03704

Coastal Zone
Information
Center

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STANDARD CLASSIFICATION SYSTEM FOR LAND COVER IN MAINE

COASTAL ZONE
INFORMATION CENTER

LAND COVER CODING MANUAL

NOVEMBER 1974
DEVELOPED BY THE
INTERDEPARTMENTAL
MIDAS USER'S GROUP

KENNETH M. CURTIS
GOVERNOR

PHILIP M. SAVAGE, DIRECTOR
STATE PLANNING OFFICE

State Planning Office.

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TECHNICAL SERVICES DIVISION
STATE PLANNING OFFICE

Alan Goodwin	Director
Suanne Singer	Programming Analyst
Beth Dennis	Research Analyst
Roxanne Ridlon	Programmer Assistant

Cover Design	Kenneth Ryder

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Kenneth M. Curtis
Governor

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

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STATE OF MAINE
OFFICE OF THE GOVERNOR
AUGUSTA, MAINE 04330

TO: All State Agencies:

Beginning on December 1, 1974, I am directing all State agencies to follow the land cover code set forth in this manual for all land cover coding in Maine. In addition, I am directing the State Contract Review Committee to disapprove proposed contracts for State and Federal funding for State agencies in which land cover codes vary from the enclosed official code.

With all State agencies using the enclosed land cover code we can begin to share data describing land cover characteristics even though it may originate from different sources. This will reduce the overlap and expense of State data collection.

I am asking local, regional and federal agencies collecting land cover data to use the enclosed land cover code that is defined and explained in the Introduction to this manual. This is of particular importance in view of recent State, Regional and Federal interest concerning land development and its effect on the natural environment. Maine must be ready to collect and tabulate land cover data that will help to enable developers and environmentalists to analyze the total impact of land use changes on the environment.

I am happy to say that a group of State agencies have worked together to produce the land cover code presented in this manual. This code is the first step toward the development of an analytical tool that may be used to measure the effect of built-up areas on the environment. Through cooperation in land cover identification and collection we can achieve greater returns from our total data collection efforts than by proceeding on a piecemeal basis.

In conclusion, I am asking the State Planning Office to maintain and update the Maine Land Cover Code. This will be accomplished with the advice and assistance of the MIDAS Users' Group that represents the interests of those agencies which are maintaining files in the Maine Information Display Analysis System.

Sincerely,

Kenneth M. Curtis
Governor

PREFACE

This Standard Classification System for Land Cover in Maine was developed by an inter-departmental group of planners representing State agencies that are members of MIDAS, and who are interested in a common land cover code for the State of Maine. The acronym, MIDAS, stands for the Maine Information Display Analysis System, a growing mechanized data bank consisting mainly of natural resources data placed there by an increasing number of State agencies. MIDAS is administered by the State Planning Office with the assistance of a MIDAS Users's Group (MUG). This group is made up of representatives of those agencies that maintain one or more files in MIDAS.

A small working committee in MUG worked on the development of the following land cover code for over six months. During the latter part of this period, the committee met once a week to work out differences of view and to refine the definitions of the terms used in the manual. They worked well together and by so doing, proved that State agencies concerned about a particular problem could cooperate and produce a product that would be of use to a large number of agencies.

The following cover code has been distributed to all MUG members and State and regional agencies concerned with land cover coding. Another manual will be published at a later date by the State Planning Office, the result of the efforts of another working committee of MUG, the Land Use Coding Committee. The land use manual will set forth a standard code for use by agencies concerned with the use to which land is put by man rather than a description of the cover over the land surface as determined by photo interpretation of ERTS satellite imagery or aerial photography. This type of land classification usually requires a ground survey while data for land cover characteristics can be collected by the more economical method of photo interpretation.

This land cover coding manual for Maine has been produced by a competent and hard working committee of MUG. Gary Higginbottom of the Coastal Planning Division of the State Planning Office wrote the Introduction to this manual. His work was edited by the Land Cover Committee of the MIDAS User's Group. Each individual on this committee has given a great deal of his time in developing the Standard Classification System For Land Cover in Maine, as part of an interdepartmental effort to publish a land cover coding manual that would be of use to agencies collecting land cover data. I am especially indebted to the following persons who expended a great deal of their time so that a land cover coding manual could be made available to all of you.

Dr. Burton R. Anderson	Water Resources Planning Division, State Planning Office
Walter A. Anderson	Bureau of Geology, Department of Conservation
James F. Connors	Land Use Regulation Commission, Department of Conservation

Philip L. Goggins	Department of Marine Resources
Alan D. Goodwin	Committee Chairman, State Planning Office
Gary Higginbottom	Division of Coastal Planning, State Planning Office
Frederick B. Hurley	Department of Inland Fisheries & Game
James P. Norris	Bureau of Property Taxation, Department of Finance and Administration

In addition, I am indebted to all those who took their time to make a thorough review of the Committee's Draft. Many of their recommendations have been incorporated into this manual thus making it more useful to those who wish to classify and code Maine's land cover.

Undoubtedly the real test of the code will be made in the field as technicians begin to utilize the code in categorizing land cover. When a sufficient number of needed changes are warranted, the Land Cover Coding Committee will be reconvened to determine which changes should be made to the land classification and coding system.

Sincerely,

Philip M. Savage

Philip M. Savage, Director
State Planning Office

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INTRODUCTION TO THE STANDARD CLASSIFICATION SYSTEM FOR LAND COVER IN MAINE

Abstract

Numerous characteristics of land can be classified or mapped, and for this reason many different "land classification" systems have evolved. Land can be classified according to the use of the land by man, by its vegetation and cover types, by ownership, by plant and animal ecosystems, by landscape character, etc. The purpose here has been to produce a standard system for planners and resource managers to classify land according to a single factor, the nature of the surface land cover.

The Standard Classification System for Land Cover in Maine and the Standard Classification System for Land Use in Maine (in a separate publication) have been produced as a step toward making it possible for various State and Federal agencies, regional and local planners and University groups to produce comparable classification maps of Maine's land cover and the land use activities of Maine people. By using a single classification system for each of these types of information, groups and agencies can share and apply information and thus share the time and expense necessary for gathering it.

MIDAS (Maine Information Display and Analysis System) provides the system for organizing and storing this information. However, for inclusion in MIDAS land use and land cover information from numerous sources must be organized into compatible categories. For this reason, the MIDAS Users' Group (the advisory body for MIDAS) has produced standardized land use and land cover codes for use throughout the State. Obviously different groups have different information needs, but by fitting these needs into the standard land use and land cover categories, data collectors can participate in an information system which allows reasonable comparisons to be made between locations and over periods of time.

Separate land use and land cover codes have been developed because the two types of information constitute parameters which should be identified, mapped, and evaluated separately. This publication presents and explains the land cover classification system. The land use system will be presented in a separate document.

The Nature of "Land Use"

The term "Land Use" is used rather loosely to refer to a broad range of concepts. Literally speaking, "land use" generally refers to "man's activities on land which are directly related to the land" (Clawson and Stewart, 1965). This definition may be followed strictly in land use inventories which are conducted through surveys on the ground, direct observation of on-going activities or discussions with landowners. In these cases, human activities are viewed directly, or their existence is confirmed by a reasonably reliable authority. Aerial photography and remote sensing imagery have altered this situation. This imagery shows the nature of the land surface at a single instant in time. Air photo interpreters can identify human activities from the nature of the land surface with considerable accuracy, especially when the activity

leaves an unmistakable imprint on the land surface. For example, a field showing parallel furrows caused by plowing can be assumed to indicate agricultural activities. However, in other areas the interpreter may simply indicate the nature of the land surface because man's activities are not present or visible in the photograph, and no solid evidence is apparent. This can be the case for sandy lake shores which support heavy concentrations of people only during certain periods. Another example is that of forested areas where man's primary use of the land may be for growth of timber, wildlife management or recreation. A single photograph may show no conclusive evidence of such activity, and the interpreter will often simply indicate the character of the land surface, in this case forested land.

These situations make it obvious that "land use" inventories have come to the point where quite often they are indicating two different things; (1) man's activities on land, and (2) "the vegetational and artificial constructions covering the land surface" (Burley, 1961).

Marion Clawson and Charles L. Stewart offer sound advice for preparation of a land data system,

"....the data collection, tabulation, and summarization should not mix indiscriminately different ideas about land in one system or plane. Each concept should be kept pure, as far as possible, and data on each idea or concept kept separate, up to the stage of analysis" (Clawson and Stewart, 1965).

Rather than mix and confuse two separate and distinct characteristics of land we have chosen to produce two separate systems for land classification; a land use code for man's activities on the land and a land cover code to indicate the nature of the land surface itself. This approach is designed to minimize the confusion involved in deciding how to classify land areas according to conventional classification methods which often mix the concepts of land use and land cover together. The system also will hopefully provide products which fit the needs of a wider range of information users. Thus we can avoid the problems inherent in a single classification system which almost fits the needs of everyone but does not really fit the needs of anyone.

Development of the Land Cover Code

This system for classifying land cover in Maine has been developed by those members of the MIDAS Users' Group who use land cover information as an integral part of their planning and management work. The objective has been to devise a classification system which categorizes the land surface by major characteristics and by minor traits which can be distinguished using aerial photography. The intention has been to avoid confusing with the system for classifying land use in Maine, and to refer to man's past and present activities only as they are the major factors which determin the character of Maine's land cover or surface.

The system employs a four digit code consisting of seven first order categories. These are general classes of land cover which in turn are broken into more detailed subcategories at the second third and fourth levels. First level categories are designed to be as consistent as possible with the Land Use Classification System for Use with Remote Sensor Data being developed for national use by the Federal Government Interagency Steering Committee on Land Use Information and Classification. (The national system is described in the U.S. Geological Survey Circular 671).

The Maine land cover categories are essentially organized according to the nature of surface materials and characteristics, such as forest vegetation, agricultural vegetation or plowed lands, wetland vegetation, water, bare soil and rock, unnatural materials and conditions that are built or maintained by man and miscellaneous cover types that are not covered by the other categories. Most of these categories are relatively consistent with the proposed national land use system. However, the breakdown of the "Urban or Built-Up Land" category differs significantly from the corresponding category in the proposed national code. In the proposed national code the category "Urban and Built-Up Land" is subdivided into the categories of: "Residential" land, "Commercial and Services," "Industrial," "Transportation, Communications and Utilities," "Industrial and Commercial Complexes," "Mixed" uses and "Other". These categories represent land use activities rather than cover types, and therefore they correspond more closely to the use code than the cover code. Further explanation of the Maine's cover classes can be found in the "Land Cover Category Definitions", section of this report following the "Introduction".

Using the Cover Classification System

The manner in which the code is used depends upon the needs of the user and upon the scale of aerial photography. Essentially the first and second level categories are intended for generalized analysis or for use with small-scale photos and maps where detail is not needed. * When greater detail is necessary, second and third and fourth level categories should be used.

When small-scale or high altitude photography or imagery is used, relatively detailed land cover types are not observable, and thus they cannot be delineated separately from surrounding land types. An example is the situation of roads and highways. The category "Pavement and Transportation Facilities" defines the nature of the land cover where roads and highways exist. However, narrow strips of pavement are hardly distinguishable on small aerial photographs or cannot be delineated as a significant area of separate cover type on a small scale map. In such a case, the major cover type(s) surrounding the highway would be mapped as that cover type which surrounds the road. This policy also covers any other cases of small parcels of isolated cover types. The feasibility of delineating such areas as separate units depends upon the scale of mapping and of photo imagery.

For foresters and others who require forestland inventories by individual species or by species associations, this can be accomplished while being consistent with the cover classification system. Codes for individual natural forest and plantation species are available in MIDAS, and these categories can be simply related to the proper cover category. For example, a natural stand classified as white pine under Major Forest Type Edit 223, must be further classified as "Natural Forest, Softwood"(1120)PN. Similarly, more specific categories may be developed when needed under the other categories of this code. For example, specific crops such as potato land, corn land, etc., may be designated under code number 2110, "Tilled Land."

* Small scale maps are maps on which the given roads, structures, waterways, topography and other physical features appear small. Large scale maps are maps on which the given physical features appear large. A map with a 1"=200 foot scale is therefore a larger scale map with more detail than a map at a scale of 1"-5,000 feet.

The general philosophy behind the "Buildings and Structures" category deserves some explanation. The "Urban or Built-Up Land" category deals with situations in which the cover characteristics are essentially the results of man's concentrated and relatively permanent activities. "Building and Structures" are one result of such activities, and therefore they are considered here as a cover type. The judgment of the land cover committee was that the most logical and generally useful subdivision of the "Buildings and Structures" category would be to categories of density: low density, medium density and high density. These densities, as they are defined, relate to the situation in Maine. Relative to Maine, downtown Gardiner is "high density". In the context of another state this might not be the case. After a period of experience in use of the land cover code in Maine, photo interpreters will be able to give a more specific measurement of density than the generalized categories now used.

Use of the "Buildings and Structures" category also offers an example of the use of the four -level category system. The land cover interpreter must first designate those areas which fit the definition of "Urban or Built-Up Land". Within these areas he can delineate those sections which fit the definition of "Buildings and Structures". If his mapping scale and his information requirements are such as to make a further breakdown feasible, he can further designate the density of development within the "Buildings and Structures" land areas. By doing this, the interpreter achieves a logical definition of density of buildings and structures.

The definitions of the cover categories are intended as a guide for the land cover interpreter as well as an explanation for the person using the cover data. The definitions should enable the person classifying cover types to make interpretations based upon readily observable land surface characteristics. References are made throughout to confusing circumstances, apparent overlaps of categories and other problems. For these reasons, all persons using any part of the land cover code or the information generated by it should study the entire set of definitions before proceeding. Many problems will undoubtedly arise as the land cover and land use classification systems are used. For this reason, both codes are intended to be flexible and open to changes. However, in order to keep the code up-to-date and consistent for all users, proposed changes should be submitted to the State Planning Office for review by the MIDAS Users' Group.

References

Anderson, James R., Hardy, Ernest E., and Roach, John T., A Land Use Classification System for Use with Remote-Sensor Data, Washington, D.C., U.S. Geological Survey for the Inter-Agency Steering Committee on Land Use Information and Classification.

Burley, Terence M., 1961, "Land Use or Land Utilization?" Professional Geographer, V. 13, no. 6, p. 18-20.

Clawson, Marion, and Stewart, Charles L., 1965, Land Use Information: A Critical Survey of U.S. Statistics Including Possibilities for Greater Uniformity, Baltimore, Md., The Johns Hopkins Press for Resources for the Future Inc., pp.29, 161.

LAND COVER CATEGORIES

STATE OF MAINE
LAND COVER CODING SYSTEM

1000 FOREST LAND

- 1100 Natural Forest*
  - 1110 Hardwood
  - 1120 Softwood
  - 1130 Mixed Growth Predominantly Softwood
  - 1140 Mixed Growth Predominantly Hardwood
- 1200 Forest Land Plantations*
  - 1210 Hardwood Plantations
  - 1220 Softwood Plantations
  - 1230 Mixed Plantation Predominantly Softwood
  - 1240 Mixed Plantation Predominantly Hardwood
- 1300 Other Forest Land
  - 1310 Alders
  - 1320 Scrub
  - 1330 Insect or Disease Damaged Land
  - 1340 Burned Areas
  - 1350 Clear Cuts
  - 1360 Forest Nurseries

2000 AGRICULTURAL LAND

- 2100 Active Agricultural Land
  - 2110 Tilled Land

* See Major Forest type codes in MIDAS for more specific classifications of forest and forest land plantations.

2120 Field

2130 Blueberry Land

2140 Orchards & Vineyards

2150 Horticultural Nurseries

2160 Barnyards and Feed Lots

2170 Other

2200 Abandoned Agricultural Land

2210 Abandoned Field Reverting to Softwoods

2220 Abandoned Field Reverting to Alders

2230 Abandoned Field Reverting to Poplar

2240 Abandoned Field Reverting to Alder-Poplar-Grey Birch

2250 Abandoned Field Reverting to Mixed Growth

2260 Abandoned Agricultural Land Being Reclaimed

2270 Abandoned Orchard

2280 Blueberry Land - Unmanaged

3000 WETLANDS*

3100 Inland Fresh Wetlands

3110 Seasonally Flooded Basins or Flats

3120 Inland Fresh Meadow

3130 Inland Shallow Fresh Marsh

3140 Inland Deep Fresh Marsh

3150 Shrub Swamp

3160 Wooded Swamp

3170 Bog

* For further information concerning the categories under Wetlands see the Official Maine Wetlands Classification (Edit #222) in MIDAS.

3200 Coastal Wetlands

3210 Coastal Shallow Fresh Marsh

3220 Coastal Deep Fresh Marsh

3230 Coastal Salt Meadow

3240 Regularly Flooded Salt Marshes

3300 Intertidal Land

3310 Unvegetated Tidal Flats

3320 Vegetated Tidal Flats

3330 Unvegetated Ledge

3340 Vegetated Ledge

3350 Unvegetated Rocky Shore

3360 Vegetated Rocky Shore

3370 Sand or Gravel Beach

3380 Other

4000 SURFACE WATER

4100 Flowing Waters

4110 River (Major Flowing water)

4120 Stream (Minor flowing water)

4130 Intermittent Brooks

4200 Standing Waters

4210 Lake (Great Pond)

4220 Pond (Minor Surface)

4230 Beaver Flowage

4300 Tidal Waters

4310 Bays and Estuaries

4320 Coastal Open Fresh Water

4330 Open Marine Waters

5000 BARREN LAND

- 5100 Naturally Exposed Land
  - 5110 Bedrock
  - 5120 Gravel
  - 5130 Sand
  - 5140 Boulder Fields
  - 5150 Rock Slides
  - 5160 Other
- 5200 Unnaturally exposed Land
  - 5210 Cleared Land
  - 5220 Quarries or open pit mines
  - 5230 Sand or Gravel Pits
  - 5240 Strip Mines
  - 5250 Sand or Gravel fill
  - 5260 Spoil or tailings
  - 5270 Other

6000 URBAN OR BUILT-UP LAND

- 6100 Buildings and Structures
  - 6110 Low Density
  - 6120 Medium Density
  - 6130 High Density
- 6200 Pavements and Transportation Facilities
- 6300 Rights-of-Way or Pipelines
- 6400 Open
  - 6410 Trash and Debris
  - 6420 Vegetated
  - 6430 Other

7000 MISCELLANEOUS

7100 Coastal Scrub

7200 Other

LAND COVER CATEGORY DEFINITIONS

1000 FOREST LAND

Forest land consists of land areas dominated by the growth of forest trees and other woody vegetation such as alders, scrub and nursery areas. Forest lands also consist of areas that show indications of recent growth of forest trees which include burns and cutovers. Forest tree growth includes natural stands, plantations and insect damaged areas. Forest trees are woody plants that have a well-developed stem and grow to more than 12 feet in height at maturity.

In classifying forest land, the question will arise as to how to classify roads. For the purpose of this land cover classification system, roads will be included within the associated and abutting land cover types when the smallest mappable unit is insufficient to permit their delineation. However, when the scale is sufficient to permit delineation of roads, they should be identified separately and placed in the proper cover category. ("Pavement and Transportation Facilities, Category 6200"). Natural forest, forest land plantations and other forest land make up "Forest Land."

1100 Natural Forest

Natural forest land consists of areas covered by naturally regenerated forest trees which are randomly spaced in stands. A "stand" of forest trees means a contiguous group of trees sufficiently uniform in species, arrangement of age classes, and condition to be identified as a homogeneous and distinguishable unit. In order to qualify as a natural forest, however, there must be sufficient numbers of trees to produce an approximate 10 percent crown closure over the area to be classified.

1110 Hardwood

Natural hardwood forest lands are characterized by stands of trees with broad leaved foliage that are bare in the winter time and consist of broad rounded crowns. Larch, even though it is bare in the winter time, is not included as a hardwood. Over 75 percent of the crown closure in an area to be classified must be hardwood in order for the area to be coded as a natural hardwood forest.

1120 Softwood

Natural softwood forest lands consist of stands of coniferous trees with needles or scale-like leaves that have conical shaped crowns. Over 75 percent of the crown closure in a stand must be softwood in order for the area to be classified as natural softwood forest land. Larch is included as a softwood.

1130 Mixed Growth Predominantly Softwood

A Natural mixed stand of hardwood and softwood forest trees with the softwoods comprising 50 to 75 percent of the crown closure.

1140 Mixed Growth Predominantly Hardwood

A natural mixed stand of hardwood and softwood forest trees with the hardwoods comprising 50 to 75 percent of the crown closure.

1200 Forest Land Plantations

Forest Land Plantations consist of stands of forest trees in rows that have been planted in this fashion by man. Plantations are distinguished by regularly spaced trees of uniform height and shape. Plantations may also be identified by the predominant type of tree grown such as Pine, Spruce, Douglas Fir, Balsam Fir, Larch and Poplar. Even aged natural forest stands do not display regular spacing in rows and older plantations may not be distinguishable from even aged natural stands. In that case, older plantations would be classified as natural forest land.

1210 Hardwood Plantations

Plantation forest lands in which over 75 percent of the crown closure is hardwood (see definition for "hardwood" 1110).

1220 Softwood Plantations

Plantation forest lands in which over 75 percent of the crown closure is softwood (see definition for "softwood" 1120).

1230 Mixed Plantation Predominantly Softwood

A mixed plantation stand of hardwood and softwood forest trees with the softwoods comprising 50 to 75 percent of the crown closure.

1240 Mixed Plantation Predominantly Hardwood

A mixed plantation stand of hardwood and softwood forest trees with the hardwoods comprising 50 to 75 percent of the crown closure.

1300 Other Forest Land

Other forest land consists of areas other than natural forest or forest land plantations supporting or showing evidence of recent woody vegetation, or displaying special conditions of forest trees. Areas supporting woody vegetation consist of alders, scrub, cutover and similar areas. Special condition areas consist of insect and disease damaged trees, burned over areas and forest nurseries.

1310 Alders

An area predominantly covered by alders. A stand of alders can be distinguished from "Abandoned Field Reverting to Alders" by the lack of field grass and weeds.

1320 Scrub

A mixed stand of small woody plants without evidence of cutting where field grass is not in evidence and woody vegetation is prevalent. Scrub can be distinguished from "Reverting Field" by the lack of field grass and weeds.

1330 Insect or Disease Damaged Land

An area of forest trees predominantly damaged by insect pests or disease. These areas may be distinguised by groups of trees without foliage, that are dead when surrounding conditions appear normal. Insect or disease damaged forest land may also be distinguished by an interspersion of defoliated, and dead trees with normal, healthy trees.

1340 Burned Areas

An area that has been burned with conspicuous loss of forest trees and crown cover. It is an area of burned trees where all or most trees are dead. Patches of exposed mineral soil or boulders may be observed in these areas.

1350 Clear Cuts

Land area where forest trees have been removed with less than 10 percent of the forest cover remaining. Evidence of removal includes a pattern of "skid roads" and "landings," as well as slash deposits. "Skid roads" are the paths over which the timber is pulled, and "landings" are the temporary storage locations for the timber where mineral soil has been exposed.

1360 Forest Nurseries

Land area used for growing forest trees from seed that will later be transplanted into plantations. Forest nurseries show a pattern of beds, paths, roads, piping and other accessories needed for the culture of trees.

2000 AGRICULTURAL LAND

Agricultural land includes areas actively or recently utilized for the growth of food and fibre for man and livestock. These areas may be tilled, grazed, or managed for crops and usually are open fields or bare ground. Included are lands reverting to bush and forest that still may be distinguished from other categories by evidence of field grass and weeds.

2100 Active Agricultural Land

Land actively managed to grow crops of food and fibre. This includes land actively used for row crops, grains, grazing, berries, orchards, nurseries, and feed lots.

2110 Tilled Land

Agricultural land that shows indications of having been plowed and/or harrowed because of the flatness of slope, and pattern of furrows. Included are cultivated field grass or grain and row crop land.

2120 Field

Agricultural field consists of grassland and uncultivated pasture or wild hayland.

2130 Blueberry Land

Land predominantly covered with blueberry bushes and showing signs of being managed, such as evidence of burning and/or a pattern of roads.

2140 Orchards & Vineyards

Open land with a regular pattern of fruit trees and/or grape vines of uniform height and spacing.

2150 Horticultural Nurseries

Characterized by beds of closely spaced seedlings in association with areas of widely spaced plants with a variety of sizes and shapes. There will also be paths, roads, piping, ponds and other accessories needed for the growth and care of the plants found in these areas.

2160 Barnyards and Feed Lots

Enclosed areas for the holding of livestock and/or the gathering, feeding and rearing of farm animals, usually associated with a farm type building.

2170 Other

Any other agricultural land cover type that may be distinguished by signs of management.

2200 Abandoned Agricultural Land

Agricultural land that has been used in the past which is reverting to shrubs and tree species. This category may be distinguished from forest land "scrub" by the existence of field grass, and weeds and/or the remains of a regular pattern of field boundaries. This general definition also includes abandoned agricultural land being reclaimed.

2210 Abandoned Field Reverting to Softwoods

Agricultural land that has reverted primarily to pine, spruce, fir, hemlock or other softwoods.

2220 Abandoned Field Reverting to Alders

Agricultural land that has reverted primarily to Alders.

2230 Abandoned Field Reverting to Poplar

Agricultural land that has reverted primarily to poplar.

2240 Abandoned Field Reverting to Alder-Poplar-Grey Birch

An abandoned field reverting to a mixed growth of Alder-Poplar-Grey Birch.

2250 Abandoned Field Reverting to Mixed Growth

An abandoned field reverting to a random mixture of trees, bushes and shrubs.

2260 Abandoned Agricultural Land Being Reclaimed

Abandoned agricultural land in the process of being cleared evidenced by the cutting, piling, and bulldozing of trees, bushes and shrubs.

2270 Abandoned Orchard

Land evidencing regular patterns of fruit trees and/or grape vines of uniform height and spacing in which extensive undergrowth indicates a lack of management.

2280 Blueberry Land - Unmanaged

Land predominantly covered with blueberry bushes showing no signs of management such as roads or burning.

3000 WETLANDS*

Inland and coastal areas characterized by a waterlogged soil. This soil may be regularly or permanently flooded by up to three feet of water. Any forest types associated with wetlands are to be either coded as a forest type (see Forestland) or as wetland (see Wetland). In wetlands, herbaceous vegetation characteristic of aquatic conditions as well as drier site grasses such as sedges and rushes may be observed. Various wetland types are likely to occur along the peripheries of open fresh water. These should be delineated and typed, scale permitting. (This category excludes wetland Type 5, Inland open fresh water and wetland type 14, Coastal open fresh water. These are included in the open fresh water category).

* Additional clarification of Wetland characteristics can be found in Inland Fisheries and Game's, "Manual for Maine Wetlands Inventory."

3100 Inland Fresh Wetlands

Inland fresh wetlands are wetlands influenced by fresh non tidal water. These areas consist of flat areas of waterlogged soils. These soils may be regularly or permanently flooded by up to three feet of fresh water. Characteristic vegetation consists of grasses, shrubs, sedges, rushes, tamarack, black spruce, balsam firs, red maple and black ash. Alder, willow and dogwood may predominate in the drier areas. (Wetland type 5. "Inland Open Fresh Water" is excluded from the wetland categories).

3110 Seasonally Flooded Basins or Flats (Type 1 **)

These flats occur in upland depressions, which may fill with water during periods of heavy rain or melting snow, and along river courses, where flooding ordinarily occurs in late fall, winter or spring. The soil is covered with water or is waterlogged during variable seasonal periods, but is generally well drained during the growing season. Herbaceous vegetation, characteristic of aquatic and drier site conditions such as grasses, sedges and rushes, predominate in these areas.

3120 Inland Fresh Meadow (Type 2)

These meadows often fill shallow lake basins or potholes. They may also be found bordering the landward side of shallow marshes. The soil is waterlogged to within a few inches of the surface during the growing seasons. Characteristic vegetation includes various aquatic grasses, sedges and rushes.

3130 Inland Shallow Fresh Marsh (Type 3)

Shallow marshes may nearly fill shallow lake basins or potholes, or they may border the landward side of deep fresh marshes occupying such depressions. The soil, normally waterlogged during the growing season, may be flooded with as much as six inches of water. Common plant species found in northern regions are plume grass, rice cutgrass, carex and giant burreed. Various other marsh plants (cattails, arrowheads, pickerelweed and smartweeds) may also be found. Hummocks are generally characteristic of these wetlands in contrast to Inland deep fresh areas.

3140 Inland Deep Fresh Marsh (Type 4)

These marshes often occupy shallow lake basins and potholes or they may border open water occurring in such areas. The soil is covered with six inches to three feet of water during the growing season. The vegetation is interspersed with open water and consists mainly of cattails, plume grass, spikerushes in the shallow areas and wild rice, pondweeds, duckweeds coontail and spatterdock in the deeper, open areas.

** The term, "type," refers to wetland types as identified in the "Manual for Maine Wetlands Inventory."

3150 Shrub Swamp (Type 6)

Shrub swamps occur primarily along sluggish streams. The soil is generally waterlogged, but many be covered with a foot or more of water. Alder and dogwood predominate on the drier soils. Willow, buttonbush and sweet gale characterize the wetter sites.

3160 Wooded Swamp (Type 7)

These swamps occur along sluggish streams, on flat uplands, and in shallow lake basins and potholes. The soil is normally waterlogged but may be seasonally covered with as much as one foot or more of water. (When such areas are flooded for a period of one or more years, the trees die and the site reverts to a meadow association). Northern swamps are composed of tamarack, black spruce, balsam fir, arborvitae (cedar), red maple, and black ash. The coniferous swamps usually have a thick carpeting of mosses, deciduous swamps often support duckweeds, smartweeds, and other herbaceous vegetation.

3170 Bog (Type 8)

Bogs occur most often in shallow lake basins, and potholes, along sluggish streams, and on flat uplands. The soil is generally saturated and supports a spongy ground-cover of mosses or other plant material. Vegetation may be woody, herbaceous and interspersed with open water. Northern representatives include Labrador-tea, leather-leaf, cranberries, carex, cottongrass, sweet gale and sphagnum moss. Stunted black spruce and tamarack may also occur.

3200 Coastal Wetlands

Coastal wetlands are salt and fresh water wetlands influenced by tidal action. Wetland type 19, (tidal flats) and Wetland type 14, "Coastal open fresh water" are excluded from coastal wetland categories.

3210 Coastal Shallow Fresh Marsh (Type 12)

These marshes occur along tidal rivers and abut or are adjacent to the landward side of deeper marshes. The soil is waterlogged and may be flooded with as much as six inches of water at high tide. Vegetation consists of various grasses and sedges, cattails, arrowheads, smartweeds, and arrow-arum.

3220 Coastal Deep Fresh Marsh (Type 13)

These deep marshes occur primarily along tidal rivers. During the growing season the soil is covered with six inches to three feet of water at average high tide. Common plants found are cattails, wild rice, pickerelweed, and spatterdocks; pondweeds, widgeon grass, and other submersed species often occur in marsh openings.

3230 Coastal Salt Marsh (Type 16)

Salt meadows border the landward side of salt marshes, or open water. the soil is always saturated during the growing season but is rarely inundated by tidal water. Indigenous plant species are salt meadow cordgrass (Spartina patens) and black rush; common three-square occurs in fresher areas.

3240 Regularly Flooded Salt Marshes (Type 18)

Salt marshes occur most often along coastal bays. At average high tide during the growing season, the soil is covered with six inches or more of water. The predominant plant species is saltmarsh cordgrass (Spartina alterniflora). Open water areas often support widgeon grass, eelgrass, and Sago pondweed.

3300 Intertidal Waters

Land located between high and low tide water levels excluding coastal marshes and meadows (3200). This category includes Type 19 (Tidal flats) included in categories 3310 and 3320 below.

3310 Unvegetated Tidal Flats

A wide expanse of intertidal area ranging from a blue clay color to a sand color with possible small isolated areas of vegetation. However, the overall impression is of a non-vegetated area. Near the low tide level, boulders, cobbles and large fragmented rocks may be observed.

3320 Vegetated Tidal Flats

A wide expanse of intertidal flats characterized by vegetative cover. Although large isolated areas may be without vegetation, the general impression is one of continuous vegetative cover. Fragmented rocks, cobbles and boulders with vegetative cover may be observed near the low water mark. The vegetation covering these flats may consist of intertidal eelgrass, rockweed or algae. Such vegetation distinguishes these flats from coastal marshes and meadows (3200).

3330 Unvegetated Ledge

An intertidal area consisting of bedrock outcroppings without vegetation.

3340 Vegetated Ledge

An intertidal area consisting of bedrock outcroppings with vegetation near the low water mark.

3350 Unvegetated Rocky Shore

A steep intertidal area consisting of large aggregates of boulders, rocks and cobbles.

3360 Vegetated Rocky Shore

A steep intertidal area consisting of vegetation covering large aggregates of boulders, rocks and cobbles.

3370 Sand or Gravel Beach

A gently sloping area consisting of sand, gravel or cobbles without vegetation. This sand or gravel beach may progress toward a mud tidal flat.

3380 Other

All other intertidal areas not defined by the previous categories or by the "Coastal Wetlands" categories.

4000 SURFACE WATER

Land covered by water most or all of the year. This category contains those portions of rivers, streams, lakes, ponds, beaver flowages, bays and estuaries that are free of vegetation. This category includes wetland type 5, "Inland open fresh water", and wetland type 14, "Coastal open fresh water". Various wetland types are likely to occur along the peripheries of open fresh water. These should be delineated and typed as wetlands if imagery and scale permit.

4100 Flowing Water

A surface water within a stream channel that has a perceptible flow. Such waters are commonly referred to as rivers, streams and brooks. A stream channel is a channel between observed banks created by the action of surface water. It is characterized by the lack of vegetation, and the presence of a bed devoid of topsoil, but comprised of waterborne deposits or parent material.

4110 River

A flowing water downstream from the point of which it provides drainage for a watershed of 25 square miles or more.

4120 Stream

A permanently flowing water that drains less than 25 square miles of land. This includes any flowing water area upstream from the point at which it becomes a river.

4130 Intermittent Brooks

A stream channel carrying water only during a part of the year.

4200 Standing Waters

A body of surface water that has no perceptible flow and is relatively permanent in nature. Such bodies of water are commonly referred to as man-made or natural lakes or ponds. Major beaver flowages should also be classified in this category.

4210 Lake (Great Pond)

An open, standing body of non-vegetated water larger than 10 acres in size. Various wetland types are likely to occur along the peripheries of open fresh water. These should be delineated and typed as wetlands if imagery and scale permit. Wetland type 4 is excluded "Deep fresh marsh." This wetland type may be found under cover category 3140, "Inland deep fresh marsh."

4220 Pond (Minor Surface)

The definition of a pond is the same as a lake except it is less than 10 acres in size.

4230 Beaver Flowage

A pond characterized by impoundment by a beaver dam.

4300 Tidal Waters

Waters that customarily ebb and flow as a result of tidal action.

4310 Bays and Estuaries

Tidal waters partially enclosed by river banks or headlands with a peripheral vegetation characteristic of the marine (saltwater) environment.

4320 Coastal Open Fresh Water

Tidal fresh waters occurring in tidal rivers with a peripheral vegetation characteristic of fresh water.

4330 Open Marine Waters

Water areas seaward from those areas classified as bays and estuaries.

5000 BARREN LAND

Barren land has little or no vegetation or other permanent signs of life. This may be because the land is naturally unsuited for plants or permanent man-made structures, or because the land has been stripped bare by man.

5100 Naturally Exposed Land

Naturally exposed land lacks vegetative cover because naturally occurring conditions prevent the establishment of such a cover. If development were to occur on such barren land, the land would be classified according to the type and density of development. Naturally exposed land can be further classified according to the nature of the material which is exposed.

5110 Bedrock

A bare, solid rock or ledge.

5120 Gravel

An unconsolidated, loose material made up of stones or pebbles.

5130 Sand

An unconsolidated or loose material made up of sand grains.

5140 Boulder Fields

Land surface areas which are covered only by rocks that are larger than 3" in diameter.

5150 Rock Slides

Undeveloped and unvegetated land surface areas which are covered by talus, or rock fragments which have fallen from a cliff or steep slope.

5160 Other Naturally Exposed Land

Other naturally exposed lands are identified by exposed materials not mentioned above. Such materials might include silt, clay, mud, etc. not identified in other categories of the land cover code.

5200 Unnaturally Exposed Land

Land areas which have lost their vegetative cover due to man's construction or mining activities. Such areas can be distinguished from naturally exposed areas by evidence of bull-dozing operations, digging, blasting or dumping of fill.

5210 Cleared Land

Land areas from which all vegetation has been cleared and where the soil has been exposed. This category includes lands which are temporarily bare or on which development is starting. In many cases this land type would represent a temporary situation, being followed closely by construction of buildings, parking lots or roads. When a sparse pattern of weeds and brush may be observed, this area should be classified as "Cleared Land." When the growth is sufficiently dense, this area should be placed in the appropriate land cover category.

5220 Quarries or open pit mines

Land areas that are characterized by a bare bedrock surface which has been obviously blasted, dug or cut for removal of stone or minerals. In Maine, the most prevalent quarries are granite and limestone quarry operations. Note that shaft mining operations do not influence the character of the land surface in the same manner as stone quarries and open pit mines. Service and maintenance structures located on the surface that are connected with shaft mining operations may be classified as "Urban or Built-up Land," (6000). Spoil and tailings, if any, should be classified as "Other" (5260).

5230 Sand or Gravel Pits

Areas where excavations have been made for the purpose of removing sand or gravel for construction purposes.

5240 Strip Mines

Excavations which have removed surface vegetation and soil cover for the purpose of removing shallow subsurface minerals.

5250 Sand or Gravel Fill

Land areas composed of loose unvegetated construction fill brought to the site. These areas may be distinguished by an unnatural landform rising above the natural elevation of the surrounding land.

5260 Spoil or Tailings

Accumulations of waste materials separated from ore rocks associated with mine operations.

5270 Other

All other materials not covered in the above categories.

6000 URBAN OR BUILT-UP LAND

Urban or Built-Up Land is composed of areas where the major factors which determine the character of the land surface are man's structures, facilities, unnatural surface materials, and the construction and continuous use of such facilities. Included in this category are cities, towns, villages, strip developments along highways, transportation, power and communications facilities, industrial parks, mills, parking lots, shopping centers, recreation facilities, mining facilities and structures, and associated land such as lawns, yards, gardens and other similar areas. In some situations, small blocks of undeveloped land may be isolated (surrounded on all sides) in the midst of built-up areas. In most cases these should be included in the Urban or Built-up category as open space within the developed area. This judgment, however, will depend on the scale and needs of mapping. Similarly, individual small buildings and associated land areas or small roads, which are isolated amidst an expanse of forestland, wetland, barren land or agricultural land need not be placed in the Urban or Built-Up category unless the scale of mapping is such that the developed land can be mapped as a distinguishable unit. The Urban or Built-Up category takes precedence over others when the criteria for more than one category are observed. For instance, a built-up areas that has sufficient tree cover to meet "Forest Land' criteria would be classified as "Urban or Built-Up."

Once an area has been categorized as "Urban or Built-Up Land," that area can be further classified by the nature of the development such as Buildings and Structures, Pavement and Transportation Facilities, Rights-of-Way or Pipelines and Open Land.

6100 Buildings and Structures

This category includes all land areas within the "Urban or Built-Up" category in which the land is dominated by buildings (houses, barns, garages, stores, factories, etc.), structures (towers, machines, silos, grain elevators and so forth) and the associated areas directly influenced by the construction and use of the buildings and structures (maintained yards, lawns, gardens, and driveways, etc.) An area defined as "buildings and structures" may include patches of other land types (forest land, agricultural land, etc.) that are too small to be delineated.

Once an area has been properly classified as "Urban or Built-Up Land-Buildings and Structures," that area can be further qualified according to the density of buildings and structures with their associated land. The map scale will determine the extent to which buildings and structures and associated land can be interpreted as dominating the land surface. (Please see, "Introduction.") We realize that specific coverage densities for each of the following density categories can eventually be more accurately defined according to the percentage of structural coverage within each density. However, photo interpreters have not as yet had enough experience in working with this classification system to allow such a specific breakdown at this time.

6110 Low Density

Built-up areas with a sparse pattern of buildings and structures separated by large areas of associated land and/or small patches of other types (See definition 6100). The interpreter must avoid including land which is so sparsely developed as to include mappable areas in which buildings, structures and associated land are not the dominant characteristics of the land surface.

6120 Medium Density

Built-up areas where buildings and structures are located rather close to one another but are separated by associated land which is vegetated (lawns, trees, etc.) Medium density areas would normally include groups of closely related structures as in village centers, subdivisions or urban fringe areas.

6130 High Density

Urban areas dominated by buildings and structures which are located directly adjacent to one another and where virtually no traces of vegetation can be seen between buildings or between buildings and pavement. This situation usually occurs in industrial or commercial downtown areas and along some strip developments. Small roads and parking lots can be distinguished separately as "Pavements and Transportation Facilities" (6200) if the scale of imagery and maps is sufficient to permit this. If the scale is not sufficient, however, service roads should be included within the "buildings and structures - high density categories".

6200 Pavements and Transportation Facilities

Includes roads, highways, parking lots, railroads, air strips and associated land such as median strips and shoulders of roads, highways, runways, service roads and similar areas. When map and imagery scale is insufficient to permit delineation of roads, they should be included in the adjacent cover types.

6300 Rights-of-Way or Pipelines

Continuous paths or strips of scrub, field or other land cover types where the vegetation has been controlled for utility, pipe, power and/or communication lines.

6400 Open

Urban or built-up areas which have been altered or developed for a relatively intensive use which does not require buildings, structures, pavement or other facilities. Open lands can be characterized by being vegetated or non-vegetated. Associated buildings and structures may be included within the open land category when the mapping scale is insufficient to permit their separate delineation as buildings and structures (6100).

6410 Trash and Debris

Areas covered by an accumulation of items dispersed in random patterns. This would include areas such as junkyards and dumps.

6420 Vegetated

Open land within urban or built-up areas that is vegetated. This would include areas such as golf courses, cemeteries, urban parks, ski slopes, etc.

6430 Other

Other urban built-up-open land which is not appropriately defined by any of the above categories.

7000 MISCELLANEOUS

Land cover not appropriately defined by any of the above categories

7100 Coastal Scrub

Areas of low herbaceous growth with no signs of forest trees having occupied the site. This situation occurs on exposed coastal lands and islands.

7200 Other

Other land cover not appropriately defined by any of the above categories.

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