

Canada's National Forest Inventory

Land Use Classification Scheme

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1. Introduction

A land use classification system has been developed to meet the needs of Canada's National Forest Inventory (NFI). The goal was the development of a national classification scheme to serve as a useful and effective standard for land use classification. Present systems were found to be inadequate when used to assess integrated resource management options. It was from this perspective that the classification scheme was created. It is important to note that the term 'land use' describes *current* land use. Land use classification provides snapshots of land use that can be used as benchmarks for tracking global and local changes. The major land use classes recognized by the NFI are:

- Industrial
- Forestry
- Agriculture
- Conservation
- Infrastructure
- Settlement
- Recreation
- National Defence
- Unknown

This manual describes the classification system and provides a schematic of the structure of the land use classification scheme. Current land use is identified by a three-letter code, followed by an optional modifier code. Potential sub-category descriptions have been added for further clarification in the assignment of land use and modifier codes.

For instances where more than one land use class is applicable, a primary or dominant land use category is specified followed by an optional secondary land use classification. An example of this would be stand density management practices (pre-commercial or commercial thinning) that enhance wildlife habitat (as measured by indicators such as: number and size of snags, volume of shrubs and herbs and/or percent cover of understory shrubs, etc.). In this case, the primary land use would be Forestry (intensive) and the secondary land use, Conservation (wildlife areas).

Primary land use is the overriding land use. It is not specifically defined in terms of a percent value but is delineated according to policy or management regimes. In the above example, the overriding land use is intensive Forestry. The secondary use, increased percent cover and volume of understory shrubs and herbs, is a spin-off of the pre-commercial thin or intensive forestry practice. The resulting understory shrubs then serve as wildlife habitat and forage.

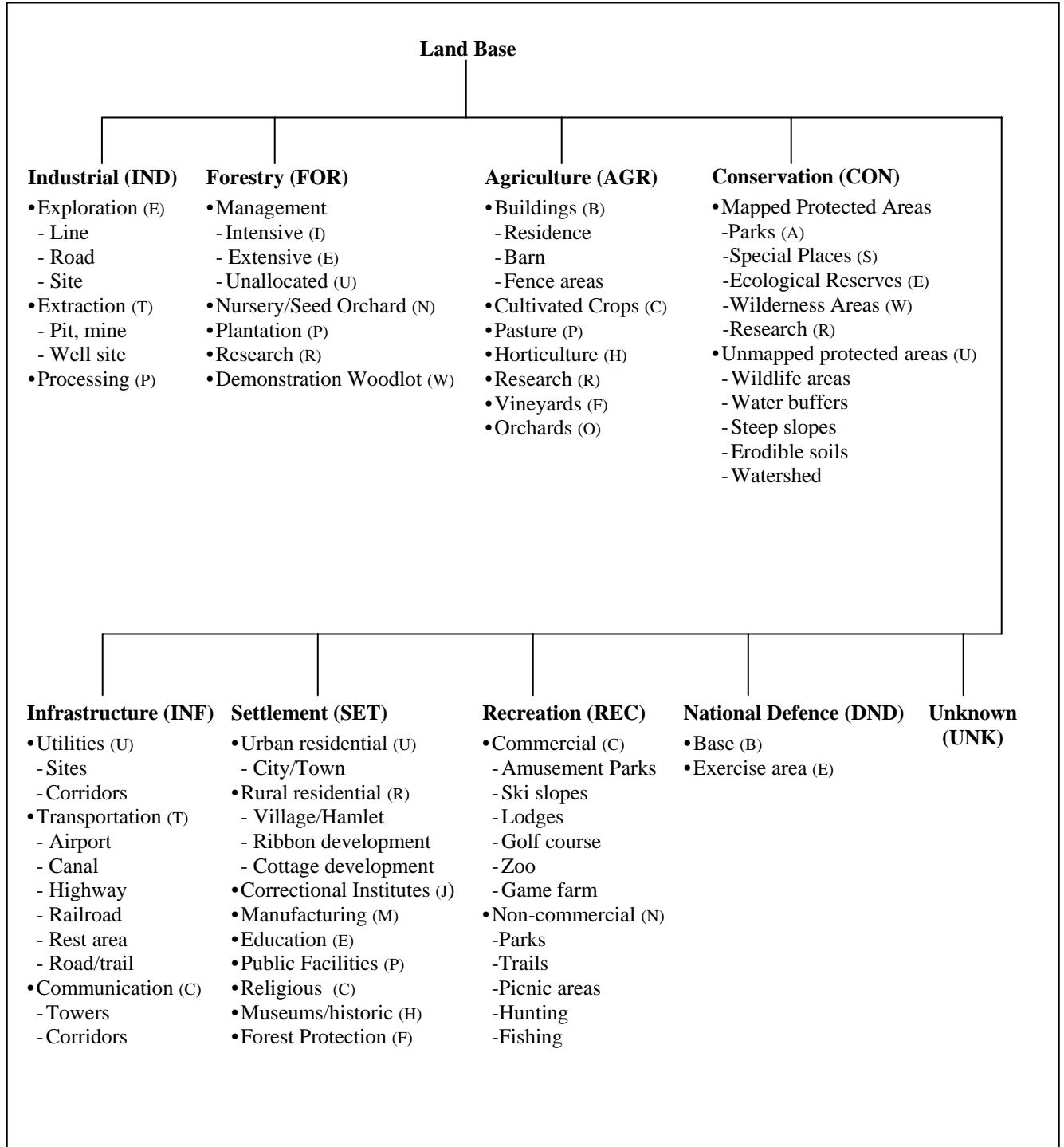


Figure 1. Structure of the National Forest Inventory Land Use Classification Scheme.

2. Land Use Classification Definitions

Industrial (IND)

The Industrial land use classification describes land used for mineral, rock, soil and petroleum exploration and extraction/processing activities encompassing both surface and subsurface operations, such as sand and gravel pits, stone quarries, oil and gas wells, and metallic and non-metallic 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/processing operation are included in this category. Associated structures and equipment may include loading devices, vehicle parking areas, stockpiles, spoil areas, and equipment sheds. Abandoned pits and quarries are included in this category unless they are being used for another purpose.

Modifiers:

E = Exploration

Areas where a mining / petroleum operation involves prospecting and/or exploring for evidence of a mineral / petroleum occurrence. Also included are areas where evaluation of mineral / petroleum deposits takes place, to determine if they have the potential for extraction (e.g., seismic lines).

T = Extraction

Excavated areas that have undergone mining or extraction activities including areas associated with extraction activities and areas occupied by loading devices, equipment buildings, and spoil piles that do not have appreciable vegetative cover. Reclaimed areas are included within their appropriate post-mining land use.

P = Processing

Land used for the refinement and preparation of raw materials from petroleum, mineral, and metal ore extractive operations. Also included are processes that convert raw materials, such as oil, ore, wood, stone and phosphates into usable products for direct use or for other manufacturing stages.

Forestry (FOR)

The Forestry land use classification describes lands that support timber-harvesting activities or managed tree plantations used for lumber or pulp production. This includes tracts and their associated buildings, equipment, and stockpiles 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. Stands designated for future harvest are also included in this category. 'Forest land' is a general term usually applied in full or in part to describe the extraction of wood products for commercial purposes.

Management: This includes areas supporting active harvesting or thinning operations or other forested areas that are experiencing active management practices related to timber harvesting. Also included are forest areas at a mature stage of growth for which future harvesting is planned or anticipated but which are not yet experiencing active management practices.

Modifiers:

- I = Intensive Forest Management
Forestry practices designed to obtain a high level of volume and/or quality of product per unit area. They may include, but are not limited to: plantation espacement, pre-commercial thinning (juvenile spacing) and fertilization, commercial thinning, juvenile-stand improvement and the use of artificial regeneration. Intensive forestry requires greater inputs of labour and capital in terms of quantity, quality or frequency than extensive forestry practices.
- E = Extensive Forest Management
Extensive forestry practices are larger in extent, and relate to the cultivation of vast areas of land, ideally with a minimum of labour or expense. Also included in this category are the protection of the forest from fire and insects, and relying on natural regeneration for provision of the next forest.
- U = Unallocated
This category includes forest 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 forestland, wetlands, and other forest land unused or unmodified by humans.

Other modifiers under the forestry land use classification heading include:

- N = Nursery / Seed Orchard
Land used for the cultivation and production of tree seedlings and seeds, which will be used for the purpose of reforestation.
- P = Plantation
This includes areas that have been seeded or planted with trees for the purpose of reforestation and young, immature plantations, including Christmas tree plantations.
- R = Research
This is used for any forested land (mature or immature) and associated facilities specifically used for research purposes, related to tree reforestation or growth, where the designation for research takes precedence over any timber harvesting. Private plots used temporarily for research studies are not included.
- W = Demonstration Woodlot
This includes land used for woodlots that are designed to provide woodlot owners, forest contractors and members of the general public with visible evidence of the results of forest management practices, often established to help increase public awareness of forestry. Open to the public, they exhibit many aspects of current forestry techniques, as well as information on natural history, wildlife management and forest ecology.

Agriculture / Horticulture (AGR)

The Agriculture / Horticulture land use classification describes land used primarily for the production of farm commodities, including land used for row crops, grain and forage crops, pasture land, and fallow 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 ornamental tree crops, specialty crops, horticultural products, and other agricultural activities are included in this category.

Modifiers:

- B = Buildings
Land used for buildings associated with agricultural production, including barns, implement buildings, grain storage buildings, and the family dwelling.
- C = Cultivated Crops
Land used for the cultivation and harvesting of food and fibre crops, including grains, root crops, vegetables, and hay, as well as agricultural fields in rotation or lying fallow.
- P = Pasture
Land used for pastureland; land that produces grasses for animal consumption. Areas of appreciable tree cover that are used for grazing are included.
- H = Ornamental Horticulture
Land used for the production of sod, grass, flowers, ornamental trees and shrubs.
- R = Research
Cultivated land and associated facilities where the designation for research takes precedence over the specific crops being cultivated. Private plots used temporarily for research studies are not included.
- F = Bush Fruits / Vineyards
Land used for the production of bush and vine fruits, including berries, grapes, and melons.
- O = Orchards
Land used for the cultivation and production of fruit and nut trees.

Conservation (CON)

The Conservation land use classification is used to describe designated lands where conservation strategies are applied for the purpose of attaining specific conservation objectives. These include flora, fauna, landscapes, heritage, and cultural aspects.

Mapped Protected Areas: Mapped areas of land and/or water set aside for ecosystem protection, outdoor and tourism values, preservation of rare species, gene pool, wildlife protection etc., that are protected by legislation, regulation, or land-use policy to control human occupancy or activity.

Modifiers:

- A = Parks
Areas declared a national, provincial, territorial, or community park by legislation, regulation, or land-use policy.
- S = Special Places
Areas of natural and ecological significance focusing on rare, outstanding and unique natural features such as rare plant habitats, old-growth forests, waterfowl breeding colonies, endangered species habitats, etc.
- E = Ecological Reserves
Legally protected natural areas where human influence is minimal. The main functions of an ecological reserve are the preservation of genetic resources and scientific research.
- W = Wilderness areas

Areas established to conserve their natural ecological characteristics, in perpetuity, devoid of permanent development or human habitation. Wilderness areas are protected and managed to preserve their natural conditions so that alterations only occur by the forces of nature. The imprint of human activity should be substantially unnoticeable.

R = Research
Areas set aside to preserve representative ecosystems for scientific study and educational purposes.

Unmapped Protected Areas: Unmapped areas of land and/or water set aside for ecosystem protection, outdoor and tourism values, preservation of rare species, gene pool, wildlife protection etc., that are protected by land-use policy to control human occupancy or activity.

Modifiers:

U = Unmapped Protected Areas

Examples of an unmapped protected area include the following:

Wildlife - Designated land where wildlife conservation strategies are applied for the purpose of attaining specific wildlife conservation objectives.

Water Body Buffers - An area of trees, shrubs and/or other vegetation located adjacent to and up-gradient from water bodies, that restricts non-water dependent or non-water related development within the riparian area. Water body conservation strategies are applied for the purpose of attaining specific objectives, such as providing desired aesthetics, cultural, and recreation opportunities, and conserving significant riparian, wetland, and water body natural resources through the designation and protection of transition areas between the resource and other development and activities.

Steep slopes - An area with greater than 25% slope, where steep slope conservation strategies are applied for the purpose of attaining specific objectives such as: minimizing erosion, flooding, landslide, upland slumping, and pollution protection.

Erodible soils - An area of land that is highly susceptible to erosion, where erodible soil conservation strategies are applied for the purpose of attaining specific objectives such as conserving water quality.

Watershed protection - Designated land where watershed protection conservation strategies are applied for the purpose of attaining specific objectives such as conserving water quality and fish habitat.

Infrastructure (INF)

The Infrastructure land use classification is used to describe lands used for facilities and services that provide the basic framework needed to sustain given types, levels and patterns of land development. This includes utilities, transportation and communication facilities/frameworks and drainage systems.

Modifiers:

U = Utilities

This category includes land uses associated with the transport, storage, distribution and collection of gas, oil, electricity, water, wastewater or solid waste. Pumping stations, electric substations, transmission infrastructures, etc., will constitute the major components of this subcategory. Small facilities, or those associated with an industrial, commercial, or extractive land use, are included within the appropriate category with which they are associated. Long-distance pipelines, etc., rarely constitute the dominant use of land over which they pass. If these uses meet the minimum width criteria, they may be identified as transportation uses. Areas of observable utility rights-of-way such as transmission line cuts through forested areas are included in this subcategory. Examples of utilities include the following:

Sites - Land uses associated with the storage, distribution and collection of gas, oil, electricity, water, wastewater or solid waste. Pumping stations, electric substations, etc., will constitute the major components. Small facilities, or those associated with an industrial, commercial, or extractive land use, are included within the appropriate category with which they are associated.

Corridors - Land uses associated with the transport of gas, oil, electricity, water, wastewater or solid waste. Long-distance pipelines, if they are the dominant use and meet the minimum width criteria, may be included. Areas of observable utility rights-of-way such as transmission line cuts through forested areas are included.

T = Transportation

Includes major transportation facilities, including those associated with ground, water, and air transportation. Interchanges, limited access right-of-way, and service and terminal facilities are characteristic of highways and railways. 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 category. Airports, seaports, and major lake ports are isolated areas of high utilization, usually with no well-defined intervening connections, although canals connect some water ports. 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.

C = Communication

Land occupied by buildings and structures associated with radio, radar, television, telegraph, telephone, etc. Small facilities, or those associated with an industrial, commercial, or extractive land use, are included within the larger category with which they are associated. Long-distance telephone 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.

Settlement (SET)

The Settlement land use classification is used to describe lands used for urban residential, correctional institutions, manufacturing / processing, educational facilities, religious sites, cemeteries, museums / historic sites, rural residential, and forest protection.

Modifiers:

U = Urban Residential

- An area of settlement with a population density greater than 400 people per square km; includes cities, towns, villages, and hamlets.
- R = Rural Residential
An area of settlement with a population density less than 400 people per square km.
- J = Correctional Institutes
Land occupied by prisons, jails, and other correctional facilities, including any buildings, surrounding grounds, and parking lots associated with these facilities. Areas not specifically related to the purpose of the institution should be placed in another appropriate category.
- M = Manufacturing / Processing
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 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.
- E = Educational Facilities
All public and private educational institutions, including pre-schools, elementary and high schools, colleges, universities, trade and vocational schools, camps, and other educational institutions. Land occupied by the educational buildings and associated immediate grounds and parking areas are included in this category.
- P = Public Facilities
Includes police and fire stations and land occupied by the buildings and associated grounds and parking areas.
- C = Religious Sites / Cemeteries
Land occupied by churches and related religious site including public and private cemeteries, access roads and all cemetery grounds, and maintenance and storage buildings. First Nations' burial areas are included in this category.
- H = Museums / Historic / Archaeological Sites
Any site occupied by a museum or other archaeological agency for the purpose of collecting and/or displaying objects having scientific, historical, or artistic value, or any site of historical significance.
- F = Forest Protection
An area occupied by that branch of forestry concerned with the prevention and control of damage to forests. This includes such facilities as lookouts and camps.

Recreation (REC)

The Recreation land use classification is used to describe indoor and outdoor land and facilities developed to support assembly, recreational, cultural, or entertainment activities (amusement

parks, planetariums, civic centres, theatres, auditoriums, indoor tennis courts, field houses, botanical gardens, zoos, playing fields, golf courses, and stadiums). Commercial operations and public facilities are included.

Modifiers:

C = Commercial
Land used for the aforementioned type of recreational activities, that produces a profit for a business or any type of commerce (e.g., fishing/hunting lodges, and pay-for-use areas/campgrounds).

N = Non-commercial
Land used for the aforementioned type of recreational activities, which is owned or managed by a public institution (or maintained through voluntary donation) and not meant to produce a profit for a business or any type of commerce. Also included is land used for non-profit, recreational activities where the fees support the upkeep of the area/facility. Examples of non-commercial recreation include: campgrounds/picnic areas, parks, trails, hunting, fishing, berry picking and mushroom collecting.

National Defence (DND)

The National Defence land use classification is used to describe lands occupied by military bases and defence installations, including military training grounds, storage depots, and military command centres.

Modifiers:

B = Bases
Land occupied by military bases and defence installations, including storage depots, and military command centres.

E = Exercise Area
Land occupied by military training grounds and exercise areas.

Unknown (UNK)

The Unknown land use classification is used to describe lands with no apparent active or passive use, recent human modification, or those areas for which a use cannot be determined.