patterns in bays and estuaries than channelized flow of the linear drainage lines.

#### **59 Other Water Bodies**

This subcategory includes other areas covered by surface water that cannot be classified in subcategories 51, 52, or 53.

### **6 Bare Land**

This category includes non-forested and non-agricultural land that has less than 50 percent herbaceous cover. Excluded from this category is developed land (Category 1) and land that is in transition to a non-bare or developed state in cases where source information is adequate to determine its transition status. For example, land that has been scraped bare or is excavated in preparation for construction would be placed in Category 1 if it is determined that it is actively in transition to the developed state. Otherwise, it will be included in this category. Plowed agricultural land temporarily supporting no vegetation should be placed in Category 2. Areas of active or abandoned mines, quarries, and spoil areas should be placed in this category.

### **61 Beaches, Bare Coastal Land, and Upland Sand Areas**

Sandy or silty areas abutting tidal areas, and inland lakes and upland sand areas that have no or little established vegetation. Beaches, active dunes, dune fields, tidal flats, sand hills, and the like are included. Low-lying areas may be periodically inundated.

### **62 Riverbanks and Bars**

Sandy, silty, or gravel banks and bars along rivers and inside the river channel that support little or no vegetation. These areas may be periodically inundated.

### **63 Exposed Rock**

Any area where bedrock is exposed at the surface or where a layer of soil exists that is not thick enough to support significant vegetation. Non-vegetated or poorly-vegetated mountain balds and cliffs are examples of areas that fall into this category.

### **69 Other Bare Land**

Other areas of bare land not included in Sub-categories 61, 62, or 63 are included here. Examples may include active or inactive and mined areas, spoil piles, and areas covered by wind-borne sediment.

## **9 Other Unclassified Land Cover**

Land will be assigned to this category in cases where the cover type does not logically fall into a previously defined land cover category.

## **PART 4**

### **Description of LAND USE Categories**

#### **1 Urban and Developed Land**

Urban and developed land comprises areas of intensive use with much of the land covered by structures. Included in this category is land used for residential, commercial, and industrial purposes; colleges; strip developments along highways; transportation, power, and communications facilities; areas developed for passive or active recreational purposes; and such isolated units as mills, mines, and quarries, shopping centers, and institutions.

As development progresses, small blocks of undeveloped land may be isolated in the midst of developed areas and will generally be included in this subcategory. Agricultural, forest, or water areas on the fringe of urban and developed areas will not be included in this category except where they cannot be delineated separately from urban or developed land. Low-density residential areas that exhibit dwelling units on large lots with significant tree cover will be placed in the residential subcategory (1.01).

## **1.01 Residential**

Residential land uses range from high density, represented by the multiple-unit structures of urban cores, to low density, where houses are on lots of more than an acre, at the periphery of urban expansion. Linear residential developments along transportation routes extending outward from urban areas are included, but care must be taken to distinguish them from commercial strips in the same locality. Residential development along shorelines is also linear and sometimes extends back only one residential parcel from the shoreline to the first road.

Areas of sparse residential land use surrounded by other uses (e.g., Agricultural) are not included in this subcategory. In some places, the boundary will be clear where new housing developments abut intensively used agricultural areas, but the boundary may be vague and difficult to discern when residential development is sporadic, or occurs in small isolated units over an extended period of time in areas of mixed or less intensive uses.

Housing within the confines of a military base is included in subcategory 1.03.05.08. Residential areas that are difficult to separate from associated uses (such as college dormitories, living quarters for laborers near a work base, lodging for employees of agricultural field operations) may sometimes be included in other use categories where they are integral parts of that other use.

### 1.01.01 Single Family Detached or Duplex

This subcategory includes areas having detached single and two-family structures used as a permanent dwelling more than two rows wide except for those strip developments connected to larger residential areas. It is inclusive of lawns, parking areas, any small-area recreational facilities, tool sheds, garages, garden sheds, etc.

#### *1.01.01.01 Very Low-density Detached Dwellings*

A development or grouping containing an average gross density of 1 dwelling unit or less per 5 acres.

#### *1.01.01.02 Low-density Detached Dwellings*

A development or grouping containing an average gross density of more than 1 dwelling unit per 5 acres and up to 1 dwelling unit per acre.

#### *1.01.01.03 Medium Density Detached Dwellings*

A development or grouping containing an average gross density of more than 1 dwelling unit per acre and up to 5 dwelling units per acre.

*1.01.01.04 High-density Detached Dwellings*

A development or grouping containing an average gross density of 6 or more dwelling units per acre.

1.01.02 Mobile Homes

This subcategory includes areas occupied predominantly by mobile homes outside of mobile home parks. It is inclusive of lawns, parking areas, any small-area recreational facilities, tool sheds, garages, garden sheds, etc.

*1.01.02.01 Very Low-density Mobile Homes*

A development or grouping containing an average gross density of 1 or less dwelling unit per acre.

*1.01.02.02 Low-density Mobile Homes*

A development or grouping containing an average gross density of more than 1 dwelling unit per acre, but less than 6 dwelling units per acre.

*1.01.02.03 Medium- and High-density Mobile Homes*

A development or grouping containing an average gross density of 6 or more dwelling units per acre.

1.01.03 Multi-family Dwellings

This subcategory includes all low and high-rise multi-family and apartment structures exclusive of duplexes that are included in subcategory 1.01.01. Included are apartment buildings, condominiums, and the like, whether in complexes or as single structures. It is inclusive of lawns, parking areas, and any small-area recreational facilities.

*1.01.03.01 Low-density Multi-family*

A development containing an average gross density of 6 or less dwelling units per acre.

*1.01.03.02 Medium-density Multi-family*

A development containing an average gross density of more than 6 dwelling units per acre, but less than 17 dwelling units per acre.

*1.01.03.03 High-density Multi-family*

A development containing an average gross density of 17 to 30 dwelling units per acre.

*1.01.03.04 Very High-density Multi-family*

A development with more than 30 dwelling units per acre.

1.01.04 Mobile Home Parks

An area of land used specifically for a grouping of mobile homes shall be classed into this subcategory. Usually these areas will include mobile homes in numbers over five. Related services and recreational spaces are to be included. Single mobile homes or areas occupied by mobile homes not part of a mobile home park will be classed as part of subcategory 1.01.02.

*1.01.04.01 Low-density Mobile Home Park*

A development or grouping of mobile homes containing an average gross density of 6 or less dwelling units per acre.

*1.01.04.02 Medium-density Mobile Home Park*

A development or grouping of mobile homes containing an average gross density of more than 6 dwelling units per acre, but less than 12 dwelling units per acre.

*1.01.04.03 High-density Mobile Home Park*

A development or grouping of mobile homes containing an average gross density of 12 or more dwelling units per acre.

1.01.05 Group and Transient Quarters

This subcategory includes structures and associated grounds used for housing, whether permanent or temporary, of a number of unrelated individuals. All of these quarters could also logically go under other uses (i.e., hotels -- commercial, dormitory -- educational), but they are classed here because all have predominantly residential characteristics in common. Lawns, outbuildings, and parking facilities associated with these structures are included. Military barracks and residence buildings within the confines of a military base are included in subcategory 1.01.05.08.

*1.01.05.01 Rooming Houses, Boarding Houses, and Residential Hotels*

Generally operated on a commercial basis and includes organizational lodging houses and membership residences and dormitories normally housing 5 or more persons unrelated to the proprietor. This subcategory also includes non-organizational residential or apartment hotels operated as a facility wherein guests reside on a semi-permanent basis. Residential hotels normally exhibit 75 percent or more of available accommodations used for permanent guests who reside more than 30 days. This subcategory does not include fraternity or sorority houses

(see subcategory 1.01.05.02) associated with an educational institution. Nursing homes are included in subcategory 1.03.04.

#### *1.01.05.02 Membership Lodging*

Includes organizational private hotels, organizational lodging houses, membership residence dormitories, and college or university fraternity and sorority houses. This subcategory does not refer to religious organizational facilities or to residence halls associated with an educational institution.

#### *1.01.05.03 Student Residences*

Includes student residence halls and dormitories associated directly with an educational institution. Fraternity and sorority houses are included in subcategory 1.01.05.02.

#### *1.01.05.04 Retirement Homes and Orphanages*

Includes residential facilities for the aged, orphaned, or indigent.

#### *1.01.05.05 Religious Quarters*

Includes convents, monasteries, abbeys, rectories, parish houses, and parsonages.

#### *1.01.05.06 Migrant Quarters*

Seasonal dwellings used for housing seasonal workers.

#### *1.01.05.07 Shelters*

Living facilities run by public or private groups to house homeless, disadvantaged, or otherwise dependent persons (normally adults or adults with children) exclusive of orphanages or nursing homes.

#### *1.01.05.08 Military Barracks and Group Residence*

Includes the buildings and immediate grounds and parking facilities, within the confines of a military installation, used for housing military personnel. Apartment complexes inside military installations in which the families of military personnel reside are also included in this subcategory.

#### *1.01.05.99 Other Group or Transient Quarters*

#### 1.01.99 Other Residential Land

This subcategory is used to designate land predominantly in residential use that does not logically fall in another residential subcategory. Since Residential subcategories 1.01.01 to 1.01.05 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here.

## **1.02 Commercial and Services**

Commercial areas are those used predominantly for the sale of products and services. They are often abutted by residential, agricultural, or other contrasting uses, which help differentiate them. The principal components of this subcategory are in urban central business districts, commercial strip developments along major highways, access routes to cities, resorts, shopping malls, industrial facilities, or office parks in suburban or rural areas. The main buildings, secondary structures, and areas supporting the basic use are all included -- office buildings, warehouses, driveways, sheds, parking lots, landscaped areas, and waste-disposal areas.

Commercial areas may include some non-commercial uses too small to be separated out such as churches, schools, and small residential units that occur in urban centers. These are not separated out into their respective categories unless they occupy a sufficient area to be discriminated and mapped at the selected scale being used. Commercial operations associated with recreational, cultural, or entertainment activities are included in subcategory 1.09.

### 1.02.01 Commercial Retail

Land used for supplying retail goods and services for sale, including the loading and parking facilities directly associated with the retail establishment.

#### *1.02.01.01 Building Materials, Hardware, and Farm Equipment*

Land used for the retail trade of lumber and building materials, plumbing and heating equipment, glass, paint and related supplies, electrical supplies, and farm and agricultural equipment.

#### *1.02.01.02 General Merchandise and Department Stores*

Land occupied by department stores or mail order houses, variety stores, dry goods, and other general merchandise establishments.

#### *1.02.01.03 Food, Groceries, and Beverages*

Land used by retail food stores, including groceries and supermarkets, specialty food stores, bakeries, fruit and vegetable vendors, and dairy product stores. Liquor stores are included under subcategory 1.02.01.09.

#### *1.02.01.04 Automotive, Marine Craft, Aircraft, and Accessories*

Land used for the sale of cars, trucks, and other motor vehicles; water craft; aircraft; and accessories associated with these items (auto parts, tires, marine supplies, etc.)

*1.02.01.05 Gasoline Stations*

This subcategory includes gasoline service stations with or without associated repair services.

*1.02.01.06 Apparel and Accessories*

Land used for the retail sale of all clothes, shoes, and accessories. This subcategory includes furriers and custom tailors but excludes shoe repair and other apparel repair shops that belong in subcategory 1.02.04.

*1.02.01.07 Furniture, Home Furnishings, and Home Electronic Equipment*

Land used for the retail sale of all furniture items, floor coverings, appliances, and electronic equipment such as TVs, stereos, etc.

*1.02.01.08 Eating and Drinking Establishments*

Land occupied by restaurants, fast-food stands, and drinking establishments.

*1.02.01.09 Liquor and Spirits*

Land used for the sale of alcoholic beverages by the container. Bars and other drinking establishments are included in 1.02.01.08.

*1.02.01.99 Other Retail Establishments*

Land used for all other retail uses not considered in subcategories 1.02.01.01 through 1.02.01.09 which may include drugstores, stationery, bookstores, sporting goods, antiques and crafts, jewelry, garden supplies, office supplies and computers, tool and equipment rental businesses, etc.

1.02.02 Commercial Wholesale

Land used for the wholesale distribution of goods. This subcategory includes warehouses and loading facilities directly attached and associated with the wholesale operation.

*1.02.02.01 Motor Vehicles and Automotive Equipment*

Includes establishments providing wholesale distribution of automobiles and trucks, automotive parts and equipment, tires, and related goods.

*1.02.02.02 Marine and Aviation Supplies*

Includes establishments providing wholesale distribution of aircraft and water craft and associated parts and equipment.

*1.02.02.03 Drugs, Chemicals, and Allied Products*

Land used for the wholesale supply of pharmaceuticals, druggists' sundries, paints, varnishes, and all other chemicals and allied products.

*1.02.02.04 Dry Goods and Apparel*

Land used for the wholesale supply of all clothes, footwear, and accessories, as well as all dry goods and piece goods.

*1.02.02.05 Groceries and Related Products*

Land used for the wholesale supply of all food and beverage items except alcoholic beverages. "Discount" grocery stores should be classified under subcategory 1.02.01.03.

*1.02.02.06 Hardware, Plumbing, Heating Equipment, and Electrical Goods*

Land used for the wholesale supply of all tool and hardware items, appliances, plumbing, heating, and air conditioning supplies, and other related items.

*1.02.02.07 Machinery and Equipment*

Land used for the wholesale supply of commercial and industrial machinery, farm equipment, professional and scientific equipment.

*1.02.02.99 Other Wholesale*

Includes land used for all other wholesale activities that cannot be included in subcategories 1.02.02.01 through 1.02.02.07 which may include metals and minerals, scrap and waste, alcoholic beverages, paper products, lumber and construction materials, furniture, etc.

1.02.03 Commercial Services

This subcategory includes land occupied by establishments offering business or personal services. It includes parking and other facilities associated with the building structure.

*1.02.03.01 Business Support Services*

Land occupied by establishments providing services supporting business operations. Included in this subcategory are services for advertising, duplicating and mailing, building services such as extermination and janitorial service, news service, employment service, and other support services.

#### *1.02.03.02 Finance, Real Estate, Insurance*

Land used by establishments providing services for banking, credit, security or commodity brokerage, insurance, real estate, and other related services.

#### *1.02.03.03 Self-storage and Warehouses (not directly associated with manufacturing)*

Land devoted to services for storage of goods, including personal self-storage services, and commercial storage facilities not attached or associated directly with a commercial retail or wholesale operation.

#### *1.02.03.04 Repair and Automotive Services*

Land used by establishments whose principal business is for the repair and servicing of automobiles, appliances, furniture refinishing or reupholstering, and other repair services. Automobile repair facilities that are connected physically with an auto dealership should be classed under subcategory 1.02.01.04 or 1.02.02.01. Establishments whose primary activity is the sale of automobile fuel but which also have auto repair facilities should be included in subcategory 1.02.01.05.

#### *1.02.03.05 Medical, Legal, Consulting, and Other Professional Services*

Land used for providing professional services. This subcategory includes law and professional consulting, physicians' offices, hospitals, medical or dental laboratories, sanitariums, auditing and bookkeeping businesses, engineering and architectural services, computer design and software firms, and other professional services.

#### *1.02.03.06 Contract Construction Services*

Land occupied by businesses offering contract construction services, including residential or commercial building construction, road and bridge construction, roofing, masonry, plumbing and heating, painting, and interior improvements. This includes land used for offices, garages, parking, and equipment or material storage associated with these establishments.

#### *1.02.03.07 Landscaping, Lawn, and Garden Services*

Land occupied by businesses offering services for landscaping and/or lawn maintenance services.

#### *1.02.03.08 Personal Services*

Land occupied for establishments providing services to the public such as laundering and dry cleaning, photographic services, beauty shops and barber shops, appliance repair, funeral and crematory services, apparel alteration and repair, and other personal services.

#### *1.02.03.99 Other Business and Professional Services*

Land used for all other personal, business, and professional services such as non-governmental social service or charitable institutions.

#### 1.02.04 Hotels and Lodging

##### *1.02.04.01 Hotel/Motel*

##### *1.02.04.02 Bed and Breakfast*

##### *1.02.04.99 Other Hotel or Lodging*

#### 1.02.99 Other Commercial Services

This subcategory is used to designate land predominantly in commercial use that does not logically fall in another commercial service subcategory. Since subcategories 1.02.01 through 1.02.04 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here.

### **1.03 Institutional**

This subcategory includes government administrative offices and facilities; military installations; educational, religious and health institutions; and correctional facilities. Buildings, surrounding grounds, and parking lots associated with the facility are included in this subcategory, but areas not specifically related to the purpose of the institution should be placed in another appropriate subcategory. Auxiliary land use, particularly residential, commercial and services, and other supporting land uses on a military base, would be included in the institutional subcategory, but agricultural areas not specifically associated with correctional, educational, or religious institutions are placed in the appropriate agricultural subcategory. Small institutional units, as, for example, many churches and some secondary and elementary schools, will not meet the minimum area requirements and will be included within another subcategory, usually residential or commercial.

#### 1.03.01 Governmental Services and Institutions

This subcategory includes land occupied by branches of federal, state, or local government or quasi-public institutions supported by the government. Excluded are public educational institutions which are included in subcategory 1.03.02 and public indoor cultural and public assembly uses which are included in subcategory 1.09.

##### *1.03.01.01 Correctional Institutions*

Land occupied by prisons, jails, and other correctional facilities, including the grounds associated with these facilities. Utility or communication facilities of appreciable size associated with correctional facilities may be included in subcategory 1.06. Jail facilities attached or inside

government administrative offices or inside public protection facilities should be placed in subcategory 1.03.01.04.

*1.03.01.02 Social Service and Public Assistance Facilities*

Land occupied by government-run or administered social service and public assistance offices (excluding public medical clinics and hospitals).

*1.03.01.03 Postal Service*

Includes post offices with associated loading and transfer facilities.

*1.03.01.04 Government Administrative Offices*

Includes all government administrative office buildings supporting activities of the executive, legislative, and judicial branches. Courthouses, government office buildings, and legislative buildings along with surrounding grounds are placed in this subcategory. This subcategory excludes administrative offices associated with public works and public protection functions. These are placed in subcategory 1.03.01.05.

*1.03.01.05 Public Protection and Public Works Facilities*

Includes administrative offices, equipment storage, and associated grounds occupied by public police, fire, emergency medical, and civil defense groups.

*1.03.05.99 Other Government Services or Institutions*

1.03.02 Educational

This subcategory includes all public and private educational institutions, including pre-schools, elementary and high schools, colleges, universities, trade and vocational schools, and other educational institutions. Land occupied by the educational buildings and immediate grounds and parking areas are included in this subcategory. Significant recreational, utility, communication, or other uses associated with educational institutions are included in their appropriate subcategory.

*1.03.02.01 Preschools and Day Care*

Includes land occupied by public or private day care and pre-schools for children below kindergarten age.

*1.03.02.02 Primary, Elementary, and Secondary Schools*

Includes land occupied by public or private primary, elementary schools, high schools, or college preparatory schools.

#### *1.03.02.03 College/University*

Includes instructional buildings and surrounding grounds of public and private colleges or universities.

#### *1.03.02.04 Vocational/Trade*

Includes land occupied by public or private trade or vocational schools, including technical schools, business schools, barber and beauty schools, art and music schools, and other schools devoted to specific trades or specialized instruction.

#### *1.03.02.99 Other Educational Institutions*

#### 1.03.03 Religious Institutions

This includes buildings and grounds occupied by churches and other structures used for meetings, worship, and activities of religious groups. Religious group-affiliated educational facilities, cemeteries, and residence structures are not included in this subcategory when they can be discriminated from the main religious structure.

#### 1.03.04 Medical and Health Care Facilities

This subcategory includes land occupied by facilities that provide a variety of health care and physical or mental rehabilitation services to residents, including hospitals, medical clinics, doctors' offices, medical laboratories, nursing homes, and sanitariums. The surrounding grounds, parking areas, and support buildings associated with these facilities are included.

#### *1.03.04.01 Hospitals*

Hospitals are health care facilities that typically provide a large range of health care and/or rehabilitation services. Hospitals may include offices for physicians and laboratory facilities.

#### *1.03.04.02 Health Clinics and Physicians' Offices*

This subcategory includes public or private clinics for medical or mental health treatment or diagnosis which are located within the communities that they serve. Their smaller scope of services and size differentiate them from hospitals. Private doctors' offices or areas occupied by buildings with group medical practices are included in this subcategory.

#### *1.03.04.03 Nursing Homes and Residential Rehabilitation*

This subcategory includes the buildings and surrounding grounds occupied by nursing homes, facilities for the mentally or physically handicapped, sanitariums, and rehabilitation centers where residents are housed for long treatment periods or for perpetual care.

#### *1.03.04.99 Other Medical and Health Care Facilities*

#### 1.03.05 Membership Organizations

This subcategory includes buildings and associated grounds serving as permanent meeting and activity places for membership groups such as unions, fraternal organizations, clubs, lobbying or advocacy groups, professional associations, or political organizations.

#### 1.03.06 Military Installations

Land occupied by military bases and defense installations, including military training grounds, storage depots, and military command centers. Military airfields are included in subcategory 1.05.03.03; military port facilities are in 1.05.04.03; and military barracks are included in 1.01.05.08.

#### 1.03.99 Other Institutional

This subcategory is used to designate land predominantly in institutional use that does not logically fall in another institutional subcategory. Since subcategories 1.03.01 through 1.03.06 have been designed to be as inclusive as possible; only small land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.03.99 may be created.

### **1.04 Manufacturing and Raw Material Processing**

This subcategory includes land used for light and heavy manufacturing and for the processing and refinement of raw materials. Light manufacturing operations are focused on design, assembly, finishing, and packaging of products. Light manufacturing areas may be, but are not necessarily, directly in contact with urban areas. Many are now found at airports or in relatively rural areas. Heavy manufacturing operations use raw materials such as iron ore, lumber, or petroleum. Included are steel mills, pulp or lumber mills, electric power generating stations, oil refineries and tank farms, chemical plants, and brick-making plants. Stockpiles of raw materials, large power sources, and waste product disposal areas are usually visible, along with transaction facilities capable of handling heavy materials. Raw material processing includes the operations devoted to on-site storing and transporting of mined materials and petroleum, and the refinement and preparation of these products for direct use or for use in manufacturing.

#### 1.04.01 Light Manufacturing

Land used for the manufacturing, assembly, packaging, and associated storage and transportation of finished goods not requiring major refinement or raw material preparation.

##### *1.04.01.01 Food and Kindred Products Processing and Preparation*

Land used for treating, refining, preparing, and manufacturing food products, including meat, fish, and dairy products, canning, grain milling, distilling, and other related operations.

##### *1.04.01.02 Apparel Manufacturing*

Land used for the manufacture of all clothing, including shoes, head gear, and fur garments.

*1.04.01.03 Furniture and Fixture Manufacturing*

Land used for the manufacture of business and household furniture and related items such as blinds, office equipment, lighting, and related items.

*1.04.01.04 Printing, Publishing, and Allied Industries*

Land used for the composition, printing, binding, and publishing of books, business forms, newspapers, periodicals, greeting cards, and other printed goods.

*1.04.01.05 Professional and Scientific Instruments*

Land used for the manufacture of equipment and instruments for laboratory and scientific analysis, engineering equipment, measurement and optical instruments, computers, surgical instruments and medical equipment, photographic equipment and supplies, and other scientific and professional equipment or instruments.

*1.04.01.06 Textile Mill Product Manufacturing*

Land occupied by facilities engaged in the manufacture and preparation of woven and knit fabrics to be used in the production of finished goods. Included is the production of fabrics from cotton, wool, and manmade fiber, yarn and thread manufacture, fur and hide preparation, carpet manufacture, fabric dyeing operations, and other related manufacture or preparation operations.

*1.04.01.07 Craft Industries*

Includes buildings and land principally used for the manufacture of craft items such as pottery, woodcrafts, metal crafts and ornaments, etc. These operations are characterized by their small size and use of handtools and simple equipment occurring frequently in rural areas of the state. Retail operations that are connected to these manufacturing operations are included in this subcategory.

*1.04.01.99 Other Light Manufacturing*

Land used for light industry in the manufacture of other goods, including jewelry, toys and amusements, tobacco products, and other items.

1.04.02 Heavy Manufacturing

Land used for the manufacture and associated storage and transportation of refined products from raw materials.

*1.04.02.01 Lumber and Wood Products (except furniture)*

Land used for processing that starts with wood (logs), not the final wood products such as furniture. An establishment which, in one operation, starts with logs and ends with paper is included, but one that starts with pulp is not. This includes sawmills, wood planing operations, wood treatment, and the production or preparation of all lumber products, including veneers, plywood, and prefabricated wood components.

#### *1.04.02.02 Paper and Allied Product Manufacturing*

Land used for the manufacture of pulp and paper products, including paperboard, bags, wallpaper, sanitary paper products, and paper containers.

#### *1.04.02.03 Chemicals, Rubber, and Plastic Production*

Land used for organic and inorganic chemical manufacturing, plastic and rubber production, asphalt plants, drug manufacturing, soap product manufacturing, paint and varnish production, agricultural chemical manufacture, and similar establishments. They are usually identified by the large number of tanks, pipelines, and associated rail or, more often, boat transportation. Small asphalt plants may be associated with sand and gravel operations.

#### *1.04.02.04 Stone, Clay, and Glass Manufacturing*

Land used for the manufacture of cement (dry, not ready mix), bricks, finished building stone, cinder blocks, clay, tiles, glass, and other similar types of products. These establishments are usually located near their source of raw materials, such as an open pit extractive area, and near large uses of water and stockpiles of sand or stone. Sand, gravel quarrying, or rock quarrying operations are included in subcategory 1.10.01.

#### *1.04.02.05 Fabricated Metal Product Manufacturing*

Land used for the re-shaping of primary metal products for production of a final marketable item. No forging occurs, but rolling, casting, and machining will occur. This subcategory includes the production of arms and ordnance, mechanical and electrical machinery, transportation equipment and vehicles, and other metal products.

#### *1.04.02.99 Other Heavy Industry*

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#### 1.04.03 Raw Material Refinement and Preparation

This subcategory includes land used for the refinement and preparation of raw materials from petroleum, mineral, and metal ore extractive operations. This includes the processes for converting those raw materials, such as oil, ore, stone, phosphates, etc., into usable products for direct use or other manufacturing stages. Processing of raw lumber products is included in subcategory 1.04.02.01.

#### *1.04.03.01 Primary Metal Refining, Production, and Preparation*

Land used for the production of metals from natural mineral ores. The production excludes mining and transportation, but does include storage areas, furnaces, reducers, crushers, etc. Also included are power plants used either exclusively or primarily for metal production. These areas are usually quite large with rail or boat facilities and generally produce large amounts of heat. Excluded from this subcategory are lands occupied by the mining or quarrying activities.

#### *1.04.03.02 Petroleum Refining and Related Industries*

Land occupied by petroleum refineries and plants producing similar materials such as paving materials, lubricating oils, and other related products.

#### *1.04.03.03 Coal Preparation*

Land used for the preparation of coal from surface or deep mines for use as a fuel. This may include washing, grading, and loading of coal most often occurring at or near the extraction site.

#### *1.04.03.04 Stone, Gravel, and Sand Preparation*

Land used for the preparation of stone, gravel, and sand for use as building materials. This may include activities for washing, crushing, grading, and loading for transport.

#### *1.04.03.99 Other Raw Material Refinement and Preparation*

#### 1.04.99 Other Manufacturing and Processing

This subcategory is used to designate land predominantly being used for manufacturing or raw material processing that does not logically fall in another existing subcategory. Since subcategories 1.04.01 to 1.04.03 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.04.99 may be created.

### **1.05 Transportation**

This subcategory includes major transportation facilities, including those associated with ground, water, and air transportation.

Highways and railways are characterized by areas used for interchanges, limited access right-of-way, and service and terminal facilities. Rail facilities include stations, parking lots, roundhouses, repair and switching yards, and related areas. Spur connections from an active line are included in the appropriate industrial or extractive subcategory.

Airports, seaports, and major lakeports are isolated areas of high utilization, usually with no well-defined intervening connections, although some water ports are connected by canals. Major port areas include the docks, shipyards, dry docks, locks, and water source-control structures.

Airport facilities include the runways, intervening land, terminals, service buildings, navigation aids, fuel storage, parking lots, and a limited buffer zone.

At certain mapping scales, some of these transportation facilities would be represented as point or line features. If the mapping scale does not support delineation of the land use as an area feature, then it should not be included on a land use map. These point and line features should be included on separate map "layers."

#### 1.05.01 Rail Transportation Facilities

This subcategory includes all facilities that would be connected with rail transportation, including overland track with associated abutments and drainage facilities (where the area encompassed is large enough to delineate at a specific map scale), roundhouses, repair and switching yards, and related areas.

*1.05.01.01 Active Railyard*

*1.05.01.02 Rail Station or Terminal*

*1.05.01.03 Abandoned Railroad Right-of-Way*

*1.05.01.04 Active Railroad Track*

*1.05.01.99 Other Rail Transportation*

#### 1.05.02 Road Transportation Facilities

This subcategory includes land occupied by non-limited access roads and highways; limited-access highways; interchanges and cloverleaves; motor vehicle terminals; motor freight facilities; the medians, shoulders, pedestrian paths, and drainage structures associated with roads and highways; other road transportation facilities included in this subcategory where the area encompassed is large enough to delineate them as area features at a chosen map scale.

*1.05.02.01 Limited or Non-limited Roads and Highways*

*1.05.02.02 Truck Terminal*

*1.05.02.03 Bus Terminal*

*1.05.02.04 Auto/Bus Parking*

*1.05.02.99 Other Road Transportation*

#### 1.05.03 Air Transportation Facilities

This subcategory includes all facilities directly connected with air transport, whether commercial, municipal, military, or private. These high utilization areas include runways, intervening land, terminals, service buildings, plane hangars, navigation aids, fuel storage areas, parking lots and a limited buffer zone. Military airfields are included in this subcategory.

*1.05.03.01 Non-military Airports and Airfields*

*1.05.03.02 Non-military Heliports*

*1.05.03.03 Military Airfields*

*1.05.03.99 Other Air Transportation*

#### 1.05.04 Water Transportation Facilities

This subcategory includes those areas and structures related to water transportation, excluding the water. The major components of this subcategory are the port areas, docks, shipyards, dry docks, and locks that support shipping, fishing, military, and other water transport activities. Marinas and port facilities devoted mainly to leisure, sport, or recreational pursuits are included in subcategory 1.09.02.03. Storage buildings, loading and maintenance facilities, and other structures directly associated with water transportation are included. The waterways themselves are included in Category 4.

*1.05.04.01 Non-military Marine Terminals and Port Facilities*

*1.05.04.02 Lock and Dam Facilities*

*1.05.04.03 Military Port and Repair Facilities*

*1.05.04.99 Other Water Transportation*

#### 1.05.99 Other Transportation

This subcategory is used to designate land predominantly in transportation use that does not logically fall in another existing subcategory. Since subcategories 1.05.01 through 1.05.04 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.05.99 may be created.

### **1.06 Communication and Utilities**

Communication and utility areas involved in transport of water, gas, oil, electricity, and areas used for airwave communications are also included in this subcategory. Pumping stations, electric substations, and areas used for radio, radar, or television antennas are the major types. Small facilities, or those associated with an industrial, commercial, or extractive land use, are included within the larger subcategory with which they are associated. Long-distance gas, oil,

electric, telephone, water, or other transmission facilities rarely constitute the dominant use of land over which they pass. If these uses are dominant and meet the minimum width criteria, they may be identified as transportation uses.

At certain mapping scales, some of these communication and utility facilities would be represented as point or line features. If the mapping scale does not support delineation of the land use as an area feature, then it should not be included on a land use map. These point and line features should be included on separate map "layers."

#### 1.06.01 Communication Facilities

Those buildings and structures associated with radio, radar, television, telegraph, telephone, etc., are included in this subcategory. Small facilities, or those associated with an industrial, commercial, or extractive land use, are included within the subcategory with which they are associated .

##### *1.06.01.01 Telephone Facilities*

Land occupied by telephone exchange stations, relay towers, etc.

##### *1.06.01.02 Telegraph Facilities*

Land occupied by message centers and transmission or receiving stations.

##### *1.06.01.03 Radio Facilities*

Land used by radio broadcasting studios and radio transmission and receiving stations.

##### *1.06.01.04 Television/Cable TV Facilities*

Land occupied by television studios, satellite receiving stations, and television transmission facilities.

##### *1.06.01.98 Combined Communication Facilities*

Land occupied by studios, antennae, and transmission/receiving facilities for combined communication such as combined radio and television stations.

##### *1.06.01.99 Other Communication Facilities*

#### 1.06.02 Electric and Gas Utilities

This subcategory includes land uses associated with the transport, storage, and distribution of gas, oil, or electricity. Pumping stations, electric substations, etc., will constitute the major components of this subcategory. Small facilities and those associated with an industrial, commercial, or extractive land use are included in the appropriate subcategory. Long distance

pipelines, etc., rarely constitute the dominant use of land over or under which they pass. Areas of observable utility rights-of-way such as transmission line cuts through forested areas are included in this subcategory.

#### *1.06.02.01 Electric Generation and Transmission*

Land occupied by electric generation plants, substations, transmission facilities, and rights-of-way.

#### *1.06.02.02 Gas Storage and Transmission*

Land occupied by gas production plants, pressure control stations, transmission facilities, and rights-of-way.

#### *1.06.02.99 Other Electric and Gas Utility Facilities*

### 1.06.03 Water and Wastewater Utilities

Land associated with the transport, storage, distribution, and collection of water and wastewater are included in this subcategory. Small facilities and those associated with an industrial, commercial, or extractive land use are included in the appropriate subcategory. Long distance pipelines, etc., rarely constitute the dominant use of land through which they pass. If these uses are dominant and can be readily recognized, they may be identified as a utility use.

#### *1.06.03.01 Water Storage, Treatment, and Distribution*

Land used for the storage, treatment, and distribution of public and private water supplies. Water storage tanks and towers, treatment plants, pumping facilities, and wells are included in this subcategory. Reservoirs or impounded water bodies are included in subcategory 4.01. or 4.02.

#### *1.06.03.02 Sewage Collection and Treatment*

Land used for the collection and treatment of wastewater. Public and private treatment plants, waste treatment ponds, drying beds, and pumping facilities are included.

#### *1.06.03.99 Other Water and Wastewater Facilities*

### 1.06.04 Solid or Hazardous Waste Disposal, Storage, and Treatment

This subcategory includes all land used for the storage, disposal, treatment, and transfer of solid waste, including sanitary and toxic waste.

#### *1.06.04.01 Solid Waste Disposal and Transfer*

Land used for sanitary waste collection and transfer, sanitary landfills, sanitary waste incinerators, composting operations, recycling centers, and other sanitary waste facilities.

#### *1.06.04.02 Hazardous Waste Storage, Disposal, and Treatment*

Land used for the storage, disposal, or treatment of hazardous waste materials, including low or high-level radioactive materials, hazardous chemicals, or other hazardous materials. Hazardous waste sites undergoing clean-up or amelioration are included in this subcategory. Hazardous waste storage or treatment facilities associated with manufacturing and raw material processing that cannot be distinguished from the rest of the facility are included in subcategory 1.04.

#### *1.06.04.99 Other Waste Disposal and Treatment*

This subcategory includes land used for other waste disposal and treatment, including auto junkyards (unless part of an ongoing salvage operation), illegal dumps, and other waste disposal and treatment areas.

#### 1.06.99 Other Communication and Utilities

This subcategory is used to designate land predominantly used for communication or transportation that does not logically fall in another existing subcategory. Since subcategories 1.06.01 through 1.06.04 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.06.99 may be created.

### **1.07 Industrial and Commercial Complexes**

This subcategory is used when it is not possible or appropriate to define individual subcategories under Categories 1.01 through 1.06. Buildings, loading facilities, parking areas, and grounds associated with the complexes are normally included in this subcategory.

#### 1.07.01 Industrial Park

Land occupied by one or several closely spaced buildings normally used for light industrial uses.

#### 1.07.02 Office Park

Land occupied by a group of closely spaced low-rise or high-rise office buildings normally sharing road frontage and parking facilities. This subcategory includes lawns and common areas between the buildings.

#### 1.07.03 Shopping Center/Mall

Usually a single structure, or a group of structures, containing a large amount of floor space and a variety of commercial and service establishments. They are identified by the large common parking lot, usually larger in area than the structures group itself. These are often referred to as neighborhood, community, or regional shopping centers. Included in this subcategory are seasonal or periodic shopping areas such as flea markets and farmers' markets.

### 1.07.99 Other Industrial or Commercial Complexes

This subcategory is used to designate land occupied by other complexes of commercial and/or industrial structures that does not logically fall in another existing subcategory. Since subcategories 1.07.01 through 1.07.03 have been designed to be as inclusive as possible, only small land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.07.99 may be created.

### **1.08 Mixed Urban or Developed Land**

This subcategory is used for a mixture of urban or suburban uses in larger cities where no one use predominates and where the scale of mapping does not allow separate classes to be discriminated.

This subcategory typically includes developments along transportation routes and the smaller cities, towns, and built-up areas where separate land uses may not be distinguishable. Residential, commercial, industrial, institutional, and occasionally other land uses may be included. Farmsteads inter-mixed with strip or cluster settlements may be included in this subcategory, but other agricultural land uses should be included in their appropriate categories.

### **1.09 Public Assembly, Recreational, Cultural, and Entertainment**

This subcategory includes indoor and outdoor land and facilities developed to support assembly, recreational, cultural, or entertainment activities. Commercial operations and public facilities are included. Land uses designated for or carried out on undeveloped land not marked by major development (e.g., primitive camping, hiking areas, hunting preserves, undeveloped nature reserves or wildlife sanctuaries used for cultural or environmental purposes) are included in Category 6.

#### 1.09.01 Indoor Cultural, Public Assembly, and Recreation

This includes indoor public or private facilities for cultural activity, recreation, and public assembly, such as planetariums, civic centers, theaters, auditoriums, indoor tennis courts, field houses, and enclosed stadiums. Outdoor cultural, public assembly, and recreational lands (and their accompanying incidental buildings) are included in subcategory 1.09.02.

##### *1.09.01.01 Museums and Other Indoor Cultural*

Includes facilities such as libraries, museums, art galleries, planetariums, aquariums, nature or craft exhibits, historic buildings, and historical monuments.

##### *1.09.01.02 Theaters and Exhibition Halls*

This subcategory includes such facilities as movie theaters, other theaters, auditoriums, exhibition halls, and multiple purpose civic centers, except for those principally used for sporting events.

### *1.09.01.03 Indoor Recreational and Sporting Facilities*

Includes land occupied by enclosed stadiums, arenas, field houses, bowling alleys, tennis courts, skating rinks, indoor swimming pools, health clubs, and other indoor or enclosed sporting facilities.

### *1.09.01.99 Other Indoor Cultural, Public Assembly, and Recreation*

### 1.09.02 Outdoor Cultural, Public Assembly, and Recreation

This subcategory includes land and associated buildings and facilities supporting outdoor cultural, assembly, or recreational activities. Outdoor cultural uses may include outdoor botanical gardens and zoos. Public assembly areas include drive-in theaters or outdoor amphitheaters. This subcategory also includes outdoor, non-enclosed athletic and sporting facilities such as playfields, golf courses, and open stadiums. Water bodies that are used for sport or recreation are not included in this subcategory but are assigned to Category 4.01.

#### *1.09.02.01 Outdoor Cultural*

Outdoor cultural includes such facilities as botanical gardens, arboretums, public parks, landscaped gardens designed for cultural enjoyment, and zoos.

#### *1.09.02.02 Outdoor Public Assembly*

This subcategory includes such facilities as drive-in theaters, outdoor amphitheaters, and other open assembly areas.

#### *1.09.02.03 Developed Outdoor Recreational and Sporting*

Land used for recreation that is predominantly oriented toward outdoor activities. This subcategory includes incidental buildings such as maintenance buildings, shelters, toilets, beach change areas, clubhouses, etc., associated with the outdoor activity. Land uses designated for or carried out on undeveloped land not marked by major development (e.g., primitive camping, hiking areas, hunting preserves, undeveloped nature reserves or wildlife sanctuaries used for cultural or environmental purposes) are included in Category 6. Examples of areas included in this subcategory are playgrounds and playfields; sporting areas, including golf courses and shooting ranges; swimming pools; recreational beaches; marinas; developed camping areas; and other land developed for outdoor recreation.

#### *1.09.02.99 Other Outdoor Cultural, Public Assembly, and Recreation*

### 1.09.99 Other Public Assembly, Recreational, Cultural, Entertainment

This subcategory is used to designate land predominantly used for indoor cultural, public assembly, and recreation that does not logically fall in another existing subcategory. Since subcategories 1.09.01 and 1.09.02 have been designed to be as inclusive as possible, only small

land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.09.99 may be created.

## **1.10 Mining and Resource Extraction**

Mining and resource extraction activities encompass both surface and subsurface mining operations, such as sand and gravel pits, stone quarries, oil and gas wells, and metallic and nonmetallic mining. In size, these activities range from large surface or open pit mines covering vast areas to small gas well platforms. Areas occupied by surface structures and equipment in proximity to and associated with the extractive operation are included in this subcategory. These associated structures and equipment may include loading devices, vehicle parking areas, stockpiles, spoil areas, and equipment sheds. In cases where on-site preparation facilities can be separated from the extractive operation, they should be included in subcategory 1.04.03. Abandoned pits and quarries are included in this subcategory unless they are occupied by another use. Unused pits or quarries that are occupied by water are placed in Category 4.

### 1.10.01 Mining and Excavation Areas

This subcategory includes excavated areas that have undergone mining or extraction activities. Areas associated with the extraction activity, occupied by loading devices, equipment buildings, stockpiles, etc., are included in subcategory 1.10.02. Spoil piles that do not have appreciable vegetative cover are included in subcategory 5.01. Reclaimed areas are included within their appropriate post-mining land use if this can be determined. Otherwise, they are included in subcategory 5.01 (if no appreciable vegetation) or Category 7 if vegetated.

#### *1.10.01.01 Metal Ore Mining*

Includes areas occupied by activities for extracting ores from which metals are refined.

#### *1.10.01.02 Hard Rock Quarrying*

Includes areas used for the quarrying of hard rock material used for construction such as limestone, granite, or marble.

#### *1.10.01.03 Sand, Gravel, and Crushed Stone Quarrying*

Includes areas used for the extraction of sand, gravel, or rock (e.g., limestone or marl) used for crushed stone.

#### *1.10.01.04 Industrial Mineral Extraction*

Includes land used for the extraction of industrial minerals such as lithium, feldspar, mica, phosphates, and other minerals used in manufacturing processes. Land used for gemstone extraction is also included in this subcategory.

#### *1.10.01.05 Oil and Gas Extraction*

Land occupied by wells and pumping apparatus used in the extraction of oil or natural gas. Storage facilities at the extraction site are included in this subcategory.

#### *1.10.01.06 Coal Mining*

Includes land used for all types of surface coal mining operations as well as surface activities associated with underground coal mining.

#### *1.10.01.99 Other Mining and Excavation*

#### 1.10.02 Mining and Extraction Support Land

This subcategory includes land associated with and supporting an extraction activity that occurs near or adjacent to the excavated area. Included are loading devices, equipment buildings, stockpiles, parking areas, etc. In cases where on-site preparation facilities can be distinguished from support facilities, they should be included in subcategory 1.04.03.

#### 1.10.99 Other Mining and Resource Extraction

This subcategory is used to designate land predominantly used for resource extraction that does not logically fall in another existing subcategory. Since subcategories 1.10.01 and 1.10.02 have been designed to be as inclusive as possible, only small land areas directly associated with mining or mineral extraction that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 1.10.99 may be created.

### **1.99 Other Urban or Developed Land**

This subcategory is used to classify urban or developed land that does not logically fall into subcategories 1.01 through 1.10. Since these previous categories have been designed to be as inclusive as possible, only exceptions should be included here. One subcategory, Cemeteries, is defined at this time. Other subcategories may be created as needed.

#### 1.99.01 Cemeteries

Includes land occupied by public and private cemeteries, including access roads and all cemetery grounds, and maintenance and storage buildings.

### **2 Agricultural Land**

Agricultural land may be broadly defined as land used primarily for production of farm commodities. It includes land that is used for row crops, grain and forage crops, pasture land, and idle fields in rotation to cultivated crops or pasture. Also included in this category are land and buildings used for the raising of livestock and poultry and other animal operations. Land used for

the production of tree crops, specialty crops, horticultural products, and other agricultural activities is included in this category.

## **2.01 Cropland and Pasture**

This subcategory includes land used for the cultivation of food and fiber crops, including grains, root crops, vegetables, hay, pasture land, and agricultural fields in rotation or lying fallow.

### 2.01.01 Row Crops

Land that has crops planted in rows a distinguishable distance apart. Included are corn, dry beans, sugar beets, potatoes, vegetables, and other row crops. This category also includes land that is used for rotation of row crops (e.g., tobacco, corn, soybeans) on a year-to-year basis.

#### *2.01.01.01 Corn*

#### *2.01.01.02 Soybeans*

#### *2.01.01.03 Cotton and Fiber*

#### *2.01.01.04 Tobacco*

#### *2.01.01.05 Peanuts*

#### *2.01.01.06 Root Row Crops*

Includes potatoes, sweet potatoes, beets, and other root crops.

#### *2.01.01.07 Annual Row Crop Rotation*

Land in which row crops are rotated on a year-to-year basis.

#### *2.01.01.99 Other Non-root Row Crops*

This includes other non-root row crops (including vegetables) that do not fall in the subcategories above.

### 2.01.02 Non-row Grain Crops

Land that has close grown crops which will be harvested for grain such as wheat, oats, barley, and rye.

#### *2.01.02.01 Wheat*

#### *2.01.02.02 Oats*

*2.01.02.03 Barley*

*2.01.02.04 Rice*

*2.01.02.99 Other Grain Crops*

2.01.03 Hay and Pasture Land

Land that produces grasses for animal consumption. Areas of appreciable tree cover that are used for grazing are included in this subcategory if that use can be determined.

*2.01.03.01 Hay*

Land that produces grasses which are harvested mechanically.

*2.01.03.02 Rotation or Permanent Pasture*

Land being used for grasses and certain types of legumes which are grazed by animals. Included are pasture lands in rotation that may later be used for cultivated crops.

*2.01.03.99 Other Hay, Rotation, or Pasture*

Land that produces other kinds of hay and pasture for animal consumption.

2.01.99 Other Cropland and Pasture

This subcategory is used to designate cropland or pasture land that does not logically fall in another existing subcategory. Since subcategories 2.01.01 through 2.01.03 have been designed to be as inclusive as possible, only land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 2.01.99 may be created.

**2.02 Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas**

Orchards, vineyards, and bush-fruit areas produce the various fruit and berry crops. Horticultural areas include nurseries, floricultural areas, and seed and sod areas used perennially for that purpose.

2.02.01 Tree Fruits

Land used for the production of fruit trees.

*2.02.01.01 Apples*

*2.02.01.02 Cherries*

*2.02.01.03 Peaches*

*2.02.01.04 Pears*

*2.02.01.05 Plums and Prunes*

*2.02.01.99 Other Tree Fruits*

2.02.02 Tree Nuts

Land used for the cultivation of nut trees such as pecans.

2.02.03 Bush-fruits and Vineyards

Land used for the production of bush and vine fruits, including berries, grapes, and melons.

*2.02.03.01 Strawberries*

*2.02.03.02 Raspberries*

*2.02.03.03 Blueberries*

*2.02.03.04 Grapes*

*2.02.03.05 Melons*

*2.02.03.99 Other Bush and Vine Fruits*

2.02.04 Ornamental Horticulture

Land used for the production of sod, grass seed, flowers, ornamental shrubbery, etc., and their seeds.

*2.02.04.01 Sod and Grass Seed*

Land used for the production of sod that will be transplanted and for the production of grass for seed used for horticultural purposes.

*2.02.04.02 Floriculture*

Land used for the production of flowers for flower bulbs, flower seeds, and cut flowers.

*2.02.04.03 Nurseries*

Land used for the production of trees, shrubs, vines, etc., that will be transplanted

*2.02.04.04 Christmas Tree Farms*

#### *2.02.04.99 Other Ornamental Horticulture*

#### 2.02.99 Other Tree Crops or Horticultural Uses

This subcategory is used to designate land used for the cultivation of tree crops or horticultural uses which does not logically fall in another existing subcategory. Since subcategories 2.02.01 through 2.02.04 have been designed to be as inclusive as possible, only land areas that represent exceptions which are difficult to classify should be included here. Where applicable, subcategories under 2.02.99 may be created.

### **2.03 Confined Animal Operations**

Confined animal operations are large, specialized, livestock-production enterprises, chiefly beef cattle feedlots, large poultry farms, and swine operations, but also include large hog and fur-bearing animal farms. These operations have large animal populations restricted to relatively small areas. The result is a concentration of waste material that is an environmental concern. Feeding operations in conjunction with another farm enterprise are not included. Also excluded are shipping corrals and other temporary holding facilities. Game farms and zoos are not included in this subcategory.

#### 2.03.01 Livestock

Land used for large confined feeding operations for feeding four-legged animals, such as swine, cattle, and sheep.

##### *2.03.01.01 Beef*

##### *2.03.01.02 Dairy*

##### *2.03.01.03 Swine*

##### *2.03.01.99 Other Livestock Operations*

#### 2.03.02 Poultry

Large confined feeding operations for two-legged animals.

##### *2.03.02.01 Chickens*

##### *2.03.02.02 Turkeys*

##### *2.03.02.99 Other Poultry Operations*

#### 2.03.03 Aquaculture and Fish Hatcheries

Land used for fish hatcheries or the confined raising of fish, mollusks, or crustaceans for sale, consumption, stocking, or research purposes.

#### 2.03.99 Other Confined Animal Operations

This subcategory is used to define other high-density confined animal operations that do not logically fall in the subcategories above.

### **2.99 Other Agricultural Land**

This subcategory includes other agricultural land not included in Categories 2.01 through 2.03 or agricultural land with a mixture of uses that cannot be clearly separated or distinguished. Land with farmsteads, greenhouses, and horse training facilities are included in this subcategory.

#### 2.99.01 Farmsteads

Land used for buildings associated with agricultural production, including barns, implement buildings, grain storage buildings, and the dwelling of the farm family.

#### 2.99.02 Greenhouses and Mushroom Houses

Land with buildings used to produce farm commodities in enclosed structures.

##### *2.99.02.01 Vegetables*

##### *2.99.02.02 Flowers*

##### *2.99.02.03 Mushrooms*

#### 2.99.03 Private Stables and Horse Training

Land occupied by stables, training courses, jumping areas, and other private buildings and grounds associated with race or show horses.

#### 2.99.04 Agricultural Research Facilities

This subcategory is used for any cultivated land and associated facilities specifically used for research purposes where the designation for research takes precedence over the specific crops being cultivated. Private plots used temporarily for research studies are not included in this subcategory.

#### 2.99.05 Farm Ponds and Agricultural Treatment Lagoons

This subcategory includes human-constructed ponds and water treatment containment areas used for drainage or sediment control and water treatment, directly associated with and geographically

abutting other agricultural uses. In cases where these features cannot be distinguished from surrounding land uses, they will be classified as part of that surrounding use.

### **3 Active forest management and harvesting**

This category includes lands that are being used for active timber harvesting or managed plantation of trees used for lumber or pulp production. This includes tracts, with associated buildings, equipment, and stock piles, that are undergoing selective or clear-cut operations. Tree plantation areas are included in this category if the trees have not yet achieved a mature level of growth. Also included in this category are stands designated for future harvest that are in a more passive state of management.

#### **3.01 Actively Managed Forest Stands**

This subcategory includes areas that are undergoing reforestation; young, immature plantations; areas undergoing active harvesting or thinning operations; or other forested areas that are experiencing some active management practice.

#### **3.02 Passively Managed Forest Stands**

This subcategory includes forest areas at a mature stage of growth for which future harvesting is planned or anticipated but which are not experiencing active management practices.

### **4 Water Bodies**

This category includes open water bodies that have a designated or observed active or passive use or for which no specific use is known or designated. It includes reservoirs, retention ponds, and lakes used for water supply, drainage control, waste retention or treatment, and recreational purposes. Navigable waterways of significant size are also included in this category. At certain map scales, some of these features may be best represented as line or point features. In this case, they should not be included on a land use map but should be included on separate map "layers" reserved for line and point features. Artificial water containment areas used for fish hatcheries or aquaculture operations should be included in subcategory 2.03.03.

#### **4.01 Reservoirs and Artificial Lakes**

Reservoirs are artificial impoundments of water, whether for irrigation, flood control, municipal water supply, hydroelectric power, recreation, or a combination of these. This subcategory does not include lakes that have had control structures built to stabilize lake levels without significantly increasing the water area. Reservoirs can usually be identified by the presence of dams, levels, or other water control structures.

#### **4.02 Retention or Sediment Ponds**

Land occupied by artificial ponds designed for storm drainage control, sediment control, material settling, etc. Farm ponds and treatment lagoons directly associated with an agricultural use are

classified as subcategory 2.99.05. Sewage treatment ponds are included in subcategory 1.06.03.02. In cases where these drainage lines do not occupy enough width or area to map, they are included in the surrounding land use category.

#### **4.03 Artificial Drainage Lines**

This subcategory includes artificial or human-modified linear drainage lines designed for navigation, storm drainage, and irrigation. Navigable inter-coastal waterways are not included in this subcategory. In cases where these drainage lines do not occupy enough width or area to map, they are included in the surrounding land use subcategory.

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##### 4.03.01 Canal

##### 4.03.02 Drainage Ditch

##### 4.03.99 Other Artificial Drainage

#### **4.98 Other Water Bodies in Active Use**

This subcategory is used to classify other areas covered by water that have designated use or human activity associated with them. An example is a flooded quarry where extractive activities are no longer occurring.

#### **4.99 Non-used or Passively Used Water Bodies**

This subcategory includes the area covered by water bodies that are not in active use or which may be used for passive activities (e.g., sport fishing in a mountain lake or stream).

### **5 Human-Induced Bare Land**

This subcategory includes human-induced barren land with little or no vegetation. Land that is temporarily barren owing to human activity and is in active transition to some other use is included in that category if its future state can be determined. Otherwise, barren transitional land should be included in this category. Agricultural land temporarily without vegetation because of tillage practices is classified as agricultural. Beaches that are used for recreational purposes are included in subcategory 1.09.02.03. Areas of active extractive uses or tailing and spoil piles associated with mining and quarrying operations are included in subcategory 1.10. Clear-cut areas associated with forest harvesting are included in Category 3.

#### **5.01 Altered Lands**

Includes areas with little or no vegetation that have been modified by human activity and which cannot be easily assigned to other use categories. These include excavated or scraped areas not in active transition to another use or for which the future use cannot be determined, vacant tracts

resulting from building demolition, dredge and fill areas not being used for specific purposes defined by other categories, and other similarly altered lands.

### **5.02 Burn Areas**

Areas previously occupied by other land uses or cover which have been burned and are not supporting any active land use. Forest fire burn areas in which tree and vegetative cover have been destroyed are the most common example of this subcategory.

### **5.99 Other Human-induced Barren Land**

### **6 Passive Use on Undisturbed Land**

This category includes land that is in a basically natural, wild, or unaltered state which is designated for passive uses not requiring major modification, development, or alteration. Examples include public or private designated nature reserves, wildlife protection areas, areas designated for primitive camping, and other areas with a defined passive use or uses for which land is maintained in a relatively unaltered, natural state without active management resulting in development or disturbance of the land.

### **7 Unused, Unknown Use, and Unmodified Land**

This category includes land areas with no apparent active or passive use, recent human modification, or those areas for which a use cannot be determined. These areas may include natural, or not recently modified, shrub and forest land, wetlands, and other unused or unmodified land.



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