Land Resource Unit

Brandon Research Centre

Agriculture and Agri-Food Canada

Rural Municipality of Stanley

Information Bulletin 97-11

Soils and Terrain

An introduction to the land resource

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Rural Municipality of Stanley

Information Bulletin 97-11

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PREFACE

This is one of a new series of information bulletins for individual rural municipalities of Manitoba. They serve to introduce the newly developed digital soil databases and illustrate several typical derived and interpretive map products for agricultural land use planning applications. The bulletins will also be available in diskette format for each rural municipality.

Information contained in this bulletin may be quoted and utilized with appropriate reference to the originating agencies. The authors and originating agencies assume no responsibility for the misuse, alteration, re-packaging, or re-interpretation of the information.

This information bulletin serves as an introduction to the land resource information available for the municipality. More detailed information, including copies of the primary soil and terrain maps at larger scales, may be obtained by contacting

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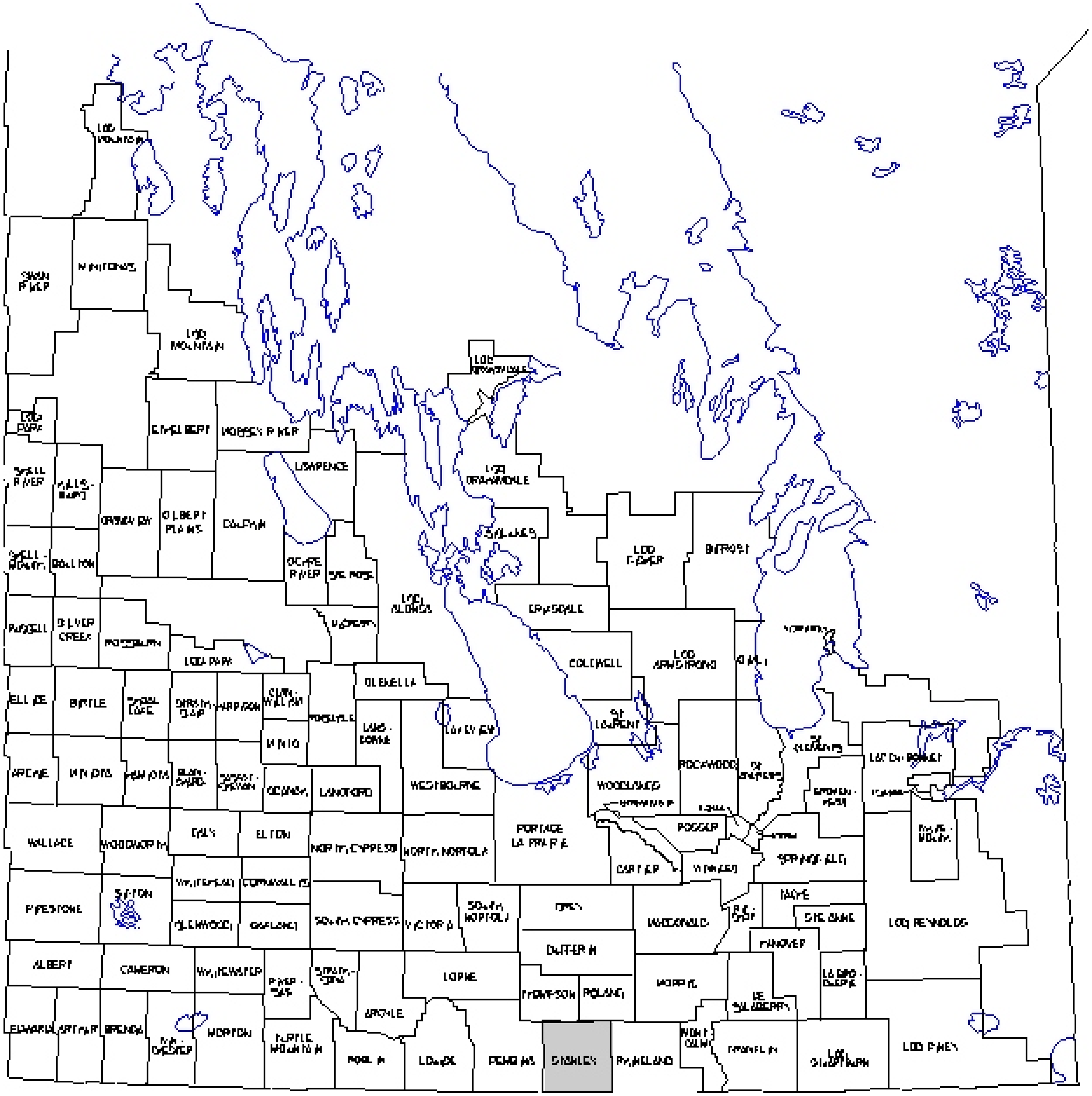


Figure 1. Rural municipalities of southern Manitoba.

INTRODUCTION

The location of the Rural Municipality of Stanley is shown in Figure 1. A brief overview of the database information, and general environmental conditions for the municipality are presented. A set of maps derived from the data for typical agricultural land use and planning applications are also included.

The soil map and database were compiled and registered using the Geographic Information System (PAMAP GIS) facilities of the Manitoba Land Resource Unit. These databases were used in the GIS to create the generalized, derived and interpretive maps and statistics in this report. The final maps were compiled and printed using Coreldraw.

This bulletin is available in printed or digital format. The digital bulletin is a Windows based executable file which offers additional display options, including the capability to print any portion of the bulletin.

LAND RESOURCE DATA

The soil and terrain information presented in this bulletin was compiled as part of a larger project to provide a uniform level of land resource information for agricultural and regional planning purposes throughout Agro-Manitoba. This information was compiled and analysed in two distinct layers as shown in Figure 2.

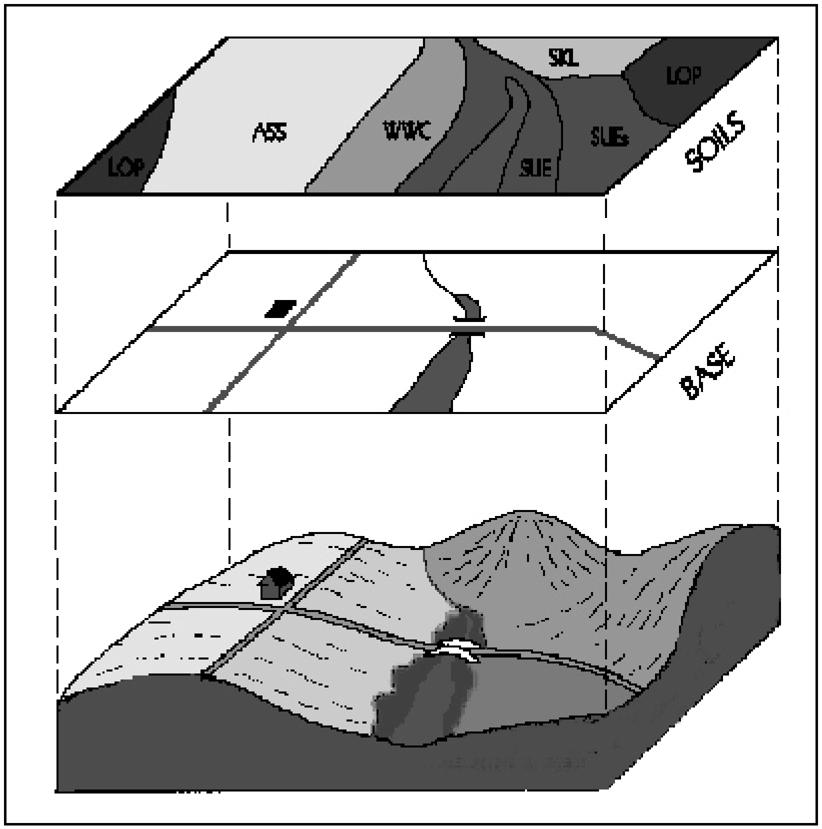


Figure 2. Soil and Base Map data.

Base Layer

Digital base map information includes the municipality and township boundaries, along with major streams, roads and highways. Major rivers and lakes from the base layer were also used as common boundaries for the soil map layer. Water bodies larger than 25 ha in size were digitized as separate polygons.

Soil Layer

The most detailed soil information currently available was selected as the data source for the digital soil layer for each rural municipality.

Comprehensive detailed soil maps (1:20 000 to 1:50 000 scale) have been published for many rural municipalities. Where they were available, the individual soil map sheets were digitized and compiled as a single georeferenced layer to match the digital RM base. Map polygons have one or more soil series components, as well as slope and stoniness classes. Soil database information was produced for each polygon, to meet national standards (MacDonald and Valentine, 1992). Slope length classes were also added, based on photo-interpretation.

Older, reconnaissance scale soil maps (1:126 720 scale) represented the only available soil data source for many rural municipalities. These maps were compiled on a **soil association** basis, in which soil landscape patterns were identified with unique surficial geological deposits and textures. Each soil association consists of a range of different soils ("associates") each of which occurs in a repetitive position in the landscape. Modern soil series that best represent the soil association were identified for each soil polygon. The soil and modifier codes provide a link to additional databases of soil properties. In this way, both detailed and reconnaissance soil map polygons were related to soil drainage, surface texture, and other soil properties to produce various interpretive maps. Slope length classes were also added, based on photo-interpretation.

LAND RESOURCE OVERVIEW

The Rural Municipality (RM) of Stanley covers nine townships (approximately 87 000 ha) in south-central Manitoba. The towns of Morden and Winkler are the largest population centres. Land use within the rural municipality is predominantly agriculture.

Soils in the municipality have been mapped previously, at 1:20 000 and 1:50 000 scales, and published in report D60, Soils of the Rural Municipalities of Grey, Dufferin, Roland, Thompson, and part of Stanley (Michalyna et al, 1988) and Report 18, Soils of the Morden - Winkler Area (Smith et al. 1973).

Based on climatic data from Morden, mean annual temperature is 3.3˚C; mean annual precipitation is 520.3 mm; growing degree days above 5˚C are 1647 (Environment Canada, 1993) and average frost-free period is 126 days (Environment Canada, 1982). The calculated seasonal moisture deficit between May and September period is 250 mm; effective growing degree days (EGDD) above 5˚C accumulated from May to September are 1500 to 1600. This parameter provides an indication of heat energy available for crop growth (Agronomic Interpretations Working Group, 1995).

The RM of Stanley can be separated into three regions based on soil and terrain factors; the Manitou Plain and Pembina Hills, the Red River Valley and the Pembina Escarpment). A bedrock-controlled, hummocky morainic landscape (Manitou Plain and Pembina Hills) occurs in the southwest corner of the municipality. This upland area ranges in elevation from 380 to 495 m a.s.l. with a local relief of 5 to 15 m on isolated knolls. Surface deposits consist dominantly of a variable thickness of loamy to fine loamy, slightly stony glacial till over shale bedrock. Dark Gray Chernozems and Luvisols are the dominant soil types. These are well drained, moderately permeable soils,with rapid runoff and a water table usually well below the rooting depth. These areas are commonly mapped as Dezwood, Oakley, and Pembina soils. Tellier, Zinman, and Nikkel soils can be found in the imperfectly drained sites. The well drained Altamont and imperfectly drained Ullrich soils are common where the till is overlain by shallow lacustrine deposits. Humic Gleysols (Cazlake, Horose, Narish and Guerra soils) occur in depressional areas where drainage is poor and surface ponding is common. Steeply sloping uplands are mostly wooded or are cleared for grazing. Gently sloping uplands are mostly deforested and cultivated for cereal crop production. Localized areas of lacustrine loam over coarse textured glacial fluvial deposits occur within the Pembina Hills. Croyon and Vandal soils are dominant in these well drained sites. Carvey soils (Rego Humic Gleysol) are found in depressional areas where drainage is restricted. A steeply sloping escarpments marks the eastern edge of the Pembina Hills and dissected by several streams. Due to their erosional nature, these steep slopes and channels are undifferentiated and classified as Eroded Slope Complex. The Pembina River cuts through the extreme southwest corner of the RM. The valley associated with the Pembina River is a large glacial meltwater channel. Elevation ranges from 450 m.a.s.l at the top of the valley banks to approximately 360 m.a.s.l. at the Pembina River floodplain. The valley sides are steep and classified as Eroded Slopes Complex, while the valley bottom is imperfectly to poorly drained loamy to coarse loamy recent alluvium deposits and mapped as Levine or Basker soils respectively.

Capability for dryland agriculture varies greatly within this region. Generally this area is class 2 or 3 and is dependant upon topography and drainage. Steeply sloping areas are classified 4T to 6T.

A lacustrine plain at the eastern base of the Pembina Hills is separated from the Red River Valley by a series of glacial beach and outwash deposits. Elevation drops from 380 m asl at the base of the escarpment to 305 m.a.s.l at the boundary between this area and the Red River Valley. The beach and outwash deposits are interspersed throughout the area and are commonly mapped as the rapid to moderately well drained Black and Dark Gray Chernozems of the Birkenhead, Agassiz, and Leary series. Dark Gray well drained Vandal and imperfectly drained Vartel series are common where beach or outwash deposits have a thin overlay of loamy lacustrine materials. Glencross and Roseisle series are found in areas where a thin veneer of medium to fine textured lacustrine sediments overlie glacial till of mixed composition. Fine textured shaly alluvium is often found between the escarpment and glacial beaches. The water table is often near the surface (1m to 2m) and the soils are commonly mapped as the imperfectly drained Blumengart series (Gleyed Cumulic Regosol) and Gretna series (Gleyed Solonetzic Black Chernozem). Saline phases of these two soils are commonly found in areas where seepage of water containing soluble salts from the Pembina Hills has occurred.

Agriculture capability of the soils in this area are generally Class 2 and 3. Soils formed on beach and outwash deposits are rated class 4 and 5 due to their low natural fertility and low water holding capacity. Blumengart and Gretna series range from class 3 to class 5 depending upon the extent and severity of soil salinity. This area has an irrigation suitability of fair to poor depending upon drainage, water holding capacity, and salinity.

The eastern portion of the RM is part of the Red River Valley. The Red River Valley is a level to very gently sloping, lacustrine plain characterized by nearly level fluvial lacustrine loams, alluvium and lacustrine clays. Elevation ranges from 305 m.a.s.l in the western portion to a low of 260 m.a.s.l in the east. Low relief and medium to fine textured deposits at or near the surface have resulted in imperfect drainage over much of this area. The soils in this area can be split into two general groupings based upon surface texture. Areas where the dominant surface texture is clay are represented by imperfectly drained Black Chernozems (Red River, Deadhorse, Dugas, Scanterbury and Plum Coulee series). Poorly drained sites have been mapped as Osborne series (Rego Humic Gleysol). The imperfectly drained Blumengart and Gretna series are developed on fine textured shaly alluvium. Black Chernozem soils developed on imperfectly drained coarse loamy to fine loamy fluvial lacustrine deposits are commonly mapped as the Reinland, Eigenhoff, Edenburg, Gnadenthal, Hochfeld, Kronstal, Neuenberg, Neuhorst and Rignold series.

Agriculture capability for the finer textured soils in this area are rated class 2 and 3. Excess moisture and the occurrence of salinity are the main limitations. These soils are considered fair to poor for irrigation with the main limitation being poor drainage and salinity. Soils with a coarser surface texture have slightly improved drainage and are generally rated class 1 and 2 for agricultural capability and good for irrigation suitability.

Land use in the RM of Stanley is primarily agricultural with small areas of woodland, pasture, urban development and recreation. Annual crop production is the dominant use of land through the RM (73.9 %). Areas in which relief or other soil factors prevent annual crop production are maintained in a native forested state (9.2%) or grassland (9.5%) and forage production (1.4%) for use in livestock enterprises. The remainder of the land area is being utilized for various non-agricultural applications.

Due to local relief, soil erosion from water can be a serious problem in the Pembina Hills. In the lacustrine plains east of the Pembina Hills, coarser textured materials may be susceptible to wind erosion. In both cases proper management techniques must be applied to minimize soil losses.

DERIVED AND INTERPRETIVE MAPS

A large variety of computer derived and interpretive maps can be generated from the digital soil and landscape databases. These maps are based on selected combinations of database values and assumptions.

Derived maps show information that is given in one or more columns in the computer map legend (such as soil drainage, soil salinity, or slope class).

Interpretive maps portray more complex land evaluations based on a combination of soil and landscape information. Interpretations are based on soil and landscape conditions in each polygon. Interpretative maps typically show land capabilities, suitabilities, or risks related to sustainability.

Several examples of derived and interpretive maps are included in this information bulletin:

<u>Derived Maps</u>
Slope
Surface Texture
Drainage
Salinity
Management Considerations

<u>Interpretative Maps</u>
Agricultural Capability
Irrigation Suitability
Potential Environmental Impact
Water Erosion Risk
Land Use.

The maps have all been reduced in size and generalized (simplified) in order to portray conditions for an entire rural municipality on one page. These generalized maps provide a useful overview of conditions within a municipality, but are not intended to apply to site specific land parcels. On-site evaluations are recommended for localized site specific land use suitability requirements.

Digital databases derived from recent detailed soil inventories contain additional detailed information about significant inclusions of differing soil and slope conditions in each map polygon. This information can be portrayed at larger map scale than shown in this bulletin.

Information concerning particular interpretive maps, and the primary soil and terrain map data, can be obtained by contacting the Manitoba Soil Resource Section of Manitoba Agriculture, the local PFRA office, or the Manitoba Land Resource Unit.

Slope Map.

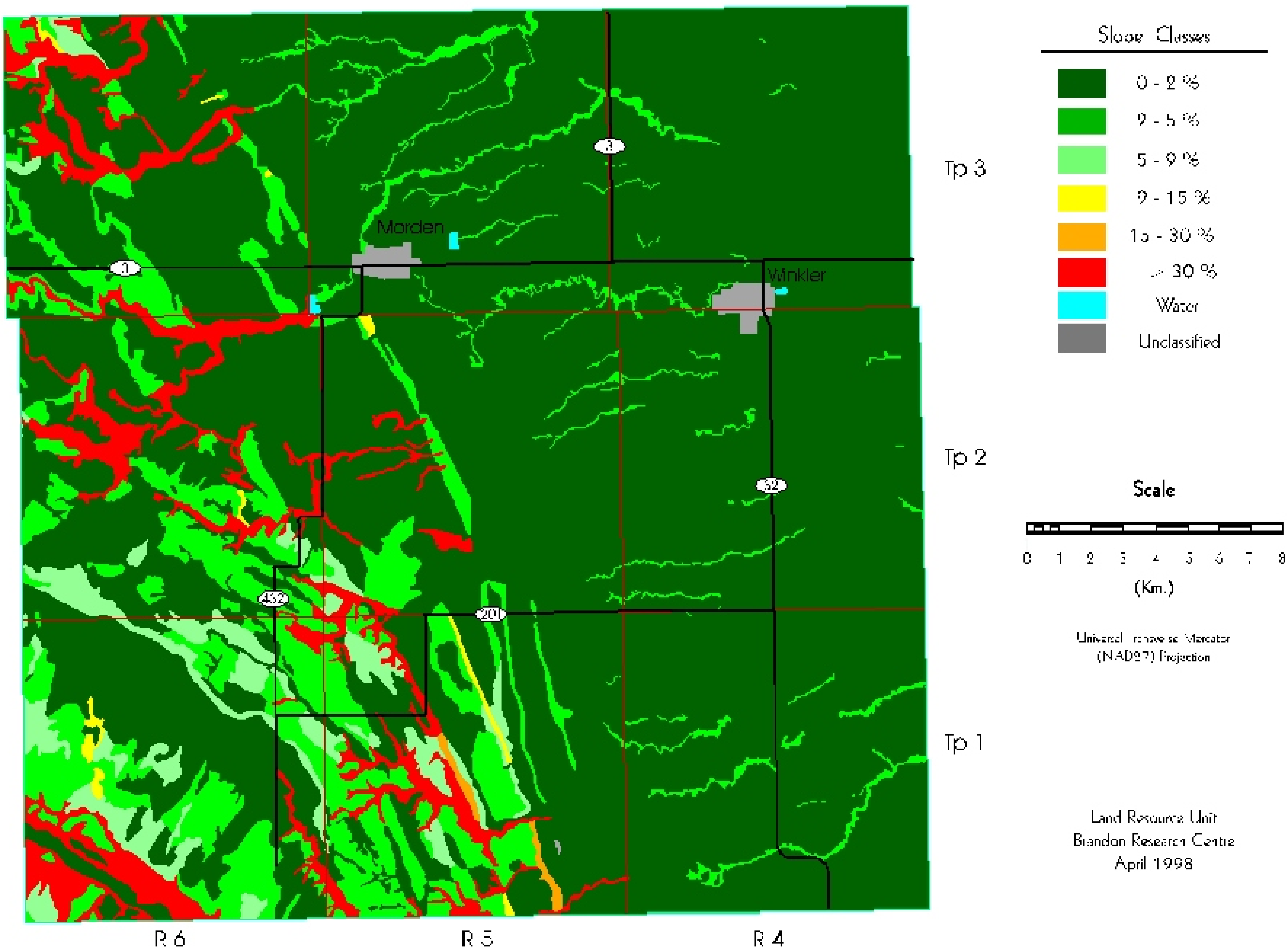
Slope describes the steepness of the landscape surface. The slope classes shown on this map are derived from the digital soil layer database. Specific colours are used to indicate the dominant slope class for each soil polygon in the RM. Additional slope classes may occur in each polygon area, but cannot be portrayed at this reduced map scale.

Table 1. Slope Classes[1]

Slope Class	Area (ha)	Percent of RM
0 - 2 %	67766	77.4
2 - 5 %	10924	12.5
5 - 9 %	2854	3.3
9 - 15 %	263	0.3
15 - 30 %	145	0.2
> 30 %	5149	5.9
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Area has been assigned to thedominant slope class in each soil map polygon.

Slope Map


Morden
Winkler
3
32
432
201
Tp 3
Tp 2
Tp 1
R 6
R 5
R 4
Slope Classes
0 - 2 %
2 - 5 %
5 - 9 %
9 - 15 %
15 - 30 %
> 30 %
Water
Unclassified
Scale
0 1 2 3 4 5 6 7 8
(Km.)
Universal Transverse Mercator
(NAD27) Projection
Land Resource Unit
Brandon Research Centre
April 1998

Surface Texture Map.

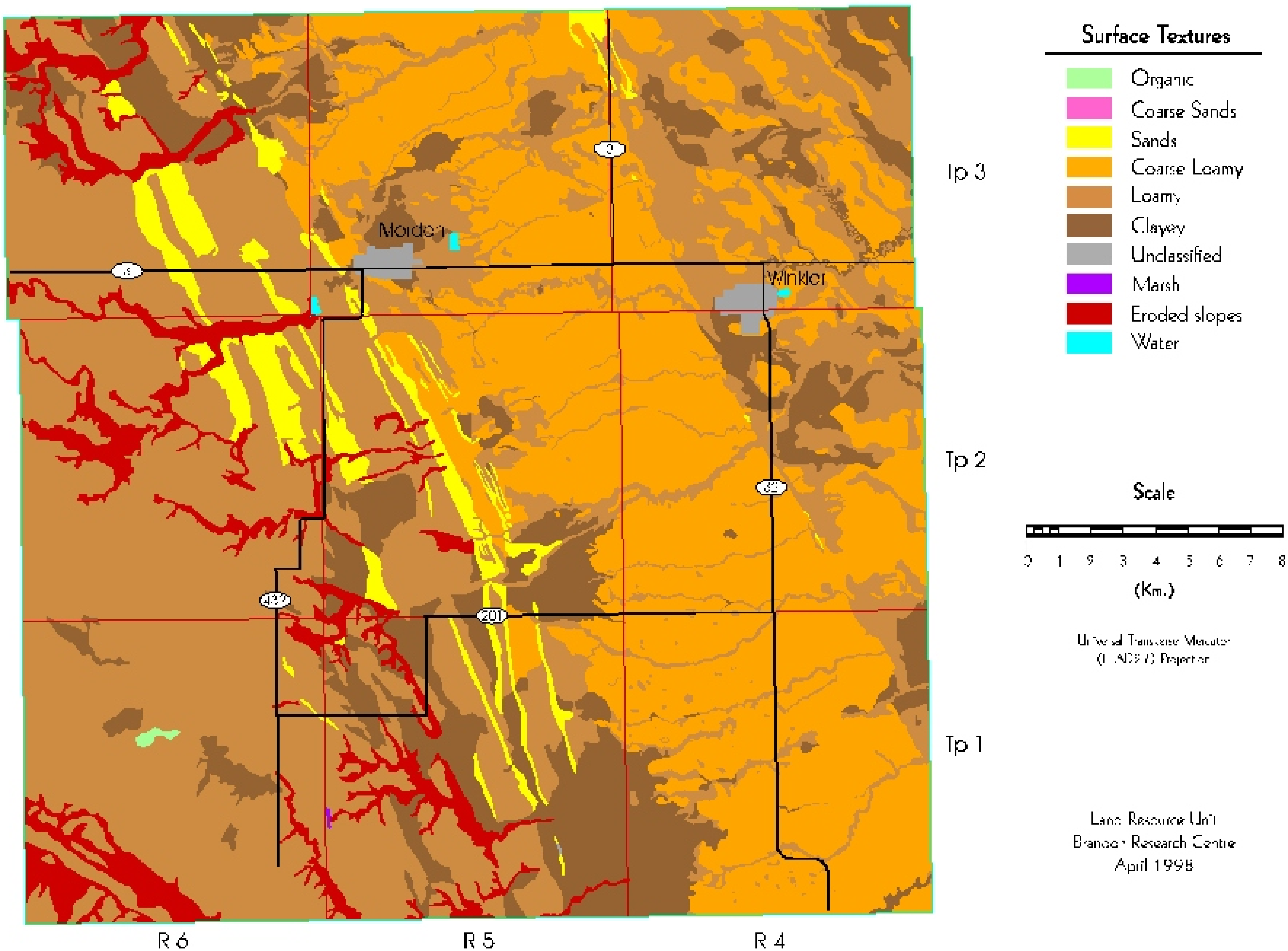
The soil textural class for the upper most soil horizon of the dominant soil series within a soil polygon was utilized for classification. Texture may vary from that shown with soil depth and location within the polygon.

Table 2. Surface Texture[1]

Surface Texture	Area (ha)	Percent of RM
Organics	45	0.1
Coarse Sands	0	0.0
Sands	3155	3.6
Coarse Loamy	27048	30.9
Loamy	39736	45.4
Clayey	11958	13.7
Eroded Slopes	5149	5.9
Marsh	9	0.0
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Based on the **dominant** soil series for each soil polygon.

Surface Texture Map



Soil Drainage Map.

Drainage is described on the basis of actual moisture content in excess of field capacity, and the length of the saturation period within the plant root zone. Six drainage classes plus four land classes are shown on this map.

Very Poor - Water is removed from the soil so slowly that the water table remains at or on the soil surface for the greater part of the time the soil is not frozen. Excess water is present in the soil throughout most of the year.

Poor - Water is removed so slowly in relation to supply that the soil remains wet for a large part of the time the soil is not frozen. Excess water is available within the soil for a large part of the time.

Imperfect - Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season. Excess water moves slowly down the profile if precipitation is the major source.

Well - Water is removed from the soil readily but not rapidly. Excess water flows downward readily into underlying materials or laterally as subsurface flow.

Rapid - Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep slopes during heavy rainfall.

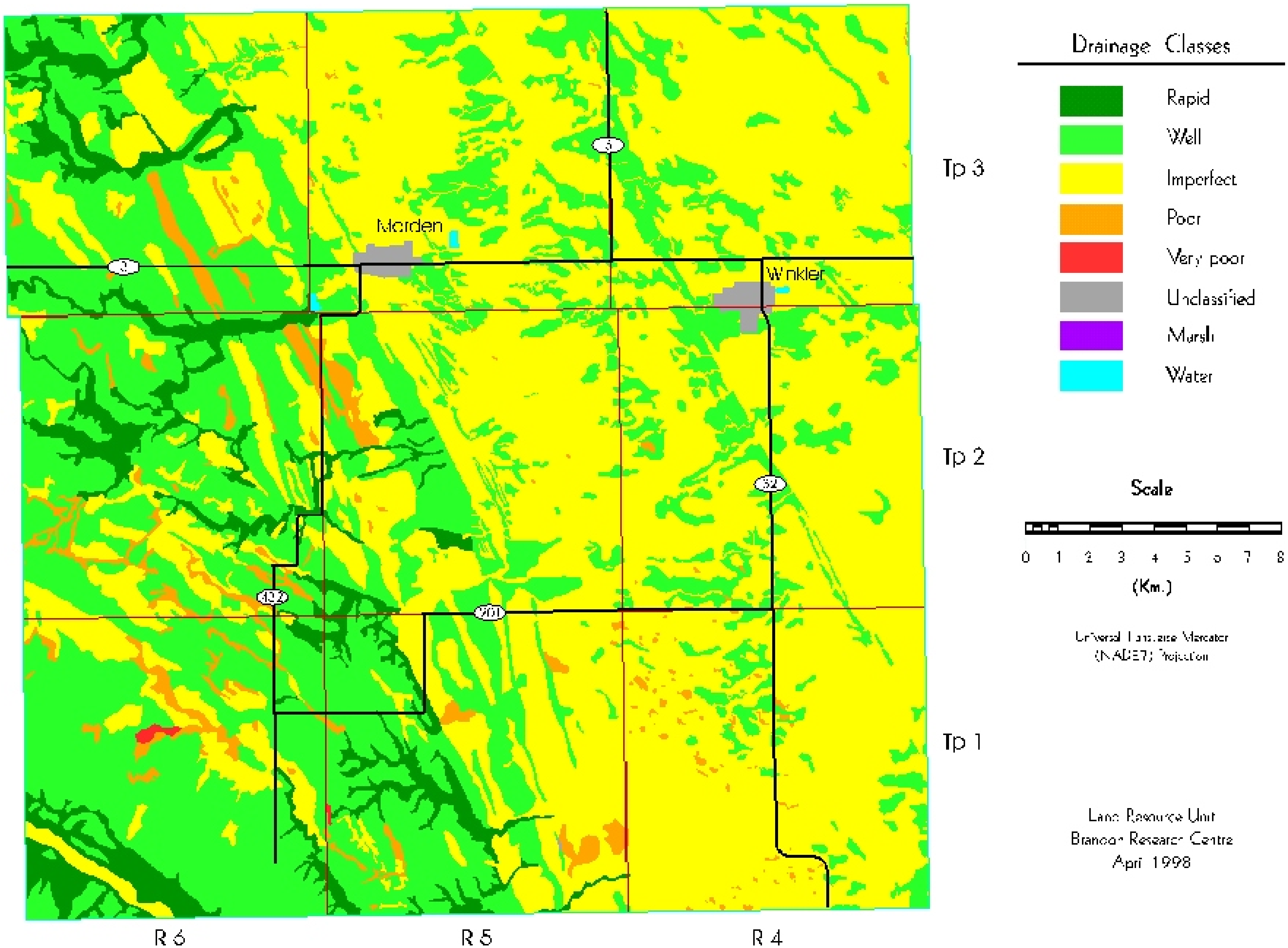
Drainage classification is based on the dominant soil series within each individual soil polygon.

Table 3. Drainage Classes[1]

Drainage Class	Area (ha)	Percent of RM
Very Poor	45	0.1
Poor	2372	2.7
Imperfect	47587	54.3
Well	31930	36.5
Rapid	5158	5.9
Marsh	9	0.0
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Area has been assigned to the dominant drainage class for each soil polygon.

Soil Drainage Map



Soil Salinity Map.

A saline soil contains soluble salts in such quantities that they interfere with the growth of most crops. Soil salinity is determined by the electrical conductivity of the saturation extract in decisiemens per metre (dS/m). Approximate limits of salinity classes are:

non-saline	< 4 dS/m
weakly saline	4 to 8 dS/m
moderately saline	8 to 15 dS/m
strongly saline	> 15 dS/m.

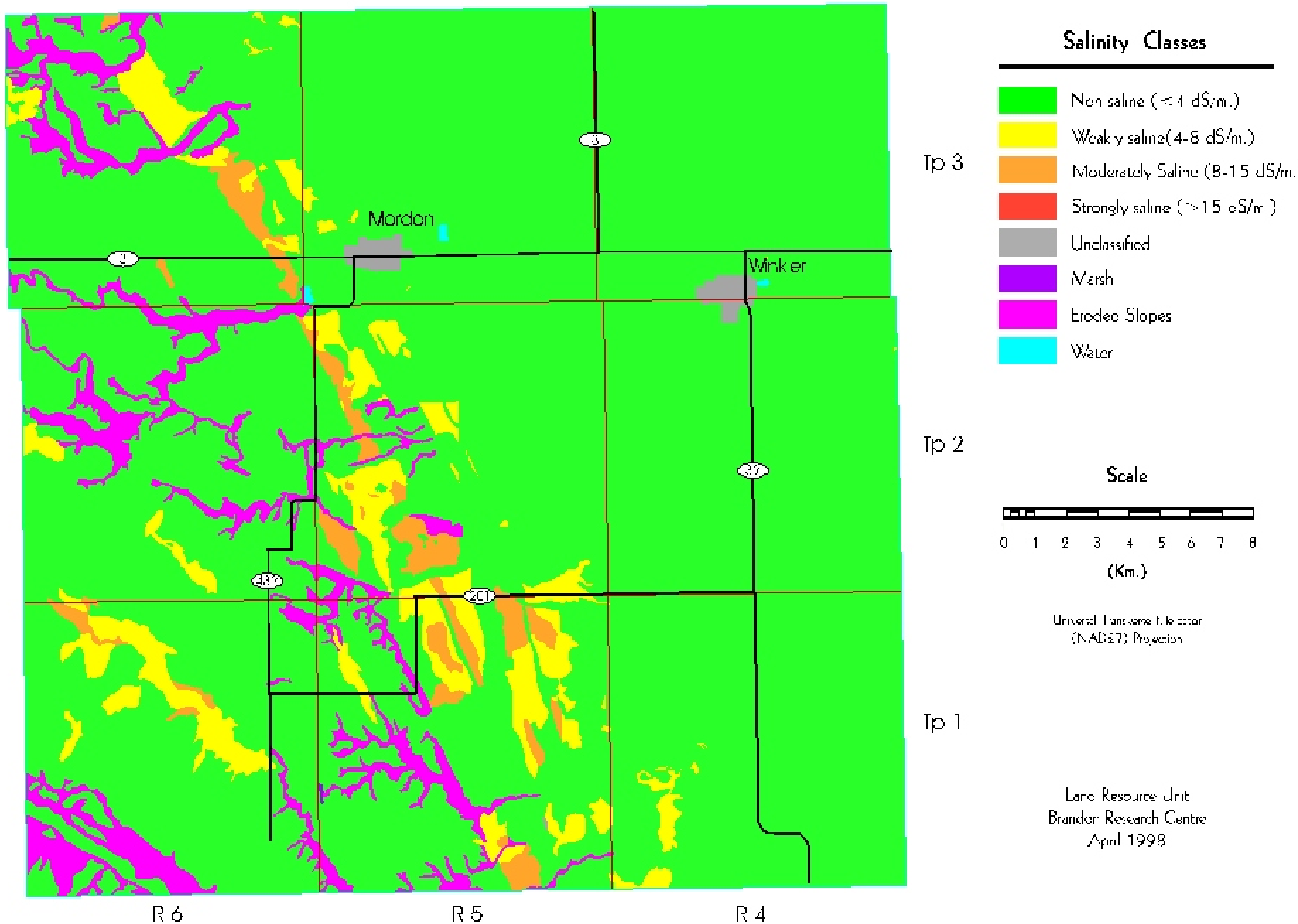
The salinity classification of each individual soil polygon was determined by the most severe salinity classification present within that polygon.

Table 4. Salinity Classes[1]

Salinity Class	Area (ha)	Percent of RM
Non Saline	75228	85.9
Weakly Saline	4764	5.4
Moderately Saline	1952	2.2
Strongly Saline	0	0.0
Eroded Slopes	5149	5.9
Marsh	9	0.0
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Area has been assigned to the most severe salinity class for each soil polygon.

Soil Salinity Map



Management Considerations Map.

Management consideration maps are provided to focus on awareness of land resource characteristics important to land use. This map does not presume a specific land use. Rather it portrays the most common and wide spread attributes that apply to most soil landscapes in the province.

These maps **highlight attributes** of soil-landscapes that the land manager must consider for any intended land use.

- **Fine texture**
- **Medium texture**
- **Coarse texture**
- **Topography**
- **Wetness**
- **Organic**
- **Bedrock**

F = Fine texture - soil landscapes with **fine textured soils (clays and silty clays)**, have low infiltration and internal permeability rates. These require special considerations to mitigate surface ponding (water logging), runoff, and trafficability. Timing and type of tillage practices used may be restricted.

M = Medium texture - soil landscapes with medium to moderately fine textures **(loams to clay loams)**, and good water and nutrient retention properties. Good management and cropping practices are required to minimize leaching and the risk of erosion.

C = Coarse texture - soil landscapes with **coarse to very coarse textured soils (loamy sands, sands and gravels)** have a high permeability throughout the profile, and require special management practices related to application of agricultural chemicals, animal wastes, and municipal effluent to protect and sustain the long term quality of the soil and water resources. The risk of soil erosion can be minimized through the use of shelterbelts and maintenance of crop residues.

T = Topography - soil landscapes with **slopes greater than 5 %** are steep enough to require special management practices to minimize the risk of erosion.

W = Wetness - soil landscapes that have **poorly drained soils and/or >50 % wetlands** (due to seasonal and annual flooding, surface ponding, permanent water bodies (sloughs), and/or high water tables), require special management practices to mitigate adverse impact on water quality, protect subsurface aquifers, and sustain crop production during periods of high risk of water logging.

O = Organic - soil landscapes with organic soils, requiring special management considerations of drainage, tillage, and cropping to sustain productivity and minimize subsidence and erosion.

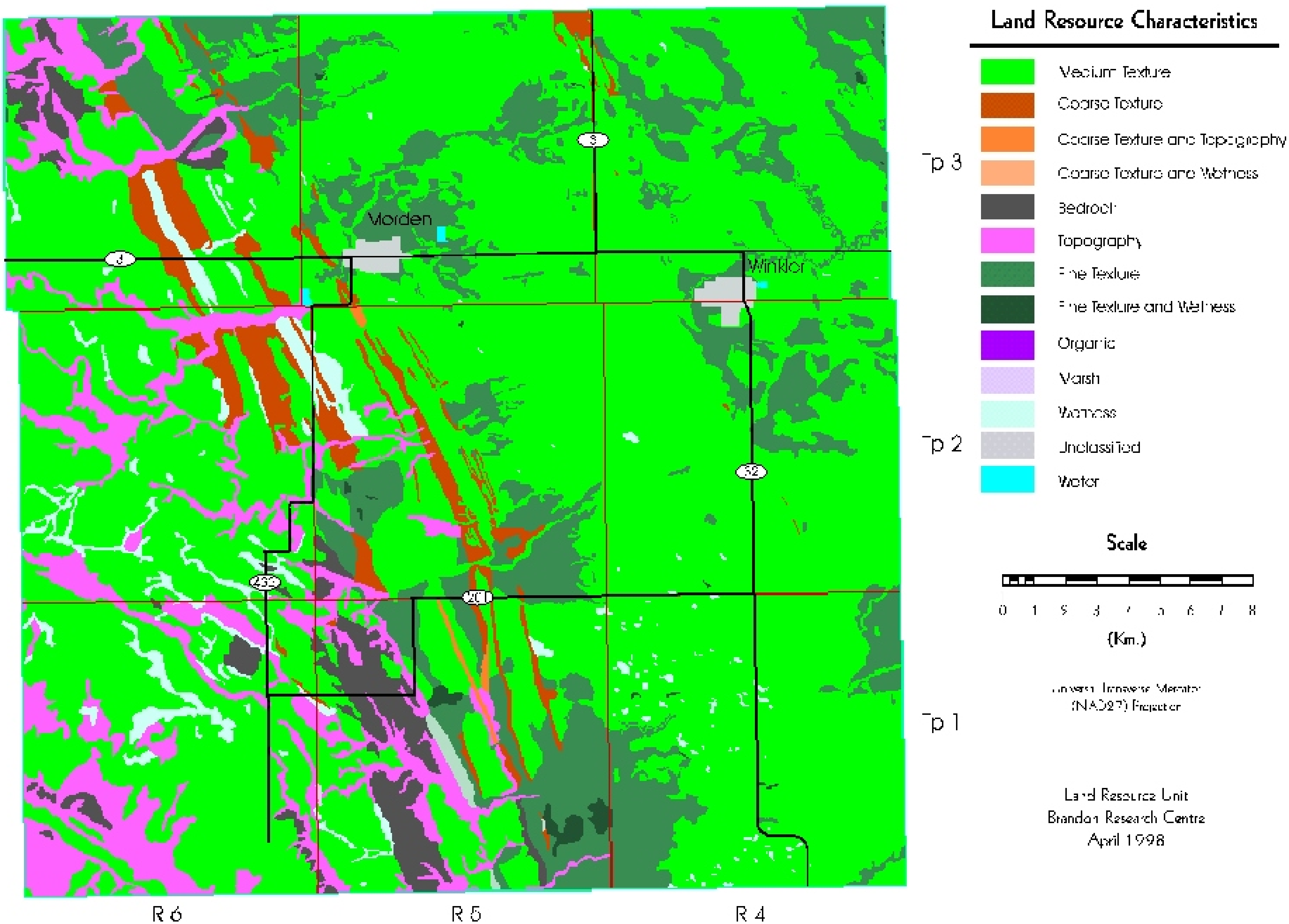
R = Bedrock - soil landscapes that have shallow depth to bedrock (< 50 cm) and/or exposed bedrock which may prevent the use of some or all tillage practices as well as the range of potential crops. They require special cropping and management practices to sustain agricultural production.

Table 5. Management Considerations[1]

Land Resource Characteristics	Area (ha)	Percent of RM
Fine Texture	12344	14.1
Fine Texture and Wetness	287	0.3
Fine Texture and Topography	148	0.2
Medium Texture	59159	67.6
Coarse Texture	3028	3.5
Coarse Texture and Wetness	0	0.0
Coarse Texture and Topography	128	0.1
Topography	7472	8.5
Topography and Bedrock	0	0.0
Wetness	2130	2.4
Wetness and Topography	0	0.0
Bedrock	0	0.0
Organic	0	0.0
Marsh	9	0.0
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Based on **dominant** soil series for each soil polygon.

Management Considerations Map



Agricultural Capability Map.

This evaluation utilizes the 7 class Canada Land Inventory system (CLI, 1965). Classes 1 to 3 represent the prime agricultural land, class 4 land is marginal for sustained cultivation, class 5 land is capable of perennial forages and improvement is feasible, class 6 land is capable of producing native forages and pasture but improvement is not feasible, and class 7 land is considered unsuitable for dryland agriculture. Subclass modifers include structure and/or permeability (D), erosion (E), inundation (I), moisture limitation (M), salinity (N), stoniness (P), consolidated bedrock (R), topography (T), excess water (W) and cumulative minor adverse characteristics (X).

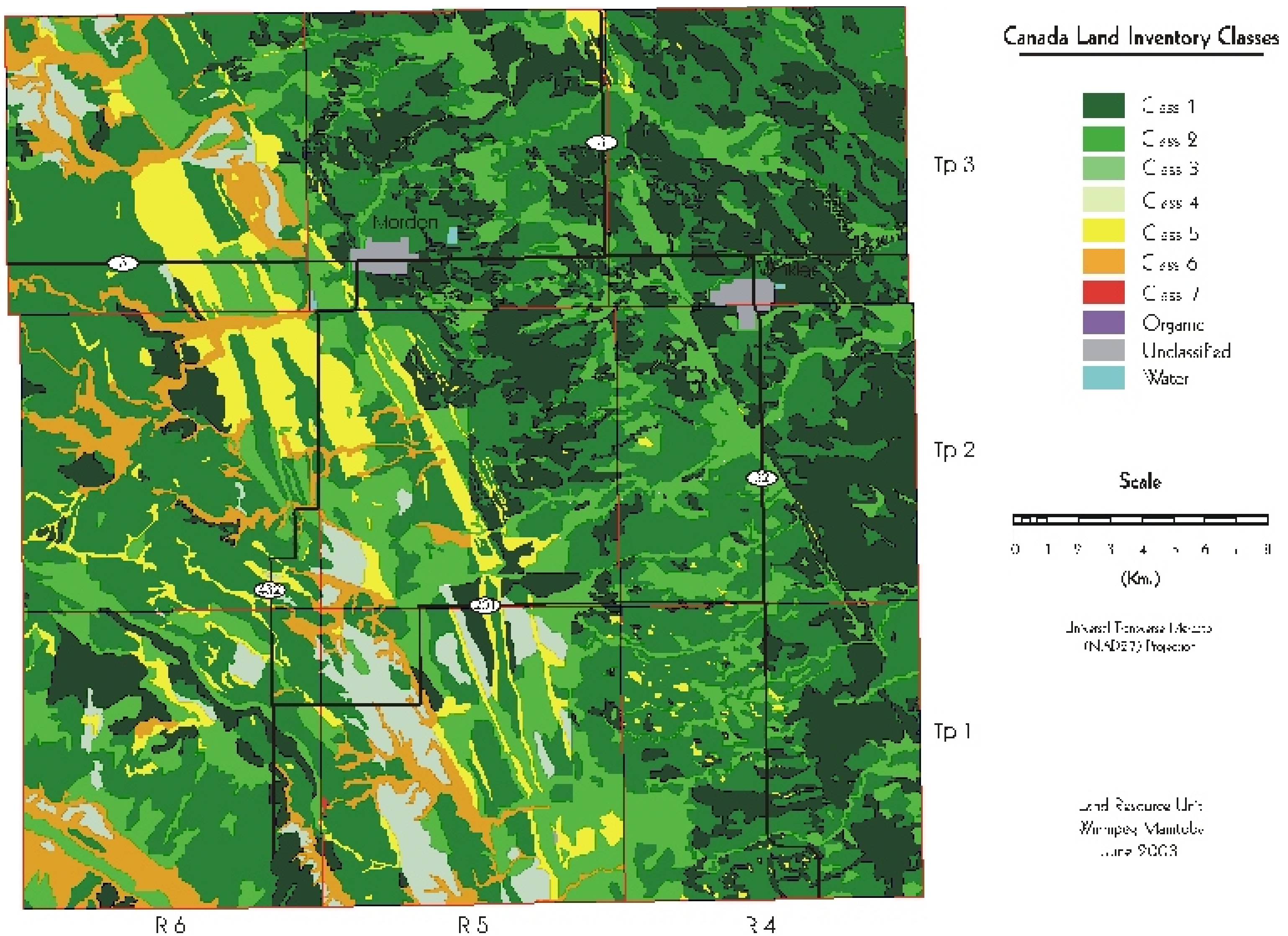
This generalized interpretive map is based on the dominant soil series and phases for each soil polygon. The CLI subclass limitations cannot be portrayed at this generalized map scale.

Table 6. Agricultural Capability[1]

Class Subclass	Area (ha)	Percent of RM
1	**17365**	**19.9**
2	**37239**	**42.6**
2D	351	0.4
2I	27	0.0
2M	12722	14.6
2ME	310	0.4
2MP	174	0.2
2P	179	0.2
2T	5765	6.6
2TE	279	0.3
2TP	665	0.8
2TW	436	0.5
2W	11475	13.1
2WP	158	0.2
2X	4697	5.4
3	**117544**	**20.1**
3D	269	0.3
3DN	918	1.1
3I	5371	6.1
3M	5820	6.7
3MP	38	0.0
3N	2349	2.7
3NI	103	0.1
3NW	48	0.1
3P	351	0.4
3T	2248	2.6
3TE	7	0.0
3W	21	0.0
4	**3521**	**4.0**
4M	6	0.0
4N	722	0.8
4NI	222	0.3
4P	124	0.1
4R	2097	2.4
4RP	212	0.2
4RT	8	0.0
4T	132	0.2
5	**5654**	**6.5**
5M	3163	3.6
5RM	105	0.1
5T	73	0.1
5W	2059	2.4
5WI	254	0.3
6	**5570**	**6.4**
6P	387	0.4
6T	5137	5.9
6W	46	0.1
7	**9**	**0.0**
7W	9	0.0
Unclassified	**430**	**0.5**
Water	**41**	**0.0**
Total	**87373**	**100.0**

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Agriculture Capability Map



Irrigation Suitability Map.

Irrigation ratings are based on an assessment of the most limiting combination of soil and landscape conditions. Soils in the same class have a similar relative suitability or degree of limitation for irrigation use, although the specific limiting factors may differ. These limiting factors are described by subclass symbols at detailed map scales. The irrigation rating system does not consider water availability, method of application, water quality, or economics of irrigated land use.

Irrigation suitability is a four class rating system. Areas with no or slight soil and/or landscape limitations are rated **Excellent** to **Good** and can be considered irrigable. Areas with moderate soil and/or landscape limitations are rated as **Fair** and considered marginal for irrigation providing adequate management exists so that the soil and adjacent areas are not adversely affected by water application. Soil and landscape areas rated as **Poor** have severe limitations for irrigation.

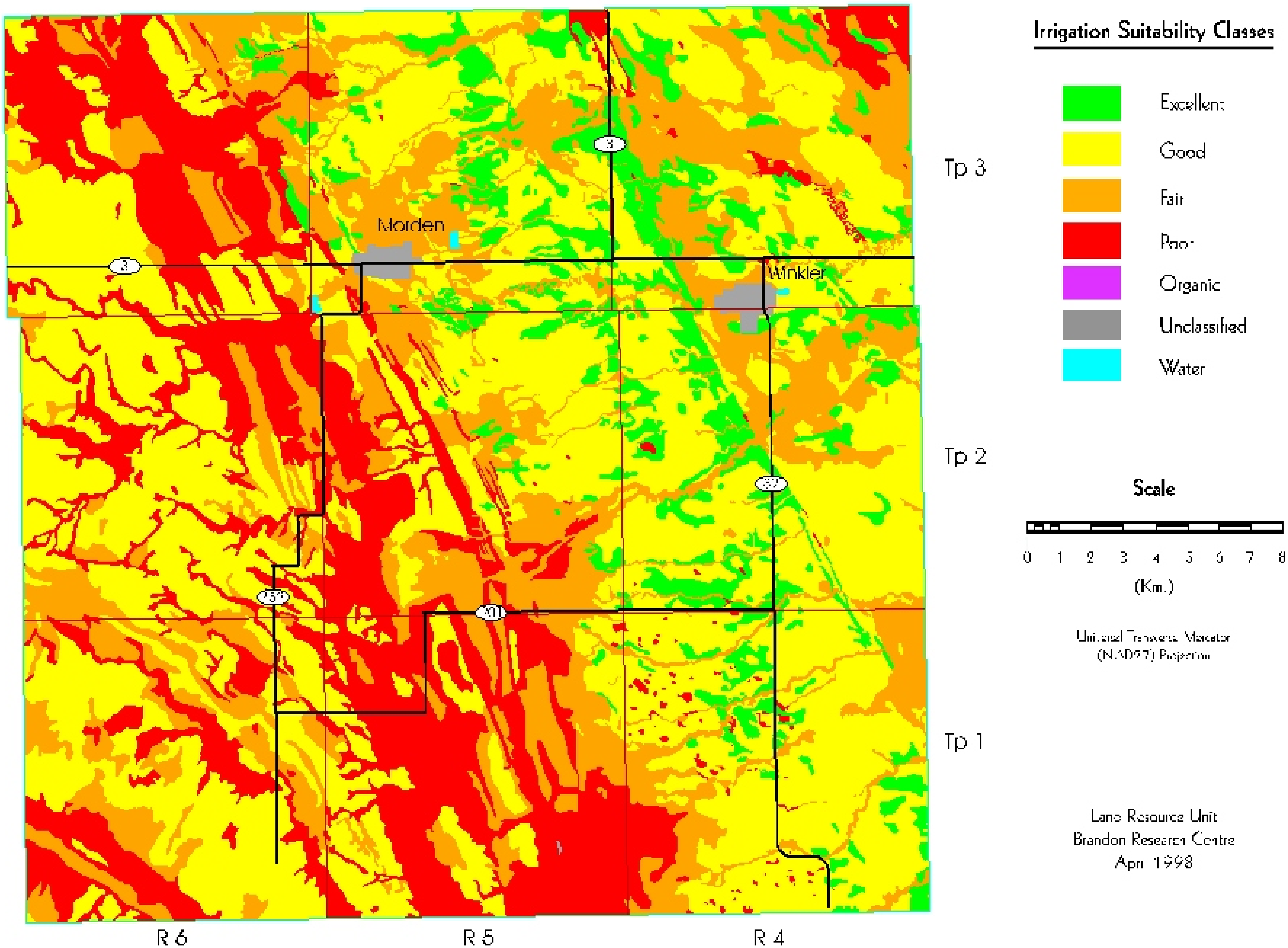
This generalized interpretive map is based on the dominant soil series for each soil polygon, in combination with the dominant slope class. The nature of the subclass limitations and the classification of subdominant components is not shown at this generalized map scale.

Table 7. Irrigation Suitability[1]

Class	Area (ha)	Percent of RM
Excellent	6918	7.9
Good	40443	46.2
Fair	20932	23.9
Poor	18808	21.5
Organic	0	0.0
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Irrigation Suitability Map



Potential Environmental Impact Under Irrigation Map.

A major environmental concern for land under irrigated crop production is the possibility that surface and/or ground water may be impacted. The potential environmental impact assessment provides a relative rating of land into 4 classes (minimal, low, moderate and high) based on an evaluation of specific soil factors and landscape conditions that determine the impact potential.

Soil factors considered are those properties that determine water retention and movement through the soil; topographic features are those that affect runoff and redistribution of moisture in the landscape. Several factors are specifically considered: soil texture, hydraulic conductivity, salinity, geological uniformity, depth to water table and topography. The risk of altering surface and subsurface soil drainage regimes, soil salinity, potential for runoff, erosion and flooding is determined by specific criteria for each property.

Use of this rating is intended to serve as a warning of potential environmental concern. It may be possible to design and/or give special consideration to soil-water-crop management practices that will mitigate any adverse impact.

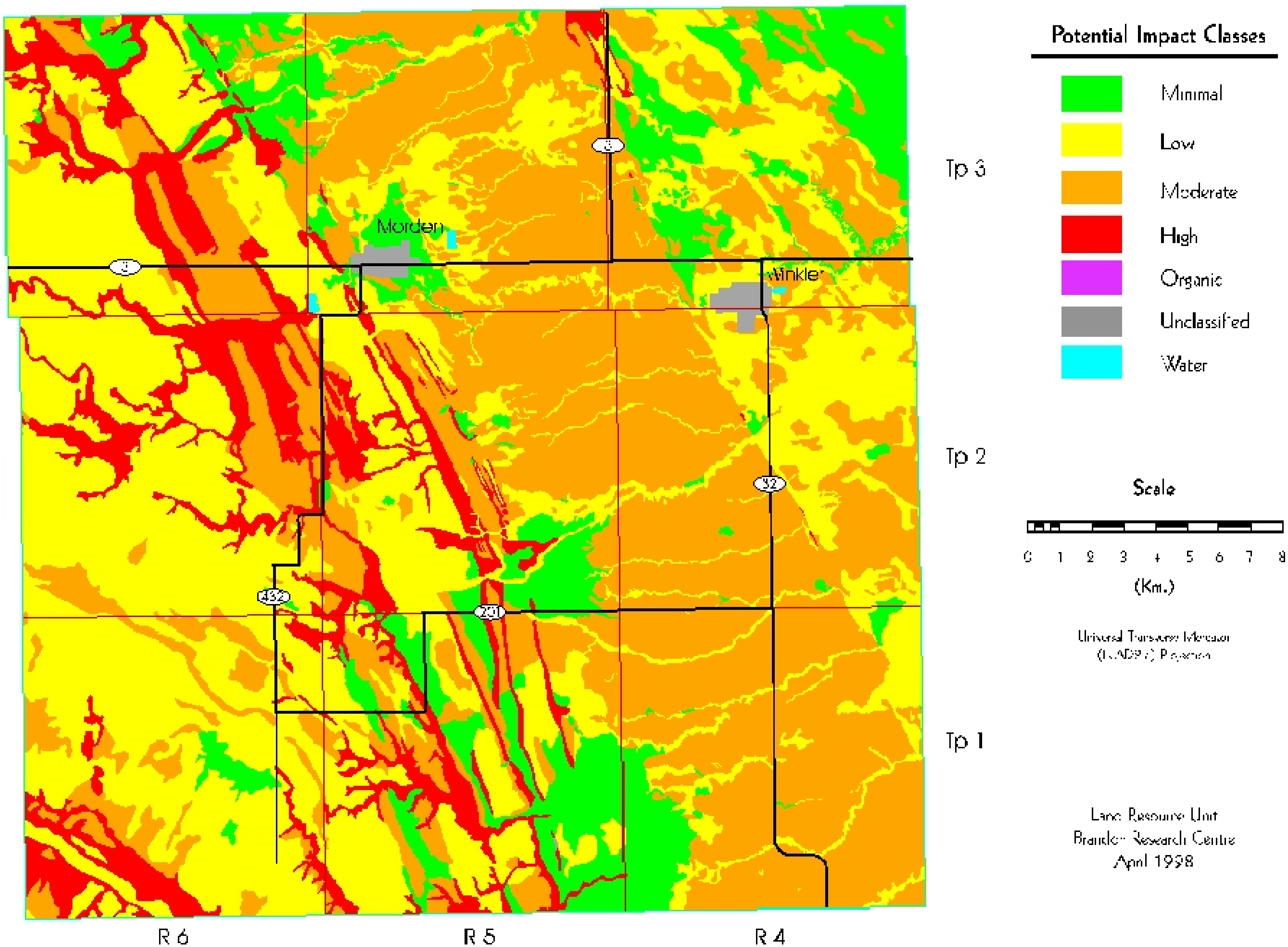
This generalized interpretive map is based on the dominant soil series and slope class for each soil polygon. The nature of the subclass limitations, and the classification of subdominant components is not shown at this generalized map scale.

Table 8. Potential Environmental Impact Under Irrigation[1]

Class	Area (ha)	Percent of RM
Minimal	**9431**	**10.8**
Low	**33731**	**38.5**
Moderate	**35188**	**40.2**
High	**8752**	**10.0**
Organic	**0**	**0.0**
Unclassified	**420**	**0.5**
Water	**43**	**0.0**
Total	**87564**	**100.0**

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Potential Environmental Impact Under Irrigation



Water Erosion Risk Map.

The risk of water erosion was estimated using the universal soil loss equation (USLE) developed by Wischmeier and Smith (1965). The USLE predicted soil loss (tons/hectare/year) is calculated for each soil component in a soil polygon. Erosion risk classes are asigned based on the weighted average soil loss for each map polygon. The map shows 5 classes of soil erosion risk based on bare unprotected soil:

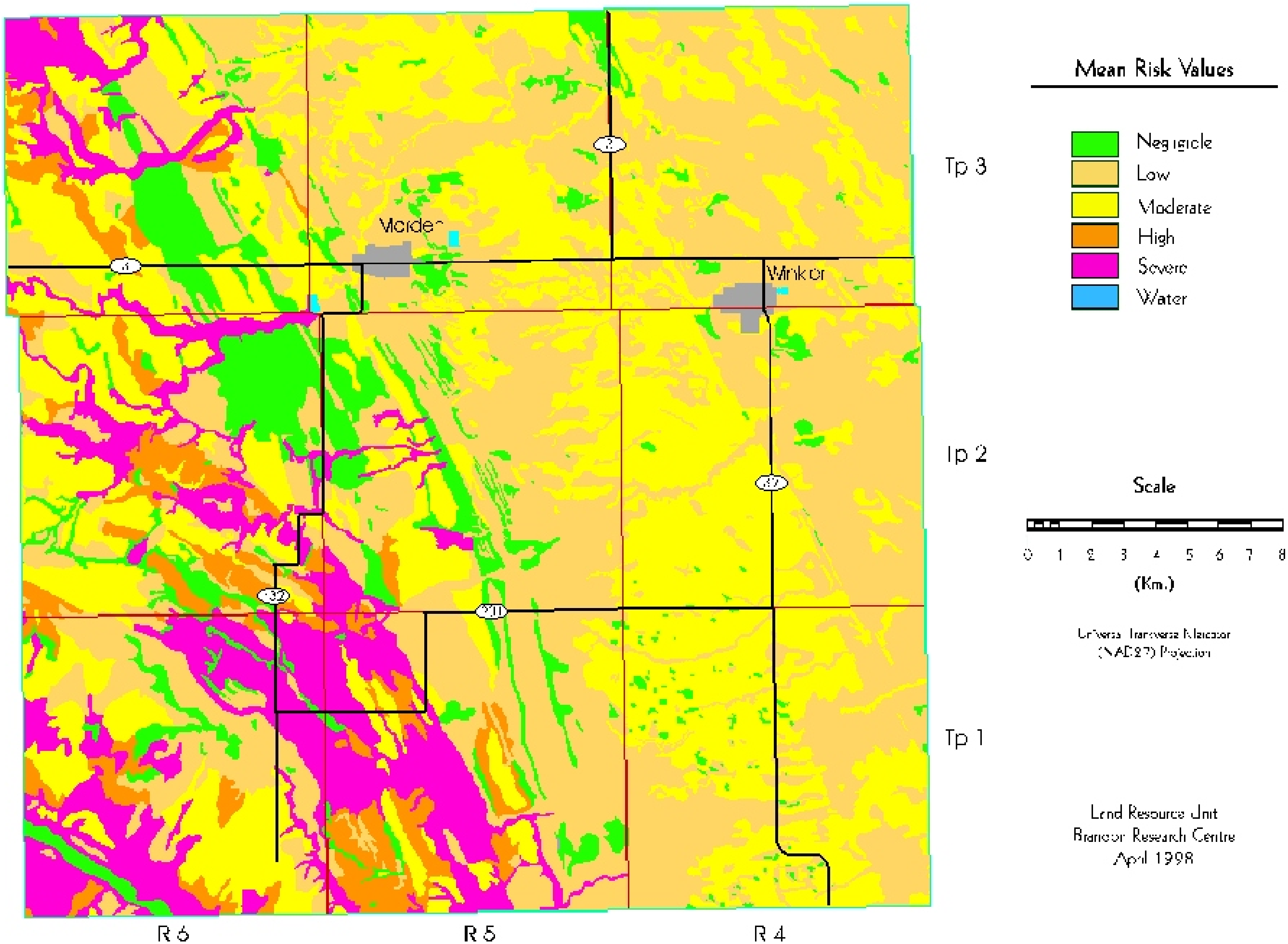
negligible
low
moderate
high
severe.

Cropping and residue management practices will significantly reduce this risk depending on crop rotation program, soil type, and landscape features.

Table 9. Water Erosion Risk

Class	Area (ha)	Percent of RM
Negligible	7047	8.0
Low	35702	40.8
Moderate	30430	34.8
High	4384	5.0
Severe	9539	10.9
Unclassified	420	0.5
Water	43	0.0
Total	87564	100.0

Water Erosion Risk Map



Land Use Map.

The land use classification of the RM has been interpreted from LANDSAT satellite imagery, using supervised computer classification techniques. Many individual spectral signatures were classified and grouped into the seven general land use classes shown here. Although land use changes over time, and some land use practices on individual parcels may occasionally result in similar spectral signatures, this map provides a general representation of the current land use in the RM.

The following is a brief description of the land use classes:

Annual Crop Land - land that is normally cultivated on an annual basis.

Forage - perennial forages, generally alfalfa or clover with blends of tame grasses.

Grasslands - areas of native or tame grasses, may contain scattered stands of shrubs.

Trees - lands that are primarily in tree cover.

Wetlands - areas that are wet, often with sedges, cattails, and rushes.

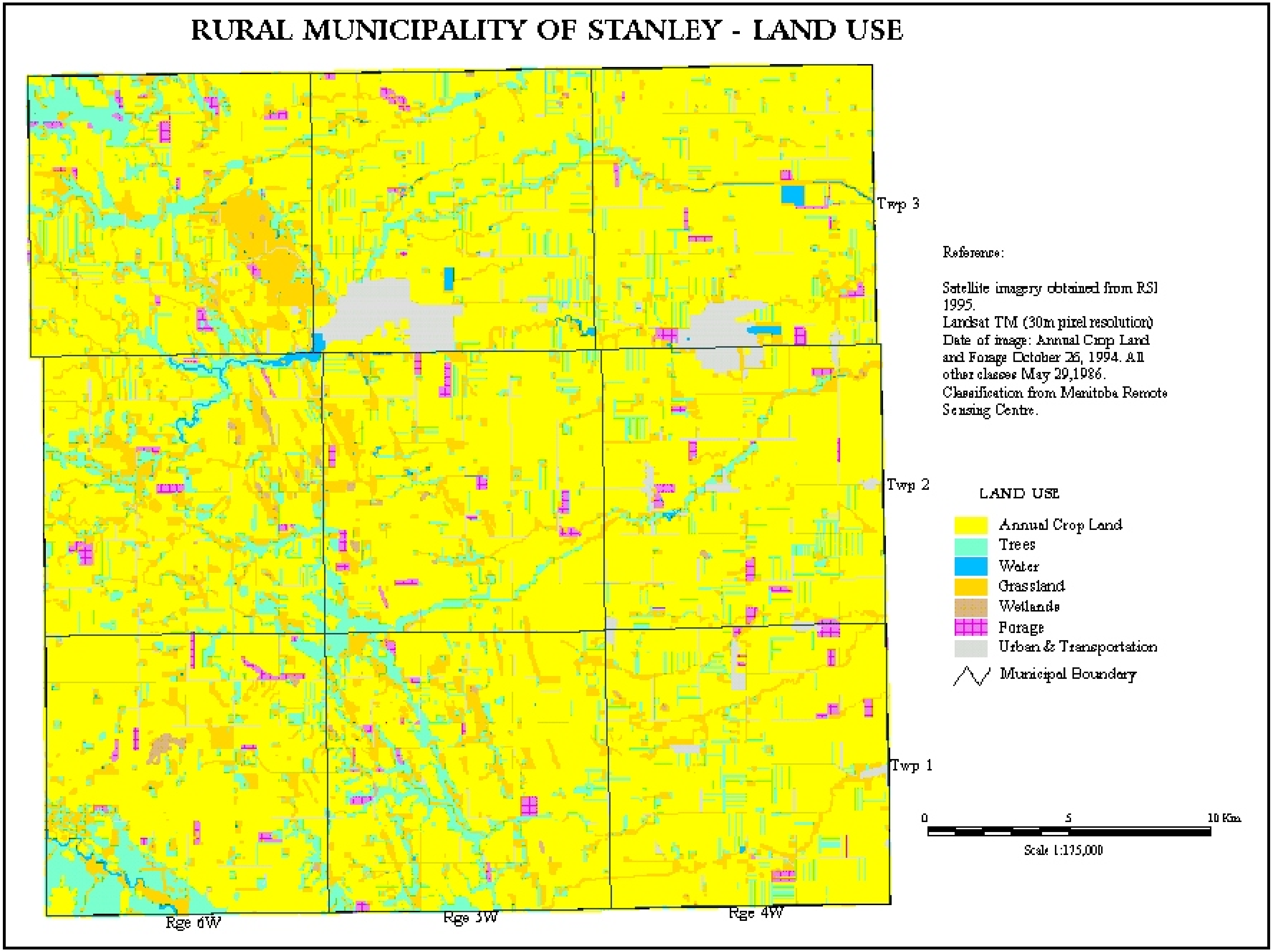
Water - open water - lakes, rivers streams, ponds, and lagoons.

Urban and Transportation - towns, roads, railways, quarries.

Table 10. Land Use[1]

Class	Area (ha)	Percent of RM
Annual Crop Land	**65058**	**73.9**
Forage	**1243**	**1.4**
Grasslands	**8330**	**9.5**
Trees	**8066**	**9.2**
Wetlands	**218**	**0.2**
Water	**304**	**0.3**
Urban and Transportation	**4777**	**5.4**
Total	**87996**	**100.0**

[1] Land use information (1995) and map supplied by Prairie Farm Rehabilitation Administration. Areas may vary from previous maps due to differences in analytical procedures.


RURAL MUNICIPALITY OF STANLEY - LAND USE
Twp 3
Twp 2
Twp 1
Rge 6W
Rge 5W
Rge 4W
Reference:
Satellite imagery obtained from RSI 1995.
Landsat TM (30m pixel resolution)
Date of image: Annual Crop Land and Forage October 26, 1994. All other classes May 29,1986.
Classification from Manitoba Remote Sensing Centre.
LAND USE
Annual Crop Land
Trees
Water
Grassland
Wetlands
Forage
Urban & Transportation
Municipal Boundary
0
5
10 Km
Scale 1:175,000

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