

Policy and Planning Branch
Department of Energy, Mines & Resources

A GUIDE TO THE CLASSIFICATION
OF LAND USE
FOR THE
CANADA LAND INVENTORY

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O T T A W A

January, 1968

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INTRODUCTION

In the spring of 1963 the Geographical Branch was asked by ARDA to devise a land-use classification suitable for the needs of the Canada Land Inventory, a reconnaissance national land capability survey. The development of the classification has been outlined elsewhere by McClellan (J.B. McClellan, The Land-Use Sector of the Canada Land Inventory, Geographical Bulletin v. 7, No. 2, 1965). Through a process of trial and error, a classification system evolved which permitted the rapid mapping of broad areas, largely by means of air photo interpretation.

The broad outlines of the present classification have developed through consultation with academic geographers and federal and provincial government researchers. This manual is an attempt to provide the working details of the classification. It has been produced to serve as a guide for interpreters at the Geographical Branch and elsewhere who are applying the classification. It is not intended as a manual of air photo interpretation, although reference has been made to interpretation in several places. In essence, this guide represents the experience gained by several land-use mapping groups across the country since the project began.

This edition of the guide was undertaken in an attempt to improve the classification by clarifying definitions of some of the land types and by enlarging on some of the difficulties encountered in mapping marginal types. It was also necessary to bring the guide closer to actual practice, since some mapping practices had evolved since the guide was originally prepared.

Undoubtedly, specific situations will still be encountered that are not covered by this manual. In order that the fullest benefit may be derived from the land-use maps it is hoped that these situations will be brought to our attention for modification of the manual.

Map Preparation

Mapping is done on 1:50,000 National Topographic System Sheets for all areas for which they are available. (Where they are not available, the procedure followed in the Geographical Branch is this: a suitable base map or air photo mosaic, of a scale from approximately 1:40,000 to 1:63,360, is obtained from provincial government or other agencies. When land use has been plotted, the map is changed to a scale of 1:50,000 by photographic reproduction and traced on blank cronaflexes prepared to a master grid by the Department of Agriculture).

When a land unit has been identified and classified, it is outlined and labelled on the air photo; the information is compiled, later, directly on cronaflexes by a staff of technicians. In cases where the air photos must not be marked, land-use information is compiled first on topographic maps by air photo interpreters, then traced onto cronaflexes by technical staff.

The minimum size of area shown on the 1:50,000 map is a square $1/8'' \times 1/8''$, corresponding to an area of 6.4 acres on the ground. In practice, however, this stipulation is not strictly adhered to; it is meant to serve more as a guide than as an absolute requirement. It serves little purpose, for example, to map a small, shallow, isolated pond surrounded by vast areas of muskeg; or to map 6.4 acres of unproductive woodland in the midst of extensive stands of merchantable timber. It becomes significant, however, in complex areas of specialized land-use types. It is important to show, for example, small units of orchard, vineyard, horticulture, gravel pits, industrial establishments and recreational sites, particularly if they are numerous in an area. It is one function of the air photo interpreter to make the most meaningful generalizations in this regard.

Unfortunately, land-use categories frequently do not appear as discrete entities on the ground. Numerous instances of transitional use occur, and present

the greatest problems in interpretation. For these borderline cases it is helpful to bear in mind the direction toward which the land use is tending. This may involve either an ecological trend (Pasture changing to unimproved pasture and Rough Grazingland, Rough Grazing changing to Non-Productive Woodland, Non-Productive Woodland changing to Productive Woodland) or a cultural trend (a residential sub-division is being developed and only the street pattern is in evidence). In these cases the interpreter will place the land in the category toward which the use is tending. This suggestion should be reserved only for the most difficult borderline cases.

Outline

1. URBAN.

Land used for urban and associated non-agricultural purposes.

- (a) Built-up Area. Mapping symbol: B. Parks and other open space within built-up areas are included.
- (b) Mines, Quarries, Sand and Gravel Pits. Mapping symbol: E. Open excavations: land used for the removal of earth materials.
- (c) Outdoor Recreation. Mapping symbol: O. Some examples are: Golf courses, parks, beaches, summer cottage areas, game preserves and historical sites.

2. HORTICULTURE, POULTRY AND FUR OPERATIONS.

Mapping symbol: H.

Land used for intensive cultivation of vegetables and small fruits. Includes market gardens, nurseries, flower and bulb farms and sod farms. Large scale commercial fur and poultry farms are also included because of their specialized agricultural nature.

3. ORCHARDS AND VINEYARDS.

Mapping symbol: G.

Land used for the production of tree fruits, hops and grapes.

4. CROPLAND.

Mapping symbol: A.

Land used for annual field crops: grain, oilseeds, sugar beets, tobacco, potatoes, field vegetables, associated fallow, and land being cleared for field crops.

5. IMPROVED PASTURE AND FORAGE CROPS.

Mapping symbol: P.

Land used for improved pasture or for the production of hay and other cultivated fodder crops, including land being cleared for these purposes.

6. ROUGH GRAZING AND RANGELAND.

Mapping symbol: K.

(a) Areas of natural grasslands, sedges, herbaceous plants and abandoned farmland whether used for grazing or not. Bushes and trees may cover up to 25 per cent of the area. Intermittently wet hay lands (sloughs or meadows) are included, if utilized.

(b) Woodland grazing. In some grassy, open woodlands, bushes and trees may somewhat exceed 25 per cent cover if the area is actively grazed and no other use dominates.

7. WOODLAND.

Land covered with tree, scrub or bush growth.

(a) PRODUCTIVE WOODLAND.

Mapping symbol: T. Wooded land with trees having over 25 per cent canopy cover and over approximately 20 feet in height. Plantations

and artificially reforested areas are included regardless of age.

(b) NON-PRODUCTIVE WOODLAND.

Mapping symbol: U. Land with trees or bushes exceeding 25 per cent crown cover and shorter than approximately 20 feet in height. Much cut-over and burned-over land is included.

(Note grazing provision in category 6).

8. SWAMP, MARSH OR BOG.

Mapping symbol: M.

Open wetlands except those which frequently dry up and show evidence of grazing or hay cutting. (Category 6).

9. UNPRODUCTIVE LAND.

Land which in its present state, does not and will not support vegetation, e.g., eroded soil or rock and active depositional features.

(a) SAND. Sand bars, sand flats, dunes, beaches. Mapping symbol: S.

(b) ROCK AND OTHER UNVEGETATED SURFACES. Mapping symbol: L.

Rock barrens, badlands, alkali flats, gravel bars, eroded river banks, mine dumps.

10. WATER.

Mapping symbol: Z.

GUIDE TO CLASSIFICATION OF LAND USE
FOR THE CANADA LAND INVENTORY

1. URBAN

Land used for urban and associated non-agricultural purposes.

MAP
SYMBOL:
B

(a) BUILT-UP AREA

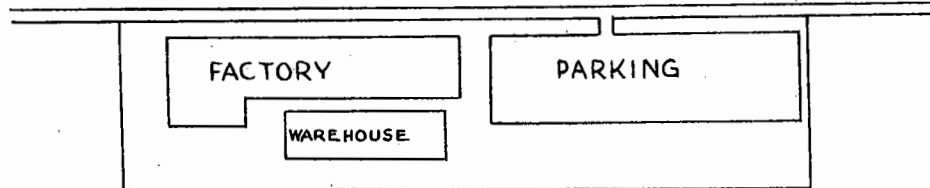
Include: All compact settlements: the built-up portions of cities, towns and villages, including any non-agricultural open space which forms an integral part of the urban agglomeration, e.g., vacant lots, town parks, etc. In most cases, residential use will predominate in these areas. Commercial, industrial and institutional uses will be interspersed and may dominate locally.

Agricultural land completely surrounded by Built-Up Area is shown as part of the Built-up Area. Agricultural land bordering Built-up Areas but not surrounded by it is mapped in the appropriate agricultural category.

Many areas of low density urban sprawl should also be mapped as "B", for example: a group of ex-urban dwellings or country estates which meets the minimum size requirement and is primarily non-agricultural in character. These scattered low density units frequently have a predominant residential function but small business establishments and even farmsteads may be interspersed. They must be examined carefully to determine the dominant function. (Farmsteads are excluded.)

Include also: isolated units separated from compact settlements which are used for industrial, commercial and associated urban purposes.

In showing these units, include the entire area occupied by the establishment (surrounding grounds, storage sheds, parking lots, etc.) e.g.



The following list, though not exhaustive, is representative of the types of isolated units occurring in the sub-category.

Manufacturing plants - saw mills
 - refineries
 - pulp and paper mills
 - cheese factories
 - sulphur recovery from natural gas

mine buildings
 warehouses
 lumber camps and associated log-storage yards
 forest ranger stations
 country grain elevators
 developed power sites, hydro and thermal
 auto wrecking yards
 builders' supply sales yards
 shopping centres
 motels
 trailer camps
 schools, universities, colleges, hospitals, monasteries, prisons and other
 correctional institutions
 transportation facilities - rail yards
 - highway interchanges
 - navigational facilities
 - airports and air strips
 oil collection, storage and pumping facilities
 T.V., radio, radar and micro-wave stations
 military camps
 cemeteries
 garbage dumps

Do Not Include:

- (i) Farmland associated with any of the above isolated units, e.g.,
 a penitentiary farm. These are included in the appropriate
 agricultural category.

- (ii) Any isolated unit, the dimensions of which are less than 1/8" x 1/8" on the 1:50,000 map sheet.
- (iii) Farm buildings. These are included in the adjoining agricultural land in recognition of their dominant agricultural function.

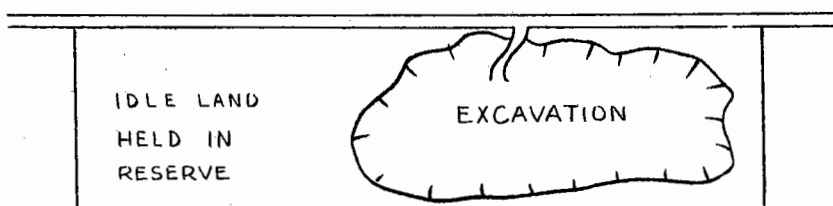
1. URBAN (Continued)

MAP
SYMBOL:
E

(b) MINES, QUARRIES, SAND AND GRAVEL PITS

Land used now or in the past for the extraction of earth materials.

Include: All open pit mining operations, strip coal mines, commercial mineral excavations, quarries, sand, gravel and clay pits, peat extraction operations, commercial topsoil removal operations. The unit may be in operation or abandoned (see (ii) below). If the unit is in production, include the total area associated with the operation.



Idle land held in reserve is frequently marked by test pits or sample drill holes. The unit may be fenced in or roughly bounded by the outline of some topographic feature such as a kame, esker or meltwater channel.

Do Not Include:

- (i) sod farms; these are included under Horticulture.
- (ii) operations abandoned for such a long period that they now have a vegetative cover permitting them to be classed as category 6, Rough Grazing, or 7, Woodland.

MAP
SYMBOL:
O

(c) OUTDOOR RECREATION

Land used for private or public outdoor recreational purposes.

Include: Land occupied by summer cottages and adjacent beach areas. The total area within the boundaries of national, provincial, municipal and private parks, wildlife sanctuaries and historical sites. Race tracks, golf courses, developed ski slopes, drive-in theatres, riding academies, non-military shooting ranges, summer camps, fishing and hunting resorts, developed bathing beaches, marinas, tourist camping grounds, roadside parks and picnic areas.

Do Not Include:

- (i) Recreational areas (usually urban parks) within the built-up portions of cities and towns. These are part of the Built-up Area.
- (ii) Hockey arenas, curling rinks, dance halls or other forms of indoor recreation; these are mapped as Built-up Area.
- (iii) Private race tracks on farms. These tracks are used for training race horses and should be included with the surrounding agricultural land.

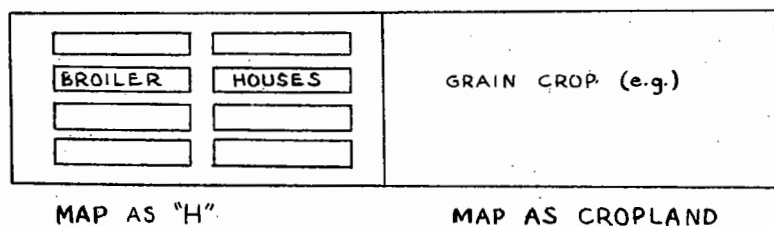
HAP
SYMBOL:
H

2. HORTICULTURE, AND FUR AND POULTRY OPERATIONS

Land used for intensive production of vegetables and small fruits, and for large-scale poultry and fur-farming operations. The latter are included because of their specialized agricultural function.

- Include: (i) Market gardens and truck farms. Emphasis is on the exclusive production of vegetables and small fruits. Holdings are usually small and intensively cultivated. Presence of greenhouses and irrigation facilities may be a distinguishing characteristic. Most fields are conspicuously small, except for extensive areas of marsh reclamation.
- (ii) Nurseries, sod farms and flower and bulb farms.

- (iii) Any fallow land forming an integral part of any of the above operations.
- (iv) Large scale fur farms and poultry operations. Include only the structures and surrounding land in this category.



Do Not Include:

- (i) Vegetables grown as part of a regular rotation with field crops, hay and pasture, e.g., potatoes, canning crops, field beans and peas. These are mapped as Cropland. Only where potatoes, tomatoes, pumpkins, etc., are grown as part of a market garden type of operation, will they be included within the Horticulture category.
- (ii) Oilseeds, sugar beets, tobacco. These are included in Cropland.
- (iii) Uncultivated tracts of land on which wild blueberries are picked. Areas burned periodically to promote blueberry growth are classified in the appropriate cover-type category. Only commercial plantings of blueberries, cranberries and other small fruits are included in Horticulture.

MAP

SYMBOL: 3. ORCHARDS AND VINEYARDS

G

Land used for the production of tree fruits and grapes.

Include:

- (i) Orchards producing tree fruits such as apples, apricots, cherries, peaches, pears, and plums.

- (ii) Vineyards
- (iii) Areas of hop cultivation
- (iv) Commercial plantings of nut trees
- (v) New plantings of any of the above that are not yet in production.

Do Not Include: Small fruits, such as strawberries, raspberries or currants.

These are included in Horticulture.

MAP
SYMBOL:
A

4. CROPLAND.

Land used primarily for annual field crops.

Include:

- (i) Land growing field crops of grain, oilseeds, sugar beets, tobacco, potatoes and other vegetables.
- (ii) Any fallow land associated with the production of any of the above.
- (iii) Land which is in the process of being cleared and on which crop production appears imminent.

Do Not Include:

- (i) Vegetables grown as part of a market garden type of operation.

These are included under Horticulture.

MAP
SYMBOL:
P

5. IMPROVED PASTURE AND FORAGE CROPS

Land used primarily for improved pasture or for the production of hay and other fodder crops.

To qualify as "improved", a pasture should exhibit some evidence of cultivation. Although such cultivation may be infrequent and little direct visible evidence (such as plow marks) may appear on aerial photographs, improved pastures may be distinguished by a general smooth texture. Mottled patterns caused by bushes or by extensive invasions of unpalatable weeds are

absent. Some stoniness or wetness may be tolerated since improved pastures may be maintained without intensive cultivation, by prevention of over-grazing, occasional fertilization, or seeding of desirable types of plants, or combinations of these.

Include: (i) Improved permanent pasture

(ii) rotational pasture

(iii) fodder crops; all forage legumes, hay and other forage crops, whether grown for forage or for seed.

(iv) land being cleared for fodder production or pasture.

Do Not Include:

unimproved grazing land or weedy, abandoned hay fields. These are classed as Rough Grazing and Rangeland.

4., 5. CROPLAND-PASTURE COMPLEX

It is recognized that in some parts of Canada it is very difficult, if not impossible, to separate Categories 4 and 5, using photos flown early or late in the growing season. Also, in areas with a livestock emphasis, crops of the two categories are usually grown in rotation, with the location of the categories shifting each year. For these reasons the following complexes can be shown on the final land-use maps:

MAP

SYMBOLS:	A	95.0 - 100.0%	Cropland					
	A ₁	75.0 - 94.9%	"					
	A ₂	50.0 - 74.9%	"					
	P ₂	49.9 - 74.9%	Improved Pasture and Forage Crops					
	P ₁	75.0 - 94.9%	"	"	"	"	"	"
	P	95.0 - 100.0%	"	"	"	"	"	"

The system is applied in the following manner. Where the separation between "A" and "P" cannot be made, then the symbol with appropriate subscript will be used. The sub-script will be determined by use of a "Cropland/Improved Pasture and Hay" ratio derived from the 1961 Census of Agriculture and applied on a census subdivision (e.g., township) basis. Census subdivisions will be divided into two or more parts with different symbols where it is known from other sources or from the photos that significant differences exist within the township.

MAP
SYMBOL:
K

6. ROUGH GRAZING AND RANGELAND

Includes grasslands such as natural range, and areas of sedges and herbaceous plants. Abandoned farmland and lightly wooded grasslands are also included.

Include:

- (i) Rough grazing land: all tracts of land used for extensive grazing which because of stoniness, shallow soil, poor drainage or drought have not been improved and are not in rotation with field crops. These grazing lands can usually be distinguished by rough topography, scattered patches of weeds, stones, stumps or shrubs and the absence of traces of cultivation.
- (ii) Rangeland: all natural grasslands and open expanses of herbaceous plants whether used for grazing or not. Brush scrub and mature trees may cover up to approximately 25 per cent of the total area.
- (iii) Many areas used for rough grazing, particularly in the western provinces, also support open woodland covering somewhat more than 25 per cent of the total area. Tracts such as this, supporting

light or open woodland of little or no commercial value and where grazing is the dominant use, are classed in the Rough Grazing and Rangeland category.

- (iv) All tracts of land on which grasses, weeds and old hay are the dominant forms of vegetation. Much of the land in this category is former agricultural land that is now open range used for grazing; in some areas, particularly the eastern provinces, much of it is idle and reverting to woodland.
- (v) Intermittently wet hay-land: swamps and marshes that periodically dry up and are used for grazing or haycutting. Check for cutting patterns and differences of tone along fence lines.

Do Not Include:

- (i) Ungrazed tracts of land on which the canopy density exceeds 25 per cent. These are included with the Woodland categories.
- (ii) Tracts of land on which more than 75 per cent of the surface is exposed rock, sand or bare or eroded soil. These are included in Unproductive Land (Category 9).

7. WOODLAND

Land covered with tree or scrub growth.

MAP
SYMBOL
T

(a) PRODUCTIVE WOODLAND

Land bearing forest of a commercial nature.

Include:

- (i) Tracts of wooded land on which the crown cover or canopy density exceeds 25 per cent and on which the bulk of the trees could be used as sawlogs, pulpwood, fence posts, or fuelwood of commercial

value at the time of the photography or field work. Most of the trees in this category are over 20-30 feet in height. Trees shorter than this range are seldom of a commercial character and are not classed as productive woodland unless some immediate commercial use is made of them, e.g., small pulpwood logs or cedar fence posts. (The regional economic situation may be the deciding factor in whether or not such economically marginal trees are utilized.) This minimum height range stipulation is somewhat arbitrary but should encourage consistent mapping.

- (ii) Artificially restocked tracts or plantations, regardless of age or height.

Do Not Include:

- (i) Land where the crown cover of trees over 20-30 feet in height is less than 25 per cent. This is classed either as Non-Productive Woodland or as Rough Grazing and Rangeland respectively, depending on whether the balance of the unit is wooded or grassland.
- (ii) Other open woodland which is steadily grazed and where no other use dominates; this is classed as Rough Grazing and Rangeland.
- (iii) Areas of trees shorter than the 20-30 foot range unless actively exploited. These are classed as Non-Productive Woodland.

MAP
SYMBOL:
U

(b) NON-PRODUCTIVE WOODLAND

Land with a growth of short trees or bushes.

Include:

- (i) Tracts of land where bush and tree scrub cover exceeds 25 per cent.
"Tree scrub" consists of short (immature or stunted) trees, i.e., less than 20-30 feet in height. (Tree scrub is seldom of a commercial nature

but when mapping a tract of scrub trees of a type known to be actively exploited for wood products in the general map area, such tract may be classed as Productive Woodland).

Willows, alder, saskatoon bushes, juniper, sumac, ironwood and dwarf conifers are examples of types commonly occurring in the Unproductive Woodland category. Much of the tree cover in this category is second or third growth found in cut-over or burned-over area. Other is stunted growth found in rocky, alpine or poorly drained muskeg sites. Some is former agricultural land in an advanced stage of reversion to forested land.

For marginal examples, where trees are near the lower end of the 20-30 foot range, it is helpful to consider site conditions. In the poorer sites with shallow soils, poor drainage or rock out-crops, Non-Productive Woodland is the more appropriate designation. Borderline types growing under better site conditions may be classed as Productive.

- (ii) Tracts of land recently logged-off or cut-over, and tracts of forest land recently burned over.

Do Not Include:

- (i) Artificially reforested areas; these are classed as Productive Woodland.
- (ii) Wetlands with a cover of bushes shorter than approximately four feet.

(If drainage conditions in these areas are too poor to support heavier cover, such units are classed as Wetland).

MAP
SYMBOL:
M

8. SWAMP, MARSH OR BOG

Open wetlands of all types.

Include:

- (i) Wetlands covered with a swamp, marsh or muskeg type of vegetation - needs

and other aquatic plants. On the aerial photographs, swamps have a relatively dark tone, smooth texture and low growth. Flow marks are occasionally visible.

- (ii) Intermittent sloughs. In these areas for all but very dry periods the surface is water covered. (There may be little or no aquatic vegetation visible on the aerial photos.) Water depth is shallow.

Do Not Include:

- (i) Areas of swamp grass or sloughs which frequently dry up and are used for grazing or hay cutting. These are included in Rough Grazing and Rangeland.
- (ii) Wetlands with a tree or dense bush cover, e.g., cedar, tamarack or black spruce forest, or willow thickets taller than approximately four feet, and with over 25 per cent crown cover. These are included in Woodland categories according to tree height and cover density.
- (iii) Permanent water bodies on which floating vegetation (usually plankton scum) occurs; this scum often forms in late summer when water temperatures are highest. Check for drift pattern.

9. UNPRODUCTIVE LAND

Land which, in its present state, does not and will not support vegetation; for example, eroded soil or rock and active depositional features.

(a) SAND FLATS, DUNES AND BEACHES

Land on which an exposed sand surface predominates.

Include: (i) All tracts of land on which bare sand comprises over 75 per cent of the total area.

(ii) Undeveloped beaches.

MAP
SYMBOL:
S

Do Not Include:

Any areas that can be classified under the Urban sub-categories.

MAP
SYMBOL:
L

(b) ROCK AND OTHER UNVEGETATED SURFACES

Rock barrens, badlands, eroded river banks, gravel bars, alkali flats, areas covered by slag dumps or mine tailings.

Include:

All tracts of land on which bare rock or non-cultivated bare earth comprises over 75 per cent of the total surface.

Do Not Include:

Any areas that can be classified in the Urban sub-categories.

MAP
SYMBOL:
Z

10. WATER

Lakes, ponds, rivers and other permanent water bodies large enough to be mapped.

Include:

In the eastern provinces, areas marked as permanent water bodies on the 1:50,000 N.T.S. base sheets. If shorelines have changed, however, due to drainage or damming, use the outline shown on the air photos. In the western provinces, experience has shown this map information to be unreliable due to fluctuating water levels. In these areas, the air photo is a better source of information concerning permanent water bodies.

Do Not Include:

Intermittent water bodies such as prairie sloughs that may be mapped as marsh, or are frequently dry and are used for grazing and hay-cutting. The latter (natural hay meadows) are included under Rough Grazing and Rangeland.