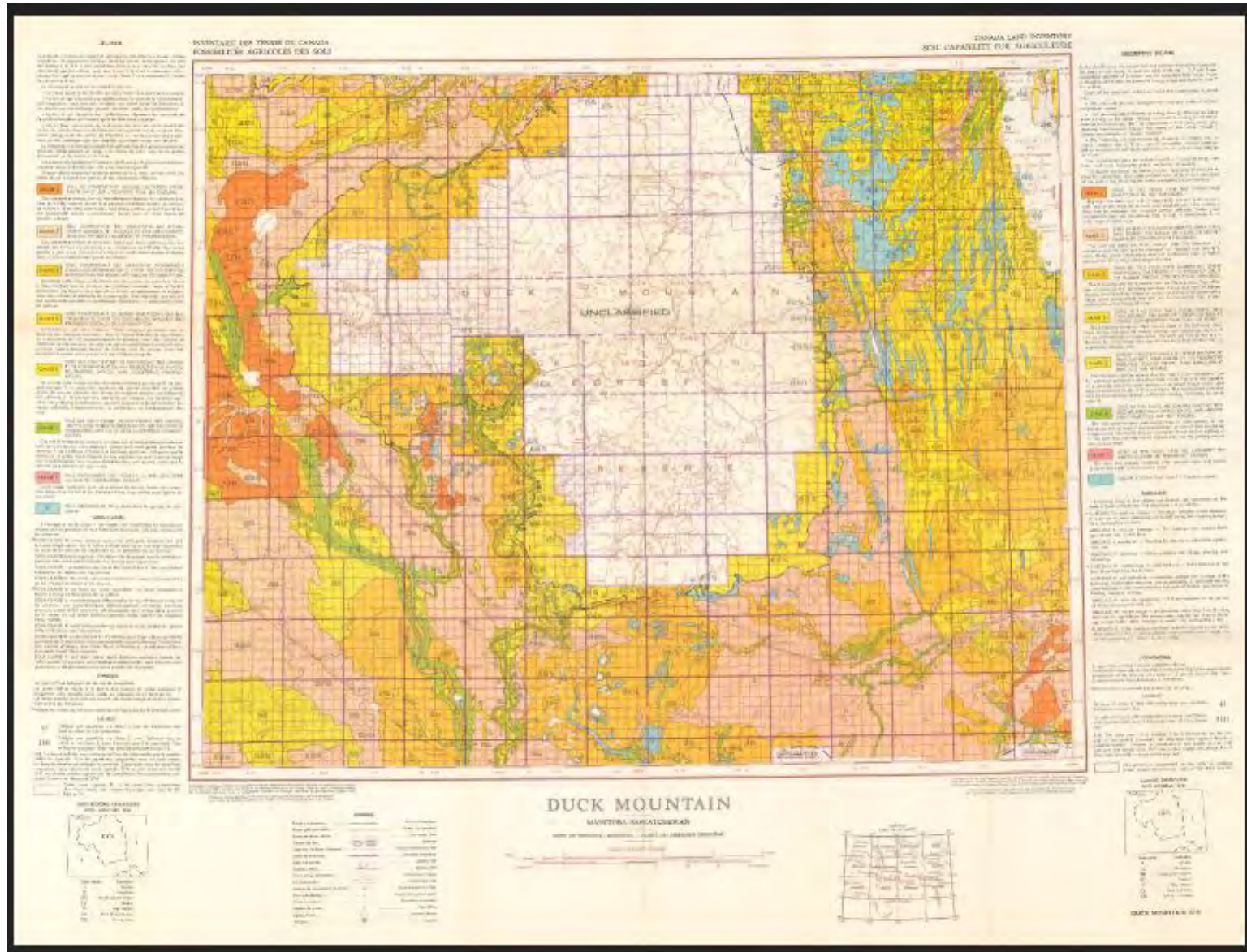


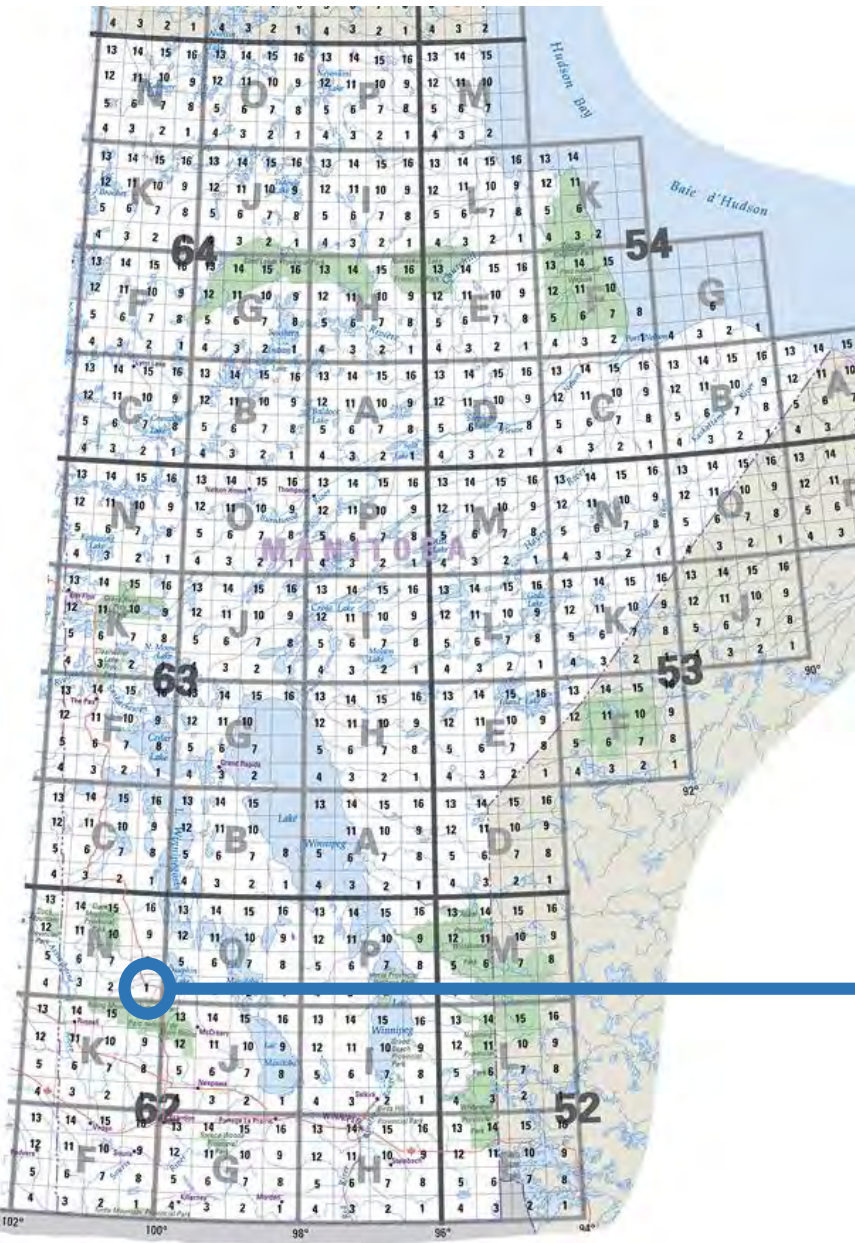
Understanding Agricultural Land Capability Maps

Soils and Geology

January 2021

This is the Agricultural Land Capability (ACL) map for the 62-O Duck Mountain 1:250,000 Mapsheet Area, from the Canadian Soil Information Service website:
<https://sis.agr.gc.ca/cansis/publications/maps/cli/250k/agr/index.html>





A mapsheet index helps you to find the correct map area. Many types of maps in Canada use this reference system: National Topographic Survey, Canada Land Inventory, and some of Manitoba's Reconnaissance Soil Survey maps.

CanadaMapSales has an index to help you find the correct map sheet.
<http://www.canadamapsales.com/en/catalogue/canadian-topographic-maps/MB/index.html>

The map in this guide is at the 1:250,000 scale. You first need to find the location you want, and then find the nearest large number (e.g. 62) and then the nearest letter (e.g. 62-N).

If smaller mapsheets are available, then you will want to add the small number at the end (e.g. 62-N-01 will have Dauphin in it).

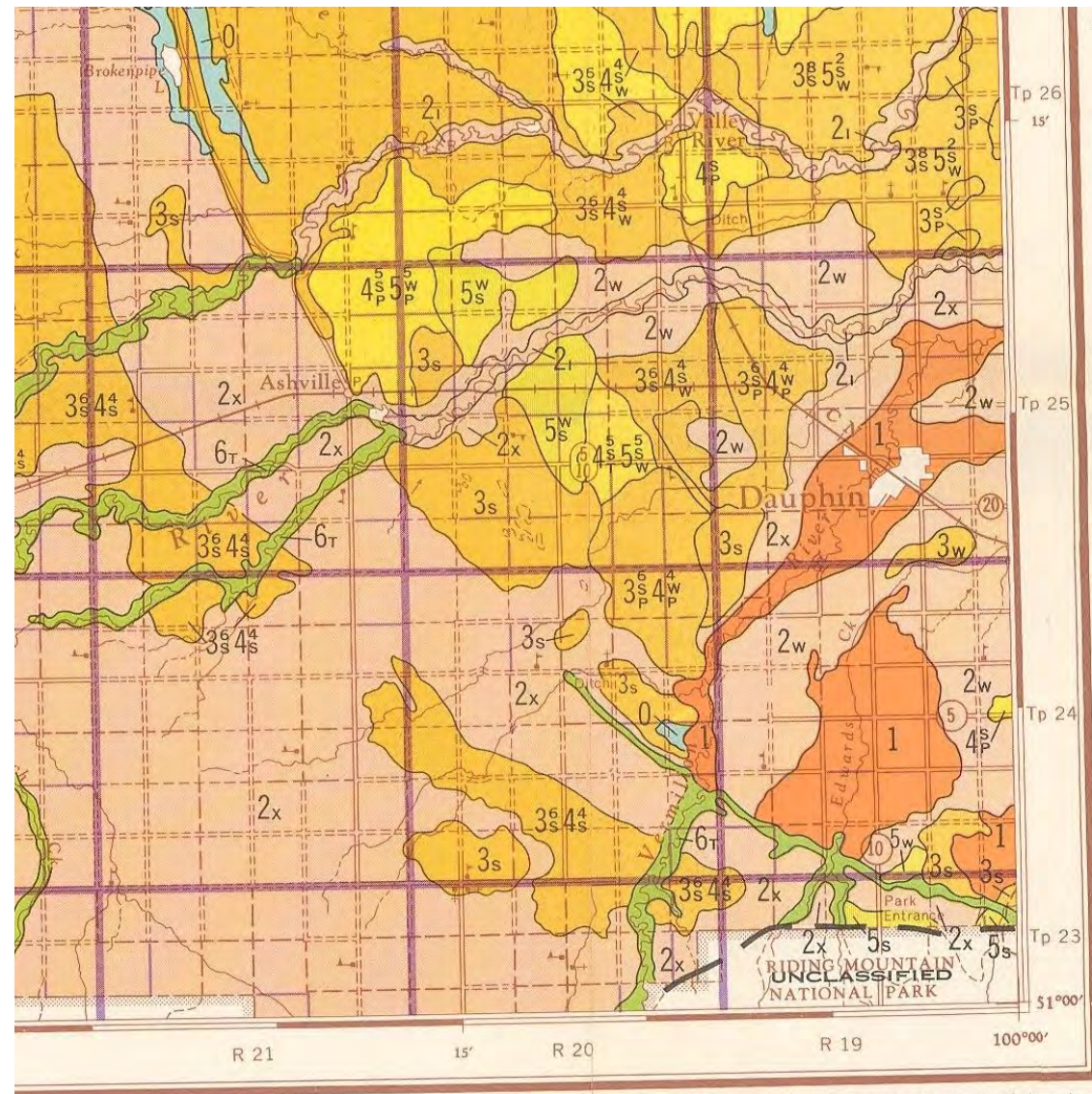
This is the lower right hand portion of the Agricultural Land Capability map on page 1.

There are two systems of location on this map:

1) Latitude and Longitude:

The bottom right corner is 51°N of latitude and 100°W of longitude. There are 60 minutes in a degree, so partway up the right margin is 15' past 51° or W51° 15', and along the bottom is 15' past 100°, or N100° 15'. There are some light and dark bars on the map edge that are 5 minutes long each, to help break it down further. The blob that is Dauphin would be located at approximately N51° 09', W100° 03'. In Canada, the numbers always get higher the further north or west you go.

2) The Dominion Land Survey System (or Legal Land Location/Description) is complicated and described on the next 2 pages. It is indicated by the grid, the R numbers on the bottom of the map and Tp numbers on the right margin of the map.



Cartography by the Soil Research Institute, Research Branch, Canada Department of Agriculture with the support of ARDA, Canada Department of Forestry and Rural Development. Base map and printing by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, 1968.

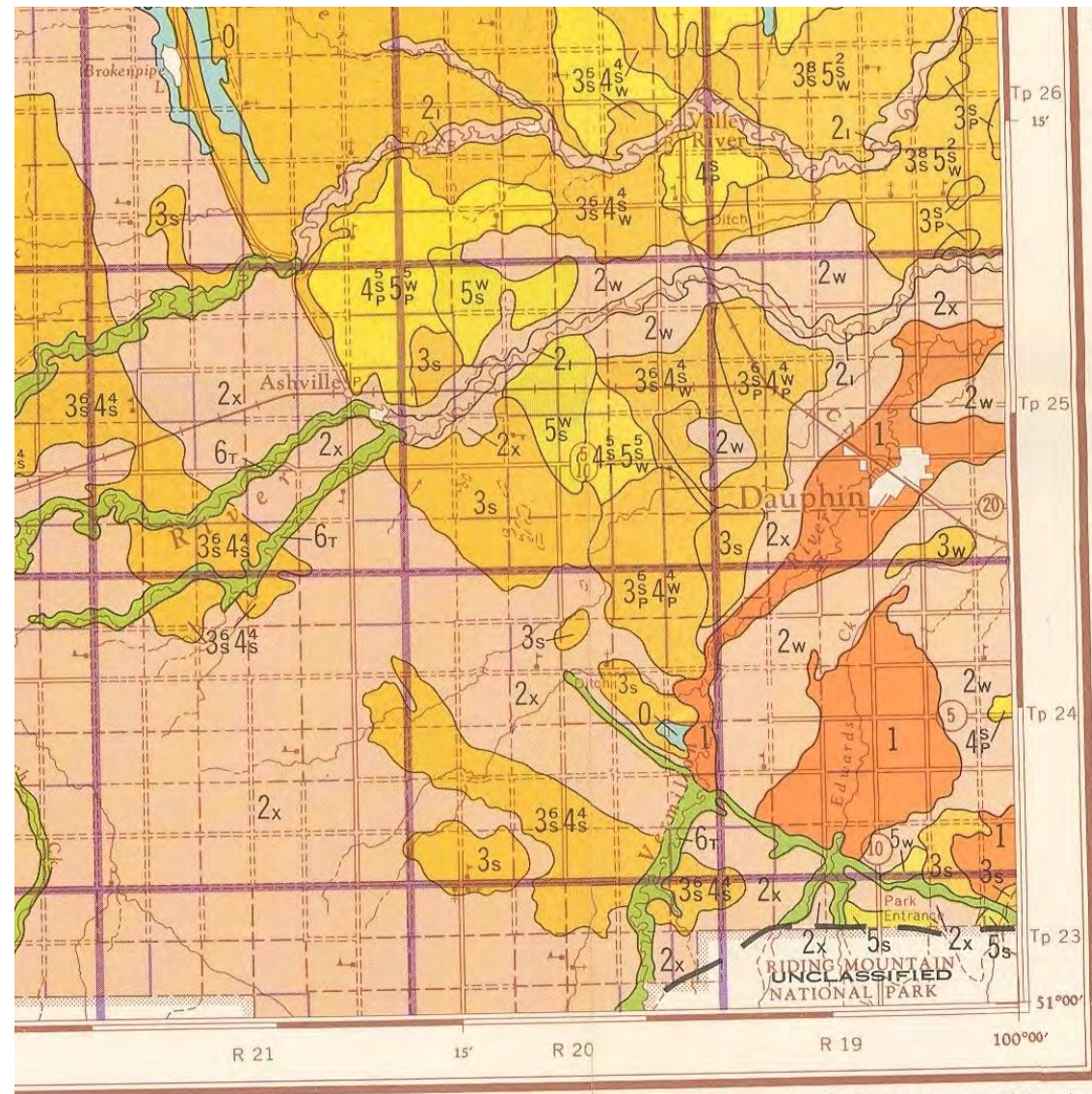
Capability classification by the Manitoba and Saskatchewan Soil Survey with the support of ARDA, Canada Department of Forestry and Rural Development.

Dauphin is at 10-25-19 W1, (section 10, township 25, range 19, west of the principle meridian). It is easiest to understand if we describe these parts from last to first:

The last number (W1) is the closest reference meridian. In Manitoba it is the Principle Meridian that runs vertically through a spot just west of Headingly (there is a monument on Highway 1). Anything to the west of it, before you reach Saskatchewan, is W1. Anything east of the Principle Meridian but before Ontario is E1. In eastern Saskatchewan, you are west of the Second Meridian, or W2.

The 2nd and 3rd numbers (25-19) are township and range and together they refer to a 6 x 6 grid. Read the first number of this pair from the side of the map, and the second of this pair from the bottom or top of the map.

The first number is the section, and smallest square shown on this map. How to locate it is explained on the next page.



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31	32	33	34	35	36
30	29	28	27	26	25
19	20	21	22	23	24
18	17	16	15	14	13
7	8	9	10	11	12
6	5	4	3	2	1

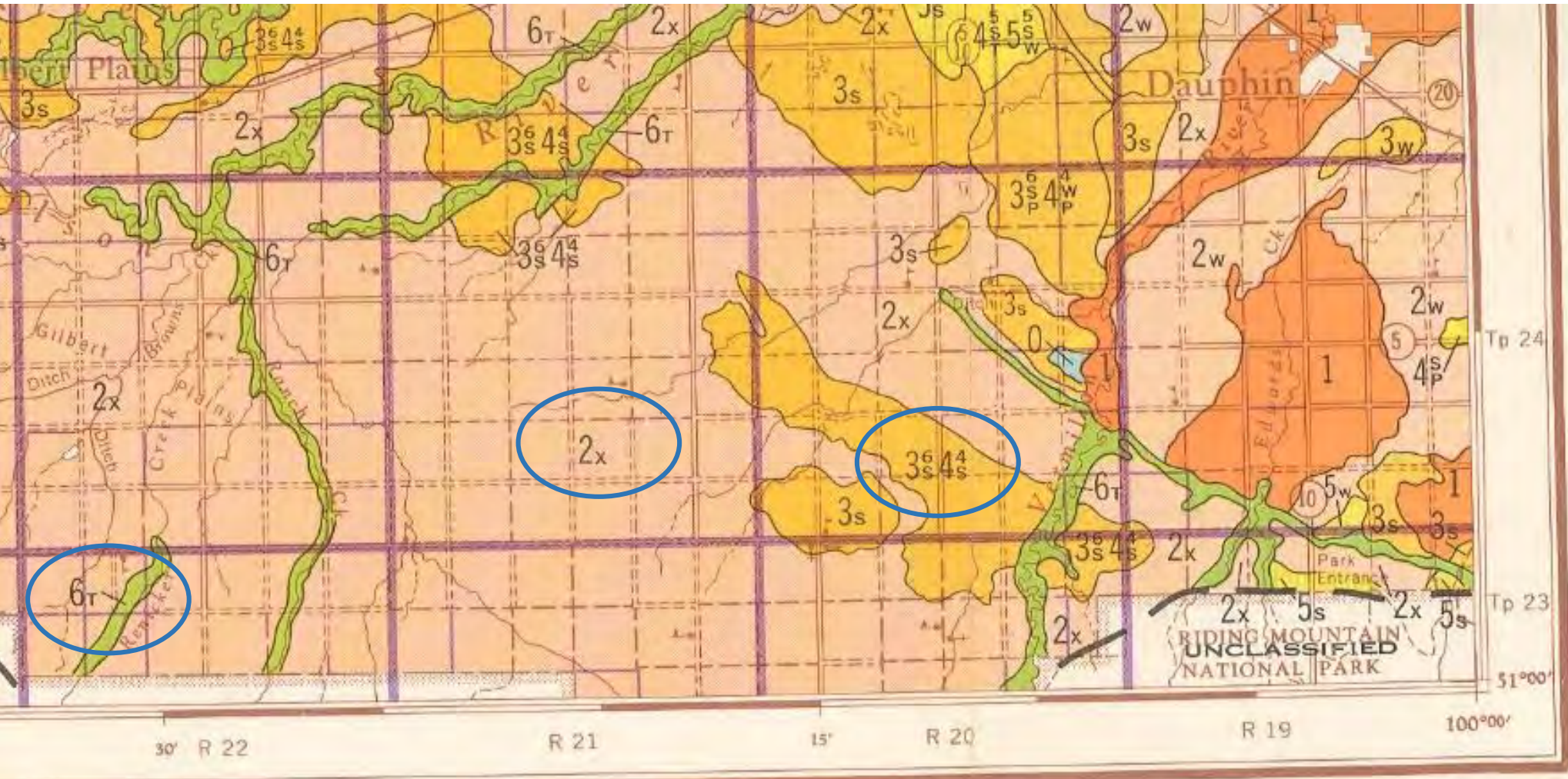
There are 36 numbers in this grid, called a Township, and they are ordered in a snake pattern from the bottom right, then to the left, up one, and right, and so on until the last one in the top right.

Townships have 36 sections of 1 mile x 1 mile each, so they are 36 square miles in size (or 92.2 square kilometers)!

For Practice, using the map on the previous page:

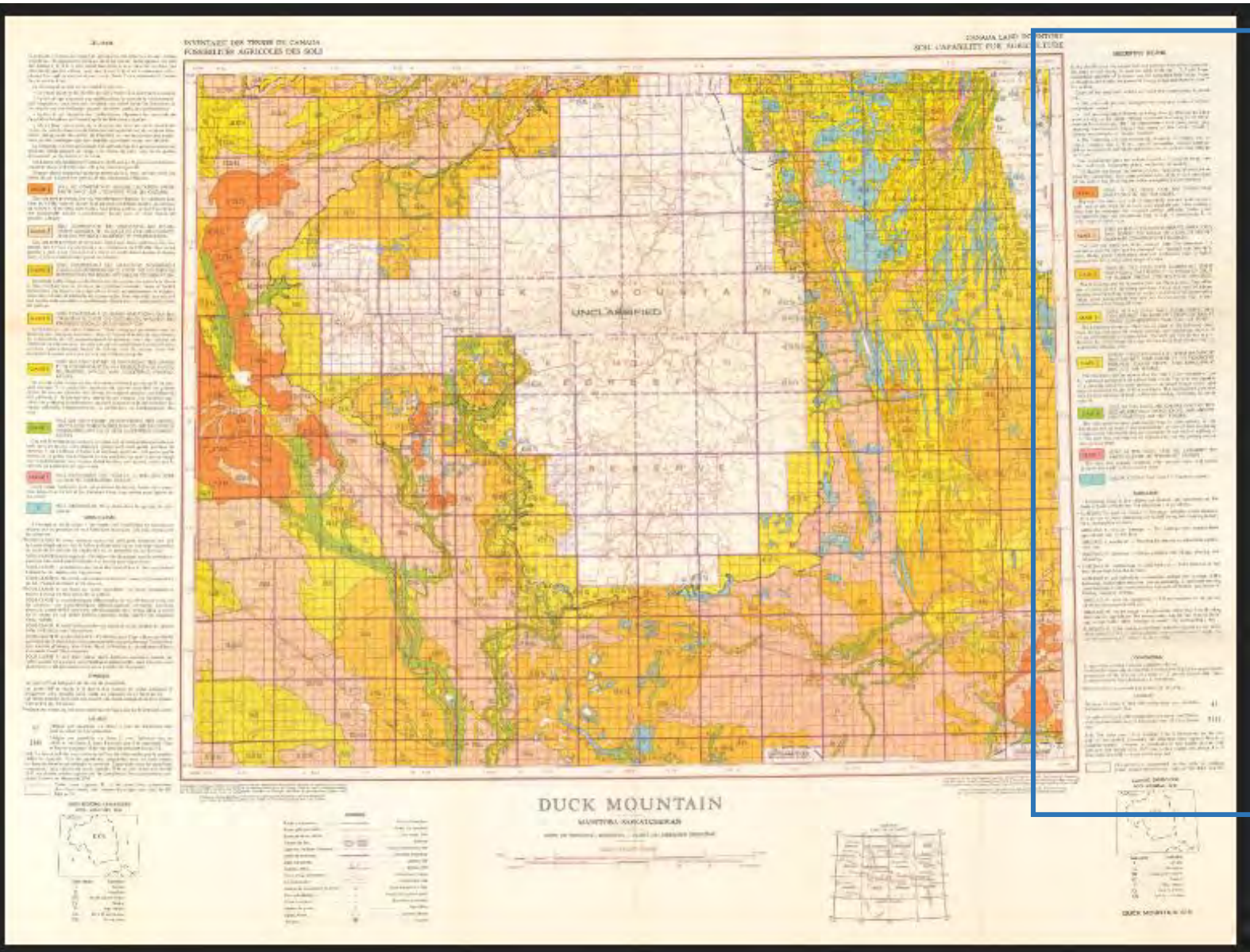
- A. What do you find at 20-26-21 W1?
- B. Where is Ashville?

a) Brokenpipe Lake b) 23-25-21 W1 (it is actually between sections 23 and 24 of 25-21 W1)



Now what do the numbers and letters INSIDE the map mean?
 Let's focus on the three items circled above...

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 Capability classification by the Manitoba and Saskatchewan Soil Survey with the support of ARDA, Canada Department of Forestry and Rural Development.



And take a closer look the legend of the full map... (the one on the far left is the same as the right, but in French language)

DESCRIPTIVE LEGEND

In this classification the mineral soils are grouped into seven classes on the basis of soil survey information. Soils in classes 1, 2, 3 and 4 are considered capable of sustained use for cultivated field crops, those in classes 5 and 6 only for perennial forage crops and those in class 7 for neither.

Some of the important factors on which the classification is based are:

- The soils will be well managed and cropped, under a largely mechanized system.
- Land requiring improvements, including clearing, that can be made economically by the farmer himself, is classed according to its limitations or hazards in use after the improvements have been made. Land requiring improvements beyond the means of the farmer himself is classed according to its present condition.
- The following are not considered: distances to market, kind of roads, location, size of farms, type of ownership, cultural patterns, skill or resources of individual operators, and hazard of crop damage by storms.

The classification does not include capability of soils for trees, tree fruits, small fruits, ornamental plants, recreation, or wildlife.

The classes are based on intensity, rather than kind, of their limitations for agriculture. Each class includes many kinds of soil, and many of the soils in any class require unlike management and treatment.

CLASS 1

SOILS IN THIS CLASS HAVE NO SIGNIFICANT LIMITATIONS IN USE FOR CROPS.

The soils are deep, are well to imperfectly drained, hold moisture well, and in the virgin state were well supplied with plant nutrients. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for a wide range of field crops.

CLASS 2

SOILS IN THIS CLASS HAVE MODERATE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE MODERATE CONSERVATION PRACTICES.

The soils are deep and hold moisture well. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good management they are moderately high to high in productivity for a fairly wide range of crops.

CLASS 3

SOILS IN THIS CLASS HAVE MODERATELY SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES.

The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under good management they are fair to moderately high in productivity for a fair range of crops.

CLASS 4

SOILS IN THIS CLASS HAVE SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES, OR BOTH.

The limitations seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. The soils are low to fair in productivity for a fair range of crops but may have high productivity for a specially adapted crop.

CLASS 5

SOILS IN THIS CLASS HAVE VERY SEVERE LIMITATIONS THAT RESTRICT THEIR CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE FEASIBLE.

The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants, and may be improved by use of farm machinery. The improvement practices may include clearing of bush, cultivation, seeding, fertilizing, or water control.

CLASS 6

SOILS IN THIS CLASS ARE CAPABLE ONLY OF PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE NOT FEASIBLE.

The soils provide some sustained grazing for farm animals, but the limitations are so severe that improvement by use of farm machinery is impractical. The terrain may be unsuitable for use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

CLASS 7

SOILS IN THIS CLASS HAVE NO CAPABILITY FOR ARABLE CULTURE OR PERMANENT PASTURE.

This class also includes rockland, other non-soil areas, and bodies of water too small to show on the maps.

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ORGANIC SOILS (Not placed in capability classes).

SUBCLASSES

Excepting Class 1, the classes are divided into subclasses on the basis of kinds of limitation. The subclasses are as follows:

SUBCLASS C: adverse climate — The main limitation is low temperature or low or poor distribution of rainfall during the cropping season, or a combination of these.

SUBCLASS E: erosion damage — Past damage from erosion limits agricultural use of the land.

SUBCLASS I: inundation — Flooding by streams or lakes limits agricultural use.

SUBCLASS P: stoniness — Stones interfere with tillage, planting, and harvesting.

SUBCLASS R: shallowness to solid bedrock — Solid bedrock is less than three feet from the surface.

SUBCLASS S: soil limitations — Limitations include one or more of the following undesirable structure, low permeability, a restricted rooting zone because of soil characteristics, low natural fertility, low moisture-holding capacity, salinity.

SUBCLASS T: adverse topography — Either steepness or the pattern of slopes limits agricultural use.

SUBCLASS W: excess water — Excess water other than from flooding limits use for agriculture. The excess water may be due to poor drainage, a high water table, seepage or runoff from surrounding areas.

SUBCLASS X: Soils having a moderate limitation caused by the cumulative effect of two or more adverse characteristics which singly are not serious enough to affect the class rating.

CONVENTIONS

Large arabic numerals denote capability classes.
Small arabic numerals placed after a class numeral give the approximate proportion of the class out of a total of 10. Letters placed after class numerals denote the subclasses, i.e. limitations.

*Denotes class or subclass not present on this map.

EXAMPLES

An area of Class 4 land with topography and stoniness limitations is shown thus: $4 \begin{matrix} T \\ P \end{matrix}$

An area of Class 2, with topographic limitation, and Class 4 with stoniness limitation, in the proportions of 7:3 is shown thus: $2 \begin{matrix} 7 \\ T \end{matrix} 4 \begin{matrix} 3 \\ P \end{matrix}$

N.B. The color used for a complex area is determined by the first digit of the symbol. Generally the dominant class appears first in a complex symbol. However, in complexes of two arable classes (1-4) and one non arable class (5-7), the arable classes are shown first if they total one half or more of the map unit.



This pattern, is overprinted on the color in complex areas, except those having ratios of 8:2, 8:1:1 and 9:1.

So with these Land Suitability Classes and Subclasses and the Convention of how they are written in the map, we can figure out that our 3 circles on the map before show (from left to right):

- 6_T = the area filled with green colour is class 6 land with topography (steep slopes) as the main limitation, so it is only good for perennial vegetation (grazing for livestock); improvement is not feasible
- 2_X = class 2 land with various limitations that add up: almost perfect for cropping with small concerns
- $3\frac{6}{S}$ $4\frac{4}{S}$ = 6 tenths (60%) of the area filled with orange colour is class 3 with one or more SOIL related limitations: it has moderately severe limitations for crops or requires special conservation measures; 4 tenths (40%) of this area is class 4 with one or more SOIL related limitations: severely limited but still able to grow crops and/or requiring special conservation practices