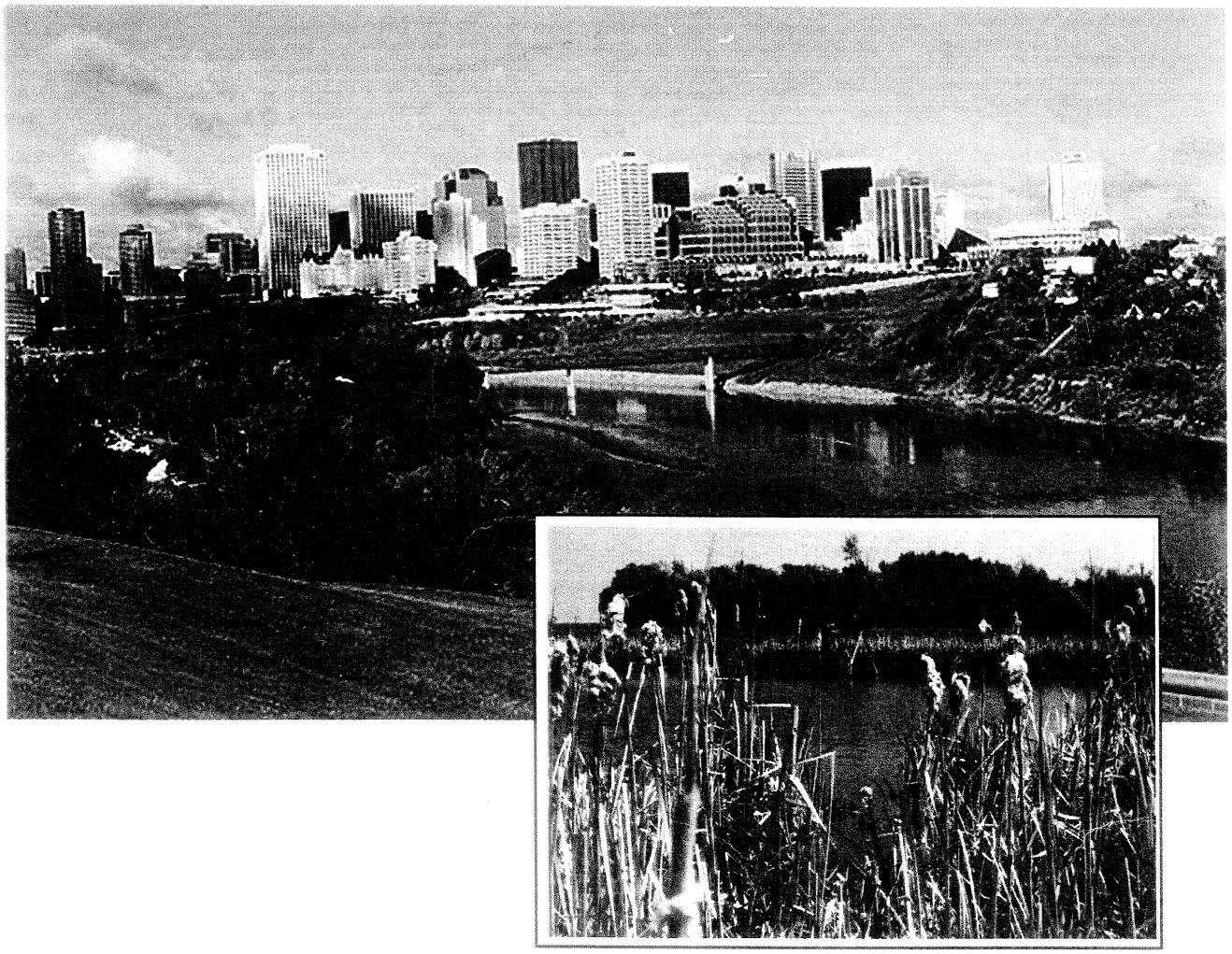
Inventory of environmentally sensitive and significant natural areas

CITY OF EDMONTON

Consolidated Technical Report



GEOWEST
Environmental Consultants Ltd.

GEOWEST
Environmental Consultants Ltd.

Mr. Harvey Crone, Director
Forecasting and Policy Development
Policy and Information Branch
Planning and Development Department
City of Edmonton
3rd Floor, The Boardwalk
10310 - 102 Avenue N.W.
Edmonton, Alberta T5J 2X6

November, 1993

Dear Mr. Crone,

GEOWEST Environmental Consultants Ltd. in association with David M. Ealey Environmental Services and Schwabenbauer Ross & Associates Ltd, Landscape Architects are pleased to submit the report Inventory of Environmentally Sensitive and Significant Natural Areas, City of Edmonton in fulfilment of the City of Edmonton Environmentally Sensitive and Natural Areas Inventory project. We believe that this document will prove very useful in attempting to develop strategies to preserve and/or conserve significant land parcels within the city.

A total of 311 sites have been identified within the table lands that meet the criteria approved by City Council on August 24, 1993. These include 246 natural areas, 27 significant natural areas and 38 environmentally sensitive areas. An additional 17 environmentally sensitive areas have been identified and classified within the North Saskatchewan River Valley and Ravine System based upon a review of existing information.

Because of the limited amount of field time spent at each site, it is recommended that additional, more detailed field work be carried out at any site that is being considered for further development to confirm the findings of this study.

In conclusion, the project team would like to thank you and the Planning and Development Department for the opportunity to work on this extremely important project. Should you need our assistance in any further endeavors, we would welcome the opportunity to work with you again.

Sincerely yours,

NOTE: Geowest Consultants Ltd. undertook an additional inventory which identified 23 natural areas, 4 significant natural areas and 16 environmentally sensitive areas (see addendum).

Dennis O'Leary, Principal
GEOWEST Environmental Consultants Ltd

GEOWEST ENVIRONMENTAL CONSULTANTS LTD.
Whitemud Business Park • Suite 102, 4249A - 97 Street • Edmonton, Alberta • T6E 5Y7 • Telephone (403) 461-5000 • Fax (403) 461-5036

INVENTORY OF ENVIRONMENTALLY SENSITIVE AND SIGNIFICANT NATURAL AREAS

CITY OF EDMONTON

Consolidated Technical Report

Prepared for

Planning and Development
City of Edmonton

Prepared by

Dennis O'Leary[1]
Jerry Bentz[1]
David Ealey[2]
Andre Schwabenbauer[3]

1. **GEOWEST** Environmental Consultants Ltd.
2. David M. Ealey Environmental Services
3. Schwabenbauer Ross and Associates, Landscape Architects

(This is a consolidation of *Inventory of Environmentally Sensitive and Significant Natural Areas, City of Edmonton, Technical Report, 1993* and *Inventory of Additional Environmentally Sensitive and Significant Natural Areas, City of Edmonton, 1993*)

The sites identified in this report consist of environmentally sensitive and significant natural areas located on Edmonton's table lands.

Addendum

Inventory of Additional Environmentally Sensitive and Significant Natural Areas, City of Edmonton December, 1993.

Amendments

The information on page 66 has been amended.

November 25, 1998

Index of Environmentally Sensitive Areas

Site	Site Name	Significance	Area(ha)	Page No.
	Northeast Edmonton			
NE 2	North Namao Wetland	Local	8.50	44
NE 24	Namao Wetland	Local	11.45	42
NE 246	-	Local	2.58	42 AI
NE 247	-	Local	15.94	44 AI
NE 8002	Manning Freeway - Fort Road Woodland	Local	21.31	40
NE 8080	-	Local	6.7	34 AI
NE 8081	-	Local	74.27	36 AI
NE 8082	-	Local	42.87	38 AI
NE 8083	-	Local	17.65	40 AI
NE 8084	-	Local	13.01	12 AI
NE 8089	-	Local	8.97	14 AI
NE 8094/ 8095	8094 = 23.39 ha 8095 = 29.13 ha -	Local	52.52	20 AI
NE 8096	-	Local	9.25	22 AI
NE 8099	-	Local	12.5	26 AI
	Northwest Edmonton			
NW 110	Grocery People Wetland	Local	2.71	141
NW 132	Glendale Wetland	Local	2.37	144
NW 204	East Winterburn Natural Area	Local	3.33	156
NW 254	Normandeau Gardens Natural Area	Local	7.60	150
NW 275	Hillview Natural Area	Local	4.68	160
NW 288	Triple 5 Farm Wetland	Local	8.90	158
NW 302	Winterburn Woodland	Regional	46.51	137
NW 318	Triple Acres Natural Area	Local	25.64	164
NW 355	23 Avenue Wetland	Local	12.37	153
NW 7009	McDonagh Peatland	Local	35.51	169
NW 7010	Winterburn School Natural Area	Local	38.04	166
NW 7012	Stony Industrial Complex	Local	4.95	147
NW 7016	Northwest Mature Woodland	Local	27.44	180
NW 7017	167 Avenue - 112 St. Wetland Complex	Local	22.12	178
NW 7018	Northwest Wetland	Local	25.18	184
NW 7024	167 Avenue Wetlands	Local	13.53	182
NW 7026	Kinokamau Lake	Regional	43.15	134
NW 7050	Potter Green South Natural Area	Local	4.34	162
NW 7051	North Poundmaker Industrial Complex	Local	33.95	175
NW 7060	Henry Singer Sports Field	Local	18.50	172
NW 7090	-	Local	39.78	30 AI

14

21

AI = Additional Inventory (see addendum)

Index of Environmentally Sensitive Areas

Site	Site Name	Significance	Area(ha)	Page No.
	Southeast Edmonton			
SE 20	Southeast Wetland Natural Area	Local	5.87	84
SE 107	34 Street Wetland	Local	5.86	92
SE 238	Maple Ridge Natural Area	Local	7.51	86
SE 5002	Southeast Mixedwood Natural Area	Local	14.90	81
SE 5004	Southeast Natural Area	Local	49.62	78
SE 5007	Koroluk - Kozub Natural Area	Regional	48.92	75
SE 5008	34 St. SW and Ellerslie Road Natural Area	Local	6.52	89
SE 5009	Henschel Wetlands	Local	2.16	96
SE 5010	Southeast Corner Slough Natural Area	Regional	22.12	72
SE 5012	Meridian Street - Twp Rd 515 Natural Area	Local	6.55	94
SE 5016	Southeast Woodland Natural Area	Local	22.51	98
SE 5090	-	Local	17.54	48 AI
SE 5093	-	Local	4.09	50 AI
SE 5094	-	Local	12.55	52 AI
	Southwest Edmonton			
SW 2	Southwest Wetland	Local	3.25	118
SW 86	Southwest Highland	Local	6.65	116
SW 6001	Southwest Mixedwood Natural Area	Local	24.53	113
SW 6002	Ogilvie Ridge Wetland	Local	3.32	110

AI = Additional Inventory (see addendum)

Index of Significant Natural Areas

Site	Site Name	Area (ha)	Page No.
	Southwest Edmonton		
SW 1	41 Avenue SW - 184 Street SW Woodland	2.14	124
SW 8	Southwest Deciduous Woodland	5.6	126
SW 26	University of Alberta Farm Woodland	5.36	128
SW 31	Virginia Park Woodland	5.37	120
SW 74	North Virginia Park Woodland	7.24	122
	Northwest Edmonton		
NW 65	156 Street - St. Albert Trail Natural Area	13.54	198
NW 89	Northwest Boundary Complex	8.09	190
NW 139	Kinokamau Lake Woodland	3.73	188
NW 339	Woodbend Ravine Woodlot	8.93	186
NW 384	Section 19 Woodlot	17.56	192
NW 7004	Freeman Woodland	22.93	200
NW 7011	Winterburn Crossing Wetlands	11.77	202
NW 7021	215 Street Natural Area	12.08	195
NW 7035	Grocery People Woodland	46.34	206
	Northeast Edmonton		
NE 8	Alberta Railway Museum Wetland	12.08	66
NE 10	Highway 37 - Meridian Street Parkland	18	64
NE 52	Bocock Woodland	4.05	54
NE 133	CNR - 17th Street Woodland	8.95	62
NE 221	153 Avenue - Meridian St. Woodland	5.3	46
NE 235	East Fraser Woodland	14.25	50
NE 8003	Horsehills Complex	8.88	56
NE 8005	Meridian Street Creek Woodland	6.35	48
NE 8006	Celanese Canada Woodland	6.9	52
NE 8010	167 Avenue - Meridian St. Woodland	10.98	58
NE 8011	Horsehills Woodland	6.58	60
NE 8091	-	13.97	16 AI
NE 8093	Little Mountain Natural Area	16.12	18 AI
NE 8097	-	4.45	24 AI
	Southeast Edmonton		
SE 244	Highway 14 - Sherwood Park Cloverleaf	4.98	104
SE 5015	Hurstwood Woodland	6.51	102
SE 5098	-	4.48	54 AI

AI = Additional Inventory (see addendum)

Executive Summary

GEOWEST Environmental Consultants Ltd. in cooperation with David M. Ealey Environmental Services and Schwabenbauer Ross & Associates were contracted by the Planning and Development Department of the City of Edmonton in the fall of 1992 to undertake the City of Edmonton Environmentally Sensitive and Natural Areas Inventory. The three primary objectives of the project were as follows:

1. To provide an updated inventory of natural areas and identify environmentally sensitive and significant natural areas in the table lands (those suburban and agricultural lands outside the North Saskatchewan River Valley, which were annexed to the City in 1982) of the City of Edmonton,

2. To identify environmentally sensitive areas in the North Saskatchewan River Valley and Ravine system (based on existing information) in the City of Edmonton, and

3. To evaluate and classify the relative significance of sites identified as environmentally sensitive areas within both the North Saskatchewan River Valley and the table lands in the City of Edmonton as to their local, regional, provincial and national importance.

A total of 311 sites were identified during the course of this study as either natural areas, significant natural areas or as environmentally sensitive areas. 246 of the 311 sites were classed as natural areas, 27 as significant natural areas and 38 as environmentally sensitive areas. An additional 17 sites within the North Saskatchewan River Valley and Ravine System were classed as environmentally sensitive areas.

The 55 site classed as environmentally sensitive areas are all highly sensitive to any disturbance that would significantly alter the sites natural conditions. The sensitivity of the 27 significant natural areas is rated as moderate to low, with most of the sites only being negatively impacted by complete destruction.

Of the 55 environmentally sensitive areas, only one was classed as nationally significant (North Saskatchewan River Valley and Ravine System), two as provincially significant (Lower Whitemud Creek and Big Island) seven as regionally significant (Big Lake Area, Riverbend, Moran Lake, Kinokamou Lake, Southeast Corner Slough, Koroluk - Kozub Natural Area and Winterburn Woodlot) and the remaining 45 sites as locally significant.

The total area designated as either environmentally sensitive areas or as significant natural areas within the table lands is approximately 936.95 ha (9.36 km^2). Of this, 652.01 ha (6.52 km^2) has been classed as environmentally sensitive areas and the remaining 284.94 ha (2.84 km^2) is classed as significant natural areas.

Two-thirds of all sites identified within the table lands occur north of the North Saskatchewan River Valley with 44 percent of all sites occurring within the northwest portion (28 sites) and 22 percent within the northeast corner (14 sites). Of the remaining sites, 20 percent occur within southeast Edmonton (13 sites) and only 14

SEE ADDENDUM FOR ADDITIONAL SITES

percent within the southwest portion (9 sites).

A number of digital databases have been developed to house the information collected during the course of this study. The graphical and non-graphical databases are relational in nature and allow the user to access both databases simultaneously.

Table of Contents

ADDENDUM

Inventory of Additional Environmentally Sensitive and Significant Natural Areas, City of Edmonton, December, 1993.

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

Acknowledgements

The authors of this report would like to thank the Edmonton Metropolitan Regional Planning Commission and the Planning and Development Department of the city of Edmonton for funding this project. In particular, we would like to thank the following individuals for their guidance, contributions and patience in the completion of this project:

Ron Mattiussi, Executive Director, Edmonton Metropolitan Regional Planning Commission
Peter Dickson, Senior Planner, Edmonton Metropolitan Regional Planning Commission.
Harvey Crone, Director, Planning and Development, City of Edmonton
Heather McRae, Senior Planner, Planning and Development, City of Edmonton
Mary Ann McConnell-Boehm, Planner, Planning and Development, City of Edmonton
Dippan Shukle, Planner, Planning and Development, City of Edmonton
Parks and Recreation, City of Edmonton

We would also like to thank Ms. Della Clish of *AcuDigital* C.A.M. for digitizing all graphical data and producing all graphical output for this project.

1.0 INTRODUCTION

In 1986, Ealey prepared a report entitled Urban Natural History Interpretative Sites in and Adjacent Edmonton for the City of Edmonton's Parks and Recreation Department. He identified 1049 natural sites within and adjacent to Edmonton.

In 1992, the City of Edmonton Planning and Development Department produced a report entitled Environmentally Sensitive and Natural Areas Protection Within Edmonton's Table Lands: Policy and Implementation Background Study proposing that Edmonton's natural sites be identified and classified as the basis for future recognition and protection.

This document provides a detailed summary of the **Environmentally Sensitive and Significant Natural Areas** study conducted for the City of Edmonton by **GEOWEST** Environmental Consultants Ltd., David M. Ealey Environmental Services, and Schwabenbauer Ross and Associates, Landscape Architects. An Executive Summary is also available. The study occurred during the fall of 1992 and the spring and summer of 1993.

1.1 Study Purpose

The purpose of this study was three-fold:

1. To provide an updated inventory of natural areas and identify environmentally sensitive areas (ESAs) and significant natural areas (SNAs) in the table lands (those suburban and agricultural lands outside the North Saskatchewan River Valley, which were annexed to the city in 1982) of the city of Edmonton;

2. To identify environmentally sensitive areas in the North Saskatchewan River Valley and Ravine system (based on existing information) in the City of Edmonton; and

3. To evaluate and classify the relative significance of sites identified as environmentally sensitive areas within both the North Saskatchewan River Valley and the table lands in the city of Edmonton as to their local, regional, provincial and national importance.

The project was broken into two phases with distinct objectives.

1.2 Phase 1 Objectives

Phase 1 of the project had five objectives:

- to review, compile and analyze existing data for the table lands;
- to undertake a field reconnaissance program to selectively categorize and confirm initial data and classifications;
- to develop a database management plan;
- to develop an evaluation methodology; and
- to screen existing information to designate environmentally sensitive areas in the North Saskatchewan River Valley and Ravine System.

1.3 Phase 2 Objectives

Phase 2 of the project also had five objectives:

- to undertake a biophysical inventory of all sites identified during Phase 1 as either environmentally sensitive or significant natural areas;
- to prepare final descriptions of all environmentally sensitive and significant natural areas;
- prepare final maps of all environmentally sensitive and significant natural areas in a format compatible with the City of Edmonton's Geographic-based Information System (GBIS);
- create a final map showing environmentally sensitive and significant natural areas and linkages to the North Saskatchewan River Valley and Ravine System; and
- prepare final significance ratings for all environmentally sensitive areas within both the table lands and the North Saskatchewan River Valley and Ravine System.

Five compendium reports were prepared during the course of the project. These include the following reports:

1. Review of Literature and Screening of Potential Sites Within the Tableland Area of Edmonton

2. Database Design

3. Evaluation Criteria and Identification of Environmentally Sensitive and Significant Natural Areas Within the Tablelands and River Valley and Ravine System of Edmonton

4. Review of Literature and Identification of Environmentally Sensitive Areas within the North Saskatchewan River Valley and Ravine System

5. City of Edmonton Environmentally Sensitive and Natural Areas Inventory - Phase 1 Final Report

2.0 STUDY AREA

The primary area of investigation includes some 357 km^2 of public and private lands occurring on Edmonton's table lands (those suburban and agricultural lands outside the North Saskatchewan River Valley which were annexed to the city of Edmonton on January 1, 1982) (Figure 1). The secondary area of investigation was the North Saskatchewan River Valley and Ravine System (Figure 2).

2.1 Surficial Materials and Landforms

The Edmonton area is underlain by Upper Cretaceous bentonitic sandstones, sandy shales and bentonitic clays and coal seams of the Edmonton Formation (Bowser *et. al., 1962).* These bedrock formations are commonly exposed along the North Saskatchewan River Valley and Ravine System (i.e., Whitemud, Blackmud, Mill Creek, Lower Horsehills and Oldman creeks, etc.). Bedrock strata are mantled with thick glacial and post-glacial deposits of variable origin, including moraine, glaciolacustrine, pitted deltaic and eolian materials.

With the exception of the southeast corner of the city, fine-textured glaciolacustrine materials from glacial lake Edmonton occur extensively throughout most of the city and mantle the underlying bedrock strata. Surface expression is level to very gently undulating (0-5% slopes). Textures are considerably heavier than those associated with the lighter-textured morainal materials in the southeast - textures vary from silty clays to heavy clay. Soils commonly include moderately well to imperfectly drained Orthic Black Chernozems of the Malmo series (Bowser *et.al.*, 1962). Black Solodized Solonetz and Black Solonetzic soils of the Wetaskiwin and Duagh series respectively, occur in the Namao area of northeast Edmonton where parent materials are considerably more saline in nature. Dark Gray Luvisols of the Mico series occur in the northwest corner of the city adjacent to Big Lake.

Coarser-textured alluvial-lacustrine materials occur within the northeast corner of the city adjacent the North Saskatchewan River valley. Textures vary from loams to sandy loams and loamy sand. Typical soils include well drained Orthic Black Chernozems of the Peace Hills and Ponoka series.

"Dead-ice" morainal deposits occur extensively within the southeast corner of the city. These deposits have a very pronounced "hummocky" surface expression (5-30% slopes) and are derived primarily from the Edmonton and Paskapoo formations and have a clay loam texture. They are generally only slightly stony in nature. Because of the hummocky nature of the topography, extensive organic accumulations have developed in depressional topography giving rise to tremendous diversity of landscapes within the southeast corner of the city. These deposits are part of the larger Cooking Lake - Beaverhill morainal complex to the east. Typical soils include moderately well to well drained Orthic Black Chernozems of the Angus Ridge series.

An extensive area of sandy eolian materials derived from pitted deltaic materials occurs in the southwest corner

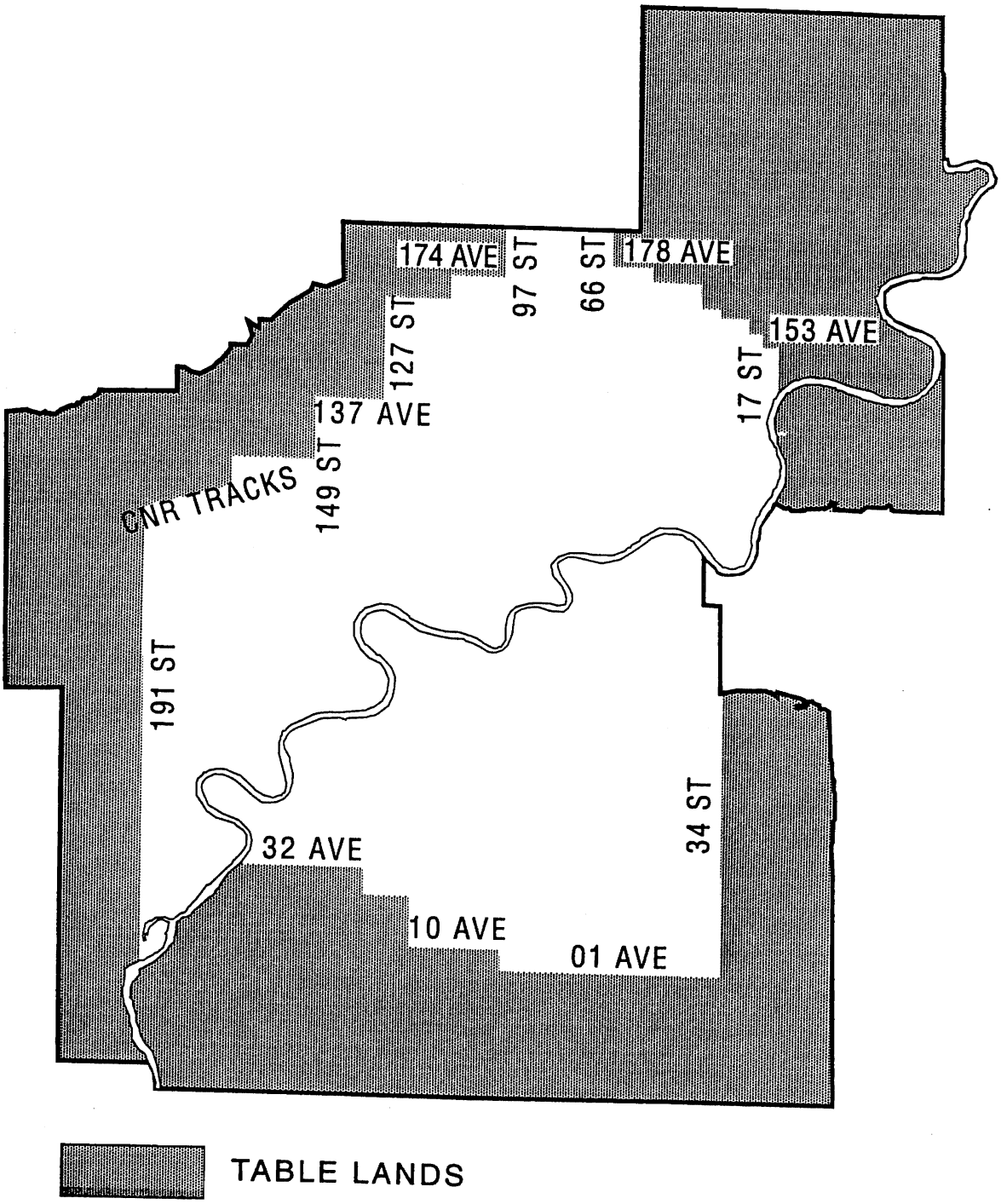


Figure 1. City of Edmonton Table Lands.

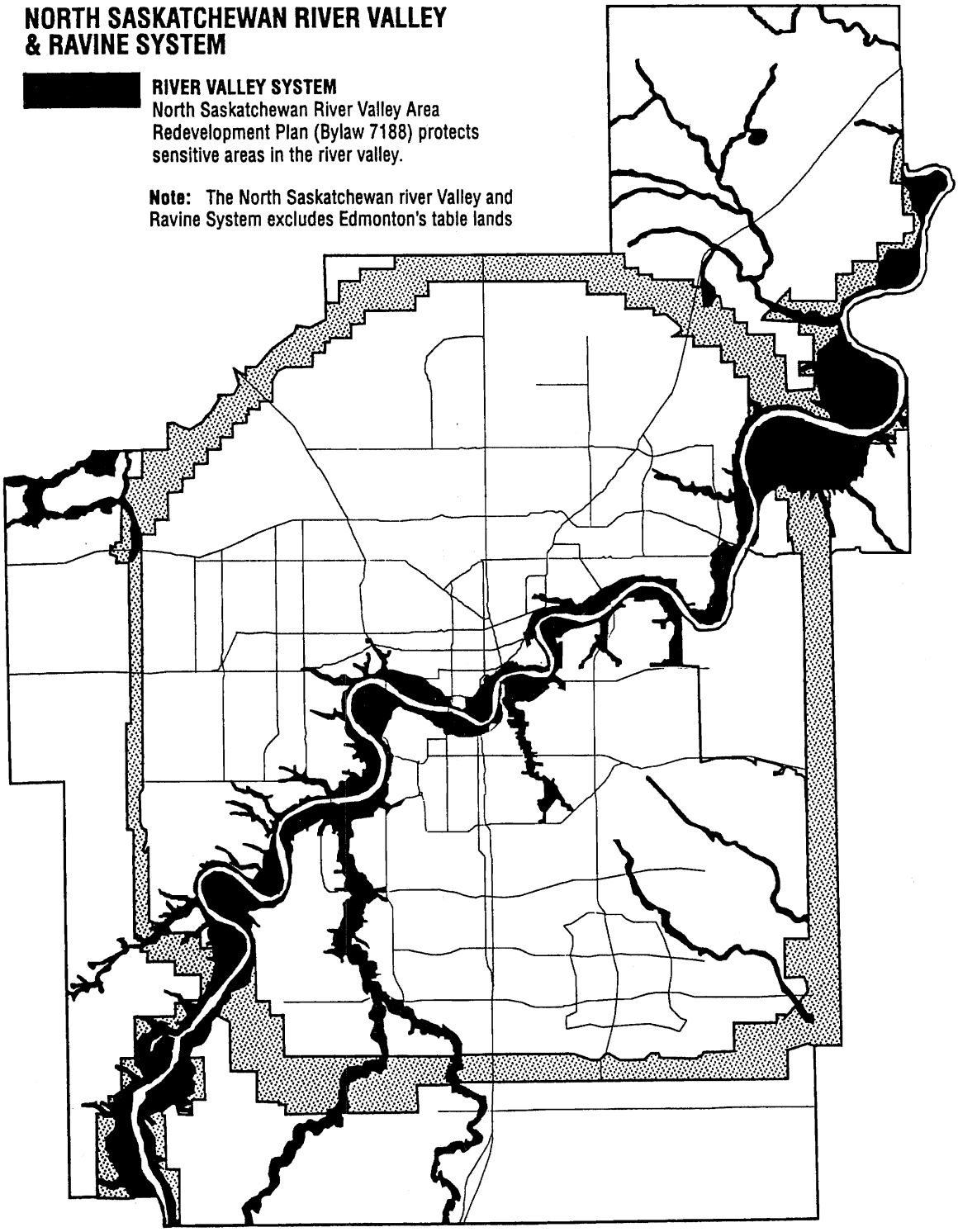


Figure 2. North Saskatchewan River Valley and Ravine System.

of the city, west of the North Saskatchewan River valley. This is part of a larger sand dune complex that originates west of the city in the vicinity of Highway 60. Surface expression is commonly undulating and ridged, with parent materials being very susceptible to erosion when ground vegetation is removed. Soils typically include well to rapidly drained Orthic and Eluviated Eutric Brunisols of the Culp series.

Numerous small wetlands have developed within the Edmonton area in response to the relatively fine-textured nature of most parent materials and variable topographic conditions. In addition, a number of permanent water bodies have also formed in response to post-glacial events. These include Big Lake and Kinokamau Lake in the northwest, Moran Lake in the northeast and the southeast corner slough in the southeast corner of the city. Water levels are highly variable and are influenced to a great deal by annual precipitation amounts and fluctuating groundwater levels.

2.2 Hydrology

There are three major drainages occurring within the Edmonton area that affect local hydrological conditions. These include the postglacial Sturgeon and North Saskatchewan river valleys and the buried preglacial Stony Valley. Bibby (1974) found that the Sturgeon, North Saskatchewan and Stony Valley all have the highest expected groundwater yields within the study area.

The Stony Valley represents the most important aquifer in the Edmonton area (Ceroici 1979). It trends northeast from the northwest corner of the study area and is commonly overlain by 45 m of surficial materials and is floored by fine- to medium-grained sands, known as Saskatchewan sands, as well as by gravels that lie unconformably on Upper Cretaceous bedrock and are overlain by till. These preglacial gravels and sands reach 21 m in thickness in the Devon area. The significance of the Stony Valley preglacial channel to the annexed lands within the city of Edmonton may lie in the occurrence of significant wetlands or wetland complexes in or adjacent to the aquifer. Numerous contact springs and seepages are found along the North Saskatchewan River valley. The general direction of groundwater flow is toward the Stony Valley and the North Saskatchewan River valley, which act as line sinks, that induce flow toward themselves.

2.3 Climate

The climate of the Edmonton area is typical of the Aspen Parkland Ecoregion, with resulting vegetation of native grassland and deciduous forest plant communities in the form of a parkland (Strong and Leggat 1992). Because Edmonton lies in the northwestern portion of the Aspen Parkland Ecoregion, many features associated with the Low Boreal Mixedwood Ecoregion, which occurs just to the north and west, are also commonly found within the city. Also, because so much of the native landscape has been modified by agricultural, industrial and residential development since the turn of the century, the climate and resulting vegetation is rather poorly reflected within the Edmonton area.

Components of Alberta's boreal and grassland climates, in addition to the

effects of the mid-Alberta storm track, interact to create the regional climate of the Aspen Parkland Ecoregion and the Edmonton area (Strong and Leggat 1992). Precipitation is highest in July with total annual precipitation averaging 412 mm for the ecoregion. Relative to the adjacent Low Boreal Mixedwood Ecoregion, the Aspen Parkland is warmer during both the summer and winter, and it is slightly wetter in the summer (Strong and Leggat 1992).

Monthly and annual precipitation values as well as daily mean temperatures are presented for selected meteorological stations in Tables 1 and 2. Information for four stations within the Edmonton area is shown as well as similar data for Calgary, Red Deer and Vegreville; the latter three stations are shown for comparison only.

Yearly precipitation values for the Edmonton area range between 458.5 mm at Edmonton Namao to 540.2 mm at Stony Plain (Environment Canada 1992). These values are considerably higher than the average precipitation (412 mm) for the Aspen Parkland Ecoregion. The Stony Plain station is considerably higher in elevation than other stations in the Edmonton area and is probably influenced to a greater extent by local storm tracks from the west and its proximity to Wabamun Lake. The Edmonton area receives amounts of precipitation similar to Red Deer and considerably more than either Vegreville or Calgary. Peak precipitation values occur at all stations during the month of July, with minimum values recorded during February.

Daily mean temperatures range from a minimum of -14.2°C in January at Edmonton International Airport to a maximum of 17.5°C at Edmonton Municipal Airport in July. It is quite apparent from Table 2 that the greater Edmonton metropolitan area produces a definite "heat island" effect, with annual temperatures being considerably higher at the Edmonton Municipal Airport (3.6°C) than either Edmonton Namao (2.7°C) or Edmonton International Airport (2.1°C). The annual daily mean temperature for the Edmonton Municipal Airport is more similar to Calgary International Airport than either the Edmonton International or Namao stations. The "heat island" affect is also seen when one compares the annual daily mean temperature of the Edmonton stations (average of 2.8°C) with that of Vegreville (1.4°C). Vegreville, like Edmonton, occurs within the Aspen Parkland Ecoregion.

The "heat island" affect is also reflected in growing degree days, a measure of the number of degree-days above 5°C. Value for the Edmonton area range between 1352 at the Edmonton International Airport and a high of 1611 at the Edmonton Municipal Airport. By contrast, Calgary has 1435 growing degree-days while Lethbridge has 1748.

2.4 Vegetation

As previously stated, the city of Edmonton is located within the Aspen Parkland Ecoregion which covers only 7.9 percent of the province (Strong and Leggat 1992). The characteristic ecological features that distinguish this ecoregion from others are the co-occurrence of chernozemic soils (Black Chernozems in the Edmonton area) and a mixture of native grassland and deciduous forest plant communities in the form of a parkland.

Table 1. Monthly and Annual Precipitation Values (mm) for Selected Meteorological Stations.

Station	Elevation	J	F	M	A	M	J	J	A	S	O	N	D	Year
Edmonton Int'l A[1]	715 m	22.9	15.5	15.9	21.8	42.8	76.1	101	69.5	47.5	17.7	16.0	19.2	465.8
Edmonton Muni[2]	668 m	23.3	16.8	17.0	22.1	43.5	79.9	94.3	67.0	41.6	17.3	16.1	22.2	461.3
Edmonton Namao	688 m	23.2	17.9	18.4	20.1	40.6	82.2	94.9	67.2	39.8	16.5	15.9	21.7	458.5
Stony Plain	766 m	24.4	19.4	21.8	24.9	48.5	91.9	112	77.6	47.6	22.8	21.9	27.8	540.2
Red Deer	905 m	20.7	14.7	16.5	22.9	49.2	85.5	87.9	64.8	54.2	20.2	14.8	18.8	470.2
Calgary Int'l A	1077 m	12.2	9.9	14.7	25.1	52.9	76.9	69.9	48.7	48.1	15.5	11.6	13.2	398.8
Vegreville CDA[3]	636 m	16.6	12.3	14.2	16.0	38.3	73.0	83.2	61.3	41.4	14.8	14.5	17.5	402.8

1. Edmonton International Airport
2. Edmonton Municipal Airport
3. Vegreville Canadian Department of Agriculture

Table 2. Monthly Mean Temperatures (°C) for Selected Meteorological Stations.

Station	J	F	M	A	M	J	J	A	S	O	N	D	Year
Edmonton Int'l A	-14.2	-10.8	-5.4	3.7	10.3	14.2	16.0	15.0	9.9	4.6	-5.7	-12.2	2.1
Edmonton Muni	-12.5	-8.9	-3.6	4.9	11.6	15.6	17.5	16.6	11.1	5.9	-4.2	-10.5	3.6
Edmonton Namao	-13.5	-10.1	-4.7	4.1	10.9	14.8	16.7	15.7	10.4	5.1	-5.1	-11.5	2.7
Stony Plain	-12.3	-9.1	-3.7	4.3	10.9	14.5	16.4	15.5	10.5	5.2	-4.5	-10.4	3.1
Red Deer	-13.5	-10.0	-4.7	3.7	9.9	14.0	15.8	15.0	9.9	4.6	-5.3	-11.9	2.3
Calgary Int'l A	-9.6	-6.3	-2.5	4.1	9.7	14.0	16.4	15.7	10.6	5.7	-3.0	-8.3	3.9
Vegreville CDA	-16.2	-12.7	-7.1	3.4	10.4	14.4	16.2	15.2	9.8	4.2	-6.5	-14.2	1.4

Vegetation of the Edmonton area is typical of northern portions of the Aspen Parkland, which is characterized by a more continuous cover of deciduous forest, usually dominated by aspen. A more favourable moisture regime beneath the forest canopy also supports the growth of a lush and diverse understorey, as compared to areas to the south of Edmonton where grassland areas are more prominent.

Undeveloped lands within the table lands of Edmonton support a high diversity of vegetation communities including upland aspen, aspen-balsam poplar and white birch deciduous forests, mixedwood aspen-balsam poplar-white spruce forest, white spruce and white spruce-black spruce coniferous forest stands, black spruce - tamarack muskeg, and various shrubland and wetland vegetation complexes associated with stream channels, moist depressional sites, small sloughs and lake margins.

Detailed descriptions of vegetation communities within the city can be found in publications such as Ealey (1986), Russel and Spiers (1984), Cotterill (1993), and Carlyle *et. al.* (1974). Descriptions of plant species present in each of the environmentally sensitive areas and significant natural areas are provided in the site descriptions in Section 4.0. A comprehensive checklist of plant species recorded during this study, as well as other recent studies within the Edmonton area, is included in Appendix C.

A number of uncommon plant communities occur in the Edmonton area that were considered significant in the identification and classification of ESAs and SNAs in this study. One such plant community or assemblage of plant species occurs in several areas in northeast Edmonton in association with marl pools formed by the pooling of calcium-rich groundwater. These small pools of mineral-rich water and associated fens and muskeg support an extremely rich diversity of plant species including several brown mosses, numerous sedges, rushes, ferns and uncommon grasses such as bog muhly grass.

The presence of relatively undisturbed, old (in excess of 100 years) forest stands composed primarily of white spruce or a mixture of white spruce, balsam poplar and aspen is quite uncommon in the city's table lands. These stands generally exist as isolated "woodlands" that have been spared from urban, industrial or agricultural development to this point. They generally contain a rich assemblage of plant species with numerous snags, fallen trees and patches of various understorey plant communities. They provide numerous habitat niches for a variety of wildlife, particularly avifauna, and are a very important, but vulnerable component of the city's landscape.

Wetland vegetation communities on the city's table lands tend to be the most diverse and are associated with a range of wetland types including ephemeral depressional sites, shallow small lakes and sloughs, bogs, fens and several larger lakes. Lakes and small ponds generally have successional zones of shoreline vegetation that occur in concentric rings around open water. These zones generally progress shoreward from cattail through to bulrush, sedge, reed grass, willow and upland forest. Drainage or in-filling of wetlands is a common occurrence that has severely impacted many sites within the city and examples of undisturbed wetland communities are rare.

The vegetation of the North Saskatchewan River Valley and Ravine System is strongly

influenced by slope, aspect, slope stability and groundwater discharge. Mature coniferous-dominated communities of white spruce occur predominantly on north-facing slopes; south-facing slopes generally have a mixture of aspen, white spruce, shrubland and grassland communities.

2.5 Wildlife

In total, 226 species of vertebrates have been reported to occur within Edmonton's boundaries (Appendix D). This total excludes some species of birds that only occur as migrants, but most of the species that have significant staging populations in Edmonton also nest here.

Edmonton's mammals (49 species) include 53 percent of the provincially occurring species, although a few, such as the gray wolf, rarely occur in Edmonton. Only 14 species are as large as or larger than a porcupine. The vast majority of Edmonton's mammals are small to tiny. Yet the importance of these inconspicuous mammals is high because they constitute the prey species of many larger mammals and birds, or else they occupy an important niche in Edmonton's ecosystems, e.g., the bats. Game species such as the white-tailed deer are high on the list of species that people most wish to see. However, most larger mammals tend to be active at dawn and dusk, so are rarely seen by people.

Most birds are active during the day, and therefore they are more conspicuous to the outdoor enthusiast. Of the provincially nesting bird species, just over half (53 percent) occur in Edmonton during the breeding season.

Edmonton's nesting bird species include 73 passerines (also known as songbirds) and 70 nonpasserines (including the waterfowl, birds of prey and woodpeckers).

Only a few of the bird species have been identified as having a special status or significant distribution in Edmonton, though all bird species have their own role in their own habitats. Two of the bird species are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as species of concern: the peregrine falcon, which is classified as endangered; and the Cooper's hawk, which is classified as vulnerable. All of the birds of prey (owls included) are particularly sensitive to nest disturbance. Visits should be actively discouraged near the large, conspicuous stick nests that many of these birds occupy. Colonially nesting species such as the eared and western grebes, the great blue heron, the black-crowned night-heron, and the gulls and terns are also particularly sensitive towards people visiting their nesting colonies.

Two species, the black-crowned night-heron and golden-crowned kinglet, were confirmed to nest in Edmonton during the course of the field surveys, yet neither had been recorded to nest in Edmonton during the five years of the Alberta Breeding Bird Atlas project (Semenchuk 1992). The black-crowned night-heron records constitute the northwest edge of the species' confirmed nesting range in Alberta.

The two garter snakes that occur in Edmonton represent 25 percent of the provincially occurring species. Sensitive habitats for these species are the sites of their hibernacula, which are used for overwintering. No hibernacula were

found during this study, but observations of snakes at a few sites near the river valley suggested hibernacula were nearby.

Five amphibian species in Edmonton make up 50 percent of the provincial total. Any disturbance to the hydrological regime of a site may have dire consequences for the survival of amphibians.

Fish species recorded within Edmonton waters (27 species) amount to 36 percent of the provincial list of fish species and hybrids. Virtually none of these species occur in the waters of the table lands, because most of these wetlands freeze to the bottom or lose too much oxygen over the winter as a result of decomposition of vegetation.

2.6 Urban Development

Natural areas are continually changing. The biophysical influences that have contributed to the creation of the sites identified in this study continue to act on them resulting in gradual environmental changes within each one. However, the most significant and often detrimental influence on these sites continues to be urban development.

The North Saskatchewan River Valley and Ravine System is a prime example illustrating the benefits of balancing conservation objectives with urban pressures in order to retain a natural landscapes within the city. Edmonton's growth has exceeded its pre-1982 boundary with urban development expanding beyond the Restricted Development Area (RDA) to the northeast, south and west. This has resulted in increased pressure on a number of table land "natural areas."

Several environmentally sensitive areas and significant natural areas have been identified in the areas between the RDA and the pre-1982 city boundary. Numerous sites are also located within the R.D.A. These sites combined with those adjacent to the development outside of the R.D.A. currently face the most imminent threats from urban development. Changes in hydrology, in-filling of wetlands, the clearing of woodlands and the elimination of linking corridors to the River Valley and Ravine System are typical impacts that have resulted in and can continue to result in the loss of natural areas.

It is hoped that the information collected in this comprehensive study combined with sensitive planning, design and management will result in the successful restoration, integration and enhancement of many of the sites. While some sites are highly sensitive to all forms of disturbance and require protection and restrictions from physical development, others can be conserved and enhanced for varying degrees and types of use. The sensitive integration of urban development with the environment provides a bond between the natural and designed context. Beyond the inherent benefits of protecting and conserving the natural environment, the societal benefits are far-reaching.

3.0 PROJECT METHODOLOGY

3.1 Evaluation Procedures

Specific procedures and criteria are required to evaluate individual sites, areas or features for identification and classification as natural areas, significant natural areas or environmentally sensitive areas. Evaluation criteria have previously been developed and applied consistently throughout Canada and especially within Alberta. It is through this consistent and often rigorous approach to evaluation that sites, areas or features can be identified and classified on a consistent basis.

It is essential that the criteria used to evaluate sites previously identified by Ealey (1986) are consistent with other studies of this type to ensure consistency and thoroughness of classification.

3.1.1 Definitions

In order to identify, evaluate and classify the relative significance of sites, it is necessary to first define the different types of sites, to provide rationale for grouping previously identified sites and to discuss rationale for establishing a minimum viable polygon size. The definitions proposed in this study were revised through consultation with the public and approved by City Council on August 24, 1993. The criteria used to identify natural areas, significant natural areas and environmentally sensitive areas are outlined in Table 3.

Natural Areas

The Planning and Development Department of the City of Edmonton recently produced a document entitled Environmentally Sensitive and Natural Area Protection Within Edmonton's Table Lands: Policy and Implementation Background Study (1992). This report draws heavily upon the work of Eagles (1984) in providing a definition of natural areas. It states:

Natural areas are defined by the "presence of vegetation, water or natural features." In other words, a natural area may have no special features, other than the presence of vegetation or unusual features of importance to Edmonton. It some instances, natural areas may be partially disturbed.

Significant Natural Areas

Significant natural areas are generally larger than natural areas. These areas are defined as "natural sites that have the potential to remain sustainable within an urban environment and are significant from an environmental perspective to the community of Edmonton because of their size or features on the site."

They usually contain a diverse blend of common species or habitat and function as a linkage between other significant natural areas or environmentally sensitive areas. They can withstand various degrees of human use.

Environmentally Sensitive Areas

Environmentally sensitive areas are defined as "undisturbed or relatively undisturbed sites which, because of their natural features have value to society and ecosystems worth protecting, but are

susceptible to further disturbance." This definition is similar to that presented by Veitch (1978).

3.1.2 Degree of Disturbance

Any disturbance ultimately affects the long-term future viability and maintenance of a site. The degree of disturbance determined whether or not a site was included for further examination.

During the initial field survey in October 1992, it was found that most small ephemeral wetlands (<1.0 ha) had been either entirely or partially cultivated around the edges in an attempt to reclaim the land for agricultural purposes. Because the adjacent upland vegetation is considered important the partial or complete destruction of these ephemeral wetlands led to these sites being removed from the list.

Similarly, sites where dumping or in-filling occurred were eliminated and were not considered for further analysis.

3.1.3 Grouping of Sites

Ealey (1986) identified 1,049 individual sites in and adjacent Edmonton. Upon review of these sites it was apparent that many sites could be grouped to form larger, complexed units. The rationale for grouping sites is primarily to maintain ecological integrity and to ensure maintenance of natural habitats. Large heterogeneous sites generally have a greater value to the natural environment as they are often able to meet more life cycle requirements than smaller, more homogeneous sites. The combination of both wetland and remnant forest may be more critical to the survival of a species or habitat than individual sites. For example, some species of waterfowl require open water and emergent aquatic vegetation for breeding, feeding and rearing requirements but also require the surrounding adjacent upland for nesting cover.

Grouped or complexed sites generally consist of remnant forest and wetland sites. Many of the sites were grouped by incorporating remnant forest corridors or small wetland drainages not previously identified by Ealey (1986). For example, in many instances Ealey identified remnant forest stands and an adjacent wetland as separate sites. This identification of sites by Ealey reflects the nature of his study. In this study, many sites consist of grouped or "complexed" sites.

3.1.4 Previously Used Criteria

Eagles (1984), Westworth & Associates (1991), Infotech (1989), Sweetgrass (1989) and Wallis (1991) used the following criteria to identify environmentally sensitive areas:

- hazard lands and areas that are unsuitable for development in their natural state (e.g., floodplains, steep and unstable slopes);

- areas that perform a vital environmental, ecological or hydrological function (e.g., aquifer recharge or groundwater storage area);

- areas that contain unique geological or physiographic features;

• areas that contain significant, rare or endangered species;

• areas that are unique habitats with limited representation in the region or areas that represent small remnants of previously abundant habitat which have virtually disappeared;

• areas that contain an unusual diversity of plant and/or animal communities due to a variety of geomorphological features and microclimatic effects;

• areas that contain large or relatively undisturbed habitats and provide shelter habitats for species which are intolerant of human disturbance;

• areas that contain plants, animals or landforms which are unusual or are of local, regional, provincial, national or international significance;

• areas that provide an important linking function and permit the movement of wildlife over considerable distances,

• areas, buildings or features that are important for cultural or historic reasons; areas that are excellent representatives of one or more ecosystems or landscapes that characterize a natural region;

• areas with intrinsic appeal due to widespread community interest or the presence of highly valued features or species such as game species or sport fish; or

• areas with lengthy histories of scientific research.

These criteria form the basis for most environmentally sensitive area studies today.

3.1.5 Criteria Used in This Study

The criteria used to evaluate individual sites included site size, vegetation composition, wildlife, landform, hydrological function, corridors and linkages, the sites ability to sustain use, the sites present use and the presence of recognized palaeotological, archaeological, prehistoric or historic resources. Figure 3 presents a simplified key that was used to guide the overall evaluation phase. Table 3 presents key criteria that were stringently applied to evaluate individual sites.

3.1.6 Minimum Polygon Size

In an urban environment, it is essential to consider the area of potential sites as size will be one of the principal determinants of the site's long-term viability. Larger sites are generally considered to be more viable and, as stated above, usually provide critical habitat to a higher diversity of species.

The size of an area was not directly used in previous studies as a criterion for identifying sites. A 0.1 ha minimum, however, was proposed by the City of Edmonton (1992) as a criterion in identifying natural areas.

This 0.1 ha minimum area was used in Ealey's (1986) study, Urban Natural History Interpretive Sites in and Adjacent Edmonton, only to select sloughs/wetlands. A 1.0 ha minimum was used by Ealey to select remnant woodlots with no wetland component. In total, Ealey identified 321 sites less than 1.0 ha in size. These sites account for nearly 30 percent of all the sites he identified in and adjacent Edmonton.

The viability of a site is critical to its

conservation and/or preservation. Small remnant wetlands less than 1 ha in size are subject to development pressures such as drainage (basin alteration and ground water fluctuation), in-filling (dumping), cultivation, and urban development. In most instances, many of the small wetlands (< 1.0 ha) are seasonal in nature and provide only temporary habitat. The value of such wetlands declines unless a complex of wetlands can be protected with a range of temporary to permanent water bodies. Small, remnant forest stands may be more viable than similar-sized wetlands for conservation purposes. Larger sites are more likely to have greater ecological diversity and hence have greater value to the natural environment.

In this study, all natural areas less than 1.0 ha in size that were previously identified by Ealey (1986) but were not complexed or grouped with other sites to form larger natural areas, were deleted from the list of natural areas and potential environmentally sensitive areas and significant natural areas. These relatively small sites are very susceptible to both man-made (cultivation, drainage, etc.) and natural disturbances (reduced soil moisture as a result of decreased annual precipitation), and hence, in most instances, are not considered to be viable sites.

3.2 Levels of Significance

Westworth *et. al.* (1991) stated that "the level of significance is primarily a function of rarity and geographic scale.... areas that provide habitat for species that have been identified as threatened or endangered in Canada may have national significance whereas key habitat areas for common or abundant wildlife species might have regional or local significance." They further stated that "significance levels often reflect the geographic context of the site... the complex of wetlands found on the Cooking Lake moraine may have national or international significance because of the importance of the region as a breeding and staging area for continental waterfowl production, however, individual lakes within this complex may only be significant at a provincial, regional or local level."

Four levels of significance are used in this study and are defined below:

Local Significance

Natural features that are considered sensitive or significant from a local perspective. These include sites that have intrinsic appeal due to community interest.

Regional Significance

Natural landscapes or features that are of limited distribution or are the best examples of a feature in the region.

Provincial Significance

Natural landscapes or features that are of limited distribution at a provincial level or are the best examples of a feature in Alberta.

National Significance

Natural landscapes or features that are of limited distribution or are the best examples of a feature in Canada

Wallis (1991), Westworth (1991), Sweetgrass (1989) and Infotech (1989) all stated that evaluating areas in terms of levels of significance requires a considerable knowledge of significant features outside the jurisdiction under

study. This knowledge is facilitated by lists of rare, threatened and endangered species (COSEWIC 1988; Wallis 1977; and Packer and Bradley 1984) or evaluations of natural ecosystem complexes or landscapes (Cottonwood Consultants 1983), which are available at provincial, national and international levels.

3.3 Methods

3.3.1 Public Consultation

The City of Edmonton's Planning and Development Department notified all private landowners within the study area, public interest groups and the general public about the study and asked that they provide any information of relevance to the study.

Numerous responses were received, however, very few were relevant to the study. Responses that were relevant to the study were field verified.

In addition to the city's public consultation program, study personnel contacted numerous individuals and organizations, including Ducks Unlimited, Alberta Environmental Protection, Alberta Culture, Edmonton Bird Club, Christmas Bird Count, University of Alberta, Department of Forestry, Western Canada Wilderness Committee, Elk Island National Park, City of Edmonton, Planning and Development and Parks and Recreation, and the Edmonton Metropolitan Regional Planning Commission.

3.4.2 Biophysical Inventory

All of the original 1049 Ealey (1986) sites were delineated on 1:5 000 1990 black and white aerial photographs (May 1990). All sites were visited in the fall of 1992 and examined for general ecological conditions and degree of disturbance. Sites were eliminated if they had been negatively impacted by surrounding developments (i.e. drainage, clearing, cutting). In addition, an exhaustive literature search was undertaken to help identify sites and their significance. (For a complete listing of the literature examined, the reader is referred to Section 6.0, References).

A total of 406 sites within the table lands remained following the 1992 fall field program; 257 sites were classed as natural areas, 66 as potential significant natural areas and 83 as potential environmentally sensitive areas.

A detailed field inventory was undertaken during the spring/summer of 1993 for each of the 149 sites identified as being either significant natural areas or as environmentally sensitive areas in Phase 1 of the study. No inventory was undertaken of the natural areas as time did not permit any further investigation of these sites.

Due to limited field time, a complete and exhaustive survey of all sites did not occur (i.e., the inventory did not attempt to locate and identify rare plants at each site). Additional time should be spent at each site identified as either environmentally sensitive area or as a significant natural area to verify the findings of this study.

Biophysical data collected at each site included vegetation, soils, landform and wildlife observations. Site information included slope, aspect, drainage, parent materials, ecological moisture regime, nutrient status, factors affecting stand establishment, surrounding land use, and general site notes. A vegetation species list was compiled to include trees,

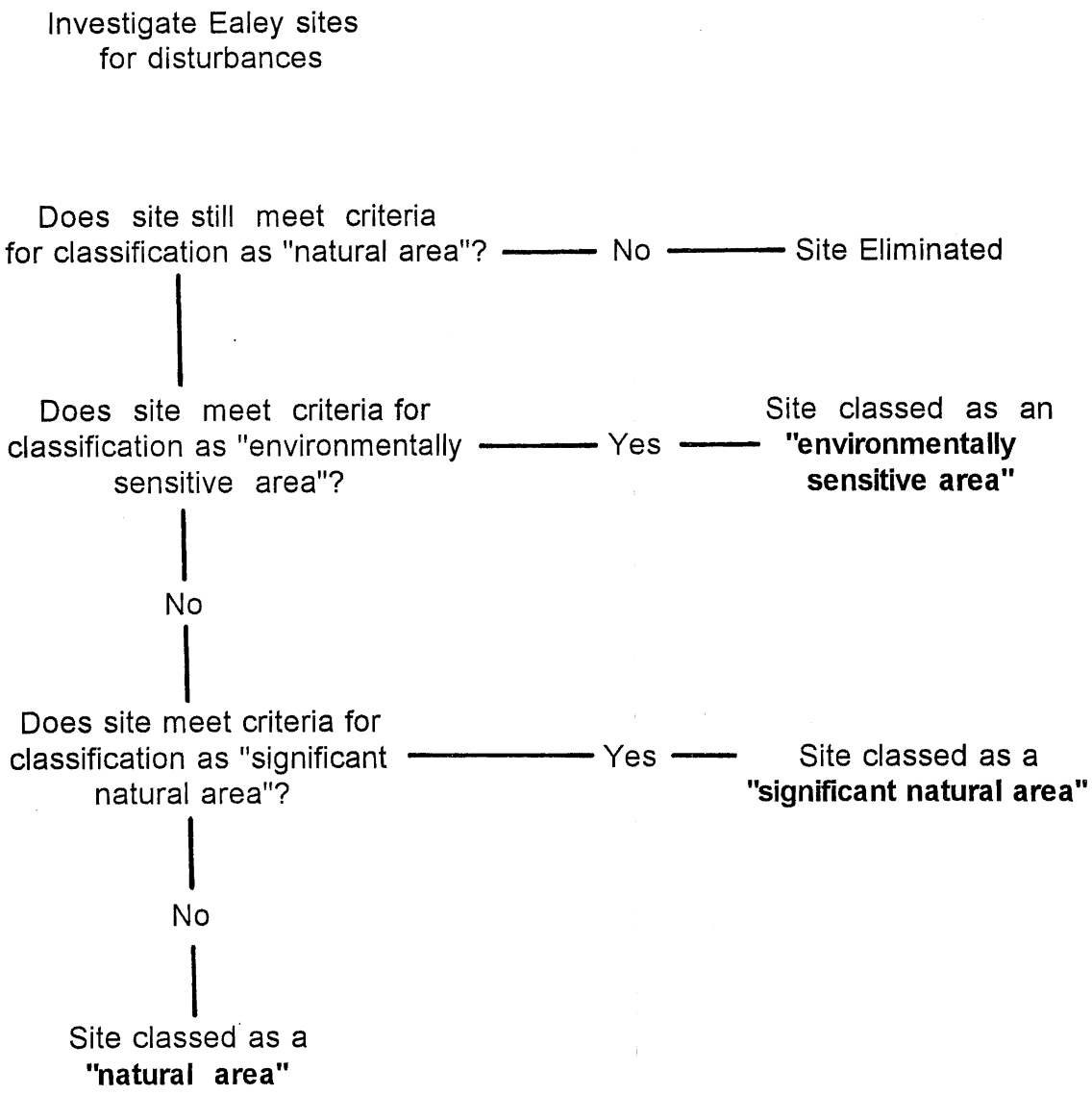


Figure 3. Overall Decision Structure for the Identification of Natural Areas, Significant Natural Areas and Environmentally Sensitive Areas.

Table 3. Detailed Decision Structure for the Identification of Natural Areas, Significant Natural Areas and Environmentally Sensitive Areas (Approved by City Council August 24, 1993)

Criteria	Natural Area	Significant Natural Area	Environmentally Sensitive Area
Size	• more than 0.1 ha for wetlands • more than 1.0 ha for forested areas	• more than 1.0 ha for wetlands • more than 2.0 ha for forested areas	• more than 1.0 ha for wetlands • more than 2.0 ha for forested areas
Vegetation	• existing natural vegetation	• good example of one or more types of vegetation	• presence of rare plant species • high plant species diversity • old-growth forest
Wildlife	• existing vegetation provides potential habitat for wildlife • may provide habitat for only a portion of a species life cycle	• habitat for local wildlife • habitat for only a portion of a species life cycle	• habitat for vulnerable, threatened or endangered species • high habitat diversity • high wildlife species diversity • provides critical habitat for maintenance of all or significant component of species life cycle
Landform	Not applicable	• good example of local landform	• unique geological or landform feature • steep, usually unstable slopes, slumps, bedrock or landform failure (hazard lands) • landforms highly sensitive to disturbances
Hydrology	Not applicable	• temporary (ephemeral) wetlands	• provides critical function in maintaining or balancing local hydrology • permanent wetlands • permanent open water • groundwater discharge/springs

Corridors/ Linkages	Not applicable	• provides linkages between ESAs and SNAs within the table lands	• provides critical linking function to ESAs identified outside the city • provides critical linking function to ESAs identified within the North Saskatchewan River Valley and Ravine System
Ability to Sustain Use	Not applicable	• highly sensitive to intensive forms of disturbance (e.g. major access routes, industrial, commercial and residential development) • low to moderate levels of sensitivity to less intensive disturbances (e.g. cross-country ski trails)	• highly sensitive to all forms of disturbance
Present Use	• used by residents for recreational purposes	• used by communities and organizations for educational purposes	• site recognized for its value by scientific organizations; used for research purposes because of its unique qualities
Palaeontolgical/ Archaeological/ Prehistoric	Not applicable	Not applicable	• recognized or documented site of significance
Historical Resource	Not applicable	Not applicable	• recognized or documented site of significance by a federal, provincial or municipal government

tall and low shrubs, forbs and grasses; notes were made on canopy height, shrub height, and stand age and condition. Soils information collected at each site included soil texture, and horizon. Special features such as stoniness and mottling were also recorded.

Field data were systematically recorded on appropriate field sheets (Appendix A). Several 35 mm photographs were taken at each site to capture vegetation and general site conditions. Notes were also made on wildlife use (tracks, fecal material, evidence of browsing, visual observation). Individual site inventories occurred between mid-May and the end of June 1993.

3.4.3 Avian Surveys

During the breeding season, systematic bird surveys of a number of sites were made to supplement descriptions of many significant natural areas and environmentally sensitive areas. In addition, these bird surveys sampled a number of natural areas to give some perspective on what bird species and numbers might be expected in suitable habitat.

These systematic surveys were conducted between 05:00 a.m. and 09:00 a.m. during late May and throughout June. This early morning time period is the most effective for detecting singing birds. On each survey, a single observer walked quietly adjacent small sites, or through larger sites, so that the major portions of the site were covered, thus detecting the birds singing. The observers were experienced in bird detection by song and were able to account for individuals of each species by noting the position of each singing bird, and taking care not to repeat counting of a bird once counted. In addition to the singing birds, any birds actually seen were also recorded. This procedure was followed at each site so that survey sampling was comparable between sites.

The breeding status of each bird detected was determined according to the criteria used for the Alberta Breeding Bird Atlas project (Semenchuk 1992). A few additional trips to sites were required to confirm status of some difficult-to-detect birds, but generally the limitations of the study allowed only one visit to a site.

4.0 DATABASE DESIGN

With the large volume of data to be collected and analyzed for use in the identification, evaluation and classification of environmentally sensitive areas and significant natural areas, data must be systematically recorded in a structured manner. As such, a number of graphical and non-graphical (attribute) databases were developed for all sites identified, including natural areas, significant natural areas and environmentally sensitive areas. These databases have open-ended structures so as to allow for periodic updates

The type of information for each of these three areas will vary accordingly, especially between natural areas and environmentally sensitive and significant natural areas. Table 4 below presents the differences in data to be included for each particular site.

The Environmentally Sensitive and Significant Areas (ESA/SNA) database is comprised of two primary databases: 1) a non-graphical, attribute database, and 2) a graphical database. These two primary databases are linked by a common data field to provide access to both data sets as well as to a number of other secondary and historical databases (Fig. 4).

4.1 Non-Graphical Database

The non-graphical, attribute database consists of several databases which can be linked by means of key fields. There are two primary non-graphical (attribute) databases: the ESA database, and the Biophysical database. In both of these databases, the first field (SITENUMB) is the key which identifies the polygon number. Using this field it is possible to link these two databases, and create a view that contains elements from both databases. For example, a view may contain elements of the ESA database as well as the vegetation information from the biophysical database. Different views can be created in this manner to provide the type of data needed for the planning tasks.

4.2 Graphical Database

It was indicated above that the first field in the two primary databases is identical. This field (SITENUMB) in turn, forms the link between the graphic and non-graphic databases. In the Intergraph file, each ESA digitized will be given a label which corresponds to the SITENUMB number in the two primary databases. This will enable the user to carry out spatial queries by pointing to graphic elements, and retrieving the associated database elements. It will also be possible to carry out database queries and show the results in map form.

The graphical database will be entered using standards (e.g. symbols, coordinates) established by the City of Edmonton, and therefore will be compatible with existing data in the system. Where necessary, the data will be linked with existing data to simplify the process of establishing topological queries (what is adjacent to this, what is contained by this, etc.).

4.3 Historical Database

There will also be a delivery of two history attribute databases corresponding to the main databases in the system. These

Table 4. Natural Areas, Significant Natural Areas and Environmentally Sensitive Areas Database for the Table Lands

Natural Areas[1]	Significant Natural Areas	Environmentally Sensitive Areas
Database to include: • data from existing sources of information, especially Ealey (1986) • site number • site name • Ealey number • date • township • range • section • quarter section • air photo number • orthophoto • ASP/NSP • area • perimeter • land ownership • present land use • access to site • proximity to RVRS • level of interest • flag field • vegetation types • wildlife comments • fields 1 - 11 of the Primary non-graphical database	Database to include: • data from detailed field work during summer of 1993 • all component fields of non-graphical and graphical databases • evaluation of level of sensitivity • detailed discussion of all biophysical, cultural and historical attributes, planning and management concerns.	Database to include: • data from detailed field work during summer of 1993 • all component fields of non-graphical and graphical databases • evaluation of level of sensitivity • evaluation of level of significance • evaluation criteria site meets • detailed discussion of all biophysical, cultural and historical attributes, planning and management concerns.

1. Other information that may be provided for natural areas include surrounding land use, historical land use, proximity to nearest ESA/SNA, planning and management concerns, and water permanence.

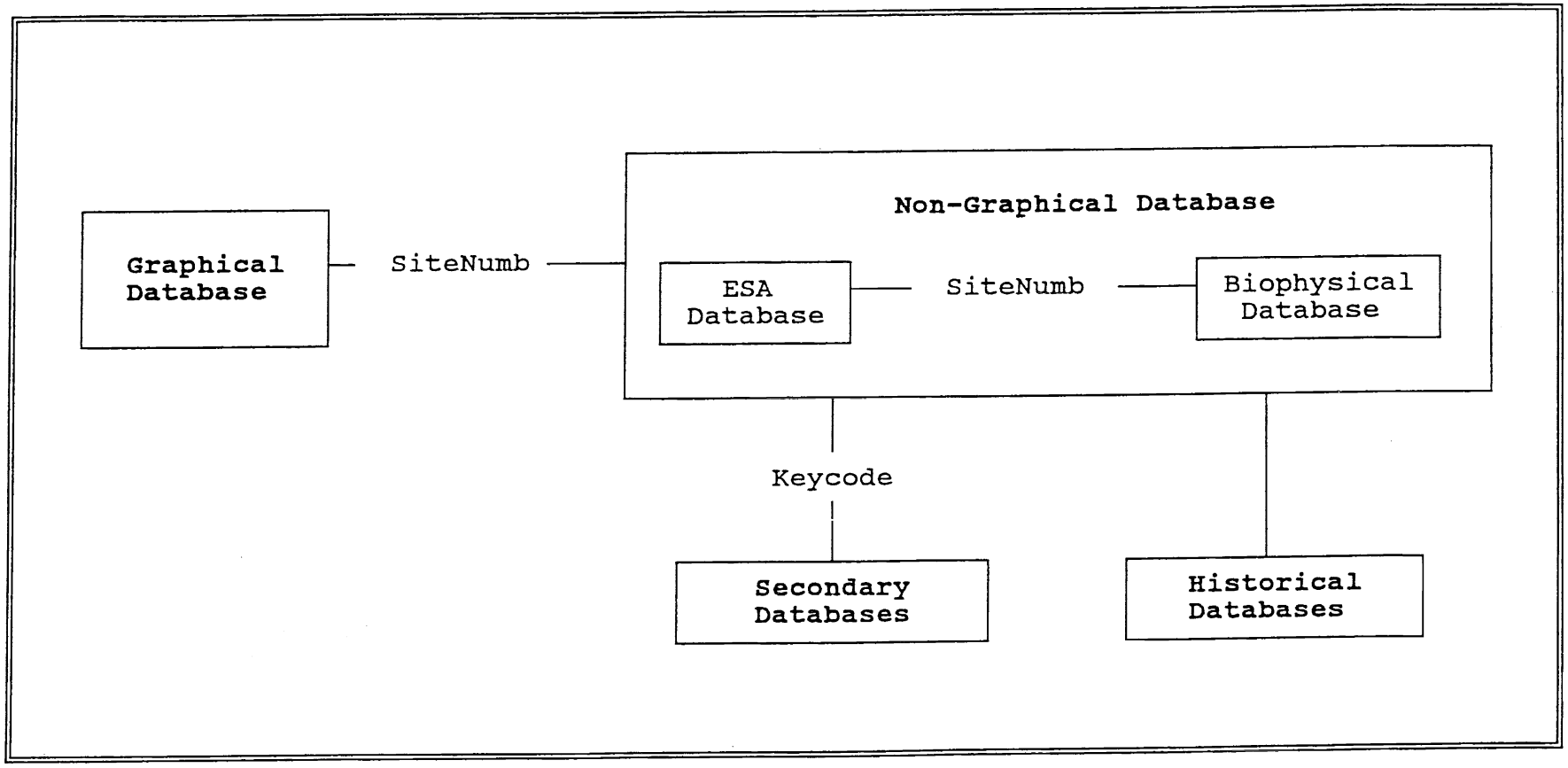


Figure 4. Schematic Diagram of Database Design

databases are designed to hold any changes made to the primary databases. For example, a decision may be made which affects the entries in the ESA or Biophysical databases. After many modifications have been made to the entries in the databases, a planner may wish to see what changes may have occurred at any one site. The historical databases provide such information.

The layout of both of these historical databases are identical to the original databases, with the exception that an extra field appears in each: the date corresponding to the change made to the database. If a site were removed from the database due to road construction, the site would be eliminated from the ESA and Biophysical databases, but added to the corresponding historical databases. An enhancement to the two tables would be the addition of an extra field which outlines the reason for the change (a code would probably be ideal).

4.4 Codes

These databases use codes for specific fields. Secondary databases (Appendix D) provide a full explanation as to the meaning of these codes. For example, the keycode fields (1 through 5) identifies elements which constitute an environmentally sensitive area. This is achieved through the use of a three character code. For example, keycode fields in the primary non-graphical database identify for the user significant features (e.g., rare plant species, **VRS**) or elements (e.g., high community diversity, **VDV**) which constitute an environmentally sensitive area.

A secondary database (KEYCODES) is used to provide a full explanation of these codes. This database contains two fields, the first is KEYCODE, which is used to link to the appropriate keycode field in the ESA database. The second field provides a full description of the code.

Many of the fields above will have comment fields attached to provide additional information that pertains to the particular field.

These databases are provided in xBase and ASCII format and have been imported into ORACLE. Each database is an ORACLE table and forms part of the GBIS database.

5.0 RESULTS AND DISCUSSION

Ealey's (1986) Urban Natural History Interpretive Sites in and Adjacent Edmonton for the City of Edmonton's Parks and Recreation Department, identified 1,049 natural sites within and adjacent Edmonton. Of the original 1,049 natural sites identified, 38 sites within the table lands have been classed as environmentally sensitive areas, 27 as significant natural areas and 246 as natural areas (Map 1). An additional 17 sites within the North Saskatchewan River Valley and Ravine System were classed as environmentally sensitive areas based upon a review of existing literature.

Ealey sites were eliminated if they occurred within the "old city" (pre-annexation boundary), North Saskatchewan River Valley and Ravine System, or were within approved Neighbourhood Structure Plans (NSPs) (except where identified for inclusion in future development); were severely disturbed by cultivation, clearing or dumping; formed part of a farmyard; were below 1.0 ha in areal extent; or, were isolated (i.e., small woodlands of generally < 2.0 ha in area in the middle of a 1/4 section of cultivated field). Ealey (1986) also identified a number of significant sites that occurred within the county of Strathcona; these sites have been eliminated from further investigation as they occur outside of the study area. They were, however, taken into account when deciding upon the legitimacy of adjacent sites within the Edmonton table lands.

In total, 82 sites within the annexed table lands and the North Saskatchewan River Valley and Ravine System have been identified and classed as either environmentally sensitive or significant natural areas (Table 5); 65 occur within the table lands, the remaining 17 areas within the North Saskatchewan River Valley and Ravine System. Fifty-five of the 82 sites are classed as environmentally sensitive areas; all are highly sensitive to any disturbances that would significantly alter the sites' natural conditions. The remaining 27 sites have been classed as significant natural areas. The sensitivity of these 27 sites is rated as moderate to low, with most of the sites only being negatively impacted by complete destruction (i.e., removal of forest cover). 246 sites meet the criteria outlined for natural area classification.

The 65 table land sites include 936.95 ha (9.36 km^2) of land (Table 5). Approximately 56 percent (4.25 km^2) of this land occurs within the northwest, 22 percent (2 km^2) within the southeast, 15 percent (1.4 km^2) within the northeast and the remaining 7 percent (0.7 km^2) occurs in the southwest.

A total of 652.01 ha (6.52 km^2) of land within the table lands area has been classed as environmentally sensitive (Table 5). Of this, 59 percent (3.8 km^2) occurs within the northwest, 30 percent (2.0 km^2) within the southeast, 6 percent (0.4 km^2) within the northeast and 5 percent (0.3 km^2) within the southwest. ESAs vary in size from a minimum of 2.37 ha (Glendale Wetland) to a maximum of 49.62 ha (Southeast Natural Area).

Similarly 284.94 ha (2.84 km^2) of land within the table lands have been classed as significant natural areas (Table 5). Of this, 36 percent (1.0 km^2) occurs within the northeast, 51 percent (1.45 km^2) within the

northwest, 9 percent (0.25 km^2) within the southwest and 4 percent (0.11 km^2) within the southeast. SNAs vary in size from a minimum of 2.14 ha (41 Avenue SW - 184 Street Woodland) to a maximum of 46.34 ha (Grocery People Woodland).

Of the 55 environmentally sensitive areas, only one was classed as nationally significant (North Saskatchewan River Valley and Ravine System), two as provincially significant (Lower Whitemud Creek, Big Island), seven as regionally significant (Big Lake Area, Riverbend, Moran Lake, Kinokamau Lake, Southeast Corner Slough, Koroluk - Kozub Natural Area, and, Winterburn Woodland) and the remaining 45 sites as locally significant. Table 6 presents a listing of all environmentally sensitive areas. Site number and area (ha) and significance ratings are presented for each site. Table 7 presents a listing of all nationally, provincially and regionally designated environmentally sensitive areas that were found within this study along with criteria for each site. Sites designated as "locally" significant are not listed in Table 7 as these sites have natural features that are considered sensitive or significant from a local perspective. These include sites that have intrinsic appeal due to community interest. Sites classed as significant natural areas are presented in Table 8.

Individual environmentally sensitive areas and significant natural areas are discussed below and are presented on Map 1(map pocket). No discussion is provided of 246 sites designated as natural areas however, these sites are shown on Map 1.

Information for all sites is presented within the accompanying databases. Sites are ordered by city quadrant (i.e., northeast, southeast, etc.) and by level of significance. No level of importance is implied unless otherwise stated.

Table 5. Environmentally Sensitive Areas and Significant Natural Areas Within the Table Lands and the North Saskatchewan River Valley and Ravine System

City Quadrant	Environmentally Sensitive Areas		Significant Natural Areas		Total Sites	
	No. of Sites	Area (ha)	No. of Sites	Area (ha)	No. of Sites	Area (ha)
Northeast	3	41.26	11	102.77	14	144.03
Southeast	11	192.18	2	11.49	13	203.67
Southwest	4	37.75	5	25.71	9	63.46
Northwest	20	380.82	9	144.97	29	525.79
River Valley & Ravine System	17	-	-		17	-
Total Sites	55	652.01	27	284.94	82	936.95

Table 6. Environmentally Sensitive Areas, City of Edmonton

Site Name	Site	Area(ha)	Significance
Northeast Edmonton			
Manning Freeway - Fort Road Woodland	NE 8002	21.31	Local
Namao Wetland	NE 24	11.45	Local
North Namao Wetland	NE 2	8.50	Local
Southeast Edmonton			
Southeast Corner Slough Natural Area	SE 5010	22.12	Regional
Koroluk - Kozub Natural Area	SE 5007	48.92	Regional
Southeast Natural Area	SE 5004	49.62	Local

Southeast Mixedwood Natural Area	SE 5002	14.90	Local
Southeast Wetland Natural Area	SE 20	5.87	Local
Maple Ridge Natural Area	SE 238	7.51	Local
34 St. SW and Ellerslie Road Natural Area	SE 5008	6.52	Local
34 Street Wetland	SE 107	5.86	Local
Meridian Street - Twp Rd 515 Natural Area	SE 5012	6.55	Local
Henschel Wetlands	SE 5009	2.16	Local
Southeast Woodland Natural Area	SE 5016	22.15	Local
Southwest Edmonton			
Ogilvie Ridge Wetland	SW 6002	3.32	Local
Southwest Mixedwood Natural Area	SW 6001	24.53	Local
Southwest Highland	SW 86	6.65	Local
Southwest Wetland	SW 2	3.25	Local
Northwest Edmonton			
Kinokamau Lake	NW 7026	43.15	Regional
Winterburn Woodland	NW 302	46.51	Regional
Grocery People Wetland	NW 110	2.71	Local
Glendale Wetland	NW 132	2.37	Local
Stony Industrial Complex	NW 7012	4.95	Local
Normandeau Gardens Natural Area	NW 254	7.60	Local
23 Avenue Wetland	NW 355	12.37	Local
East Winterburn Natural Area	NW 204	3.33	Local
Triple 5 Farm Wetland	NW 288	8.90	Local
Hillview Natural Area	NW 275	4.68	Local
Potter Green South Natural Area	NW 7050	4.34	Local
Triple Acres Natural Area	NW 318	25.64	Local
Winterburn School Natural Area	NW 7010	38.04	Local
McDonagh Peatland	NW 7009	35.51	Local

Site Name	Site	Area (ha)	Significance
Henry Singer Sports Field	NW 7060	18.50	Local
North Poundmaker Industrial Complex	NW 7051	33.95	Local
167th Avenue - 112 St. Wetland Complex	NW 7017	22.12	Local
Northwest Mature Woodland	NW 7016	27.44	Local
167 Avenue Wetlands	NW 7024	13.53	Local
Northwest Wetland	NW 7018	25.18	Local
North Saskatchewan River Valley and Ravine System			
North Saskatchewan River Valley	-	-	National
Lower Whitemud Creek	-	-	Provincial
Big Island	-	-	Provincial
Big Lake Area	-	-	Regional
Riverbend	-	-	Regional
Moran Lake	-	-	Regional
Lower Mill Creek Ravine	-	-	Local
Upper Mill Creek Ravine	-	-	Local
Upper Whitemud Creek/Blackmud Creek	-	-	Local
Horsehills Creek	-	-	Local
Horsehills Creek Headwater Lake	-	-	Local
Lower Oldman Creek	-	-	Local
Other Ravines	-	-	Local
South-end Ravine and Channel Banks	-	-	Local
Unnamed Creek - Northeast Corner	-	-	Local
Wedgewood Ravine	-	-	Local
Fulton Creek	-	-	Local

Table 7. National, Provincial and Regional Environmentally Sensitive Area

Site Name	Site	Designation	Criteria
North Saskatchewan River Valley and Ravine System[1]			
North Saskatchewan River Valley	-	National	• best example in Canada of a major river valley system relatively undisturbed in a major urban setting • provides habitat for a number of rare plant and wildlife species • recognized and documented historical, archaeological, paleontological sites of significance • provides critical hydrological function, including groundwater discharge • unique geological and landform feature, including significant "hazard lands"
Lower Whitemud Creek	-	Provincial	• provincially significant paleontological finds • provides habitat for rare wildlife species
Big Island	-	Provincial	• site of largest known balsam poplar in Alberta
Big Lake Area	-	Regional	• provides critical function in balancing and maintaining hydrology of "provincially significant" Big Lake
Riverbend	-	Regional	• largest stand of riparian forest within the Restricted Development Area (RDA)
Moran Lake	-	Regional	• unusually high wildlife species diversity

Site Name	Site	Designation	Criteria
Southeast Edmonton			
Southeast Corner Slough Natural Area	SE 5010	Regional	• regionally important waterfowl staging area
Koroluk - Kozub Natural Area	SE 5007	Regional	• unusually high vegetation diversity provides critical year-round habitat for ungulates and critical breeding, feeding and rearing habitat for waterfowl • largest continuous tract of "native" vegetation in south Edmonton
Northwest Edmonton			
Kinokamau Lake	NW7026	Regional	• most important single wetland for wetland-related wildlife within the city of Edmonton - important waterfowl breeding, moulting and staging area and used in conjunction with "provincially significant" Big Lake and "locally significant" wetlands within the city
Winterburn Woodland	NW 302	Regional	• provides habitat for uncommon and vulnerable Cooper's hawk

1. Significance ratings for the North Saskatchewan River Valley and Ravine System based solely on existing information; no field inventory work was undertaken.

Table 8. Significant Natural Areas, City of Edmonton

Site Name	Site	Size (ha)
Northeast Edmonton		
153 Avenue - Meridian St. Woodland	NE 221	5.30
Meridian Street Creek Woodland	NE 8005	6.35
East Fraser Woodland	NE 235	14.25
Celanese Canada Woodland	NE 8006	6.90
Bocock Woodland	NE 52	4.50
Horsehills Complex	NE 8003	8.88
167 Avenue - Meridian St. Woodland	NE 8010	10.98
Horsehills Woodland	NE 8011	6.58
CNR - 17th Street Woodland	NE 133	8.95
Highway 37 - Meridian Street Parkland	NE 10	18.00
Alberta Railway Museum Wetland	NE 8	12.08
Southeast Edmonton		
Hurstwood Woodland	SE 5015	6.51
Highway 14 - Sherwood Park Cloverleaf	SE 244	4.98
Southwest Edmonton		
Virginia Park Woodland	SW 31	5.37
North Virginia Park Woodland	SW 74	7.24
41 Avenue SW - 184 Street Woodland	SW 1	2.14
Southwest Deciduous Woodland	SW 8	5.60
University of Alberta Farm Woodland	SW 26	5.36

Northwest Edmonton		
Woodbend Ravine Woodlot	NW 339	8.93
Section 19 Woodland	NW 384	17.56
Kinokamau Lake Woodland	NW 139	3.73
Northwest Boundary Complex	NW 89	8.09
215 Street Natural Area	NW 7021	12.08
156 Street - St. Albert Trail Natural Area	NW 65	13.54
Freeman Woodland	NW 7004	22.93
Winterburn Crossing Wetlands	NW 7011	11.77
Grocery People Woodland	NW 7035	46.34

Environmentally Sensitive Areas and Significant Natural Areas of Northeast Edmonton

5.1 Northeast Edmonton

Although most of the northeast quadrant of Edmonton has been cleared and subsequently cultivated for agricultural purposes, 14 individual sites remain which have been identified as being of "importance" to the overall ecological integrity of the area. Included are the following sites:

- Manning Freeway - Ft. Road Woodland
- Namao Wetland
- North Namao Wetland
- 153 Avenue - Meridian St. Woodland
- Meridian St. Creek Woodland
- East Fraser Woodland
- Celanese Canada Woodland
- Bocock Woodland
- Horsehills Complex
- 167 Avenue and Meridian St. Woodland
- Horsehills Woodland
- CNR - 17th St. Woodland
- Hwy 37 - Meridian St. Parkland
- Alberta Railway Museum Wetland

Only the first three sites listed above have been classed as environmentally sensitive areas; the remaining eight sites have been classed as significant natural areas. All ESA sites within the northeast are designated as being of local significance.

Many of the sites identified within the northeast portion of Edmonton form direct links to the North Saskatchewan River Valley and Ravine System and hence provide critical links between upland table land sites and the river valley system for wildlife species. Many of the sites identified (i.e., Celanese Canada Woodland) have permanent wildlife populations.

Immediate attention is required on the Alberta Railway Museum Wetland site (NW 8). It is highly threatened and has been downgraded during the course of the study from an environmentally sensitive area to a significant natural area due to the high level of man-made disturbance (i.e., drainage for irrigation purposes). This site is in immediate need of restorative intervention or the site is almost certain to disappear.

Site Name **MANNING FREEWAY - FORT ROAD WOODLAND**

Site Reference No NE 8002 **Size** 21.31 ha

Significance **Local Environmentally Sensitive Area**

Site Location Between the Manning Freeway and Fort Road west of 211 Avenue and Fort Road
[NW 16 T 54 R 23 W4M]

Description

Complex area composed mainly of upland deciduous forest with several small wetlands, some of which are permanent in nature; upland communities include balsam poplar/red-osier dogwood and aspen-balsam poplar/dogwood-saskatoon/wild sarsaparilla; willow/sedge wetlands; open water wetlands have a cattail/willow fringe.

Upland communities have developed on moderately well to imperfectly drained Orthic Black Chernozems derived from glaciolacustrine materials; willow/sedge communities developed on poorly drained Orthic Humic Gleysols; textures vary from loams and sandy loams overlying sandy clay loams; possible marl deposits underlying wetlands; area completely surrounded by agricultural lands.

Diversity of flora provides exceptional habitat for white-tailed deer; evidence of deer includes tracks and extensive browsing on palatable shrub species including dogwood and saskatoon; most of upland forest consists of young aspen and balsam poplar, however, a portion of the area is composed of decadent balsam poplar; permanent water body provides seasonal habitat for northern shoveler, mallards and blue-winged teal; 21 different bird species noted, including red-tailed hawk, northern oriole, pileated woodpecker, western wood-pewee, eastern phoebe and least flycatcher, magpie, black-capped chickadee, house wren, American robin, warbling vireo, yellow warbler, vesper and song sparrows, red-winged blackbird, brown-headed cowbird, northern oriole, American goldfinch, and clay-colored sparrow; surrounding areas consist of mainly cultivated fields and rough pasture.

Criteria

- high plant species diversity
- "old growth" balsam poplar
- permanent open water body
- high habitat diversity
- best continuous "natural area" in northeast Edmonton

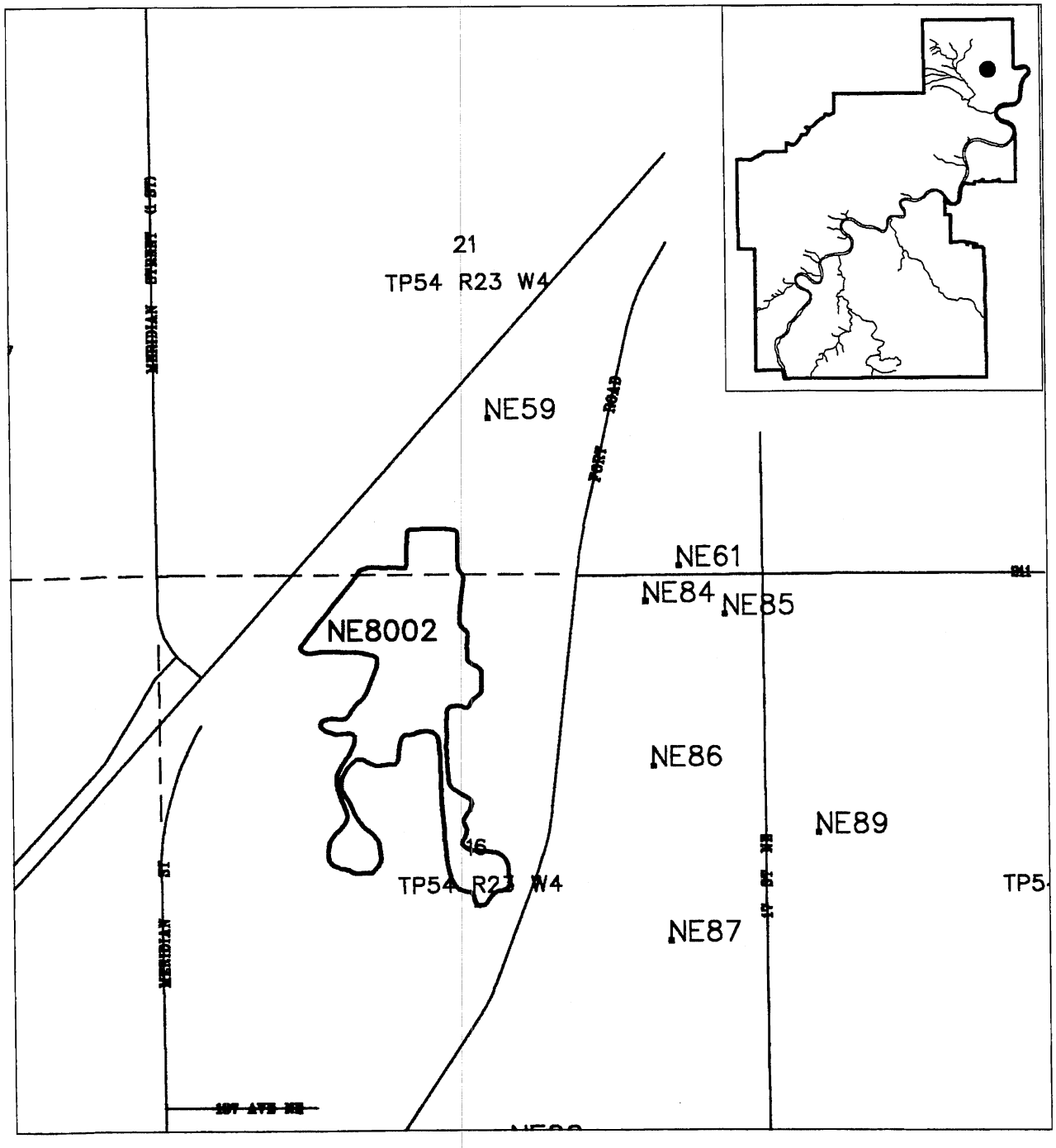
Sensitivity High

Permanent and seasonal wetlands highly sensitive to altered drainage patterns.

Management Considerations

Serious consideration should be given to maintaining water levels within the wetlands, to retain critical waterfowl breeding habitat; all physical development should be avoided.

MANNING FREEWAY - FORT ROAD WOODLAND



Site Name **NAMAO WETLAND**

Site Reference No NE 24 **Size** 11.45 ha

Significance **Local Environmentally Sensitive Area**

Site Location Northwest of the corner of 227 Avenue and 50 Street [SE 26 T 54 R 24 W4M]

Description

Ephemeral wetland complex that is relatively dry; possible water in wetter years; vegetation consists primarily of willow/sedge communities; possible native grasses on dry upland portions within wetland area.

Vegetation developed on poorly drained Orthic Gleysols; soils developed on very gently undulating glaciolacustrine and lacustrine material; textures range from clay loams to clay.

Nine bird species observed during survey including mallard, American crow, American robin, vesper, Lincoln's and savannah sparrows, red-winged blackbird, brown-headed cowbird, and clay-colored sparrow.

Relatively healthy ephemeral wetland; some attempts have been made to convert land into cultivation; although high diversity of willow species, site is not used by deer because of openness of site and surrounding land uses including Namao Air Force Base; red-tailed hawk in area; wetland probably provides temporary habitat for migrating waterfowl and brood rearing; cultivated along edge.

Criteria

- diversity of willow species
- provides waterfowl habitat
- presence of native grass species
- provides critical function in maintaining or balancing area hydrology

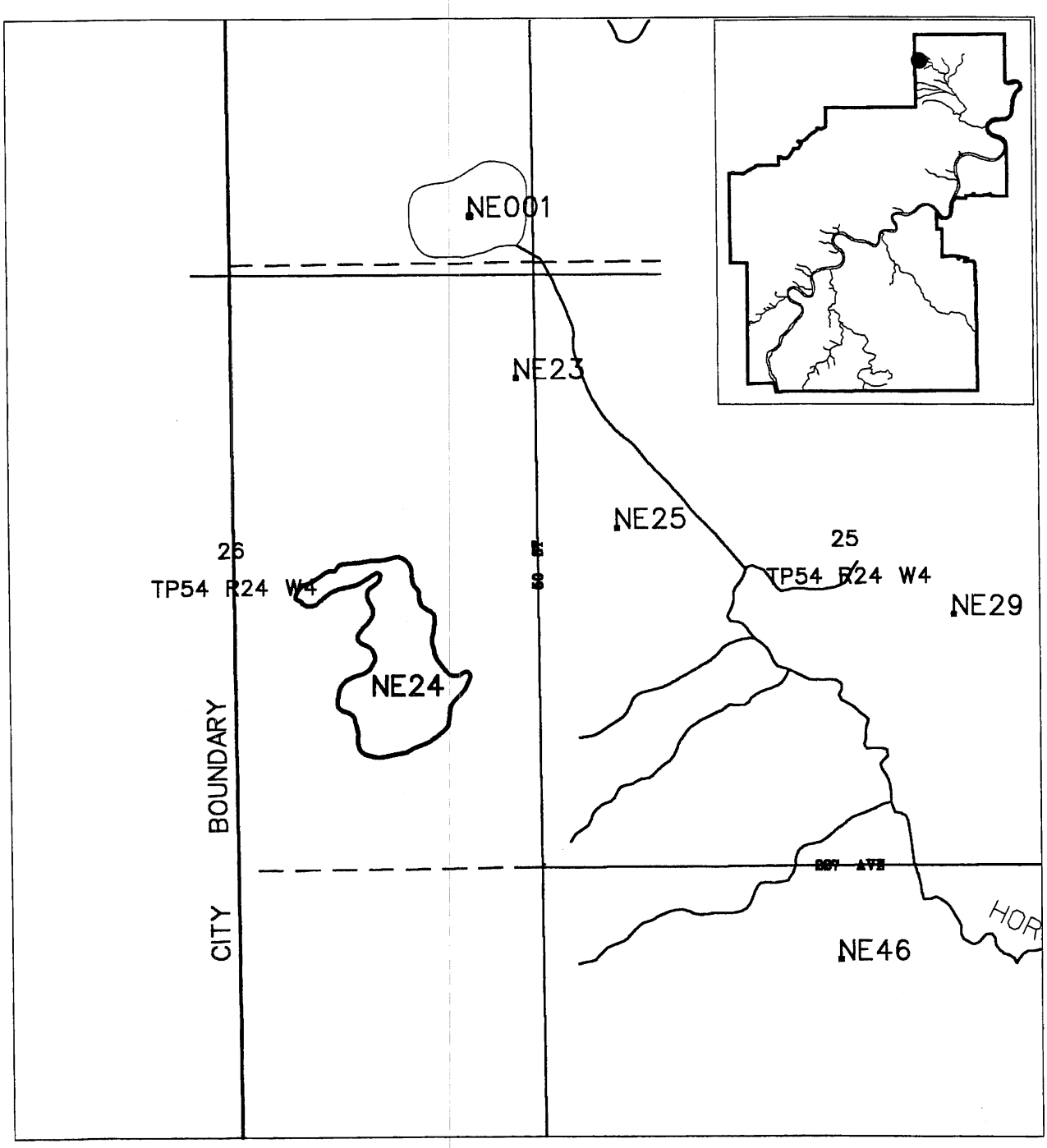
Sensitivity High

Further attempts to cultivate or drain this wetland will severely reduce the viability of this "relatively" healthy ephemeral wetland.

Management Considerations:

Efforts should be made to maintain this ephemeral wetland and further cultivation or alteration of drainage patterns should be discouraged. In addition, waste material that has been dumped within the site should be removed. Further dumping should be discouraged and all physical development should be avoided.

NAMAO WETLAND



Site Name **NORTH NAMAO WETLAND**

Site Reference No NE 2 **Size** 8.50 ha

Significance **Local Environmentally Sensitive Area**

Site Location 2.4 km north of 227 Avenue on east side of 50 Street [W1/2 36 TP54 R24 W4M]

Description

Large, relatively healthy wetland complex composed mainly of sedges and, to a much lesser extent, willows and cattails; most of willow appears to be dead--this may be result of changes to local water tables; water appears to be only temporary in nature; forms headwater area of Horsehills Creek drainage.

Poorly drained Orthic Gleysols and Orthic Humic Gleysols have developed on nearly level to depressional lacustrine materials; clay loams over clay; water levels at or very near the surface for a significant portion of the year.

Unique combination of sedges, grasses, cattails and willows may provide some important waterfowl nesting habitat; red-winged blackbirds frequent the site.

Surrounding land uses include 50 Street and cultivated fields.

Criteria

- example of sedge meadow
- ephemeral wetland
- provides critical function in maintaining or balancing local hydrological regime
- groundwater discharge area

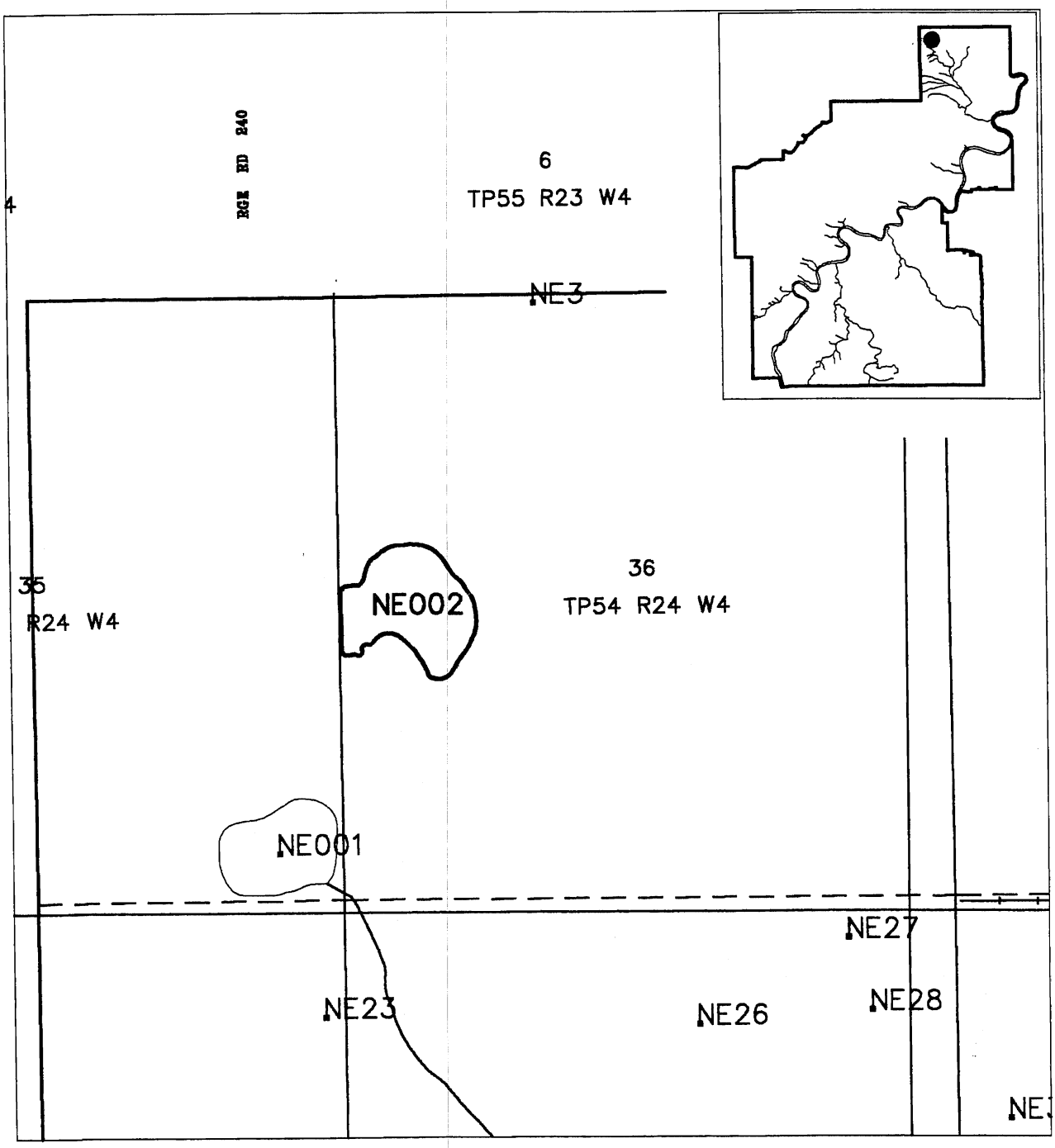
Sensitivity High

Any changes to the natural landscape that would negatively impact upon the local hydrological regime of the wetland is sure to have serious impacts on the wetland; the site appears to have already been negatively impacted by the construction of 50 Street, which has split this once larger wetland into two distinctive units--the western wetland is considerably drier with most vegetation appearing dead.

Management Considerations

It is imperative that this wetland remain intact and that it either be conserved in its natural state or enhanced by a series of drainage culverts under 50 Street. Any additional development should be avoided. Any other changes to this site will have impacts downstream on Horsehills Creek.

NORTH NAMAO WETLAND



Site Name **153 AVENUE - MERIDIAN STREET WOODLAND**

Site Reference No NE 221 **Size** 5.30 ha

Significance **Significant Natural Area**

Site Location Corner of 153 Avenue and Meridian Street
[SE32, T 53 R 23 W4M]

Description

Upland deciduous forest and wet meadow complex; upland forests composed of aspen with a dense Manitoba maple understorey and aspen-balsam poplar with dense red-osier dogwood thickets; interior wet meadow consists mainly of sedges and grasses such as rough hair grass and reed grass; low shrub and forb layers poorly developed due to dense Manitoba maple and dogwood thickets.

Upland forest developed on moderately well drained Orthic Black Chernozems, while meadows developed on poorly drained Orthic Humic Gleysols; nearly level to very gently undulating glaciolacustrine plain; loamy sands overlying sandy clay loams.

Compositional diversity of flora provides unique habitat conditions for white-tailed deer; this site in conjunction with sites immediately to the north and south (NE 8005, 235) provide critical links between upland sites and the adjacent North Saskatchewan River Valley and Ravine system; extensive deer tracks throughout site as well as heavy browsing on maple, dogwood and willow; presence of oak fern indicative of moist, rich conditions.

Criteria

- good example of upland deciduous stand with interior wet meadow
- significant plant species
- provides habitat for local ungulates
- provides links to other ESA/SNAs identified within table lands

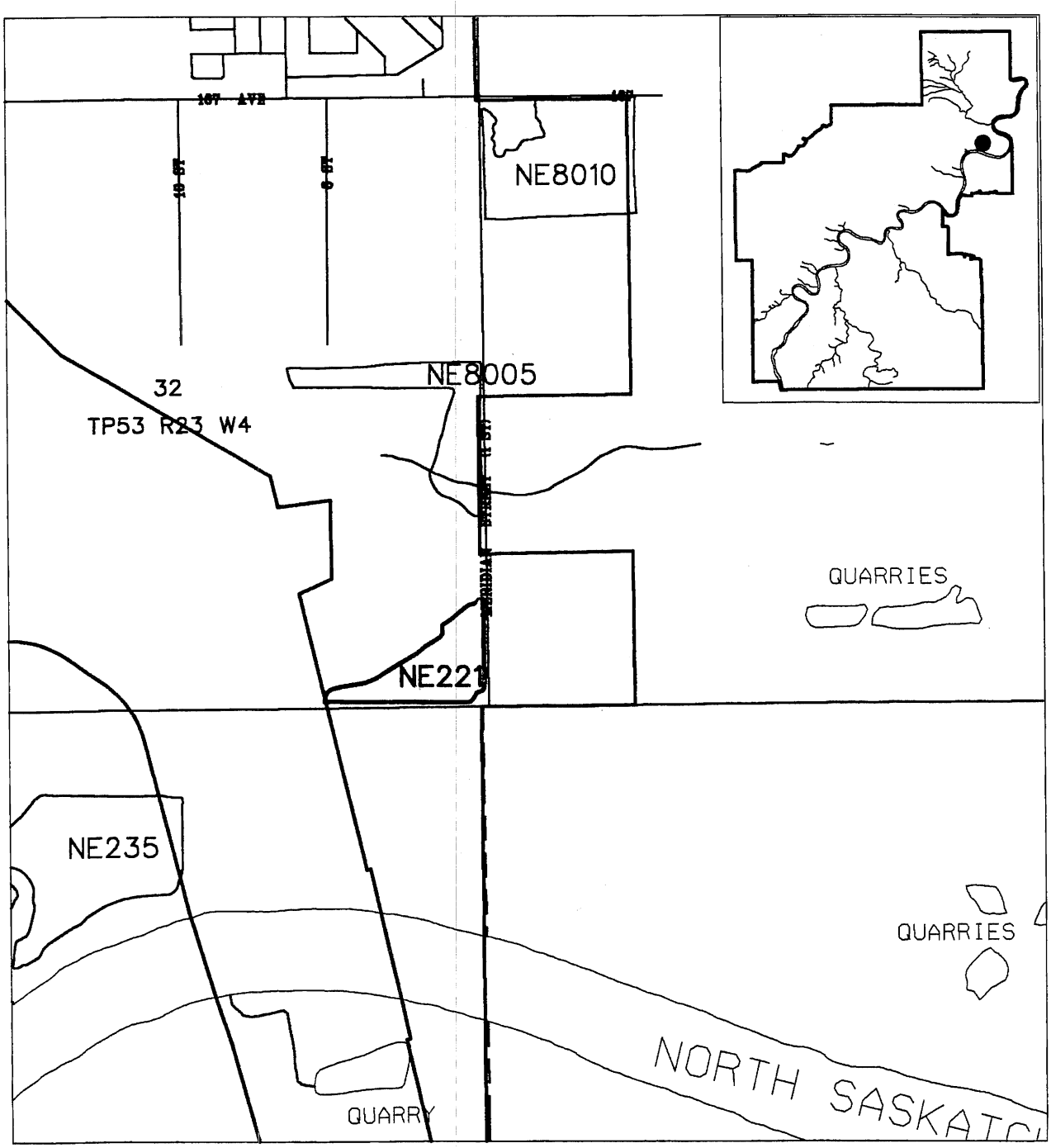
Sensitivity Moderate

Any disturbance to this site will result in alterations to existing vegetation; this will negatively impact wildlife habitat and possibly groundwater regime; removal of vegetation will expose light-textured soils to erosion.

Management Considerations

Because of the heavy use of this area by deer, it is suggested that this area remain intact and that any development consider this site in conjunction with other surrounding sites especially, NW 8005, immediately to north in order to retain a corridor to the River Valley and Ravine System. The site could tolerate limited physical development adjacent to it.

153 AVENUE - MERIDIAN STREET WOODLAND



Site Name **MERIDIAN STREET CREEK WOODLAND**

Site Reference No NE 8005 **Size** 6.35 ha

Significance: **Significant Natural Area**

Site Location 0.8 km north of 153 Avenue on Meridian Street
[NE 32, T 53 R 23 W4M]

Description

Headwater area for an unnamed stream that runs east towards the North Saskatchewan River Valley and Ravine System; diverse vegetation composed of pioneer shrublands, aspen and aspen-balsam poplar communities; pioneer shrubland community of primarily rose and snowberry and to a lesser extent elderberry and silverberry has developed on old pasture land; other areas consist mainly of aspen stands with dense grassy understories of brome and sweet grass and aspen-balsam poplar stands with good understories of red-osier dogwood.

These communities have developed on well drained Orthic Black Chernozems; parent materials consist of level to very gently undulating glaciolacustrine loams and sandy loams overlying sandy clay loams; area well protected from Meridian Street by a row of trees.

This site provides a physical link to the North Saskatchewan River Valley and Ravine System and is heavily utilized by white-tail deer; compositional diversity of the flora provide food and shelter necessary for maintenance of the species; extensive evidence of deer use including "hedging" of palatable shrub species (saskatoon, willow, etc.), pellets and numerous "beds"; nine bird species observed at site including northern orioles, Lincoln's and clay-colored sparrows, least flycatcher, house wren, American robin, warbling and red-eyed vireos and yellow warbler.

Criteria

- good example of a number of different deciduous vegetation communities
- provides habitat for local wildlife species
- provides critical linking function with adjacent sites (NE 221) to the North Saskatchewan River Valley

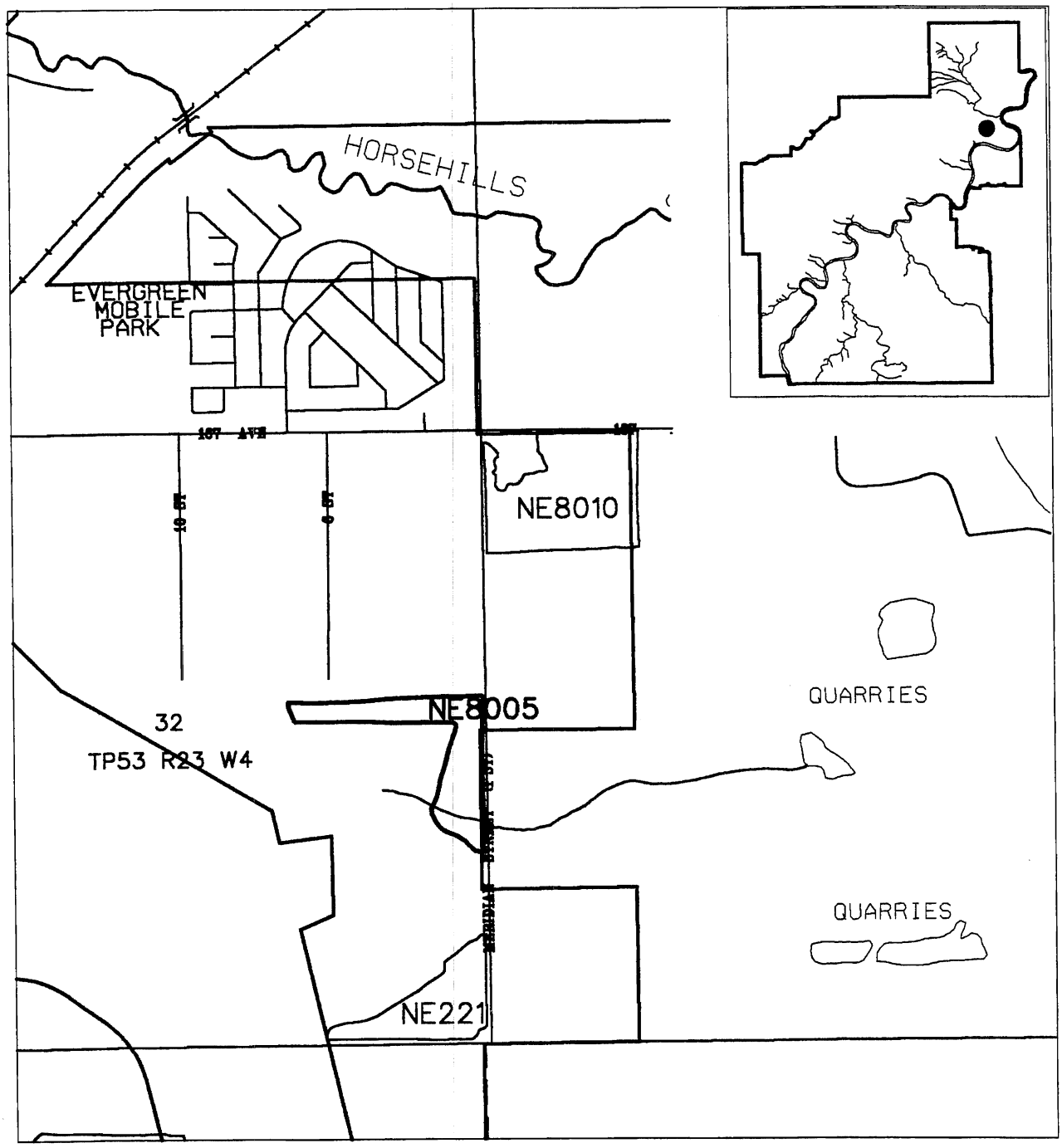
Sensitivity Moderate

Removal of vegetation would expose light-textured parent material to erosion; any alteration to the existing vegetation would have negative impacts upon the hydrology of the adjacent unnamed stream to the east.

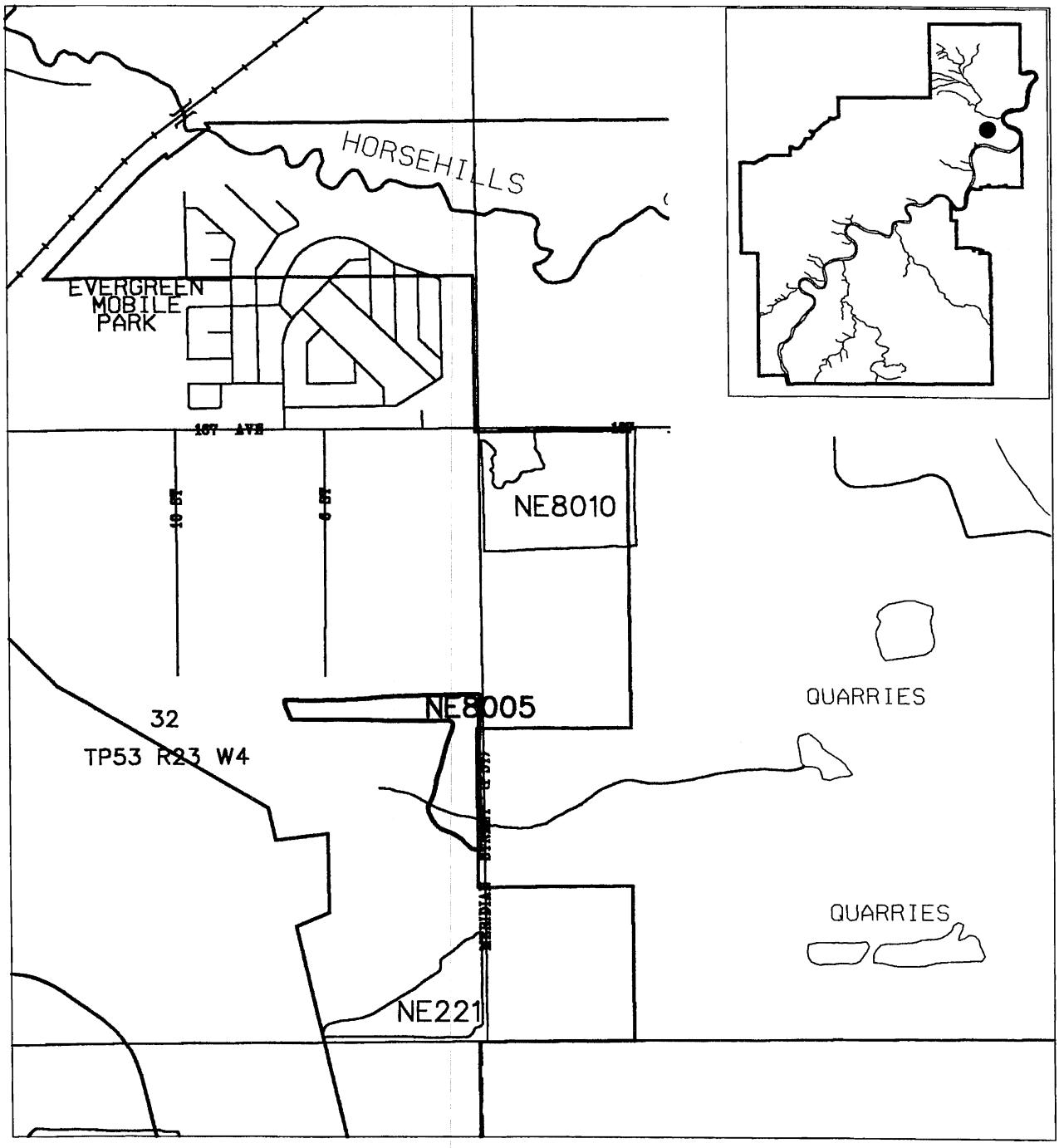
Management Considerations

Attempts should be made to allow the pioneer shrub communities to continue to succeed. Clearing of this area for improved pasture will reduce the value of this site for deer; also, it is recommend that woodland portion of site be maintained as a wildlife corridor.

MERIDIAN STREET CREEK WOODLAND



MERIDIAN STREET CREEK WOODLAND



Site Name **EAST FRASER WOODLAND**

Site Reference No NE 235 **Size** 14.25 ha

Significance **Significant Natural Area**

Site Location South of 153 Avenue, east of 18th Street NE
[NW 29 T 53 R 23 W4M]

Description

Healthy, fire origin young aspen stand adjacent the North Saskatchewan River Valley; small unnamed ravine forms western boundary; "doghair" appearance to stand, most aspen less than 8 m in height; understorey consists primarily of saskatoon; very poorly developed herb layer due to dense overstorey; high -bush cranberry, saskatoon and pin cherry occur extensively along clearings and trails; vegetation developed on well drained Orthic Black Chernozems; nearly level to very gently undulating glaciofluvial loamy sands overlying sands; cultivated fields surround stand.

Because the site occurs immediately adjacent to the North Saskatchewan River, it is used extensively by white-tailed deer; other wildlife species observed included sharp-tailed grouse, red-sided garter snake (probable snake hibernacula along banks of North Saskatchewan River Valley); excellent population of least flycatchers; 14 species of birds observed including rose-breasted grosbeak, savannah and white-throated sparrows, brown-headed cowbird, northern oriole, American goldfinch, clay-colored sparrow, alder flycatcher, black-capped chickadee, house wren, cedar waxwing, American robin, red-eyed vireo and yellow warbler.

Criteria

- good example of young aspen community
- provides habitat for local wildlife, including ungulates and numerous bird species
- provides physical and visual linkage to North Saskatchewan River Valley

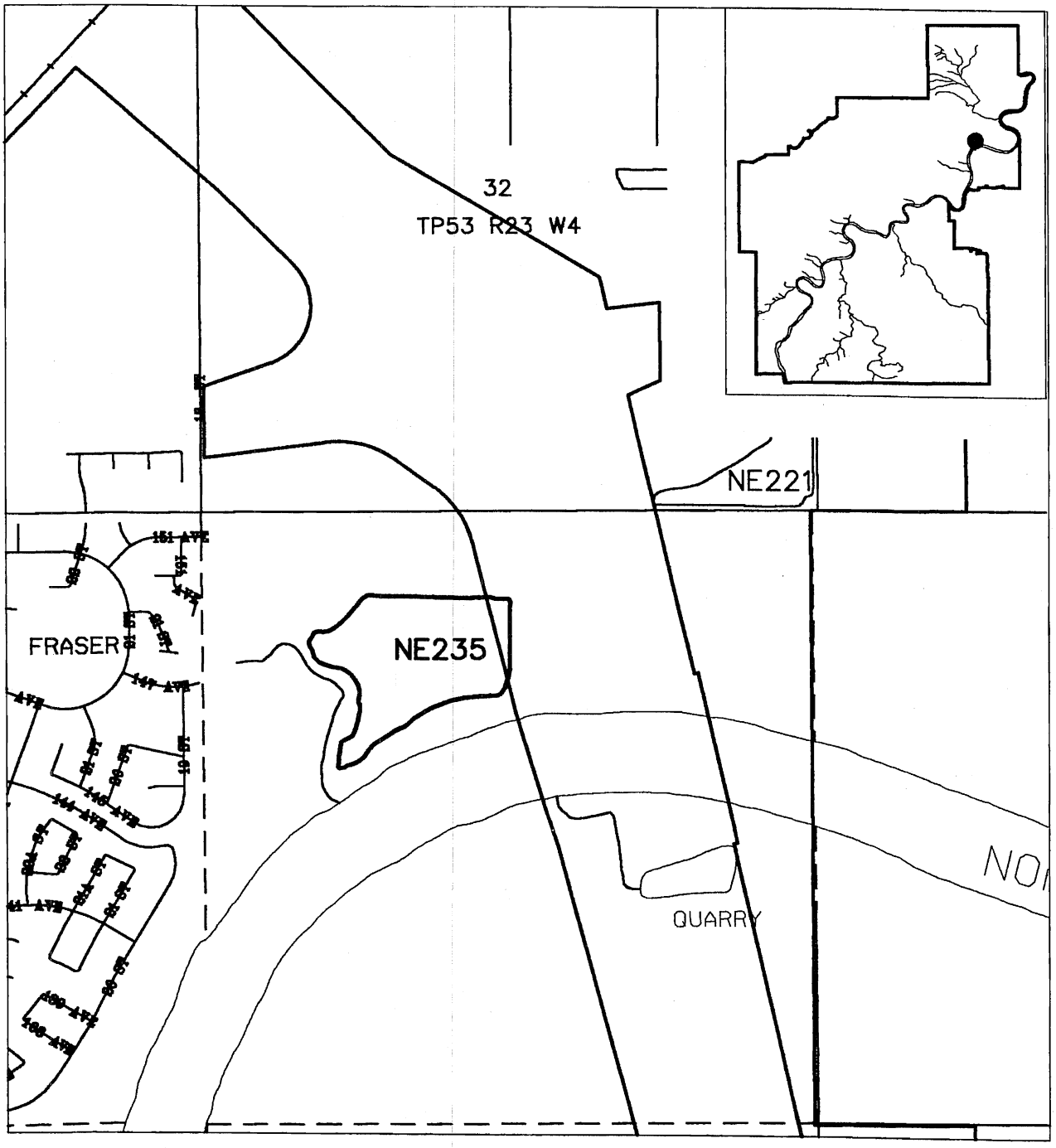
Sensitivity Low to moderate

Removal of vegetation will result in exposure of light-textured parent materials to erosion.

Management Considerations

Because the site provides a corridor between the North Saskatchewan River Valley and Ravine System and the adjacent tableland sites (NE 221, NE 8005), it is imperative that the site be conserved in an intact and relatively undisturbed condition. Any clearing will result in a loss of important bird habitat and exposure of sandy parent materials to erosion. The site could tolerate limited physical development in order to enhance the visual corridors afforded by this site.

EAST FRASER WOODLAND



Site Name **CELANESE CANADA WOODLAND**

Site Reference No NE 8006 **Size** 6.90 ha

Significance **Significant Natural Area**

Site Location 1 km north of Yellowhead, west of Meridian Street within Celanese Canada property
[NE 17 T 53 R 23 W4M]

Description

Healthy, undisturbed aspen-balsam poplar stand within the Celanese Canada property; well-developed understorey of high-bush cranberry, low-bush cranberry, red-osier dogwood and dewberry; excellent example of vertical structure within a stand; some snags around perimeter; vegetation developed on moderately well drained Black Solodized Solonetz; soils developed on nearly level to very gently undulating glaciolacustrine materials; loams over sandy clay loams; abundant earthworms.

A year-round population of 10-12 white-tailed deer inhabit stand; dogwood and cranberry "hedged" by overbrowsing; the site does not appear to be negatively impacted by the surrounding industrial land use; good example of wildlife and industry co-existing on same parcel of land.

Criteria

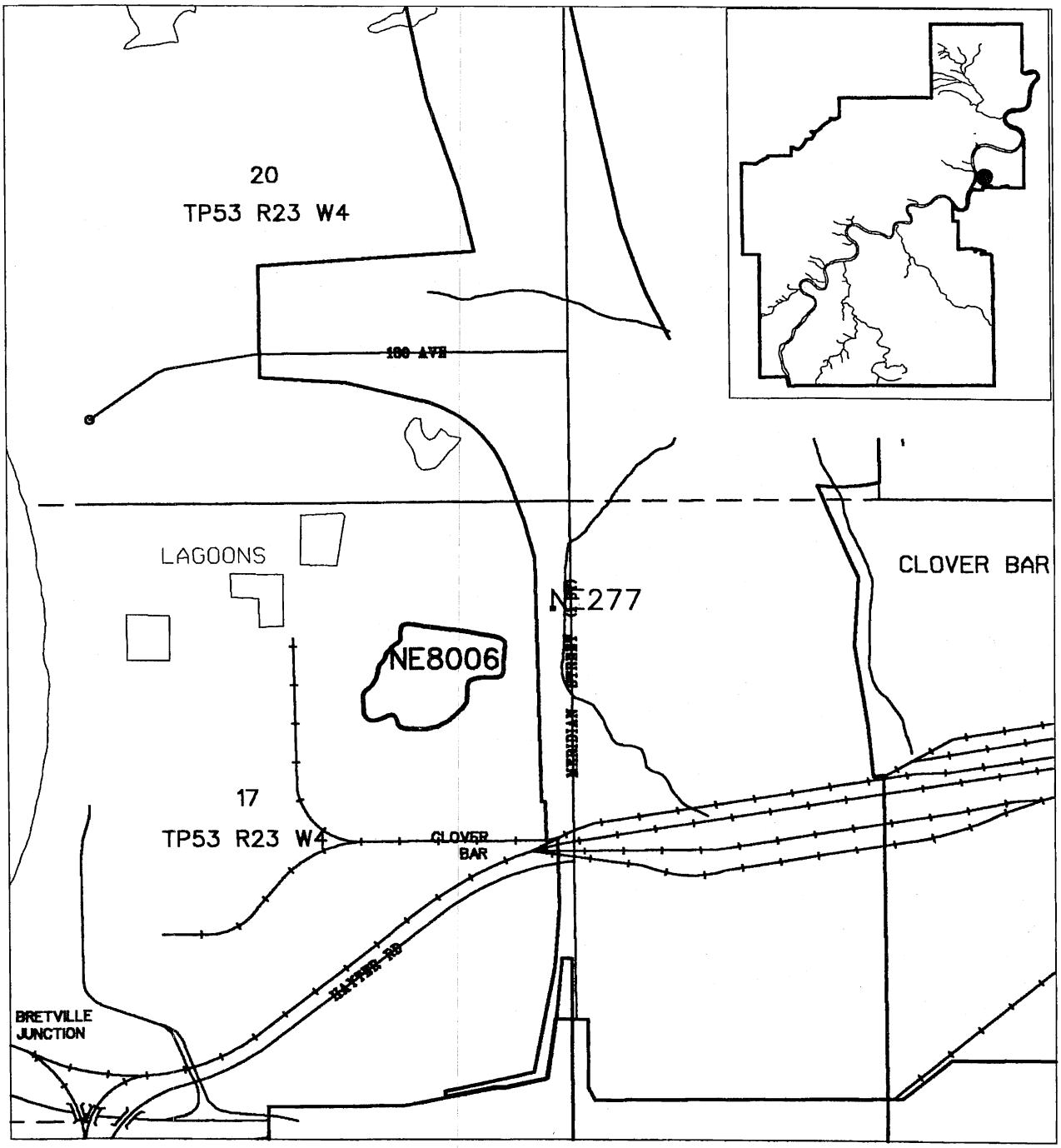
- good example of mature aspen-balsam poplar community with excellent structure
- provides habitat for local wildlife

Sensitivity Low

Management Considerations

Celanese Canada is maintaining site for wildlife habitat. Any reduction in the size of the stand would severely impact white-tailed deer numbers.

CELANESE CANADA WOODLAND



Site Name **BOCOCK WOODLAND**

Site Reference No NE 52 **Size** 4.05 ha

Significance **Significant Natural Area**

Site Location 2 km north or Manning Freeway on 18 Street
[SW 20 T 54 R 23 W4M]

Description

Healthy, undisturbed aspen-balsam poplar stand on the highest point in northeast Edmonton; remnant stand has a very "boreal" appearance with a number of significant snags and lots of deadfall; diverse understorey of red-osier dogwood with lesser amounts of rose, ash, saskatoon, low-bush cranberry, snowberry, Manitoba maple, choke cherry, pin cherry and gooseberry; vegetation developed on well drained Dark Gray Luvisols; soils developed on gently rolling morainal materials; textures vary from loamy sand and sand overlying sandy clay loam; possible kame moraine; lake to northeast of site is within the North Saskatchewan River Valley and Ravine System and is considered important for waterfowl habitat.

This particular site is the highest point in northeast Edmonton and offers a tremendous view point; possible kame moraine; because the site is adjacent to the North Saskatchewan River Valley and Ravine System, it provides a critical linking function, especially for movement of wildlife between the lake to the northeast and the Bocock Woodland.

Criteria

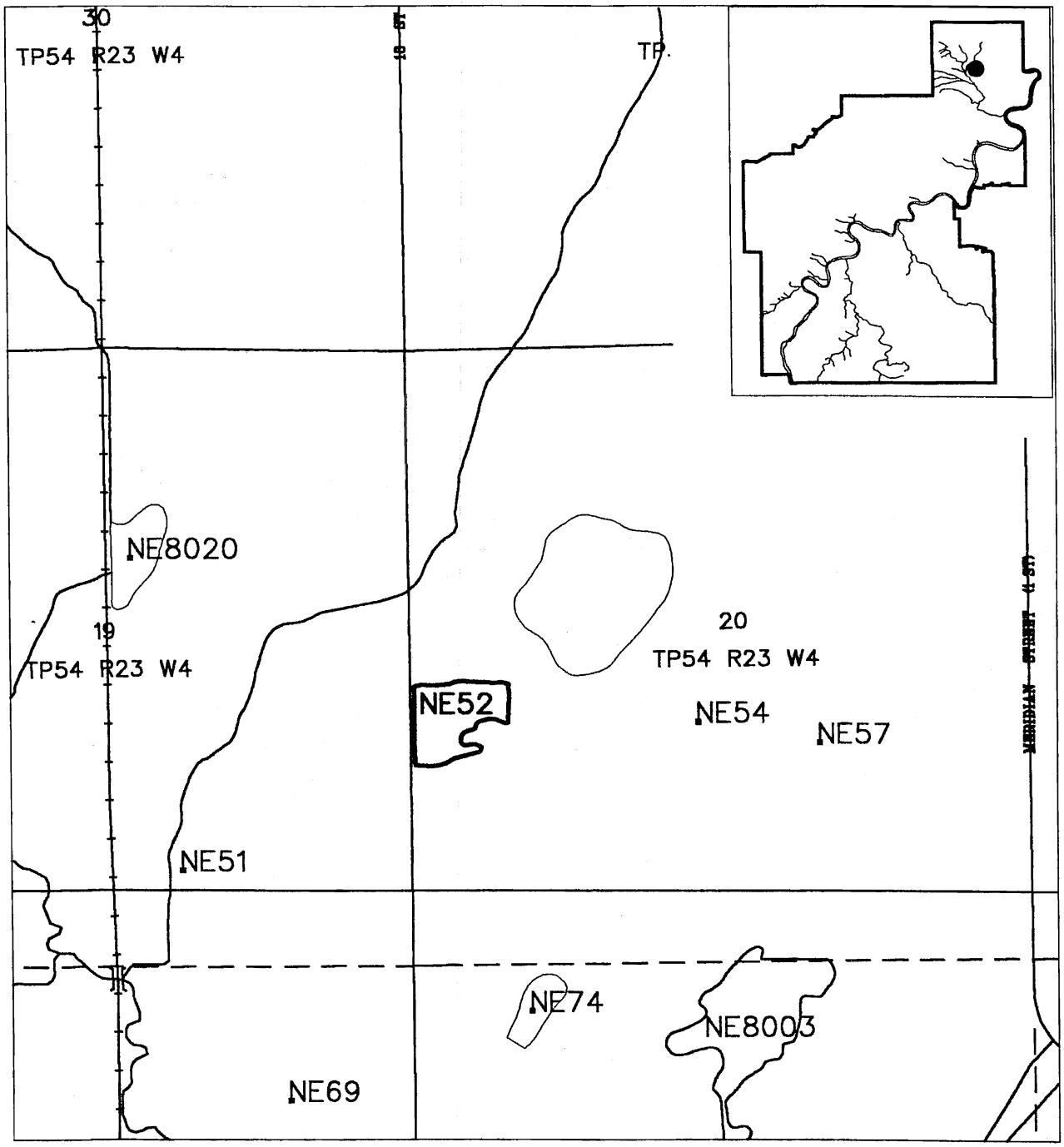
- good example of mature aspen-balsam poplar community
- significant landform feature
- link to North Saskatchewan River Valley and Ravine System
- significant visual corridors from site

Sensitivity Low

Management Considerations

Landowner is very environmentally conscious and has expressed his desire to retain the site as a natural area.

BOCOCK WOODLAND



Site Name **HORSEHILLS COMPLEX**

Site Reference No NE 8003 **Size** 8.88 ha

Significance **Significant Natural Area**

Site Location 0.8 km north of Horsehills Rd between 18 Street and Meridian Street [NE 17 T 54 R 23 W4M]

Description

Diverse upland - wetland complex surrounded by cultivated fields; wetland areas consist primarily of willow/sedge-grass while upland stands are comprised of balsam poplar-aspen; upland deciduous stands account for approximately 25 percent of the entire complex; well-developed understorey of saskatoon and choke cherry; balsam poplar to 20 m in height.

Soils consists of poorly drained Orthic Humic Gleysols in wetland areas and moderately well to imperfectly drained Orthic Black Chernozems under deciduous stands; soils developed on nearly level to very gently undulating glaciolacustrine materials; textures vary from loamy sands and sandy loams over sandy clay loams and sandy clays.

Relatively healthy ephemeral wetland; may provide temporary habitat for waterfowl in the spring.

Criteria

- good example of two vegetation communities including the willow/sedge and aspen-balsam poplar types
- potential waterfowl nesting habitat

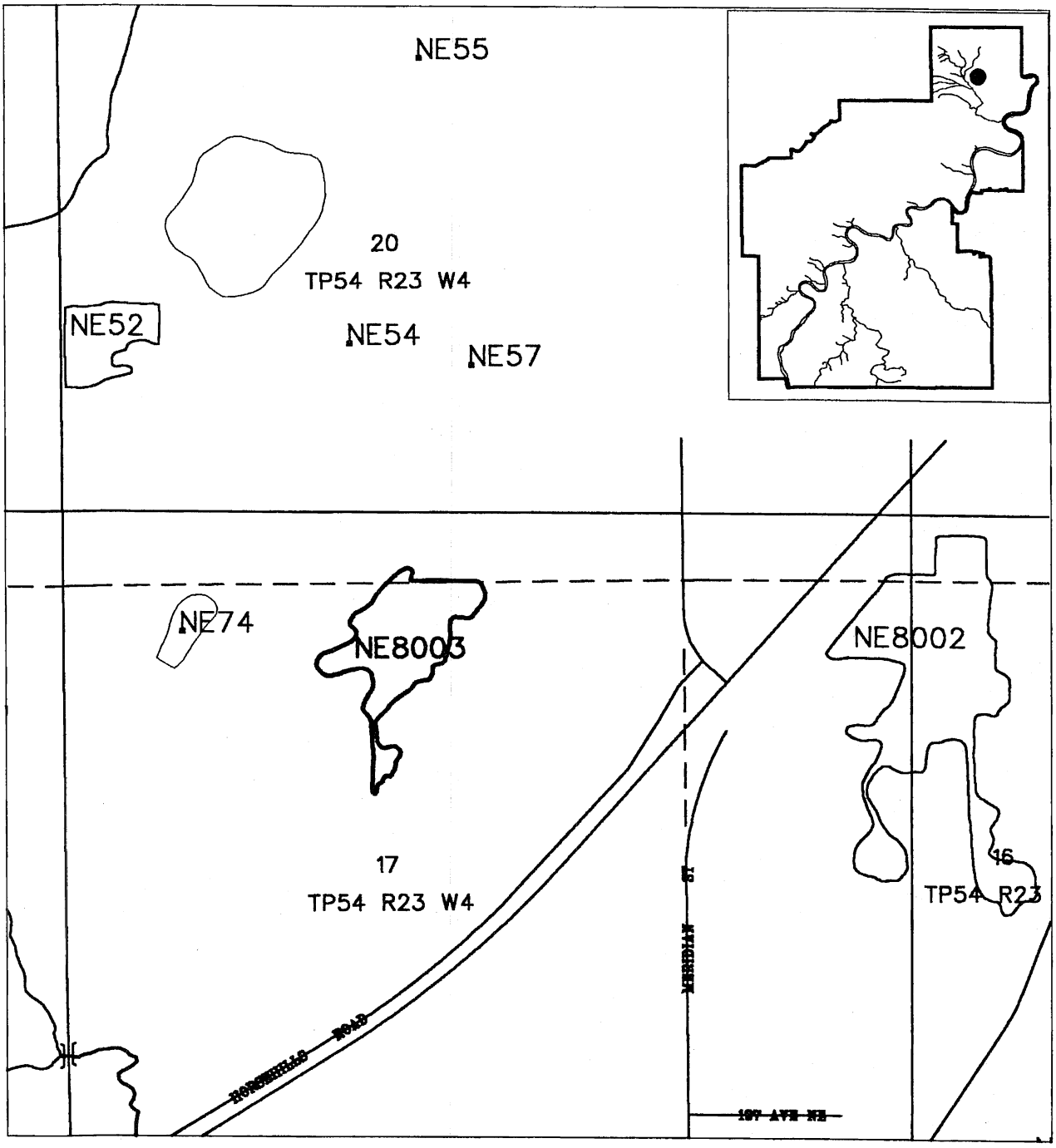
Sensitivity High

Any changes to the natural drainage patterns within this complex, particularly within the wetlands will severely reduce the viability of these wetlands to provide habitat for both ungulates and avian resources.

Management Considerations

Attempts should be made not to alter existing drainage patterns within the wetlands nor to clear the upland deciduous stand.

HORSEHILLS COMPLEX



Site Name **167 AVENUE AND MERIDIAN STREET WOODLAND**

Site Reference No NE 8010 **Size** 10.98 ha

Significance **Significant Natural Area**

Site Location Southeast corner of 167 Avenue and Meridian Street [NW 33 T 53 R 23 W4M]

Description

Relatively healthy balsam poplar/saskatoon stand; very well developed tall shrub layer (6-7 m tall) due to openings in overstorey canopy; few snags.

Forest developed on moderately well drained Orthic Black Chernozems; soils developed on level to very gently undulating glaciolacustrine materials; sandy loams over loamy sands.

Site adjacent to Restricted Development Area (RDA); high pressure oil pipeline cuts through site in a northwest/southeast direction; surrounding land use is cultivated fields, country residential and the Evergreen Mobile Park.

Forest provides possible linking function to the North Saskatchewan River Valley and Ravine System to the east; because of its location adjacent to the river valley, numerous deer and red fox are observed regularly by local residents; heavy use by deer noted by "hedging" of dogwood and browsing on Manitoba maple; 11 bird species observed including red-tailed hawk, least flycatcher, black-capped chickadee, house wren, robin, warbling and red-eyed vireos, yellow warbler, white-throated sparrow, northern oriole and American goldfinch.

Criteria

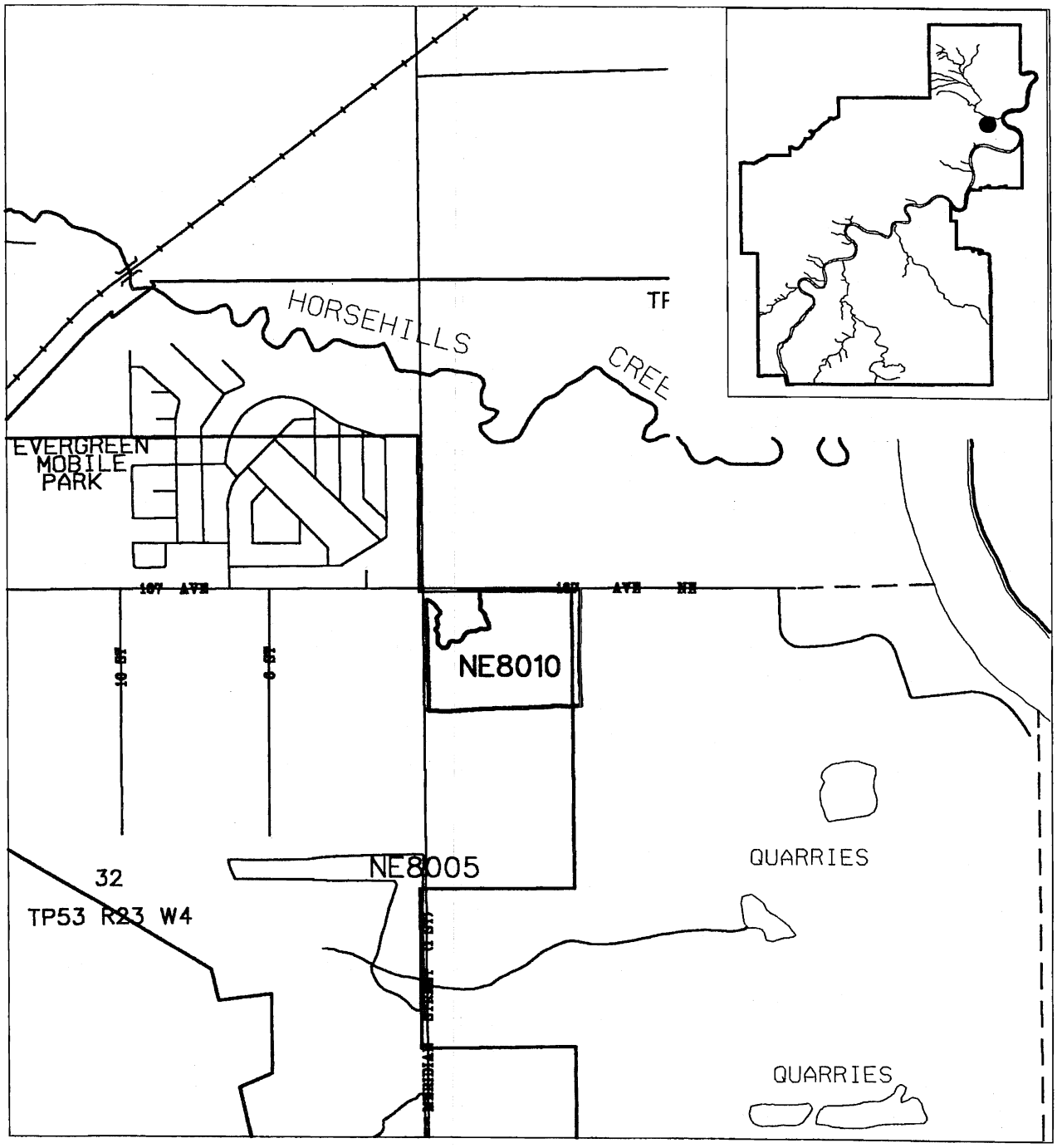
- good example of mature balsam poplar stand
- habitat for local wildlife
- provides link to North Saskatchewan River Valley and Ravine System

Sensitivity Low

Management Considerations

The removal of this stand for any future development will result in the loss of wildlife habitat and the loss of a link between other sites to the north and west with the North Saskatchewan River Valley and Ravine System. The site could tolerate limited physical development.

167 AVENUE AND MERIDIAN STREET WOODLAND



Site Name **HORSEHILLS WOODLAND**

Site Reference No NE 8011 **Size** 6.58 ha

Significance **Significant Natural Area**

Site Location 0.8 km south of 195 Avenue NE on 9th Street NE; extends south to include woodland on south side of CNR tracks
[NE 9 T 54 R 23 W4M]

Description

Complex of a large, mature balsam poplar-aspen stand, a small willow/sedge wetland, improved pasture and a small area of native grass; balsam poplar-aspen stand characterized by relatively open overstories giving rise to extremely lush and well-developed tall shrub layer (7-8 m tall); tall shrubs include red-osier dogwood, saskatoon, cherry, gooseberry, snowberry, rose, elderberry, willow, low-bush cranberry and honeysuckle; rather "decadent" appearance to deciduous stands; ephemeral wetland has water on a seasonal basis.

Moderately well drained Orthic Black Chernozems developed on very gently undulating glaciolacustrine plain; loamy sand over sandy loams; wetland areas characterized by poorly drained Orthic Humic Gleysols.

White-tailed deer, moose and fox commonly observed by local residents; heavy use by ungulates indicated by extensive browsing on most shrub species within stands and extensive game trails; diversity of communities, especially understorey shrub species gives rise to "critical" habitat for ungulates and avian resources; 17 species of birds noted including western wood-pewee, pileated woodpecker, flycatchers and American goldfinch, red-tailed hawk, alder and least flycatchers, blue jay, black-capped chickadee, house wren, American robin, warbling vireo, yellow warbler, common yellowthroat, vesper and white-throated sparrows, northern oriole, brown-headed cowbird, and common grackle; surrounding land uses include country residential, cultivated fields and improved pasture and a railway right-of-way.

Criteria

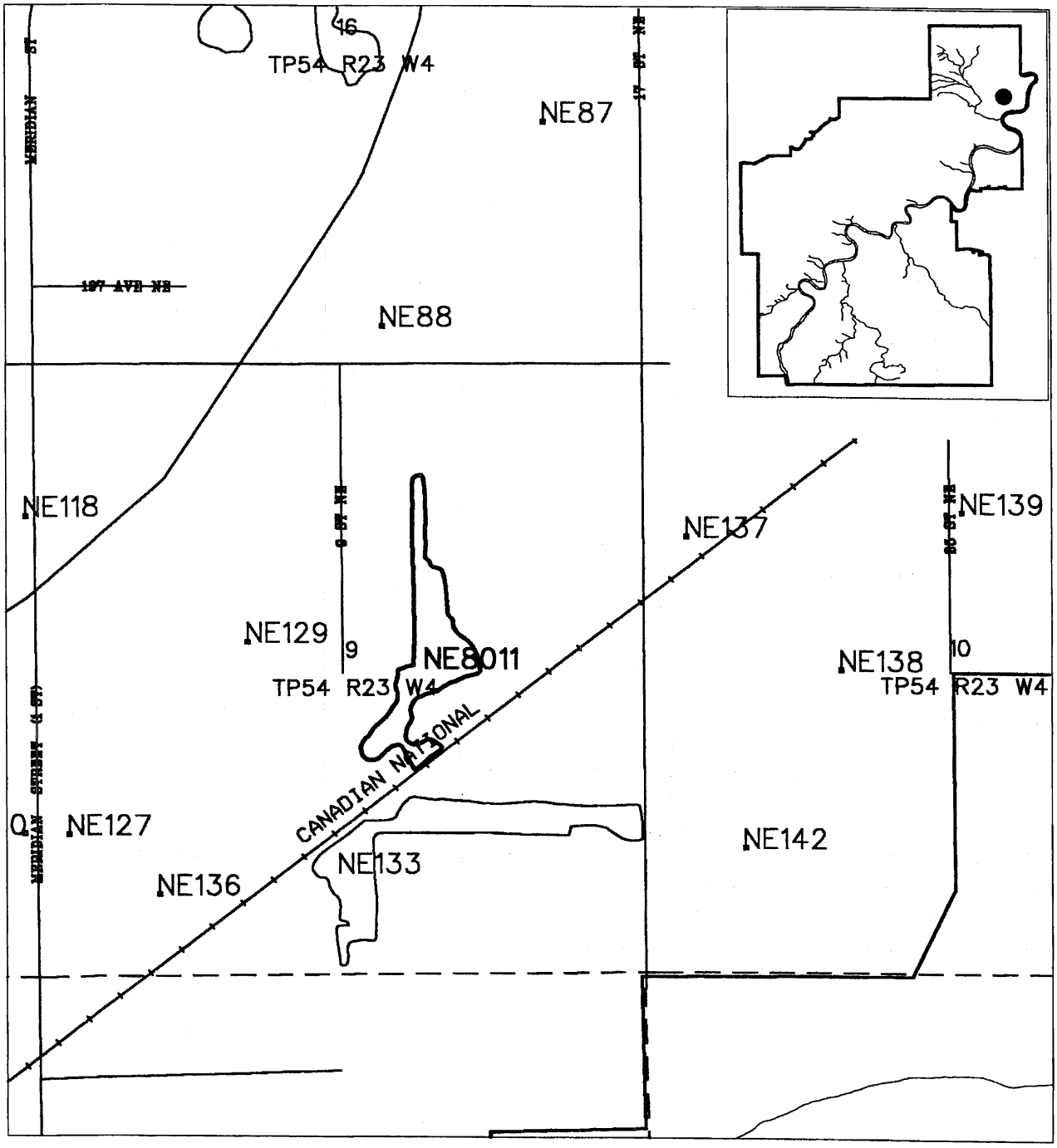
- good example of mature balsam poplar stand with excellent shrub diversity
- provides habitat for local ungulates and birds
- provides linkages between other ESA/ SNAs within tablelands

Sensitivity Low

Management Considerations

Removal of upland forest for any purpose will significantly reduce important habitat for ungulates and bird species. In addition the removal of these stands would also severely impact upon the use of these stands as corridors for wildlife between adjacent upland sites and the North Saskatchewan River Valley and Ravine System. Attempts should be made to incorporate this stand into any future development plans.

HORSEHILLS WOODLAND



Site Name **CNR - 17th STREET WOODLAND**

Site Reference No NE 133 **Size** 8.95 ha

Significance **Significant Natural Area**

Site Location 1.0 km south of 195 Ave NE between CNR line and 17th Street NE [SE 9 TP54 R23 W4M]

Description

Mature balsam poplar-aspen stand with well-developed shrub understorey of red-osier dogwood, rose, saskatoon, pin cherry, low-bush cranberry, bracted honeysuckle, gooseberry, willow and snowberry; rather decadent appearance to overstorey; poorly developed herb layer due to dense shrub overstorey.

Moderately well drained Orthic Black Chernozems have developed on very gently undulating glaciolacustrine materials; loams and sandy loams over sandy loam.

Surrounding land uses include a railway right-of-way (CNR) and cultivated fields. Seventeen species of birds noted including western wood-pewee, pileated woodpecker, flycatchers and American goldfinch, red-tailed hawk, alder and least flycatcher, blue jay, black-capped chickadee, house wren, American robin, warbling vireo, yellow warbler, common yellowthroat, vesper and white-throated sparrows, northern oriole, brown-headed cowbird, and common grackle.

Criteria

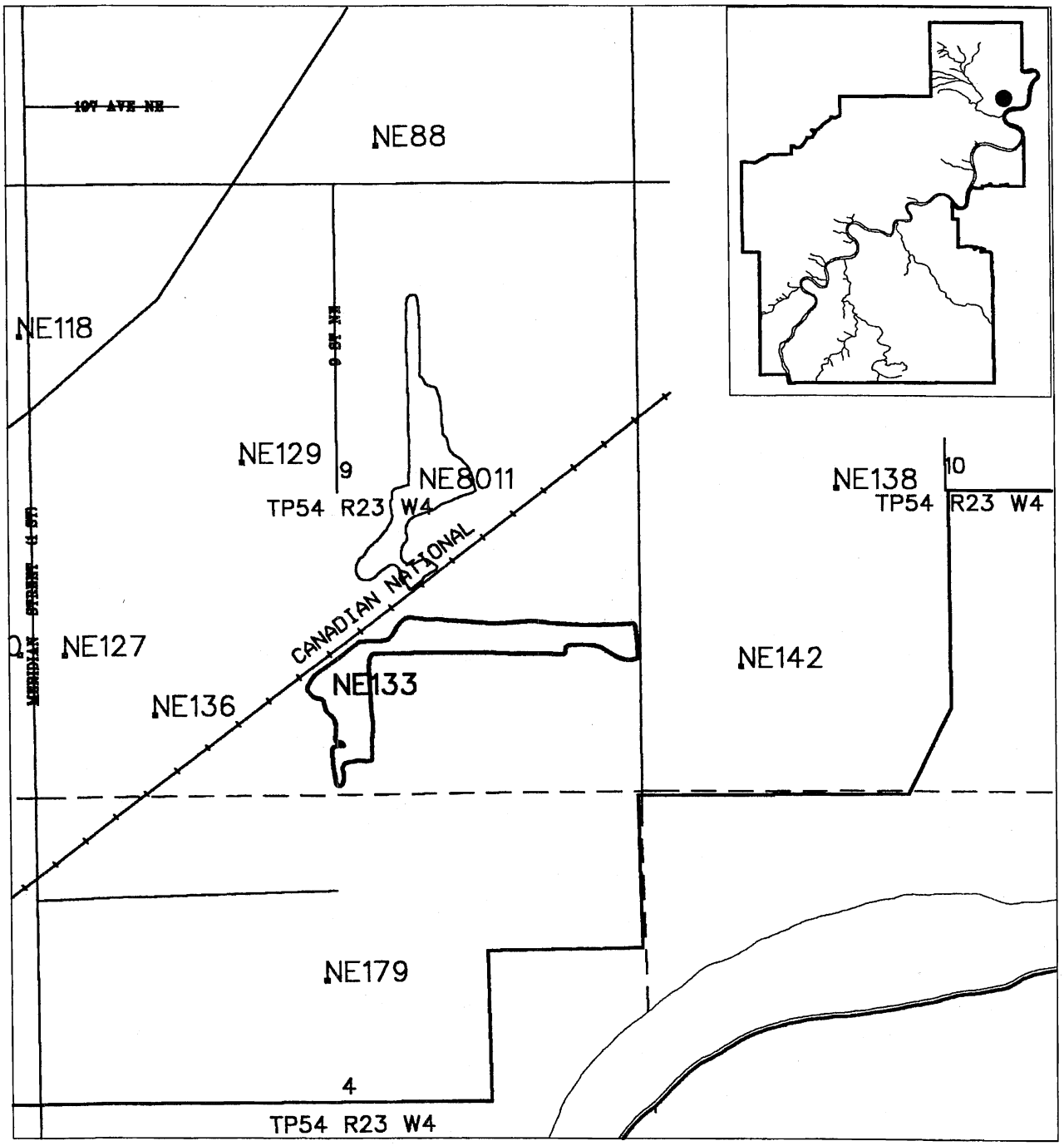
- good example of mature balsam poplar-aspen stand
- provides habitat for local ungulates and terrestrial bird species
- provides linkage between adjacent ESA/ SNAs and the North Saskatchewan River Valley

Sensitivity Low

Management Considerations

Because of the long, linear shape of this particular natural area, and its linking function to the North Saskatchewan River Valley, it is imperative that this woodland be conserved in its present shape. If the woodland is removed or altered in any way, its significance for local ungulates and avifauna will be diminished substantially.

CNR - 17th STREET WOODLAND



Site Name **HIGHWAY 37 - MERIDIAN STREET PARKLAND**

Site Reference No NE 10 **Size** 18.00 ha

Significance **Significant Natural Area**

Site Location Southwest corner of Highway 37 and Meridian Street
[NE 32 T 54 R 23 W4M]

Description

Relatively healthy complex of "aspen groves" with intermixed grasslands; grasslands do not appear to be grazed, however, interpretation of 1991 air photos suggests that these grasslands may be periodically grazed or even cut; any grazing appears to be by horses; dense grassy understories found within aspen groves.

Soils include moderately well drained Orthic Black Chernozems and Black Solodized Solonetz; nearly level to very gently undulating glaciolacustrine materials; loam over clay loam.

Twenty bird species observed during survey including hairy woodpecker, western wood-pewee, alder and least flycatchers, Eastern kingbird, magpie, American crow, black-capped chickadee, house wren, European starling, warbling and red-eyed vireos, yellow warbler, vesper, savannah, Lincoln, white-throated and clay-colored sparrows, brown-headed cowbird, and northern oriole; the occurrence of savannah and clay-colored sparrows is more closely associated with this site than most other natural areas and ESAs because of the high grassland component within the site; extensive browsing on palatable shrub species indicates that the area is used quite heavily by white-tailed deer.

Surrounding land uses include a major highways and roads, cultivated fields and country residential.

Criteria

- best example of remnant aspen parkland ecoregion within city boundary
- provides habitat for local wildlife including white-tailed deer and 20 species of birds

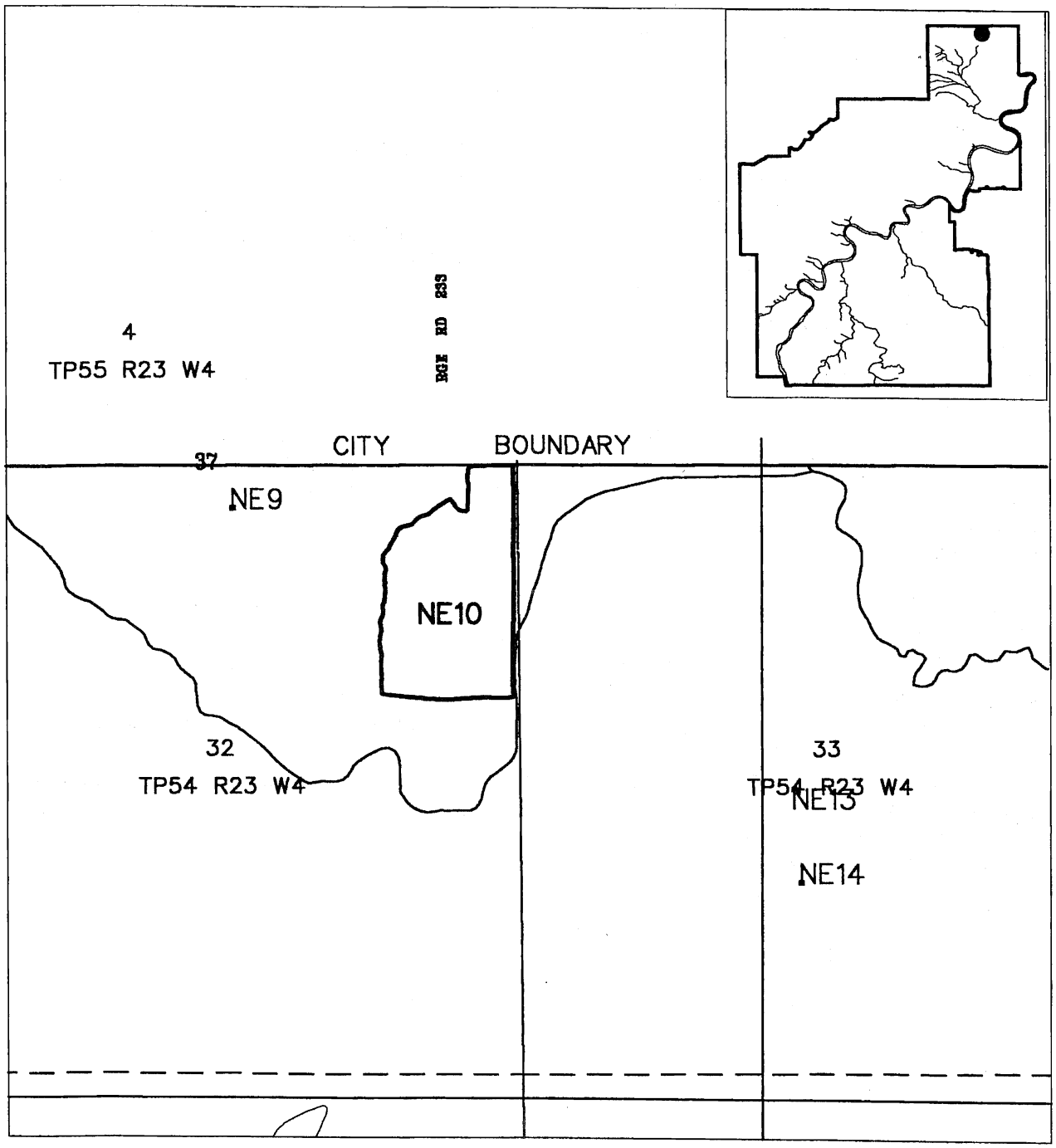
Sensitivity Moderate

Any activities that would result in the removal of aspen groves or in the alteration of grass species (i.e. overgrazing, cultivation) would severely jeopardize this site's ecological integrity.

Management Considerations

Because of the very limited extent of true aspen parkland within the city limits, it is suggested that all attempts be made to conserve this site in its present state.

HIGHWAY 37 - MERIDIAN STREET PARKLAND



Site Name **ALBERTA RAILWAY MUSEUM WETLAND**

Site Reference No NE 8 **Size** 12.08 ha

Significance **Significant Natural Area**

Site Location 1.6 km north of 227 Avenue, 0.8 km east of 34 Street along railway tracks [SW 31 T 54 R 23 W4M]

Description

Ephemeral wetland adjacent the Alberta Railway Museum; site consists of mainly weedy species including golden dock, rough cinquefoil, prickly annual sow thistle, annual hawk's beard, marsh ragwort, flixweed marsh skullcap and northern willowherb; well-developed ring of relatively decadent willow and balsam poplar.

Soils include primarily poorly drained Orthic Humic Gleysols, Orthic Gleysols and to a lesser extent, Typic Mesisols; thin organic veneers overlying glaciolacustrine materials; silty clay loams and clay loams.

Because of the current conditions of the wetland, the site has been downgraded from an Environmentally Sensitive Area; in the past, one nesting box was placed at the site by Ducks Unlimited; 20 bird species observed at site including Canada geese, mallard, killdeer, spotted sandpiper, Wilson's phalarope, least flycatcher, tree and barn swallows, magpie, house wren, robin, warbling vireo, yellow warbler, vesper and Lincoln's sparrows, red-winged blackbird, brown-headed cowbird, northern oriole and common grackle.

Surrounding land uses include the Alberta Railway Museum, cultivated fields and irrigated horticultural lands.

Criteria

- ephemeral wetland that provides critical function in maintaining or balancing local hydrology
- provides critical waterfowl habitat
- good terrestrial and shorebird habitat

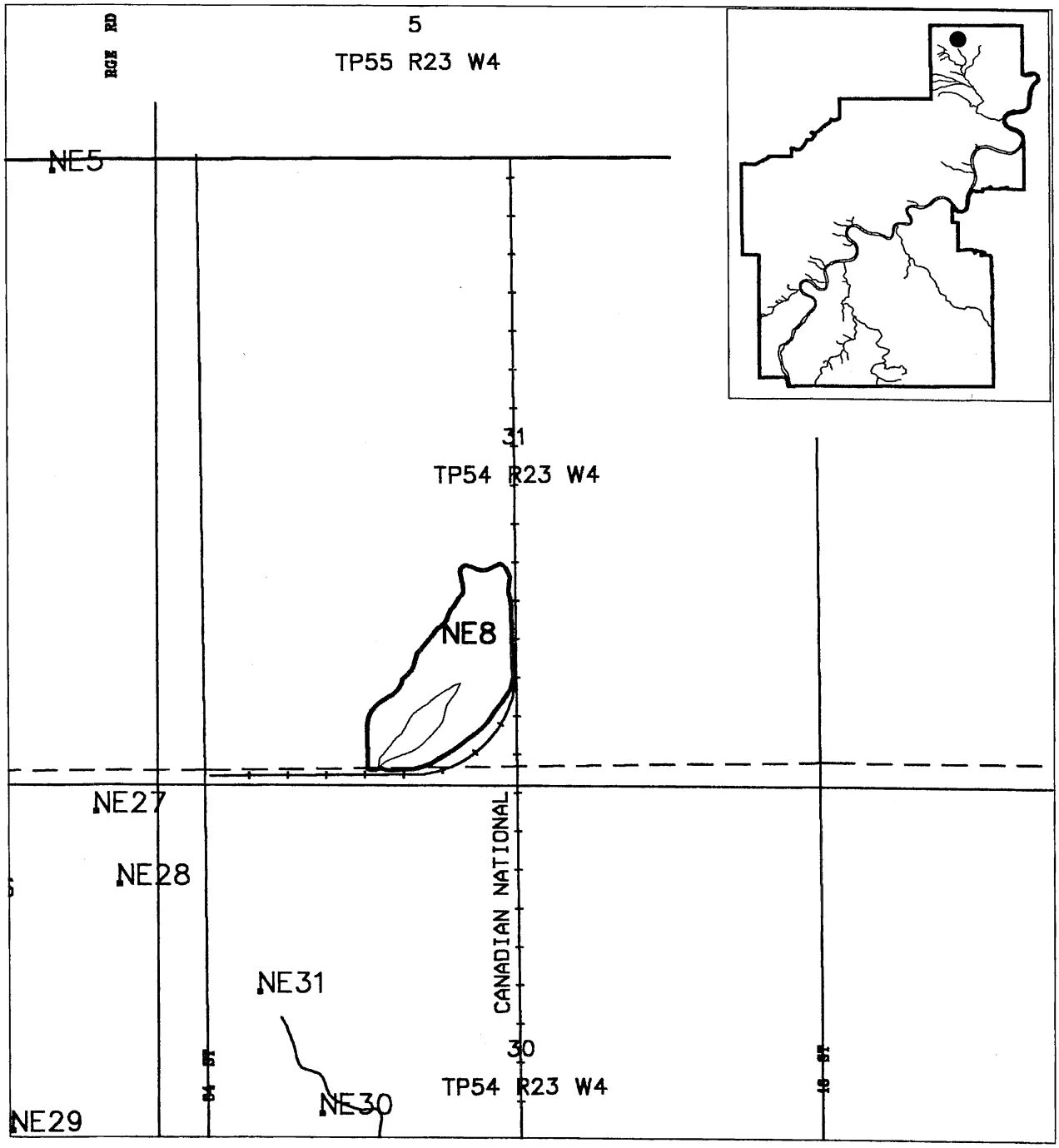
Sensitivity High

The site has already undergone significant disturbance due to severe decrease in water levels over the past few years; water loss has resulted in the abandonment of the site for goose nesting purposes; also, no deer have been observed at the site this year.

Management Considerations

Attempts should be made to reclaim this significant wetland; in this regard discussions with the land owners may be necessary; any attempt to reclaim this wetland would enhance the tourist experience at the Alberta Railway Museum.

ALBERTA RAILWAY MUSEUM WETLAND



Environmentally Sensitive Areas and Significant Natural Areas of Southeast Edmonton

5.2 Southeast Edmonton

In total, 13 sites have been identified within the southeast portion of the city of Edmonton. These sites include:

- Southeast Corner Slough Natural Area
- Koroluk - Kozub Natural Area
- Southeast Natural Area
- Southeast Mixedwood Natural Area
- Southeast Wetland Natural Area
- Maple Ridge Natural Area
- 34 St. SW - Ellerslie Rd Natural Area
- 34 Street Wetland
- Meridian St. - TP RD 515 Natural Area
- Henschel Wetlands
- Southeast Woodland Natural Area
- Hurstwood Woodland
- Hwy 14 - Sherwood Park Cloverleaf Natural Area

Eleven of the 13 sites are classed as environmentally sensitive areas; the Southeast Corner Slough and the Koroluk - Kozub natural areas are considered to be regionally significant from the standpoint of providing critical waterfowl habitat -- all other ESAs are considered to be of local significance.

Although significant portions of the southeast have been cleared and cultivated for agricultural purposes, much native land remains intact and provide critical wildlife habitat for a variety of species, including white-tailed deer and moose. These native stands provide excellent corridors for wildlife movement between the table lands and sites located in the adjacent counties of Leduc to the south and Strathcona to the east (most notably, the Beaverhill Upland - Cooking Lake area). Many of the smaller wetlands provide critical breeding, nesting, feeding and rearing habitat for waterfowl and are used in conjunction with the Southeast Corner Slough Natural Area. The Maple Ridge Natural Area is an excellent example of a "locally significant" ESA occurring within an industrial complex.

None of the sites identified within the southeast are in serious danger of being destroyed or altered in some form by development. The two sites that warrant the greatest consideration, however, are the Southeast Corner Slough (known as the Henschel Project by Ducks Unlimited) and the Koroluk - Kozub Natural Area. Both of these sites contribute significantly to the ecological importance of the southeast portion of the city.

Site Name SOUTHEAST CORNER SLOUGH NATURAL AREA

Site Reference No. SE 5010 **Size** 22.12 ha

Significance **Regional Environmentally Sensitive Area**

Site Location Corner of Ellerslie Road and 17 Street
[SW 29 T 51 R 23 W4M]

Description

Largest water body in south Edmonton; shallow back bays and shoreline have extensive emergent aquatic vegetation, consisting primarily of cattails and pondweed and to a much lesser extent, bulrush; small balsam poplar - aspen groves exist around perimeter of area; sedge ring occurs in places; water levels fairly consistent, promoting good conditions for aquatic vegetation growth; Ducks Unlimited site known as the "Henschel Project" - three floating nesting structures were placed around the shoreline by Ducks Unlimited in 1988; good snag habitat provided by flooded balsam poplar along shorelines of back bays.

Poorly drained peaty Humic Gleysols have developed immediately adjacent to shoreline in lacustrine materials; imperfectly drained Orthic Black Chernozems occur away from the shoreline; water table within 100 - 200 cm of the surface.

The permanent nature of this water body in combination with the surrounding emergent aquatic vegetation, upland forests, cultivated fields and pasture results in critical waterfowl habitat that is used for nesting, breeding, feeding and rearing; also the size of the water body allows for fall waterfowl staging; this site is of regional importance because it is the largest wetland in south Edmonton and is used extensively for staging activities; many waterfowl species use adjacent smaller wetland (i.e., SE 5007, SE 5002) throughout the spring and summer months. Ducks Unlimited considers this site to be extreme importance for waterfowl, second only to Kinokamau Lake in Northeast Edmonton.

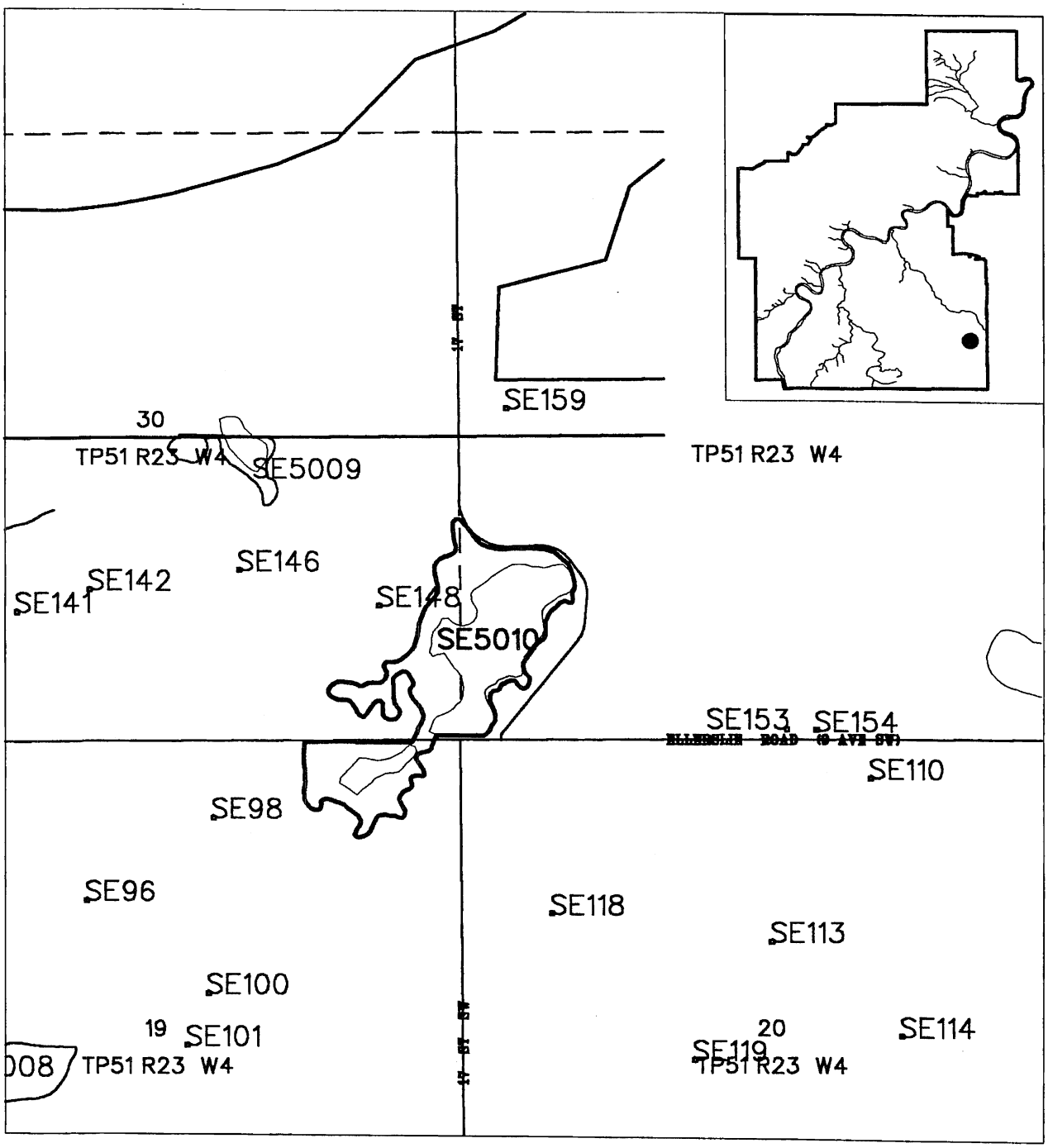
Surrounding land uses include horse pasture (between 17 St and the lake), major roads (Ellerslie Rd and 17 St), cultivated fields and country residential.

Criteria

- large permanent water body
- critical waterfowl habitat
- high habitat diversity
- provides critical function in maintaining or balancing area hydrology
- possible groundwater springs
- site recognized for its value by scientific organizations (i.e. Ducks Unlimited)

The Southeast Corner Slough has been classed as a "regionally" significant environmentally sensitive area as it is a regionally important waterfowl staging area and provides a critical function in maintaining or balancing local hydrology.

SOUTHEAST CORNER SLOUGH NATURAL AREA



Sensitivity High

Like any permanent water body, this site is extremely sensitive to any disturbances that would result in changes to the natural hydrology of the area. The unique combination of emergent and submergent vegetation and surrounding willow/sedge fringe has developed and is maintained by the current and long-term hydrological cycle. Any change in the current water levels and vegetation patterns will severely impact the importance of the wetland for waterfowl. Because the surface area is considerable, it does have a much larger capacity for assimilation than other smaller wetland with Edmonton. The land to the west has several annual drainage ditches that may be impacting water levels and water quality within this wetland. Further, any realignment of 17th Street would result in severe damage to the lake.

Management Considerations

Attempts should be made to conserve this unique water body within southeast Edmonton and to reduce any additional developments that may occur such as increased country residential development. Any further developments are sure to reduce the carrying capacity of the lake for waterfowl. Minimum water levels should be established by Ducks Unlimited to ensure that the significance of the site is not diminished. It is suggested that the city work in conjunction with Ducks Unlimited to ensure the long-term survival of this unique water body. In addition, the value of this site to waterfowl is enhanced by the well-developed upland forest which provides critical nesting cover; attempts must be made to ensure the survival of this forest fringe.

Site Name **KOROLUK - KOZUB NATURAL AREA**

Site Reference No. SE 5007 **Size** 48.92 ha

Significance **Regional Environmentally Sensitive Area**

Site Location Southwest of Ellerslie Road and 34 Street SW
[Sec 24 TP51 R 24 W4M]

Description

Relatively healthy upland/wetland complex; upland forest consists primarily of mature aspen and aspen-balsam poplar; relatively homogeneous shrub understorey of snowberry, beaked hazelnut, wild raspberry and rose; Manitoba maple has been introduced; diverse forb and grass layers; wetland composed of willow/sedge with cattails in open water areas; some balsam poplar along wetland fringes; in the western half of this unit, upland deciduous stands are two-aged with older balsam poplar (approximately 70 yrs old) and younger aspen (25 - 30 yrs old); older balsam poplar provide good snag habitat.

Moderately well drained Orthic Black Chernozems have developed on hummocky morainal materials where slopes range from very gently undulating to gently undulating and rolling (0 - 9 % slopes); poorly drained Orthic Humic Gleysols are associated with wetland topography; thin organic veneers have developed where water levels have lowered; loams and silt loams overlying clays and sandy clays; water table at or near surface around wetland.

The diversity of vegetation cover results in excellent year-round habitat for ungulates, especially white-tailed deer and to a lesser extent, moose; balsam poplar regeneration and red-osier dogwood heavily browsed by deer and moose; wetland with open water provide critical breeding and nesting habitat for waterfowl; great blue herons, a sensitive species, previously observed within this complex, however, they have not been seen for two years; waterfowl species include mallard, blue-winged teal, northern shoveler, and ruddy duck; red-tailed hawks are common; shorebirds include killdeer and spotted sandpiper; black terns observed; song bird species include common yellowthroat, white-throated sparrow, clay-colored sparrow, vesper sparrow, savannah sparrow, Le Conte's sparrow, Lincoln's sparrow, song sparrow, American robin, black-capped chickadee, American crow, red-winged blackbird, yellow-headed blackbird, northern orioles, brown-headed cowbird, American goldfinch, alder and least flycatchers, tree and barn swallows, house wren, cedar waxwing, yellow warbler and warbling and red-eyed vireos.

Area also provides an excellent example of hummocky morainal deposits and the characteristic vegetation composition and structure common in aspen parkland areas.

Surrounding land uses include country residential, pasture land, market gardens, and cultivated fields.

Criteria

- best example of contiguous habitat within the table lands of Edmonton
- good example of upland deciduous communities and willow/sedge and open water/cattail communities
- high plant species diversity
- provides critical habitat for maintenance of all or significant components of life cycle stages
- high habitat diversity
- high wildlife species diversity
- sensitive wildlife species
- provides good example of hummocky morainal deposits and resulting vegetation
- provides critical function in maintaining or balancing local hydrology
- permanent open water
- provides physical and visual links with other ESA/SNAs within table lands

The Koroluk - Kozub Natural Area has been classed as a "regionally" significant environmentally sensitive area because it represents the largest continuous tract of "native" vegetation in south Edmonton and hence is used by wildlife on a regional basis. It is an outlier of the Beaverhills Upland (Cooking Lake Moraine) to the east.

Sensitivity High

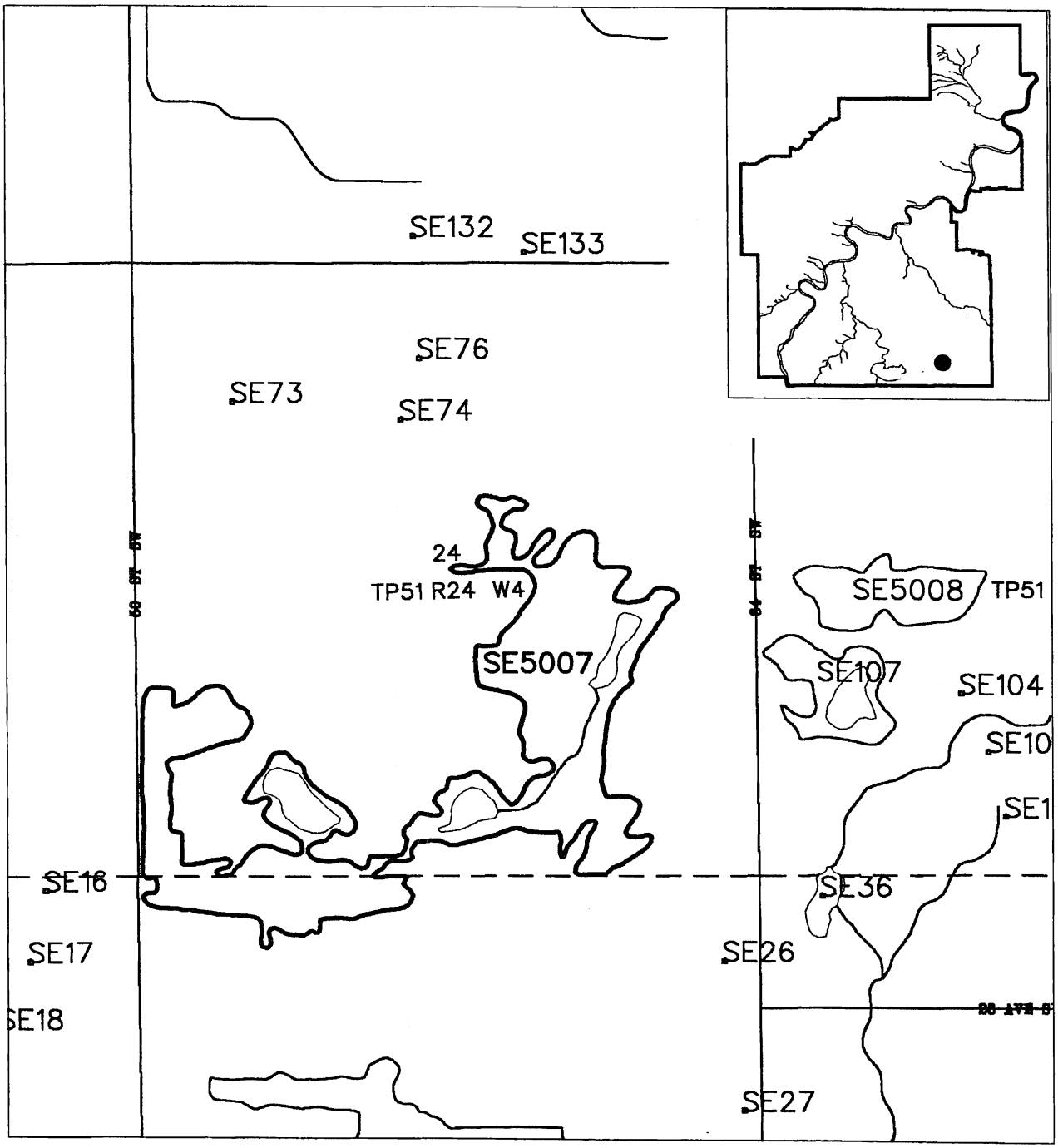
The wetlands are extremely sensitive to disturbance, especially changes that would result in alteration of the natural drainage patterns. In recent years land use changes on adjacent properties have resulted in changes to the natural flow regime of both surface and subsurface water. It is apparent from field and air photo examination that these changes have contributed significantly to the lowering of water levels within the wetland and hence may have affected the disappearance of sensitive species such as the great blue heron. In addition, lowering of water levels within the wetland will negatively impact waterfowl species as key nesting and breeding habitat will be lost. Any disturbance to the diversity of species in the upland forest components would severely alter the balance of ungulate species found within the site.

Management Considerations

All attempts should be made to conserve this large, complex and unique landscape in southeast Edmonton. Because of the size of this complex, a number of different landowners, with differing views on wildlife and natural environments, must be consulted for any actions. Because of land use changes on adjacent properties, and the subsequent changes to natural drainage patterns, it is imperative that the city seriously consider any mitigation options for this area. (All landowners consulted during field visits fully supported conservation actions for the area).

The Koroluk - Kozub Natural Area provides best wildlife habitat in south Edmonton. It provides critical upland and wetland habitat that is required not only by waterfowl, but also ungulates such as moose and white-tail deer. The closeness of these sites results in favourable travel corridors being established between sites to the west and sites within the counties of Strathcona and Leduc. Any changes to the structure of this unique area will severely impact the wildlife resources and their ability to survive; hence, all attempts should be made to conserve this significant area within Section 24 Tp 51 Rg 24 W4M.

KOROLUK - KOZUB NATURAL AREA



Site Name **SOUTHEAST NATURAL AREA**

Site Reference No. SE 5004 **Size** 49.62 ha

Significance **Local Environmentally Sensitive Area**

Site Location Extreme southeast corner of city, between 17 St SW and Meridian St, north of 41 Avenue SW
[S 1/2 17 T 51 R 23 W4M]

Description

Hummocky morainal complex with aspen - balsam poplar groves occurring on upland sites and willow/sedge wetland occupying lowland depressional topography; much of the upland forest area has been cleared and seeded to improved pasture; upland forests composed of aspen - balsam poplar forests with occasional white birch; consistent understories of saskatoon, beaked hazelnut, snowberry, rose, choke cherry and honeysuckle; wetland areas consist of a willow fringe around mainly sedges; some wetlands have water on a seasonal basis.

Pronounced hummocky moraine landform; soils range from well drained Orthic Black Chernozems and Dark Gray Luvisols on upland sites to poorly drained Orthic Humic Gleysols and Orthic Gleysols; textures range from silt loams to silty clay loams and silty clays; occasional sandy clay lenses.

The hummocky morainal deposits that form this environmentally sensitive area are part of the larger Cooking Lake Moraine, also known as the "Beaverhill Uplands" to the east; the Beaverhill Uplands have been classified as "nationally significant" because they provide critical habitat for waterfowl breeding and staging (Westworth et al. 1991); this area provides one of the best examples within Alberta of stagnant, dead-ice morainal deposits and their associated hydrological and vegetational characteristics.

Diversity of vegetation results in diverse wildlife habitat and the ability of the site to provide critical habitat on a year-round basis for species such as white-tailed deer; willows surrounding adjacent wetland have been heavily browsed by white-tailed deer, moose and hare; numerous red-tailed hawks observed.

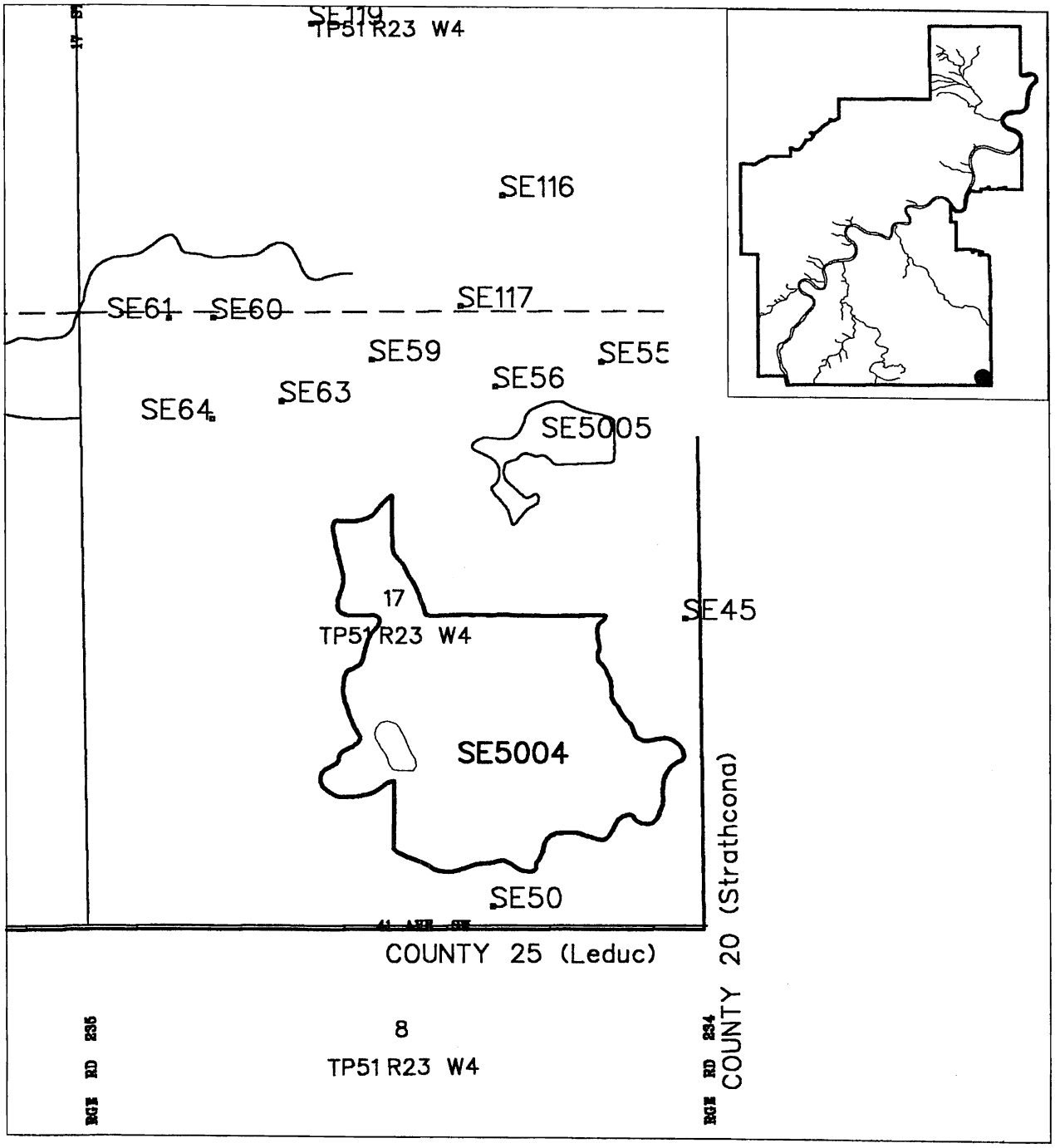
The area also serves as a corridor for wildlife movement between ESA/SNAs with in southeast Edmonton (i.e., Koroluk Natural Area, Site SE 5007) and similar sites within the counties of Strathcona and Leduc.

Surrounding land uses are primarily pasture land, cultivated fields and to a lesser extent, country residential.

Criteria

- best example of dead-ice, hummocky moraine in Edmonton city limits
- vegetation diversity
- wildlife habitat diversity
- linking function to ESA/SNA both within and outside of the city of Edmonton

SOUTHEAST NATURAL AREA



Sensitivity to Disturbance High

Wetlands are particularly sensitive to any disturbances that would result in altered drainage patterns; grazing pressure appears to be relatively high as most sedges within some wetland have been grazed quite heavily by cattle; cattle grazing within upland forests does not appear to have had significant impacts upon the species composition.

Management Considerations

Because of the size of this environmentally sensitive area, it is imperative that all natural drainage courses are maintained. This is particularly important considering the low water levels or lack of water in most of the wetland during periods of low precipitation. Grazing pressures should be reduced and all physical development should be avoided.

Site Name **SOUTHEAST MIXEDWOOD NATURAL AREA**

Site Reference No. SE 5002 **Size** 14.90 ha

Significance **Local Environmentally Sensitive Area**

Site Location 2.0 km south of Ellerslie Road on east side of 50 Street [W1/2 13 T 51 R 24 W4M]

Description

Significant upland complex consisting of mixedwood upland area; mixedwood coniferous-dominated stand comprised of white spruce, balsam poplar and aspen and to a lesser extent white birch; shrub species include low-bush cranberry, rose, wild raspberry, mountain ash, snowberry and beaked hazel, red-osier dogwood, and gooseberry; percent cover and presence of various shrub species is highly dependent upon overstorey cover and amount of openings; white spruce between 100 - 110 yrs old and between 20 - 24 m in height; most balsam poplar appear decadent and provide excellent snag habitat for birds of prey; mature spruce trees provide good seed source for regeneration.

Moderately well drained Orthic Black Chernozems have developed in very gently undulating and hummocky morainal materials; loams over silty clays and silty clay loams.

The complex nature of the vegetation results in high community diversity, ranging from deciduous-dominated portions within the uplands to mixedwood and to coniferous-dominated portions; this along with the presence of the adjacent wetland, a permanent water body and surrounding cultivated fields and rough pasture result in extremely critical wildlife habitat; palatable shrub species within the upland areas as well as the willows around the wetland have all been browsed heavily by white-tailed deer and moose.

Thirty different species of birds observed at site including red-tailed hawk, merlin, killdeer, spotted sandpiper, common snipe, western wood-pewee, least flycatcher, swallow, mapgies, crows, chickadee, wrens, American robin, warbling and red-eyed vireos, sparrows, blackbirds, brown-headed cowbird, northern oriole, ruby-crowned kinglet, and golden finches; this diversity of species and numbers observed were rarely recorded elsewhere within the table lands area.

This site is relatively close to SW 5003 and SW 5007 and as such provides key linkages for wildlife moving between areas.

Because the site is situated within the centre of the section of land, it is well protected and seldom visited by individuals interested in pursuing wildlife viewing; hence the area is a refuge for most wildlife species.

Surrounding land use includes cultivated fields and rough pasture.

Criteria

- good example of mixedwood-dominated vegetation
- high plant species diversity
- high habitat diversity
- provides critical habitat for a variety of wildlife species
- provides link with other ESA/SNAs in table lands

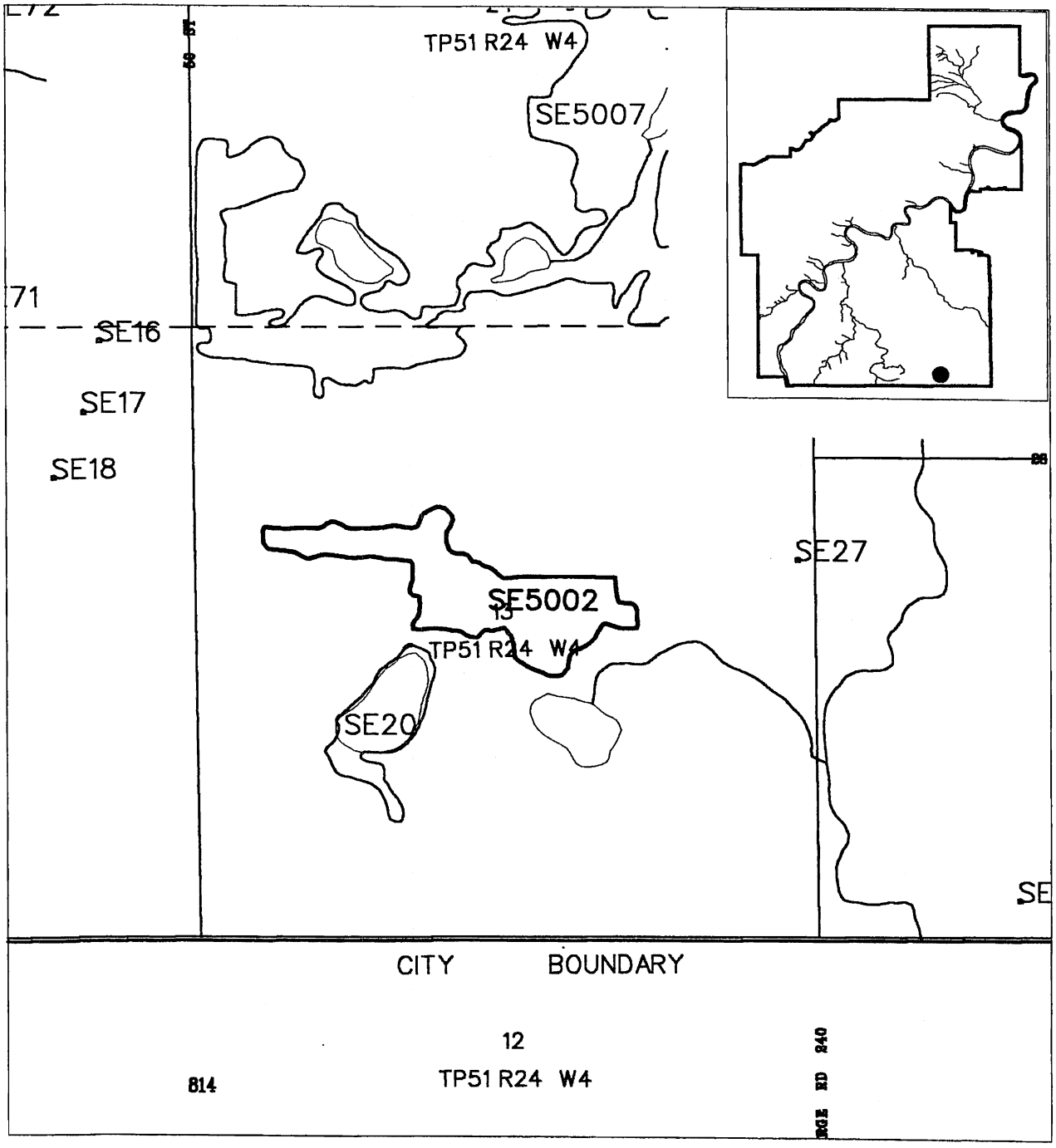
Sensitivity High

Any cutting or clearing of the upland forests would severely impact the sites ability to provide key wildlife habitat for such a wide variety of species. Species such as the western wood-pewee and merlin would be negatively affected by either a reduction in the size of the upland forest or by increased visitation to the site.

Management Considerations

A trail system has already been established within the mixedwood stand and provides easy access throughout the stand. This trail system provides for good wildlife viewing opportunities. Upgrading of this trail or additional development within this site should be limited. It is imperative to consider this site in conjunction with the adjacent wetland (Southeast Wetland Natural Area) site to the south as both combine to provide critical wildlife habitat. Any disruptions to the upland forest will certainly impact negatively upon the integrity of the wetland.

SOUTHEAST MIXEDWOOD NATURAL AREA



Site Name **SOUTHEAST WETLAND NATURAL AREA**

Site Reference No SE 20 **Size** 5.87 ha

Significance **Local Environmentally Sensitive Area**

Site Location 2.0 km south of Ellerslie Road on east side of 50 Street [W1/2 13 T 51 R 24 W4M]

Description

Significant wetland complex consisting of open water with a healthy cattail fringe; wetland consist mainly of open water (permanent in nature) with partial willow fringe along eastern side; considerable cattail growth within shallow portions of water; sedges and marsh reed grass occur along western side.

Poorly drained Orthic Gleysols occur adjacent open water in wetland area; loams over silty clays and silty clay loams.

Open water/wetland complex provides critical nesting and breeding habitat for a variety of waterfowl species including Canada goose, mallard, blue and green-winged teal, northern shoveler, gadwall, lesser scaup, ruddy duck, eared grebe, and canvasback; good forage habitat exists adjacent wetland.

This site is relatively close to SW 5003 and SW 5007 and as such provides key linkages for wildlife moving between areas.

Because the site is situated within the centre of the section of land, it is well protected and seldom visited by individuals interested in pursuing wildlife viewing; hence the area is a refuge for most wildlife species.

Surrounding land use includes cultivated fields and rough pasture.

Criteria

- good example of emergent aquatic vegetation
- high plant species diversity
- critical waterfowl habitat
- permanent water body
- provides link with other ESA/SNAs in table lands

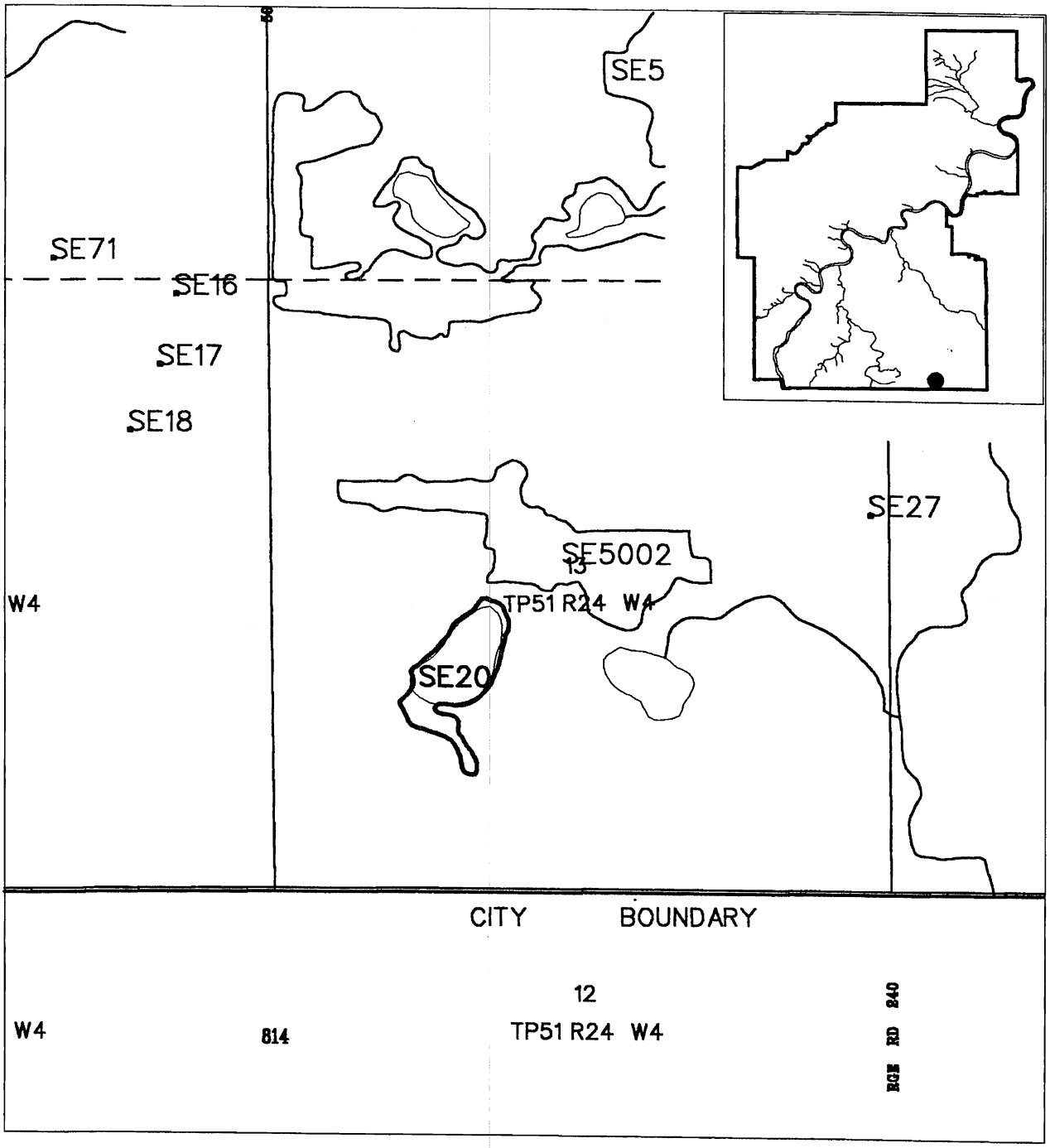
Sensitivity High

The wetland is highly sensitive to any changes that would interfere with the natural hydrological cycle in this area.

Management Considerations

Attempts should be made to preserve this wetland. Because the site is used so extensively by waterfowl for key nesting and breeding habitat, it is imperative that the site not be altered in any fashion. This site must be considered with the adjacent site (Southeast Mixedwood Natural Area) as both combine to provide a unique area for wildlife.

SOUTHEAST WETLAND NATURAL AREA



Site Name **MAPLE RIDGE NATURAL AREA**

Site Reference No. SE 238 **Size** 7.51 ha

Significance **Local Environmentally Sensitive Area**

Site Location Approximately 2.0 km north of Whitemud Drive on the west side of 17th Street adjacent Maple Ridge Mobile Park
[SE 19 TP 52 R 23 W4M]

Description

Relatively large permanent water body surrounded by upland balsam poplar -aspen forests; water body is divided into two by a gravel road which is usually flooded during the spring; northern pond is considerably smaller and less diverse vegetationally than southern pond; good emergent aquatic vegetation consisting of mainly cattails, with some rushes and sedges around the perimeter; upland forest consists mainly of balsam poplar with a minor component of aspen; more aspen is found in the forest immediately adjacent to 17th Street; significant snag habitat occurs around the perimeter of the southern water body; some willow occurs immediately adjacent to the shoreline.

Poorly drained Orthic and Humic Gleysols occur immediately adjacent to open water; water table at approximately 80 - 100 cm adjacent to the shore; loam over silty clays and silty clay loams; upland soils are primarily Orthic Black Chernozems developed on gently to moderately undulating glaciolacustrine clays and silty clays.

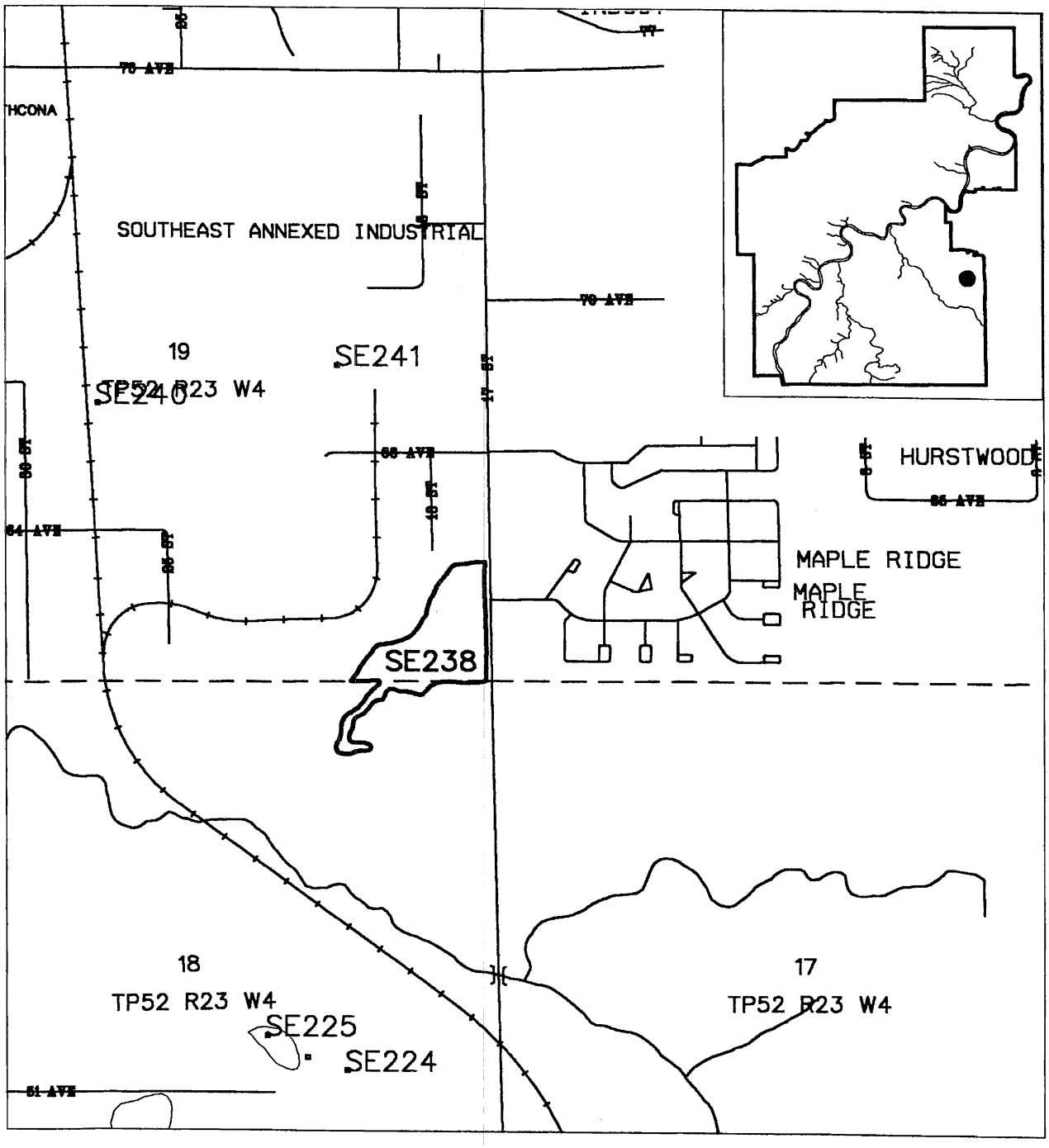
The permanent nature of the water body combined with the diversity of vegetation (emergent aquatics, upland balsam poplar - aspen forests, cultivated fields and pasture land) that occurs within 100 - 200 m provide critical nesting, breeding and feeding habitat for waterfowl, including Canada goose, mallard, blue-winged teal, northern shovelers, and American wigeon; in addition, flooded balsam poplar are providing excellent snag habitat for raptors and cavity-nesting birds; a number of small game trails occur throughout the upland forested component of the site and balsam poplar regeneration appears to be browsed quite uniformly throughout; bird species include least flycatcher, barn swallow, American crow, black-billed magpies, black-capped chickadee, house wren, yellow warbler, common yellowthroat, song sparrow, red-winged blackbird, and northern oriole.

Surrounding land uses include industrial developments to the north and southwest, cultivated fields to the west and the Maple Ridge trailer park to the east across 17th Street.

Criteria

- good example of emergent aquatic vegetation
- high plant species diversity
- provides critical habitat for maintenance of all or significant components of life cycle stages for waterfowl species
- permanent water body of significant size

MAPLE RIDGE NATURAL AREA



Sensitivity High

Because the site occurs adjacent to an industrial park, there is the potential for disturbance in the form of dumping and groundwater contamination; in addition, any land use changes that would result in changes to the natural hydrology of the area would severely impact the site's ecology; also, any changes to the upland forest would also alter the critical balance that has been achieved between the wetland, open water and forest--it is this unique combination of characteristics that results in such heavy use by waterfowl and other bird species.

Management Considerations

Attempts should be made to preserve this unique landscape within the city of Edmonton. The significance of this particular site lies in its location in an industrial park. In addition, an attempt should be made to reclaim the site to its original condition by removing the gravel road that splits the site into two open water bodies. Because of the presence of significant numbers of waterfowl species, this site could be considered for educational purposes.

Site Name **34 STREET SW AND ELLERSLIE ROAD NATURAL AREA**

Site Reference No SE 5008 **Size** 6.52 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.5 km south of Ellerslie Road on east site of 34 Street [NW 19 TP 51 R 23 W4M]

Description

Upland forest/wetland complex; upland forest consists of very mature, rather decadent balsam poplar with raspberry, saskatoon, snowberry and pin cherry; forest canopy rather open; excellent snag habitat provided by decadent poplar, especially adjacent wetland; wetland consists of three small permanent ponds with well-developed emergent vegetation comprised mainly of cattails; ponds appear to be drying somewhat due to low water tables.

Poorly drained Humic Gleysols have developed in very gently undulating and hummocky morainal materials; perched water table within 25 cm of the surface; textures vary from clays to silty clays; peaty phase Humic Gleysols occur immediately adjacent open water.

This overmature stand of balsam poplar is considered to be one of the best examples in Edmonton of "old growth" deciduous vegetation; it is characterized by a rather open canopy with extensive snags; it is anticipated that this stand is approximately 100 yrs old; the upland balsam poplar stand combined with the wetland vegetation and open water results in a diversity of vegetation that provides important habitat for ungulates and waterfowl; white-tailed deer common throughout site and browse almost extensively on raspberry; Canada geese and other waterfowl species have consistently nested within the open ponds; snags provide critical perching and nesting sites for raptors.

Two other ESAs occur in the immediate vicinity, including sites SE 107 to the south and SE 5007 across 34th Street. This site provides a key linking function to these other sites and is used by both waterfowl species and ungulates for key habitat.

Surrounding land used include country residential and cultivated fields.

Criteria

- "old growth" balsam poplar stand
- vegetation diversity
- critical linking function with adjacent ESA/SNAs

Sensitivity High

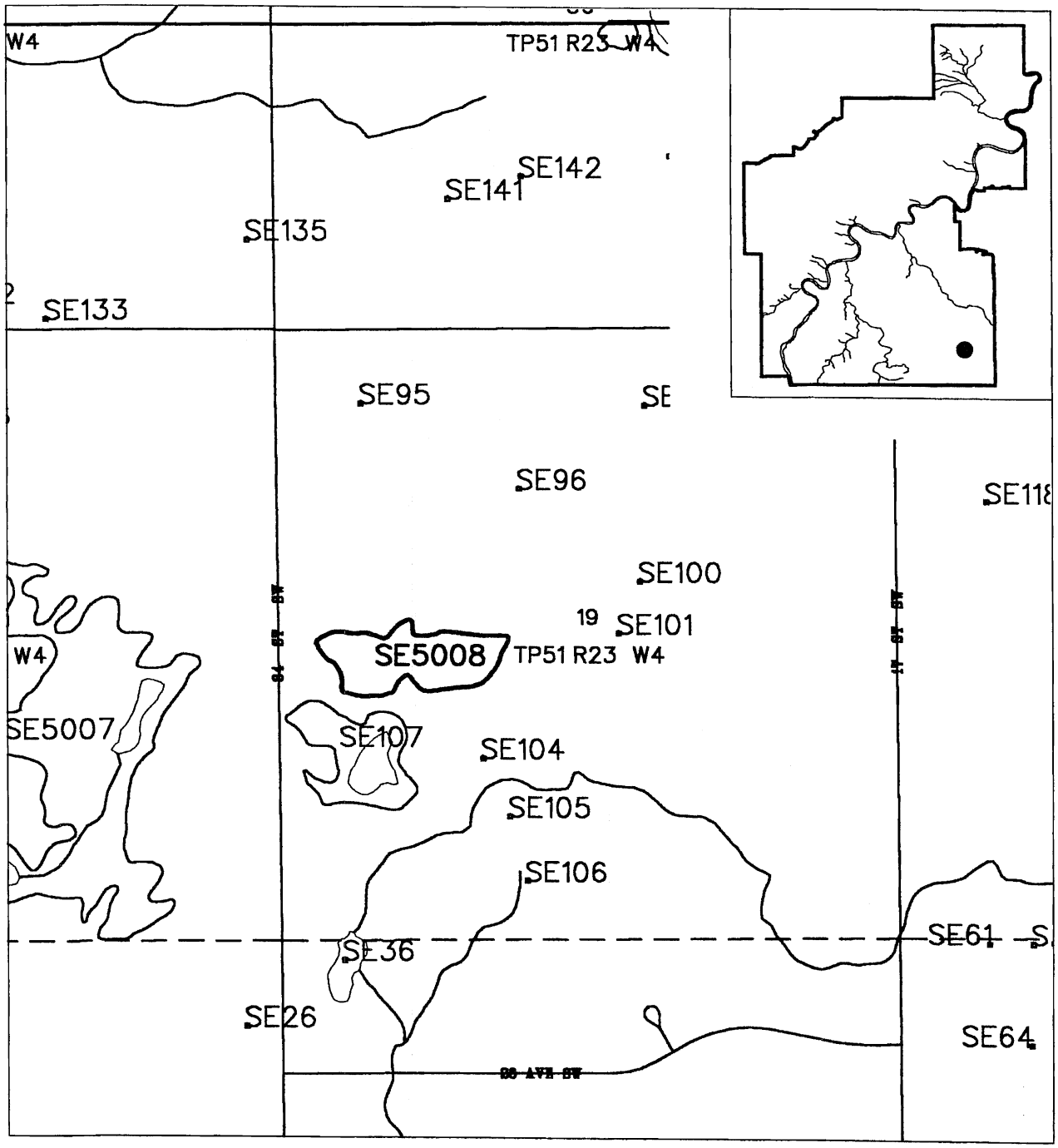
The fragile nature of the "old-growth" balsam poplar community combined with the three, relatively permanent water bodies makes this site highly sensitive to any disturbances, particularly any disturbance that would alter the natural hydrological cycle in the area.

Any removal of the upland forest would have a severe impact on the area for waterfowl and ungulate habitat as there is very little regeneration of aspen, poplar or spruce within the stand.

Management Considerations

Efforts should be made to maintain this site in its natural condition. Attempts should be made to ensure that the hydrological cycle is not altered in any way as to result in the drying of the three wetlands. All development should be avoided within this site.

34 STREET SW AND ELLERSLIE ROAD NATURAL AREA



Site Name **34 STREET WETLAND**

Site Reference No SE 107 **Size** 5.86 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.7 km south of Ellerslie Road along the east side of 34th Street; immediately south of site SE 5008
[NW 19 TP51 R23 W4M]

Description

Permanent water body with well-developed ring of willow/sedge and open balsam poplar stand to northwest; drying of pond has exposed mineral soils around edge of open water; some cattail development throughout; relatively undisturbed.

Poorly drained Orthic Humic Gleysols and Humic Gleysols have developed on mineral soils adjacent open water; wetland has developed in gently undulating and hummocky morainal materials; loams over clay loams and silty clay loams.

The diversity of vegetation communities that occur within this particular site provides for critical waterfowl habitat, including nesting, rearing and feeding habitat for Canada geese (one nesting pair with two young) and other waterfowl species such as mallard and blue-winged teal; snag habitat that occurs on fringe of balsam poplar stands results in good raptor nesting and perch sites; muskrat trails common along margins of wetland; willow and poplar regeneration heavily browsed by white-tailed deer; numerous deer tracks throughout site; site occurs adjacent SE 5008 and SE 5007, both local ESAs, and hence is important from a regional perspective in terms of both ungulate and waterfowl habitat.

Surrounding land uses include country residential, pasture and cultivated fields.

Criteria

- good example of willow/sedge community
- high plant species diversity
- permanent water body
- provides critical waterfowl habitat
- high habitat diversity
- critical linking function to other ESAs within area

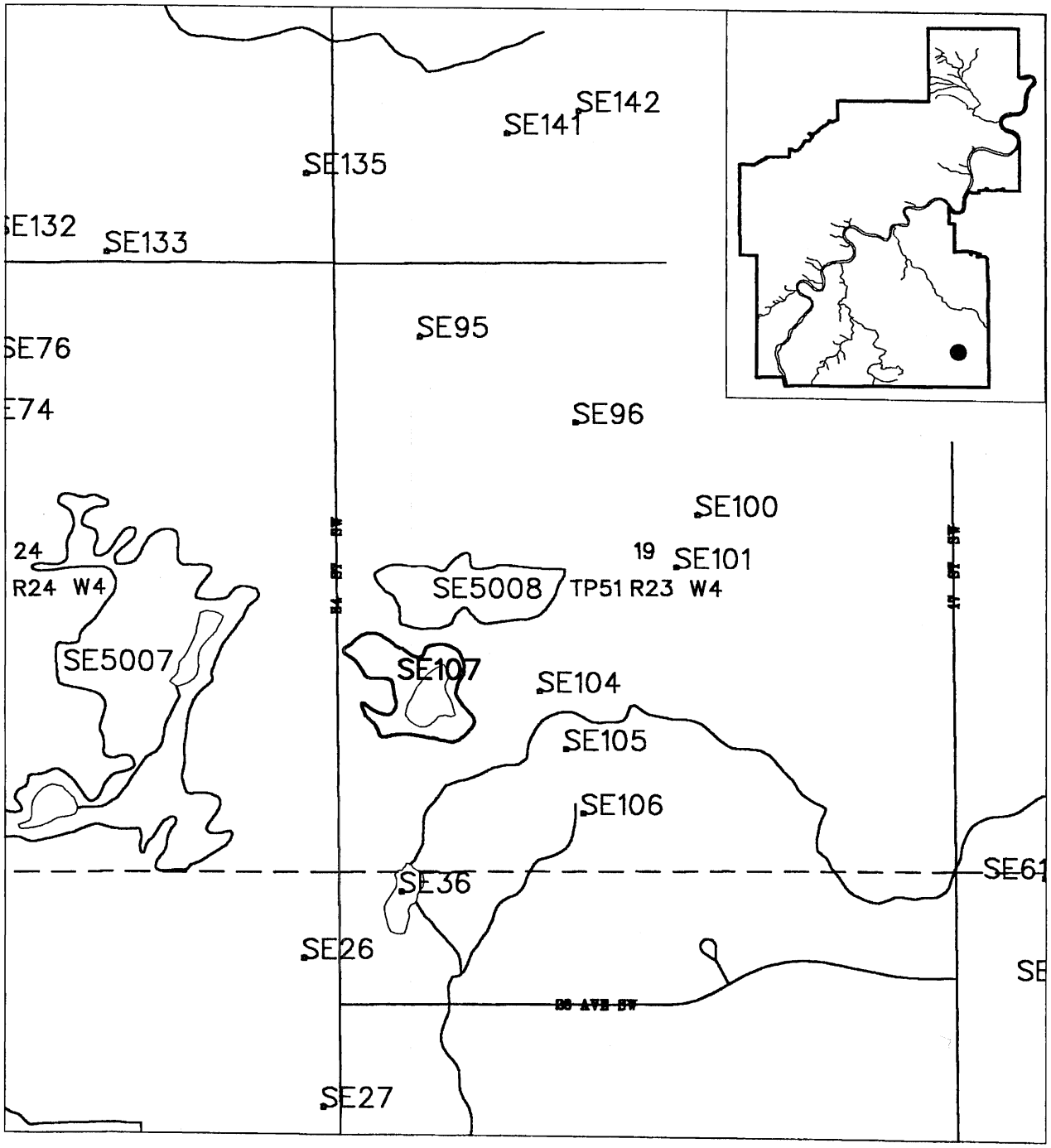
Sensitivity High

The site is particularly sensitive to any disturbances that would result in changes to the natural hydrological cycle of the site and surrounding area; disturbances that would result in the lowering of water levels would have an impact on the site for waterfowl and small mammal habitat.

Management Considerations

It is particularly important that this site be considered in conjunction with surrounding sites, including SE 5007 (Koroluk Natural Area) and SE 5008. Both waterfowl, ungulates and small mammals use all of these sites as they all provide critical habitat. As a result, it is imperative that water levels and upland vegetation be maintained so as not to disrupt the natural hydrological cycle within the area.

34 STREET WETLAND



Site Name **MERIDIAN ST. - TWP RD 515 NATURAL AREA**

Site Reference No SE 5012 **Size** 6.55 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.0 km north of Ellerslie Road; southwest of the corner of Meridian Street and Township Road 515
[NE 29 T 51 R 23 W4M]

Description

"L"-shaped pothole lake with well-developed fringe of cattails, willows and balsam poplar and aspen; permanent water body which is either spring-fed or maintained by local water table; high shrub diversity within balsam poplar-aspen, however, herb layer is poorly developed; shrubs include red-osier dogwood, willow, beaked hazelnut, bracted honeysuckle, low-bush cranberry, snowberry, and choke cherry; very few snags around open water edge.

Soils vary from moderately well drained Orthic Black Chernozems under the poplar to poorly drained Humic Gleysols around the wetland edge to Typic Mesisols immediately adjacent open water; complex formed in gently to moderately undulating and hummocky morainal materials; silt loams over clay; occasional sandy clay lenses.

The unique combination of permanent open water surrounded by diverse vegetation communities makes this site particularly attractive to wildlife species, including white-tailed deer and red-tailed hawks; the site is relatively isolated and well protected for waterfowl species, which may use this site for nesting, breeding and feeding; in addition, well-developed adjacent fence rows of aspen and poplar make this site important from a corridor perspective as the site provides critical food and cover requirements for ungulates.

Surrounding land uses include cultivated fields.

Criteria

- good example of emergent aquatic and upland balsam poplar communities
- high plant species diversity
- provides critical waterfowl habitat
- permanent open water
- critical linking function to other ESA/SNAs within area

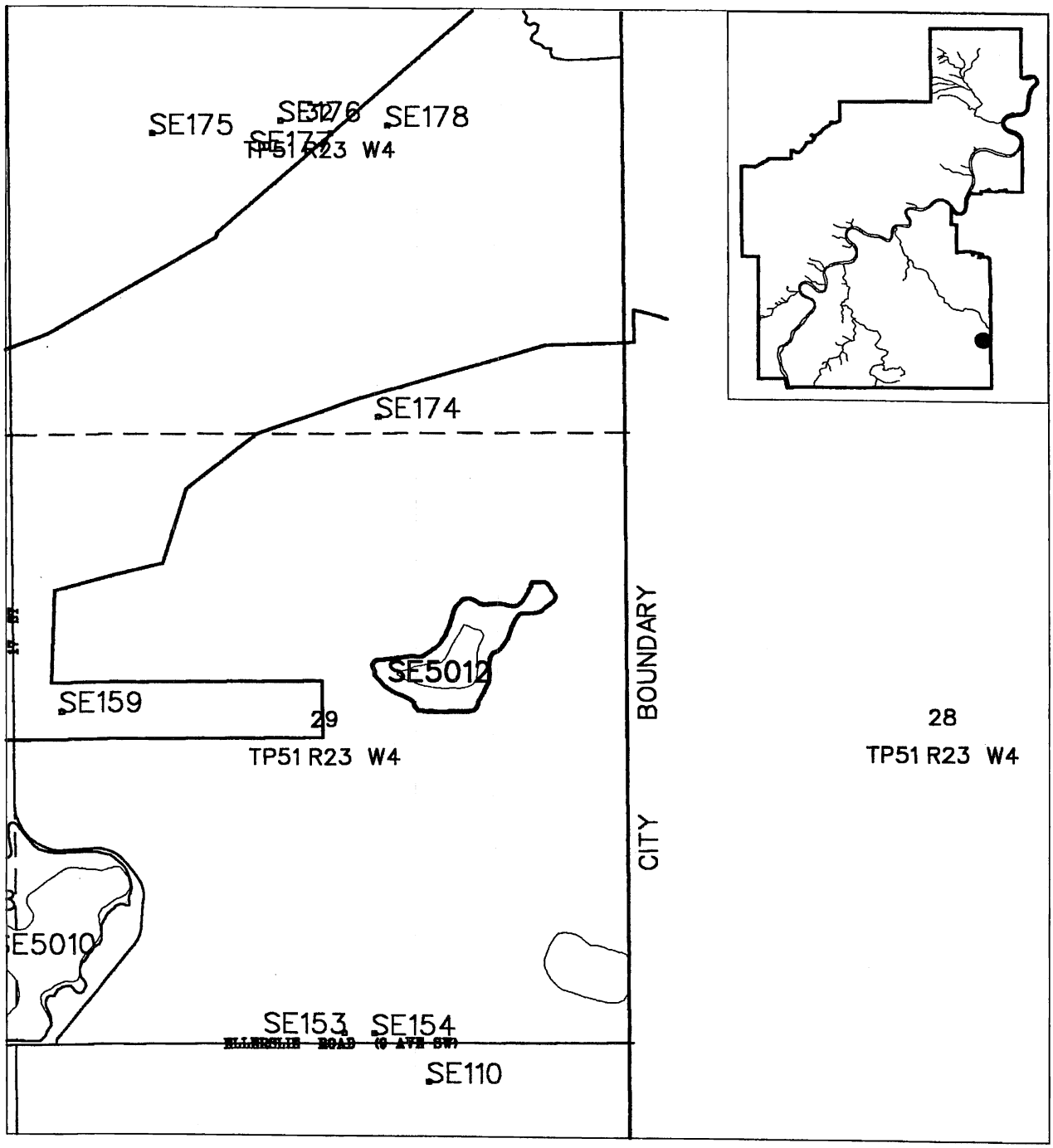
Sensitivity High

The unique nature of this site is maintained by local hydrological conditions. Any disturbances to the site which would negatively impact upon the existing water levels, water quality or current vegetation, would severely impact upon the unique conditions found at the site.

Management Considerations

Because this site is situated in the bottom of a "hummock" it is unlikely that the site will ever be developed. All attempts should be made to ensure that the site's hydrology is not impacted by any developments. Attempts should be made to maintain the site's unique vegetation patterns as well as the permanent nature of the water.

MERIDIAN ST. - TWP RD 515 NATURAL AREA



Site Name **HENSCHEL WETLANDS**

Site Reference No SE 5009 **Size** 2.16 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.8 km north of Ellerslie Road between 17 St and 34 St [SE 30 TP51 R23 W4M]

Description

Small permanent water body that extends well into the Restricted Development Area (RDA); excellent emergent aquatic vegetation growth consisting mainly of cattails; open water surrounded by willow/sedge complex and balsam poplar fringe adjacent cultivated fields; water levels appear to be relatively stable.
Poorly drained Orthic Humic Gleysols and Humic Gleysols have developed adjacent open water; loams over clay loams and loams; gently undulating morainal materials.

The open water bodies and diverse vegetation communities that make up this site provide important waterfowl habitat for mallards and red-winged blackbirds; wetland provides breeding, nesting, and feeding habitat and is probably utilized by waterfowl in conjunction with site SE 152, some 0.5 km to the southeast; site is well protected by the hummocky topography.

Surrounding land use includes cultivated fields, a major power transmission line and the Restricted Development Area.

Criteria

- good example of emergent aquatic vegetation
- high plant species diversity
- important waterfowl habitat
- permanent water body

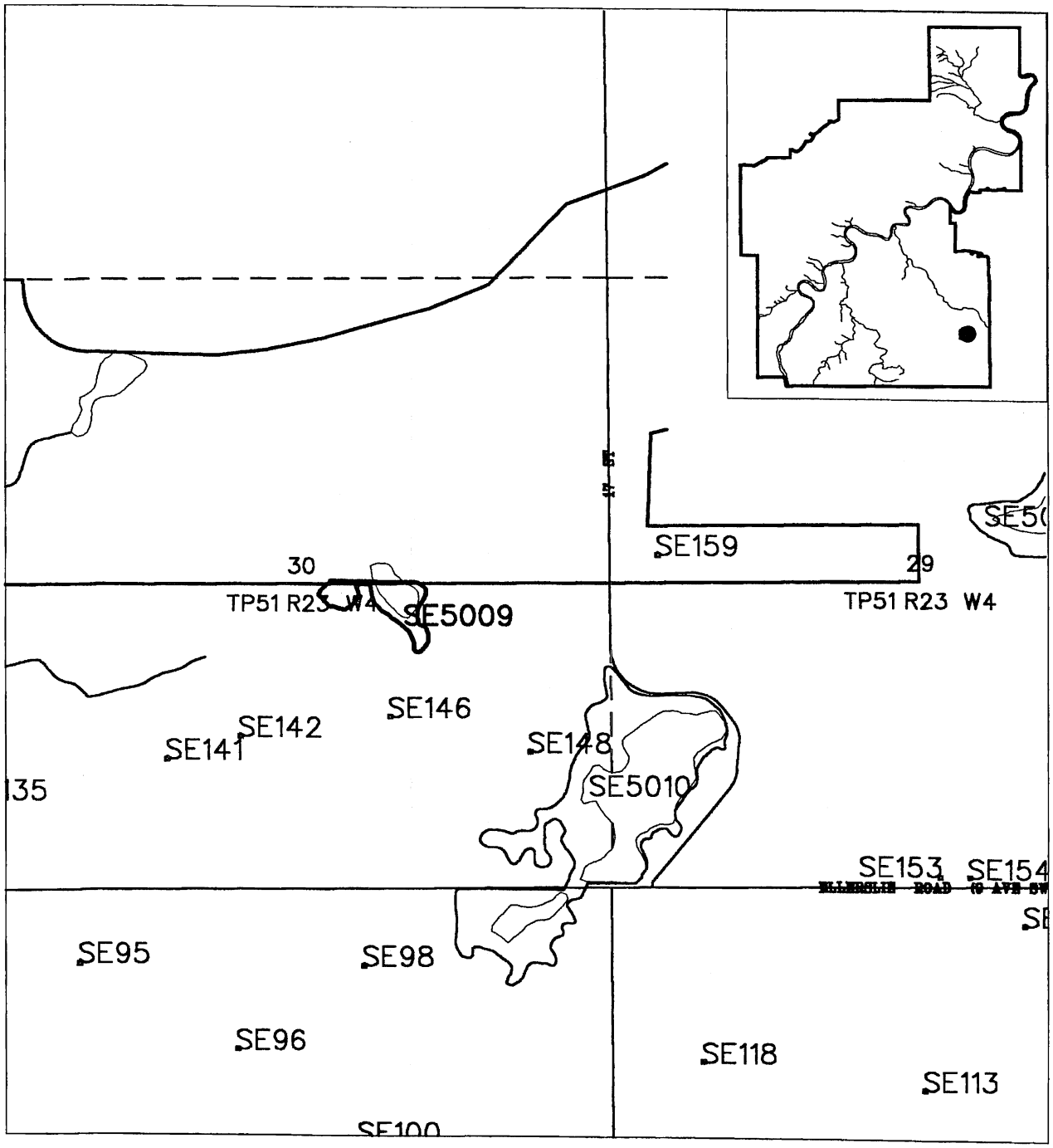
Sensitivity High

Any disturbances that would result in changes to the natural hydrology of the area would severely limit the importance of this wetland for waterfowl. Adjacent wetlands within the RDA should be maintained to ensure the protection of this site.

Management Considerations

Attempts should be made to ensure that this site and its adjacent wetlands within the RDA are maintained or enhanced in order to sustain its function within southeast Edmonton. Communication should be maintained by the city with Alberta Transportation and Alberta Environmental Protection to ensure that any development efforts will not adversely impact the natural hydrology of the area. All physical development within this site should be avoided.

HENSCHEL WETLANDS



Site Name **SOUTHEAST WOODLAND NATURAL AREA**

Site Reference No SE 5016 **Size** 22.51 ha

Significance **Local Environmentally Sensitive Area**

Site Location North of 41 Avenue SW between 91 St SW and 101 St SW [SE 16 TP51 R24 W4M]

Description

Mature, relatively undisturbed mixedwood - dominated stand with minor components of aspen-balsam poplar and wetlands with open water bodies; mixedwood stand comprised mainly of white spruce, balsam poplar and to a lesser extent, aspen; white spruce approximately 125 - 130 years of age and 20 m in height; shrubs include saskatoon, red-osier dogwood gooseberry, snowberry and elderberry; heavy cover of Western Canada violet and smooth brome grass noted throughout site; excellent white spruce regeneration, particularly in the western half of the site; portions of the site are comprised of balsam poplar-aspen with abundant balsam poplar regeneration; mountain ash is common in areas of mainly deciduous cover; good horizontal and vertical structures observed within stands; wetland has been enhanced by drainage efforts and the building of a dugout; modifications have resulted in deep, permanent water with excellent growth of cattails and sedges in areas adjacent to drainage ditch; good snag and perch habitat provided by mature to overmature balsam poplar.

Moderately well to imperfectly drained Orthic Black Chernozems developed on nearly level to very gently undulating glaciolacustrine materials; loams and clay loams over silty clay loams.

The site is composed of a variety of vegetation communities including white spruce-balsam poplar, balsam poplar-aspen and various wetland communities such as cattail and sedges; the diversity of habitat should result in excellent wildlife habitat, however, the site does not appear to be overly productive for wildlife (this may be in part due to its isolated location); some light browse by white-tailed deer on dogwood, rose and aspen regeneration, however, the site appears to be underutilized by deer considering the diversity of palatable browse species and habitats; only 15 bird species encountered within site, which is relatively poor considering the diversity of habitats.

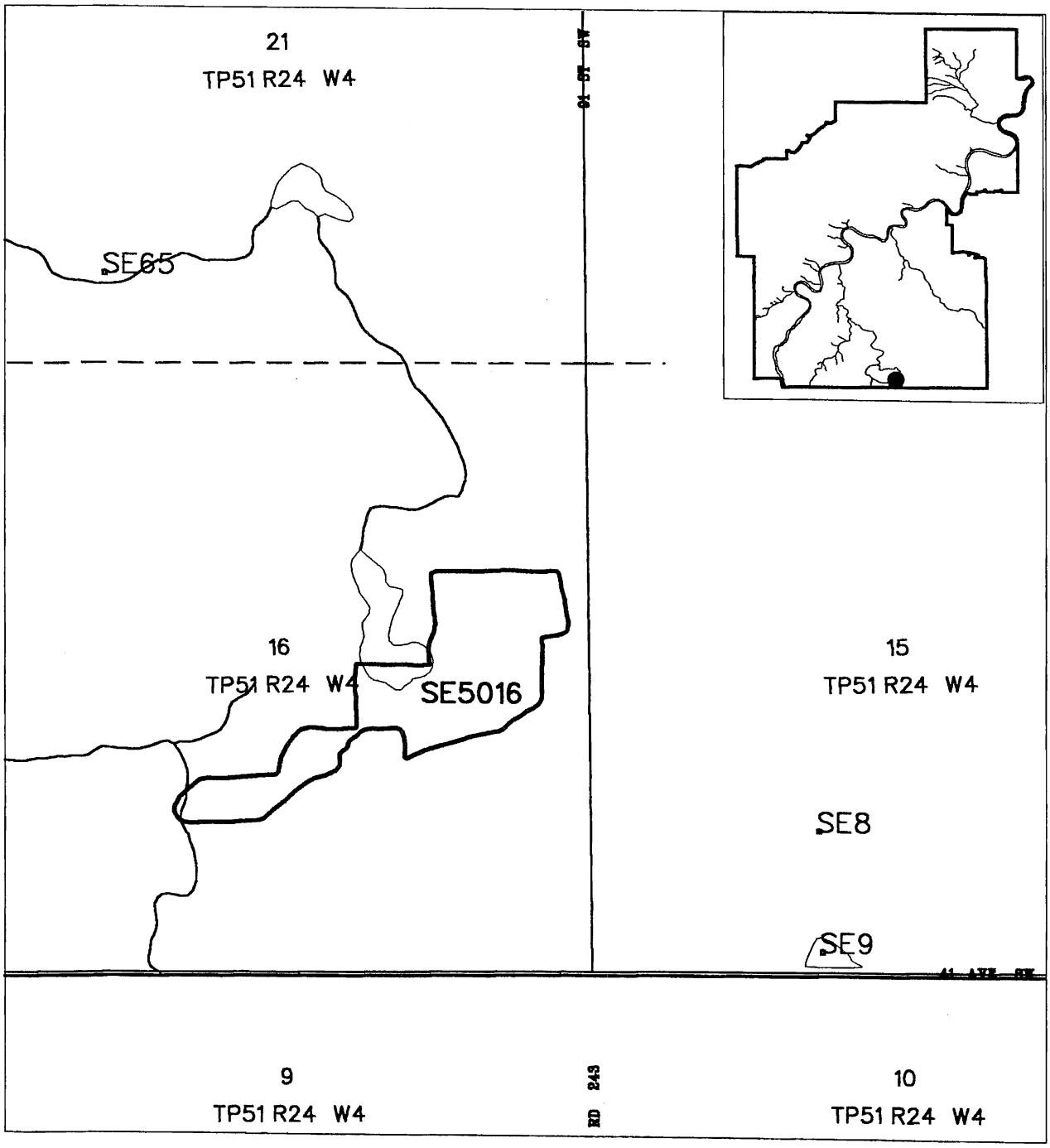
This stand, like SE 5005, provides an excellent example of "old growth" forests within an urban setting and it is perhaps the oldest stand within Edmonton occurring on the table lands.

Surrounding land uses include market gardens, cultivated fields, and country residential.

Criteria

- good example of mature mixedwood vegetation
- permanent water with well-developed cattail vegetation
- "old growth" mixedwood vegetation
- high plant species diversity
- high habitat diversity

SOUTHEAST WOODLAND NATURAL AREA



Sensitivity High

Because of the size and diversity of this site, any changes to the composition or hydrology of the area will severely impact upon the ecological integrity of the site.

Management Considerations

Attempts should be made to ensure that there are no changes to the current composition and structure of this site. Any fragmentation of habitat will severely limit the value of the site for wildlife. Current groundwater regimes should be protected in order to maintain the wetlands at this site.

Site Name **HURSTWOOD WOODLAND**

Site Reference No SE 5015 **Size** 6.51 ha

Significance **Significant Natural Area**

Site Location Between 17 St and Meridian Rd. north of 67 Avenue
[NE 20 T 52 R 23 W4M]

Description

Relatively young, homogeneous aspen woodlot with two small willow/sedge wetlands around perimeter; some balsam poplar occurs in stand in southern portion; aspen approximately 40 yrs old and 10 m in height; saskatoon common understorey species; ephemeral wetlands may have water for short period of time during early spring.

Moderately well to imperfectly drained Orthic Black Chernozems have developed on level to very gently undulating glaciolacustrine materials; loams over silty clay loams and silty clays; poorly drained Orthic Gleysols occur in two small wetlands; water table in wetlands within 50 - 100 cm of the surface.

Relatively homogeneous aspen stand provides for excellent potential white-tailed deer habitat; some bedding sites observed in willow shrublands and light browsing on shrub species; site provides a good example of young aspen stand.

Surrounding land uses include country residential and cultivated fields.

Criteria

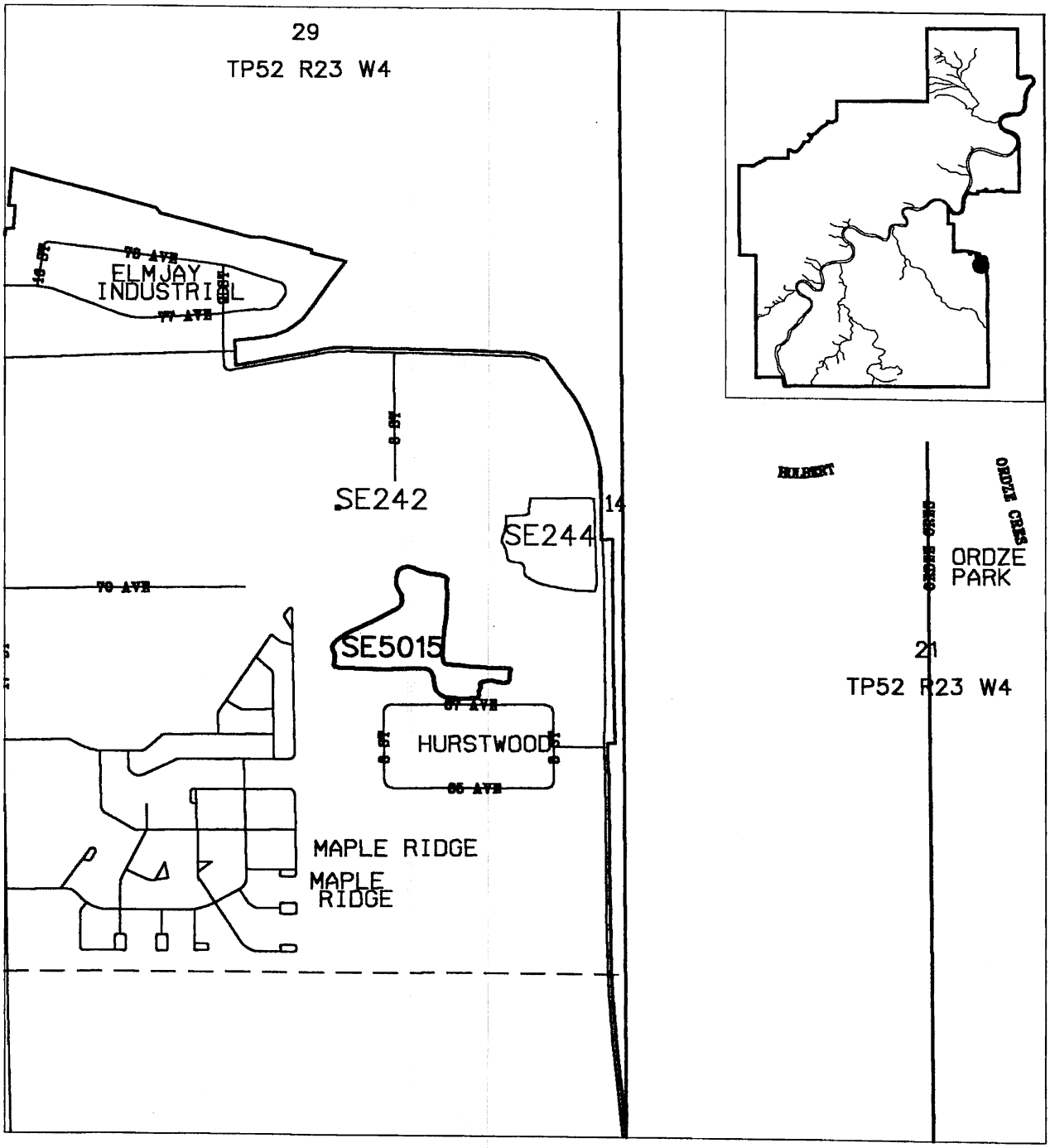
- good example of a young aspen community
- provides habitats for local wildlife

Sensitivity Low

Management Considerations

This site should be incorporated into any development plans as the site is important as potential white-tailed deer habitat. The site is also important because of its size and its close proximity to other significant natural areas (SE 244). The site may tolerate limited physical developments such as cross-country trail systems.

HURSTWOOD WOODLAND



Site Name **HIGHWAY 14 - SHERWOOD PARK CLOVERLEAF NATURAL AREA**

Site Reference No SE 244 **Size** 4.98 ha

Significance **Significant Natural Area**

Site Location Immediately southwest of the Highway 14/Sherwood Park Cloverleaf, south of the school
[NE 20 TP52 R23 W4M]

Description

Mature remnant mixedwood stand with willow/sedge interior; white spruce-balsam poplar with some pure pockets of white spruce; remnant balsam poplar around perimeter of interior wetland provide excellent snag habitat; wetland composition varies greatly, from cattails to willow and sedges.

Imperfectly to poorly drained Gleyed Black Chernozems and Humic Gleysols have developed on level glaciolacustrine materials in response to relatively high water tables; silty clays and silty clay loams.

The diversity of vegetation communities ranging from closed coniferous and mixedwood communities to open willow/sedge wetlands provides unique wildlife habitat that supports a variety of species including white-tailed deer, red fox, coyotes, red-tailed hawk; 21 bird species including downy woodpecker, northern flicker, western wood-pewee, alder and least flycatchers, tree swallow, black-capped chickadee, house wren, American robin, cedar waxwing, European starling, warbling vireo, yellow warble, song sparrow, red-winged blackbird, northern oriole, American goldfinch, clay-colored sparrow, brown-headed cowbird, white-breasted nuthatch and ruby-crowned kinglet; red squirrel and southern red-backed voles also observed during inventory.

Surrounding land uses include school yard, country residential, major roads and cultivated fields.

Criteria

- good example of mature mixedwood vegetation
- high plant species diversity
- high habitat diversity
- diverse wildlife habitat

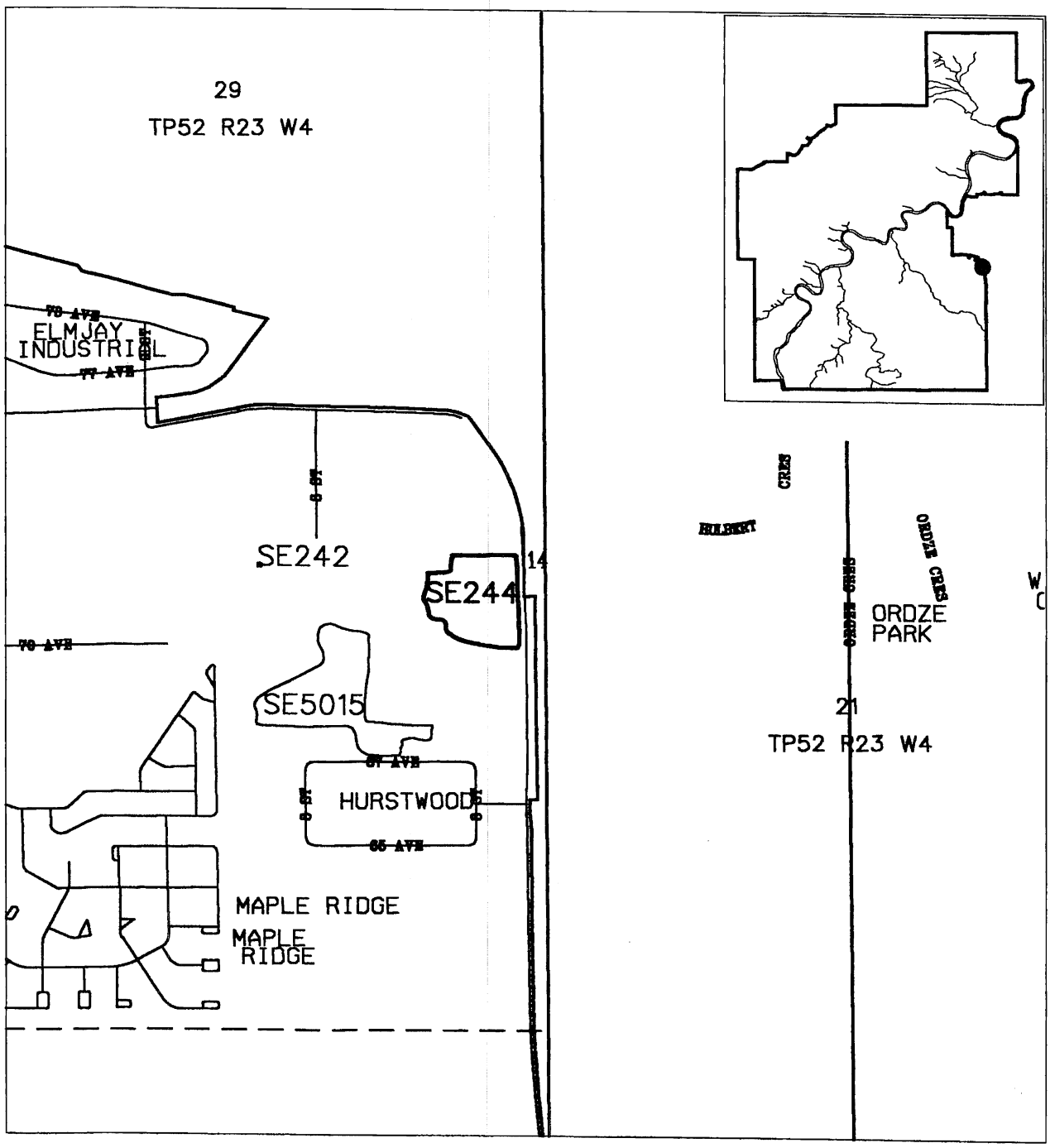
Sensitivity Moderate

Although the upland portion of this stand is not very sensitive to disturbance (with exception of compete removal), the interior of the site is particularly sensitive. The diverse nature of the stand results in critical wildlife habitat; if this balance is disturbed by altering the drainage or natural characteristics of the stand, then value of the habitat would be significantly reduced.

Management Consideration

This site should be maintained for both its natural function and as an "educational" site for the adjacent public school. Attempts should be made to ensure that the complex balance of vegetation not be disturbed in any way.

HIGHWAY 14 - SHERWOOD PARK CLOVERLEAF NATURAL AREA



Environmentally Sensitive Areas and Significant Natural Areas of Southwest Edmonton

5.3 Southwest Edmonton

Nine sites have been identified within the southwest portion of the city. They are as follows:

- Ogilvie Ridge Wetland
- Southwest Mixedwood Natural Area
- Southwest Highland
- Southwest Wetland
- Virginia Park Woodland
- North Virginia Park Woodland
- 41 Ave SW - 184 St Woodland
- Southwest Deciduous Woodland
- University of Alberta Farm Woodland

Of the nine sites identified as being either environmentally sensitive or significant natural areas, four have been designated as being ESA, all of which are locally significant.

Extensive clearing and agricultural activities have resulted in a number of relatively isolated stands and wetlands occurring within the southwest corner of the city. Some of these remnant woodlands provide critical wildlife habitat and corridors for movement between adjacent upland sites and the North Saskatchewan River Valley and Ravine System, including both Whitemud and Blackmud creeks.

The most notable site within the southwest is the Southwest Mixedwood Natural Area located on the south side of Ellerslie Road, east of 111 Street. This site represents the best example within the city limits of a mature mixedwood community that is relatively undisturbed. It is large enough to support a high diversity of wildlife species on a year-round basis and is characterized by highly diverse vegetation communities. Another notable site is the Southwest Highland which is the highest point in the city of Edmonton.

The Ogilvie Ridge Wetland is the northern most site within the southwest and is in the greatest need of immediate attention. It is currently being threatened by agricultural clearing and residential dumping. Unless steps are taken to stop these activities and to reclaim this "sensitive" wetland, it will almost certainly disappear from the landscape.

Site Name **OGILVIE RIDGE WETLAND**

Site Reference No. SW 6002 **Size** 3.32 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.8 km north of 23 Avenue and 0.4 km east of 142 Street [SW 1 TP52 R 25 W4M]

Description

Upland/wetland complex approximately 0.3 km west of Whitemud Creek; remnant upland stand consists of aspen with dense understorey of saskatoon and red-osier dogwood; wetland consists of a willow/sedge/cattails surrounding open water; only permanent water body in southwest Edmonton; wetland slightly disturbed by dumping of materials along northern and eastern sides.

Moderately well drained Orthic Black Chernozems have developed on upland sites; level glaciolacustrine materials; loams overlying clay and heavy clay; evidence of perched water table at 30 cm depth; poorly drained Orthic Gleysols have developed within wetland where fine-textured parent materials restrict downward movement of water.

Because the area consists of a permanent water body and wetland complex adjacent to an upland aspen stand, the area provides critical habitat for white-tailed deer and waterfowl; red-osier dogwood "hedged" by deer within aspen stand; numerous game trails within aspen stand and along wetland fringe; 60 - 80 mallards observed on water feeding in early June, 1993; shorebirds include killdeer and common snipe; significant number of red-winged blackbirds; upland bird species include downy woodpecker, least flycatcher, tree swallow, American crow, black-capped chickadee, house wren, American robin, yellow warbler, savannah, song and clay-colored sparrows, and mourning dove; wetland moderately well protected by willow fringe; possible linking function between other natural areas to the west with Whitemud Creek which is only 0.3 km to east.

Surrounding land use includes cultivated fields, residential developments and a Trans Alta right-of-way to the north; right-of-way is cut for hay on an annual basis. The right-of-way provides a semi-natural corridor for wildlife movement.

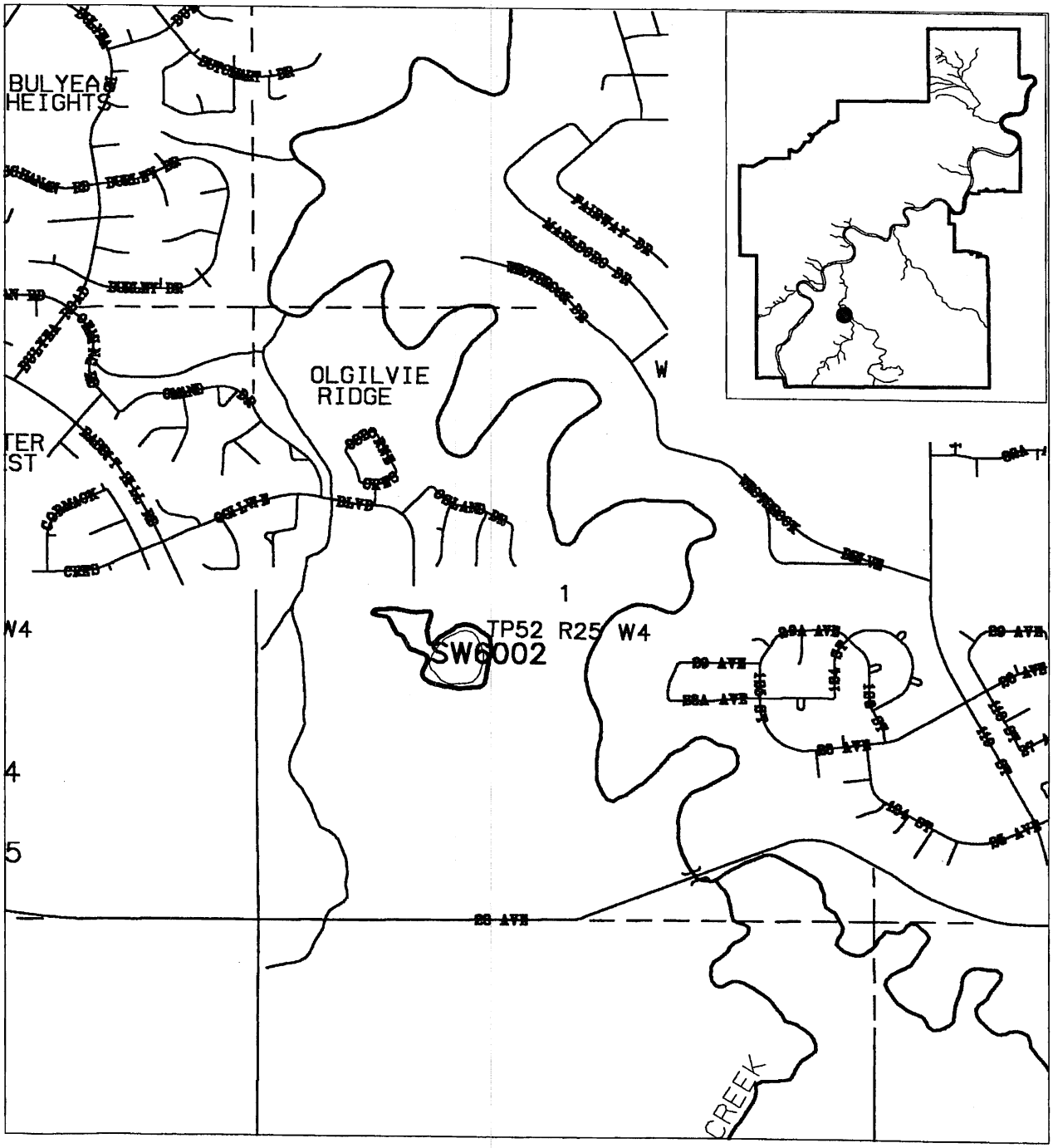
Criteria

- best example of a permanent wetland in southwest Edmonton
- critical nesting and feeding habitat for waterfowl
- possible linking function with Whitemud Creek

Sensitivity High

Wetland complex has already been disturbed to some degree; any further disturbance, especially to the wetland, will severely limit the usefulness of the site for both ungulate and waterfowl habitat; any additional residential development will likely disrupt the

OGILVIE RIDGE WETLAND



"linking function" the site provides between natural areas to the west and Whitemud Creek to the east.

Management Considerations

Because of the rather small size of this site, an attempt should be made to incorporate the site into any future development plans. Attempts should also be made to maintain a corridor between the site and Whitemud Creek. This habitat retention will ensure that the site will continue to be used to some degree by both waterfowl and deer. In addition, reclamation activities should occur as soon as possible to remove any fill that has been deposited along the edges of the wetland.

Site Name **SOUTHWEST MIXEDWOOD NATURAL AREA**

Site Reference No. SW 6001 **Size** 24.53 ha

Significance **Local Environmentally Sensitive Area**

Site Location South of Ellerslie Road between 111 Street and 127 Street SW [NW 19 TP51 R 24 W4M]

Description

Largest woodlot in southwest Edmonton; healthy appearance; mixedwood community composed of white spruce and balsam poplar and to a lesser extent, paper birch and aspen; stand characterized by rich and diverse understorey vegetation composed of mountain ash, low-bush cranberry, cherry, red-osier dogwood, saskatoon, rose, snowberry, hazelnut and gooseberry; numerous fern species observed including oak fern; richness of site indicated by 10 m mountain ash and 25 m white spruce (latter approximately 90 years old).

Well drained Orthic Black Chernozems have developed on nearly level glaciolacustrine materials; textures vary from loams and silt loams on the surface to silty clays and silty clay loams in the unaltered parent materials; high clay content of parent materials results in availability of nutrients for growth.

The size of the stand combined with the diversity of vegetation provide for excellent wildlife habitat on a year-round basis; local resident report between 35 and 40 white-tailed deer and the occasional moose using this stand (some view deer as a problem during the winter months considering its closeness to Ellerslie Road); numerous well-established game trails exist within the stand; 17 bird species recorded during site visit including western wood-pewee, least flycatcher, red-eyed vireo, warblers, red-breasted nuthatch and golden-crowned kinglet; other species include red squirrel and hare. The golden-crowned kinglet which has been designated a confirmed breeder on this site has not previously been found with any evidence of breeding in Edmonton; its breeding habitat occurs primarily in the mountains, foothills and boreal forests.

The richness of the site is indicated by the presence of ferns, especially oak fern) and the diversity of both tall tree and shrub species.

Site is surrounded by cultivated fields to the south and east, Ellerslie Road to the north and country residential and 127 Street SW to the west.

Criteria

- best example within the Edmonton table lands of a mature mixedwood forest that is of sufficient size to maintain ecological integrity
- provides year-round habitat for a variety of wildlife species
- significant plant species
- high wildlife species diversity
- "old growth" mixedwood stand

Sensitivity High

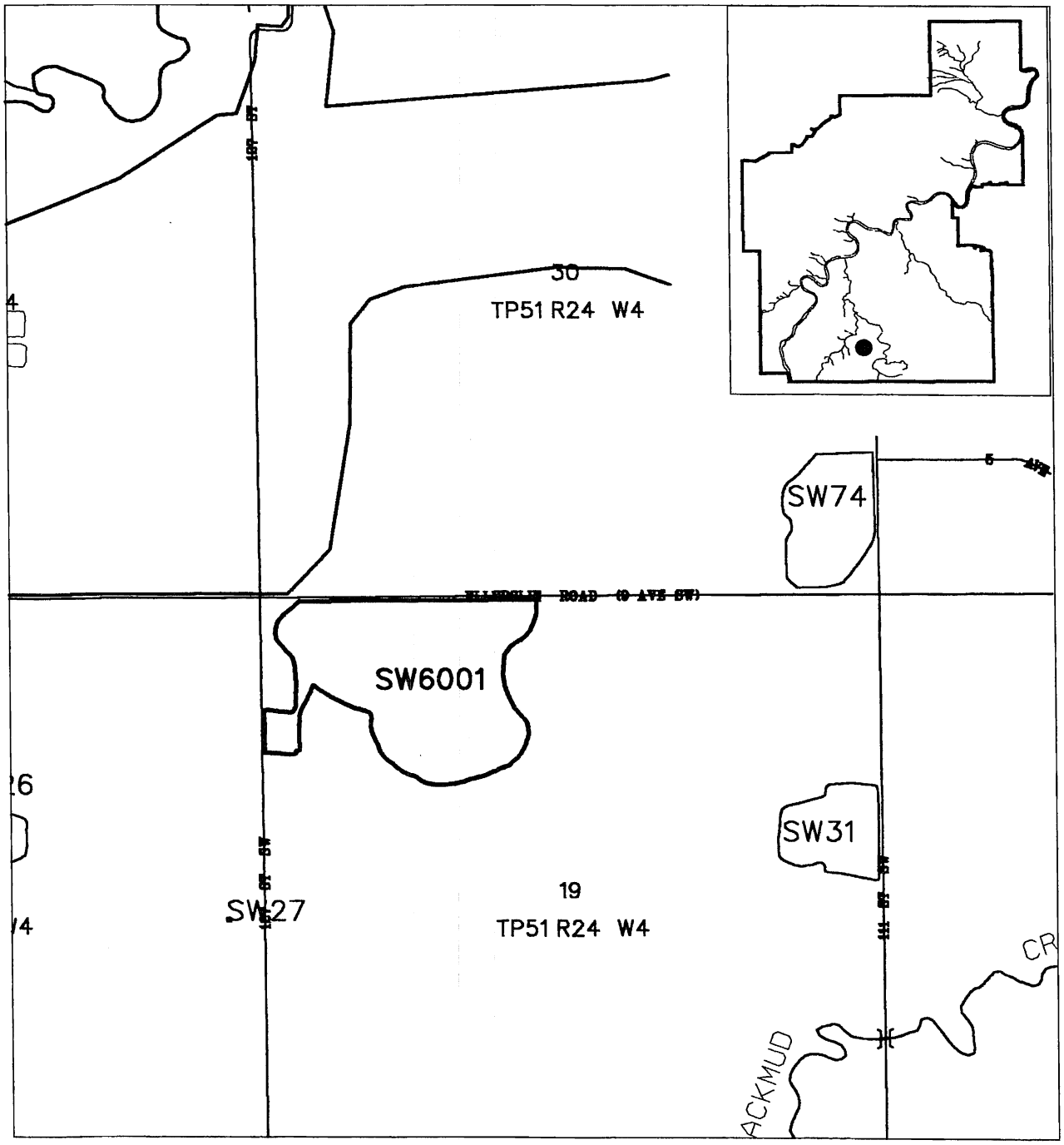
Any disturbance to this site would result in a change to both the compositional and structural diversity of the stand. Such a change would in turn result in negative changes to both the floristic and faunal composition of the stand. The loss of diversity would severely curtail the ecological integrity of the site.

Management Considerations

Attempts should be made to maintain the size of the stand, otherwise, the ecological integrity of the site will be threatened. By reducing the size of the stand, its ability to support such a wide diversity of wildlife species would be severely curtailed and would result in the displacement of species that require sites of this size. Any additional vegetation cover that could be introduced along the adjacent pipeline right-of-way would enhance the sites linking function to the North Saskatchewan River Valley and Ravine System.

Two other sites (SW 31 and SW 74) with similar vegetation occur to the east of this site. While the vegetation appears to be similar, the diversity of wildlife species present within these stands is considerably less due to their smaller size (less than 4.5 ha).

SOUTHWEST MIXEDWOOD NATURAL AREA



Site Name **SOUTHWEST HIGHLAND**

Site Reference No. SW 86 **Size** 6.65 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.4 km southwest of 23 Avenue and 142 Street
[NW 36 TP51 R 25 W4M]

Description

This site represents the highest point in the city of Edmonton; vegetation consists of a unique combination of young seral and pioneer shrubland communities; west-facing slope consists of pioneer shrubland community of beaked hazelnut and snowberry (result of clearing of native vegetation over 10 years ago and letting land revert to natural conditions); young seral aspen communities with dense understories of saskatoon occur on east- and north-facing slopes.

Well drained Dark Gray Luvisols have developed on moderately to strongly rolling (9-30% slope) glaciofluvial materials (deltaic deposits); loam overlying sandy loams; stone content increases with depth.

This feature is quite prominent in southwest Edmonton and can be easily distinguished from afar; because of its closeness to other ESA/SNAs on the tablelands and to the North Saskatchewan River Valley and Ravine System (Whitemud Creek), and its unique combination of young seral and pioneer communities, the site is extensively used by white-tailed deer; shrubs are heavily browsed; high vantage point for raptors.

Farmyard, cultivated fields, gardens and gravel pits surround site.

Criteria

- significant landform feature
- visual and physical link with other ESA/ SNAs identified within tablelands and with the North Saskatchewan River Valley
- good example of young seral and pioneer vegetation communities

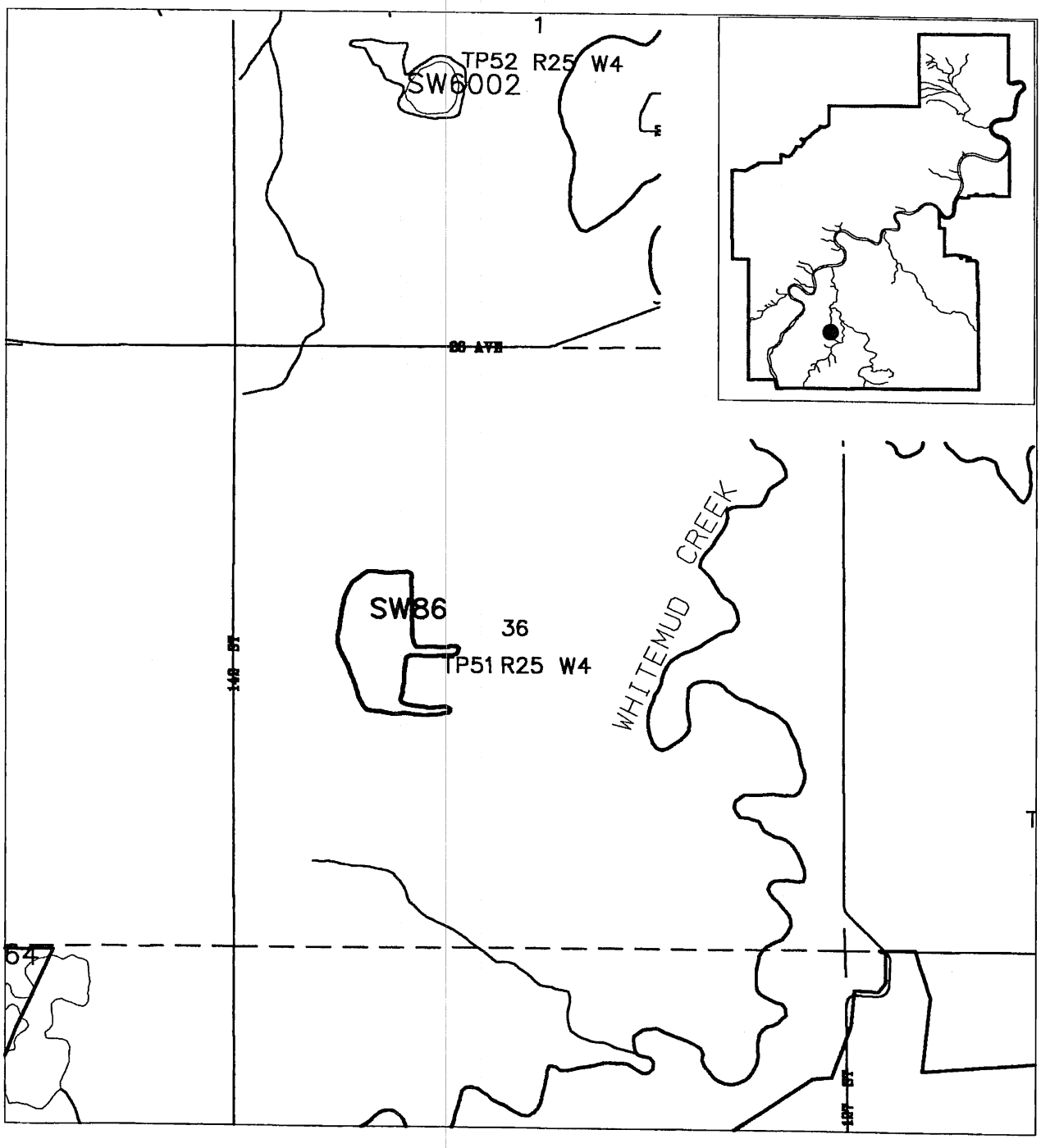
Sensitivity High

Any removal of the existing vegetation at this site will result in severe erosional problems due to the steep nature of the slopes (especially east-facing slopes that reach 30% slopes) and the coarse-textured nature of the parent materials;.

Management Considerations

Attempts to allow native vegetation to regenerate should be encouraged so as to reduce possible erosion. It is imperative that the adjacent linkages to Whitemud Creek are maintained to ensure usage by wildlife species. All physical developments on this site should be avoided.

SOUTHWEST HIGHLAND



Site Name **SOUTHWEST WETLAND**

Site Reference No. SW 2 **Size** 3.25 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.6 km south of Ellerslie on the east side of 184 Street SW [NW 16 TP51 R25 W4M]

Description

Healthy ephemeral wetland complex approximately 0.4 km east of the North Saskatchewan River Valley; vegetation consists mainly of willow/sedge with occasional balsam poplar and cattails; three species of willow recorded including *Salix discolor, S. bebbiana and S. interior*.

Poorly drained Orthic Gleysols developed on gently undulating glaciolacustrine materials; textures range from silty clays to clay; high clay content of soils and subsequent topographic position responsible for high water-holding capacity and subsequent wetland vegetation.

Because the area is less than 0.5 km from the North Saskatchewan River, it is used extensively by white-tailed deer and moose for cover and food when travelling between adjacent upland sites and the river valley; both *Salix bebbiana* and *S. discolor* are "hedged" indicating overbrowsing by ungulates; browsing at 2.5 m height common on willows (indicative of moose); extensive deer tracks observed at site.

Site surrounded by cultivated alfalfa fields.

Criteria

- good example of a willow/sedge ephemeral wetland
- provides habitat for local ungulates, including white-tailed deer and moose
- provides critical function in maintaining or balancing local hydrology
- provides linking function to the North Saskatchewan River Valley

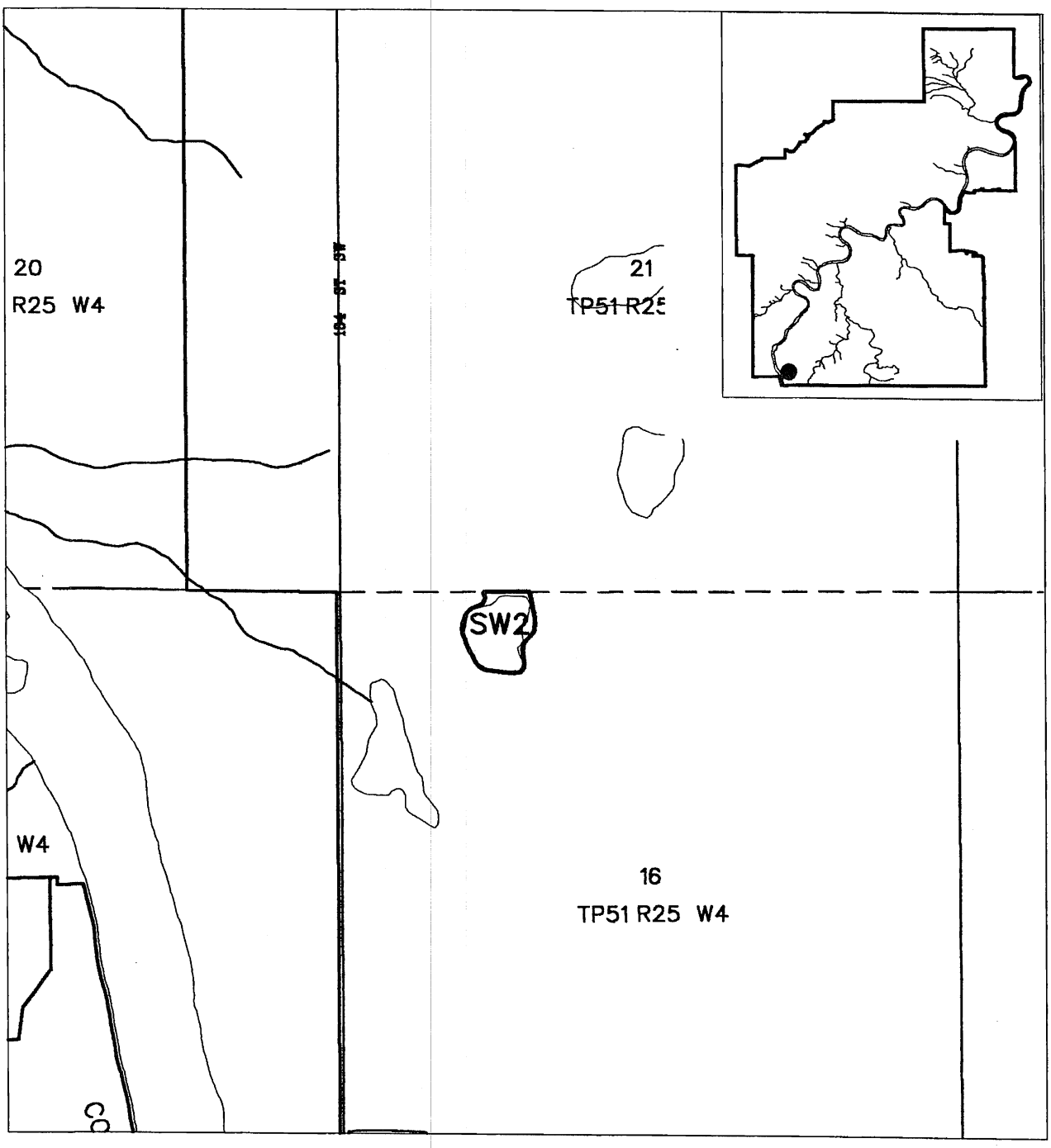
Sensitivity High

Any actions that would alter the existing drainage patterns of this site as well as the drainage of the surrounding cultivated fields would severely impact the ecological integrity of this site; drying of the site would result in a die-off of willows and subsequent loss of critical browse species for ungulates.

Management Considerations

Because of the significance of this site for ungulates adjacent a corridor for movement, it is imperative that attempts be made to maintain and/or enhance the site.

SOUTHWEST WETLAND



Site Name **VIRGINIA PARK WOODLAND**

Site Reference No SW 31 **Size** 5.37 ha

Significance **Significant Natural Area**

Site Location 0.5 km south of Ellerslie Road on 111 Street SW
[NE 19 TP51 R 24 W4M]

Description

Healthy, relatively undisturbed mixedwood stand of balsam poplar - white spruce; understorey characterized by extensive white spruce regeneration and a good diversity of shrub species including red-osier dogwood, low-bush cranberry, wild raspberry, saskatoon, bracted honeysuckle, choke cherry, elderberry and gooseberry; spruce approximately 80 years old and between 20 -24 m in height; balsam poplar approximately 90 - 100 years old and has a more decadent appearance than spruce; significant amounts of deadfall and snag habitat.

Moderately well to imperfectly drained Orthic Black Chernozems and Gleyed Black Chernozems developed on level to very gently undulating glaciolacustrine material; silt loams overlying silty clays; perched water table at 45 - 50 cm depth.

This site was formerly part of a larger woodlot that included sites SW 6001 and SW 74; because the site is considerably smaller than SW 6001 to the west, it does not provide the critical habitat required to support year-round populations of white-tailed deer as does SW 6001; site used by deer for temporary cover when moving between SW 6001 and Blackmud Creek.

Surrounding land uses include cultivated fields, the Virginia Park Greenhouse to the north and 111 Street SW to the east.

Criteria

- good example of mature mixedwood community
- provides habitat for local wildlife

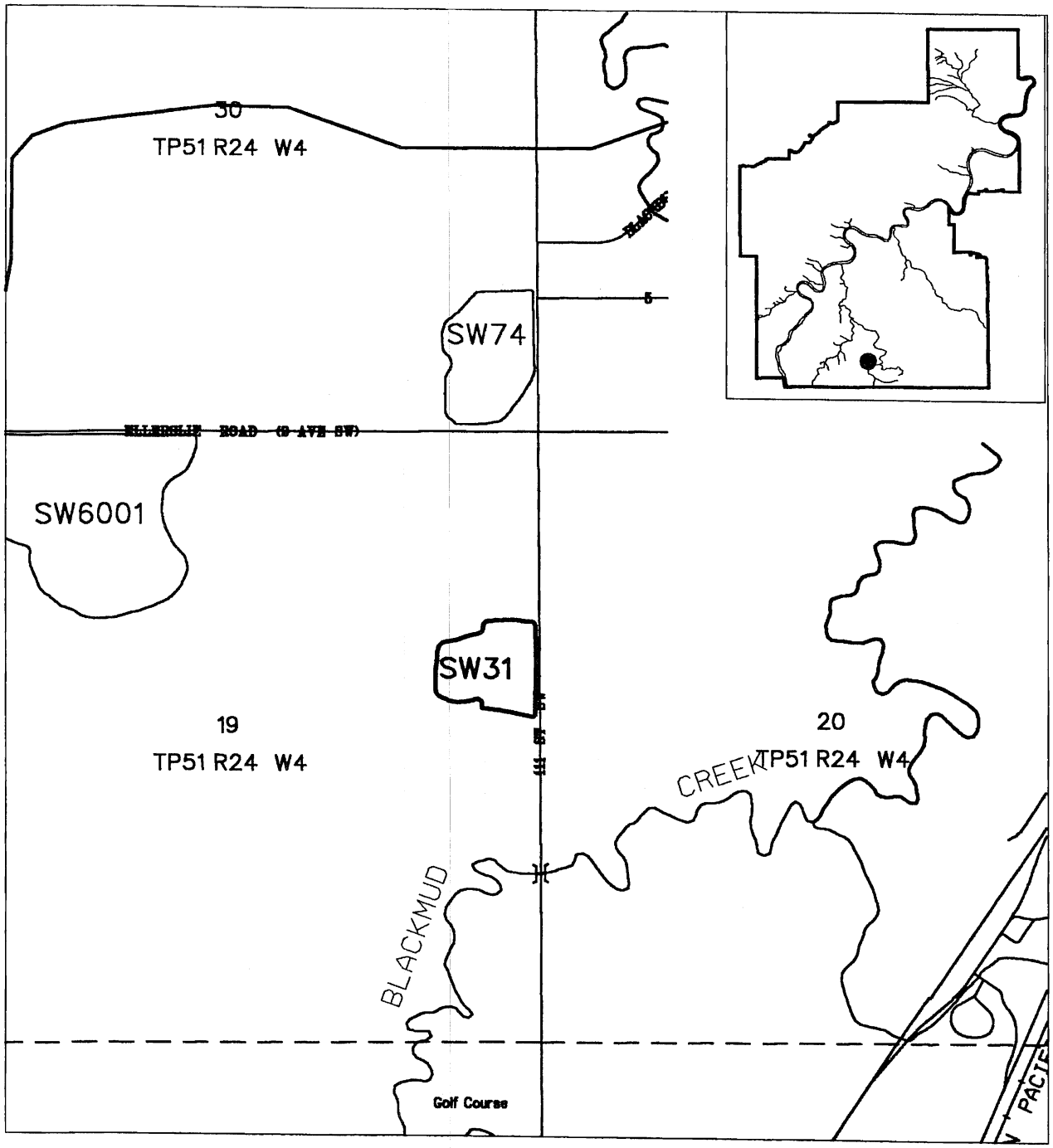
Sensitivity Moderate

A small trail has been pushed through the stand and is currently used for dumping garbage; because of the relative small size of this stand, any additional disruption will result in a further reduction of the stand's ecological integrity and its ability to support wildlife.

Management Considerations

Attempts should be made to ensure that this site remains intact so that the site continues to provide a corridor for white-tailed deer movement. Any additional disturbances will severely impact the sites viability.

VIRGINIA PARK WOODLAND



Site Name **NORTH VIRGINIA PARK WOODLAND**

Site Reference No SW 74 **Size** 7.24 ha

Significance **Significant Natural Area**

Site Location Northwest corner of 111 St. and Ellerslie Road
[SE 30 TP51 R24 W4M]

Description

Relatively healthy, mature mixedwood stand composed mainly of white spruce and to a lesser extent, balsam poplar and white birch; well-developed shrub understorey of wild raspberry, red-osier dogwood, mountain ash, snowberry, bracted honeysuckle, elderberry, tall- and low-bush cranberry, beaked hazelnut, Manitoba maple, choke cherry and gooseberry; white spruce 85 - 100 years old and 20 - 24 m in height.

Imperfectly to moderately well drained Gleyed Black and Orthic Black Chernozems have developed on nearly level glaciolacustrine parent materials; clay loams over silty clay; perched water tables within 50 cm of the surface for a portion of the year.

Although the site is not as large as the adjacent SW 6001, it does provide habitat for white-tailed deer, red squirrel, great horned owl and a number of songbirds; 12 songbird species observed including American robin, pileated woodpecker, least flycatcher, black-capped chickadee, house wren, red-eyed vireo, yellow warbler, dark-eyed junco, red-winged blackbird, northern oriole, white-breasted nuthatch and clay-colored sparrow; Bracted honeysuckle, mountain ash and red-osier dogwood browsed by deer.

Criteria

- good example of mature white spruce - balsam poplar community
- provides habitat for local wildlife

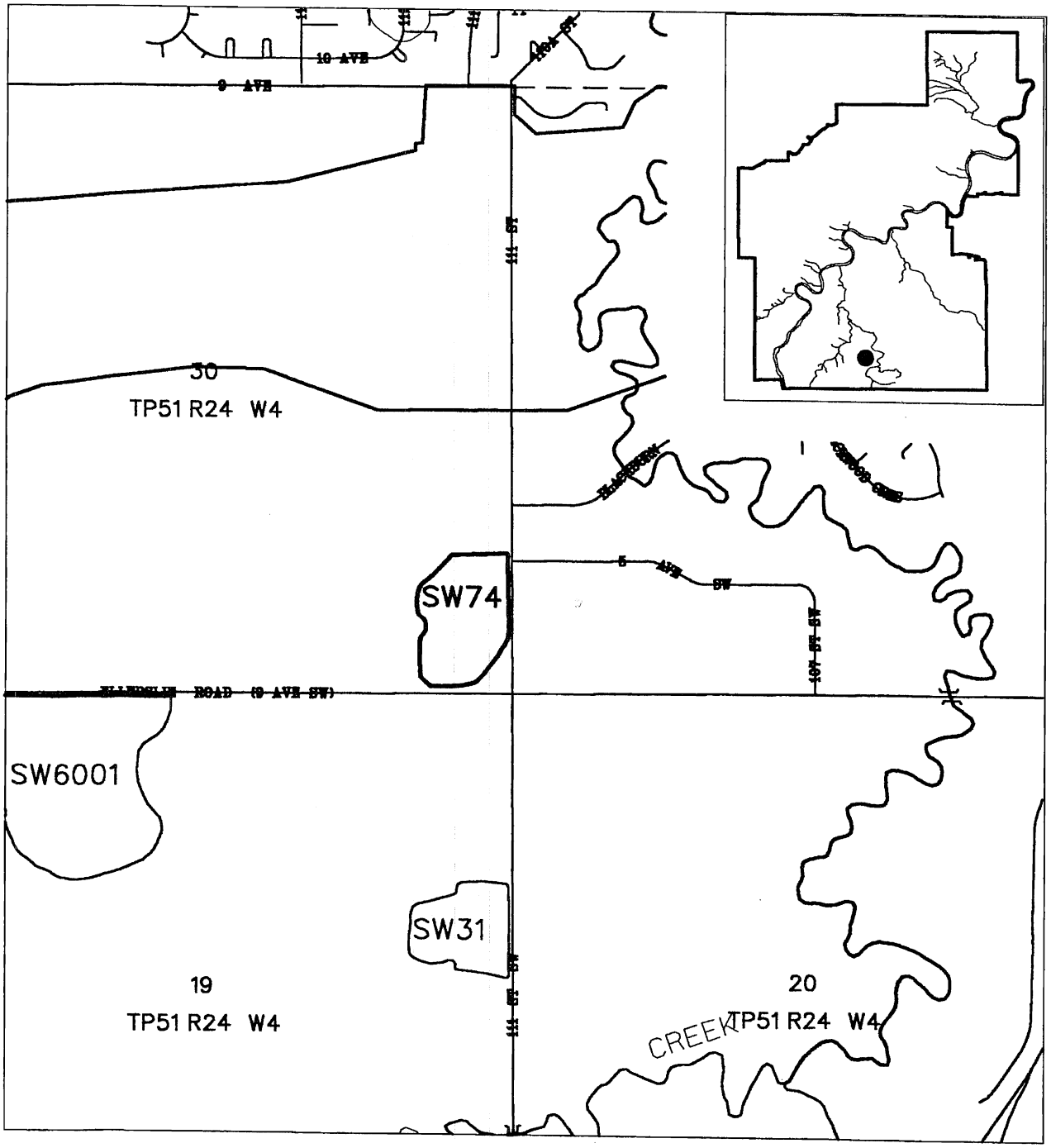
Sensitivity Moderate

This stand has already been negatively affected by forest fragmentation, as it was once part of a larger mixedwood stand consisting of SW 6001 and SW 31. Any further fragmentation will certainly reduce its value as wildlife habitat.

Management Considerations

It is imperative that attempts be made to maintain or enhance this particular site. It is highly attractive to visitors of both the Ellerslie Rugby Club to the east and the Virginia Park Greenhouse to the south. All physical developments within this site should be avoided.

NORTH VIRGINIA PARK WOODLAND



Site Name **41 AVENUE SW - 184 STREET SW WOODLAND**

Site Reference No. SW 1 **Size** 2.14 ha

Significance **Significant Natural Area**

Site Location Extreme southwest corner of city ; northwest corner of 41 Avenue SW and 184 Street SW
[SW 16 TP 51 R 25 W4M]

Description

Healthy, mature balsam poplar stand with a significant component of white birch immediately adjacent the North Saskatchewan River Valley; minor component of aspen and white spruce; well-developed shrubby understorey of red-osier dogwood, beaked hazelnut, rose, saskatoon and honeysuckle; 18-22 m stand tree height, approximately 100 years in age.

Site provides immediate access to the North Saskatchewan River Valley; because of the diverse shrub understorey, area is used extensively by white-tailed deer for food and cover; numerous bedding sites observed at site, perhaps for fawning purposes; 13 different bird species observed including downy woodpecker, least flycatcher, black-billed magpie, black-capped chickadee, house wren, American robin, cedar waxwing, warbling and red-eyed vireo, yellow warbler, song sparrow, brown-headed cowbird, and northern oriole, good snag habitat provided by mature to over-mature balsam poplar and white birch.

Well drained Orthic Black Chernozems have developed on nearly level glaciolacustrine materials; silty clay loams overlying sandy loams.

Surrounding land uses include cultivated fields, roads, the North Saskatchewan River Valley and Ravine System and country residential development.

Criteria.

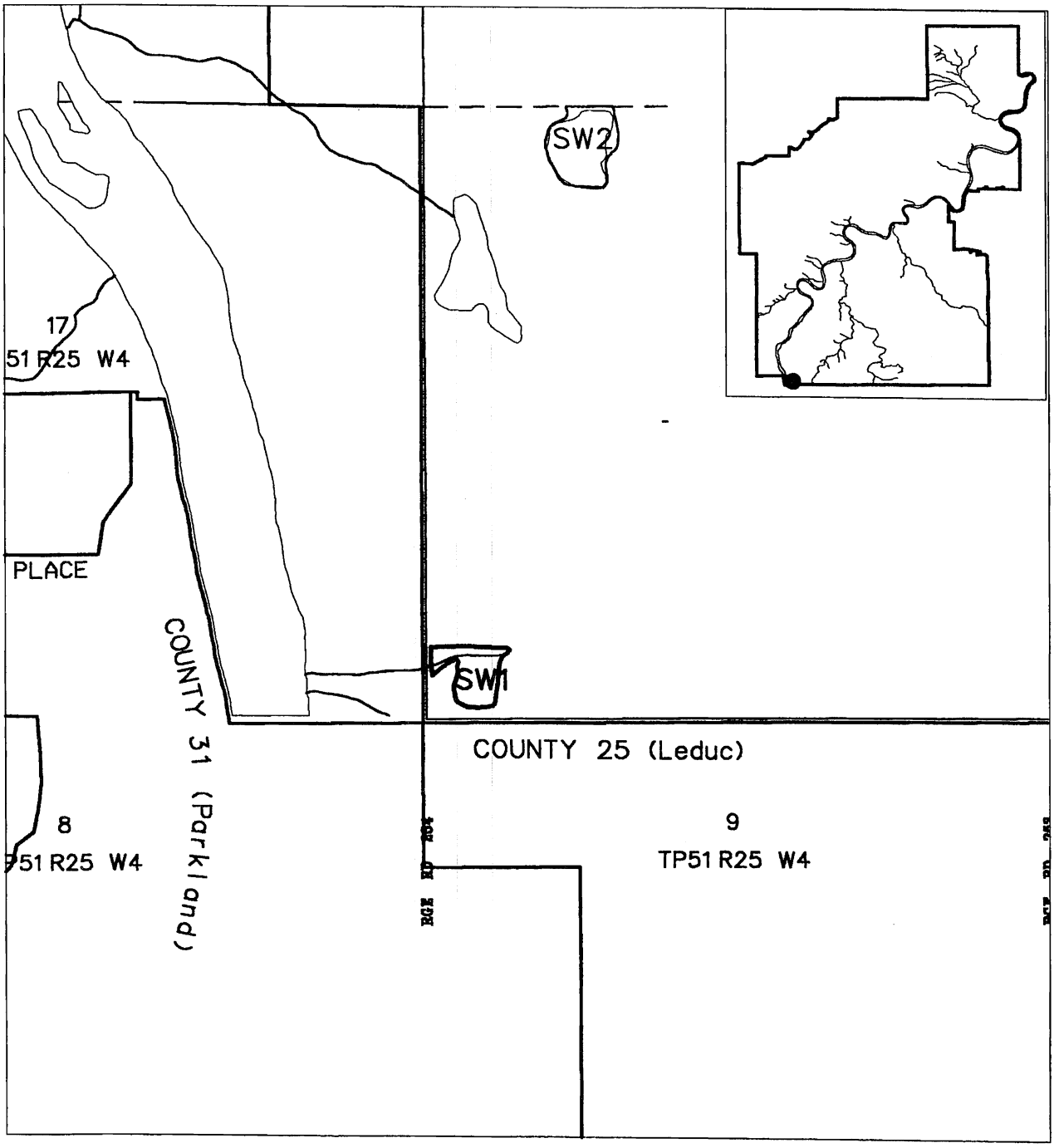
- good example of mature balsam poplar community
- possible "old growth" stand
- provides habitat for local wildlife species
- provides link to North Saskatchewan River Valley

Sensitivity Low

Management Considerations

Attempts should be made to retain site for wildlife habitat purposes. A loss of this site would result in a disruption of movement to and from the North Saskatchewan River Valley and adjacent upland sites.

41 AVENUE SW - 184 STREET SW WOODLAND



Site Name **SOUTHWEST DECIDUOUS WOODLAND**

Site Reference No SW 8 **Size** 5.60 ha

Significance **Significant Natural Area**

Site Location Between Blackmud Creek and 127 St. SW along 30 Avenue SW [NW 18 TP51 R 24 W4M]

Description

Healthy, mature, deciduous, two-aged stand comprised of balsam poplar and younger aspen; variable canopy closure gives rise to well-developed vertical structure of shrubs; shrub species include raspberry, rose, cherry, Manitoba maple, snowberry, red-osier dogwood and saskatoon.

Moderately well to imperfectly drained Orthic Black Chernozems and Gleyed Black Chernozems have developed on level glaciolacustrine materials; loamy textures overlay silty clay loams; perched water table at 50 - 60 cm depth.

Site provides a good example of a mature seral community that is relatively undisturbed and is of significant size to be of value for white-tailed deer, small mammals and songbirds; 7 bird species observed including song sparrow, brown-headed cowbird, northern oriole, western wood-pewee, least flycatcher, house wren, American robin, warbling vireo and yellow warbler; wild raspberry and red-osier dogwood browsed quite heavily by deer and rabbits; site is rather isolated and is approximately 1.0 km from Blackmud Creek but may provide some linking function for ungulates and songbirds when moving between tableland sites to the west and Blackmud Creek.

Surrounding land uses include cultivated fields and country residential developments.

Criteria

- good example of mature balsam poplar stand with young understorey of aspen
- provides habitat for local wildlife

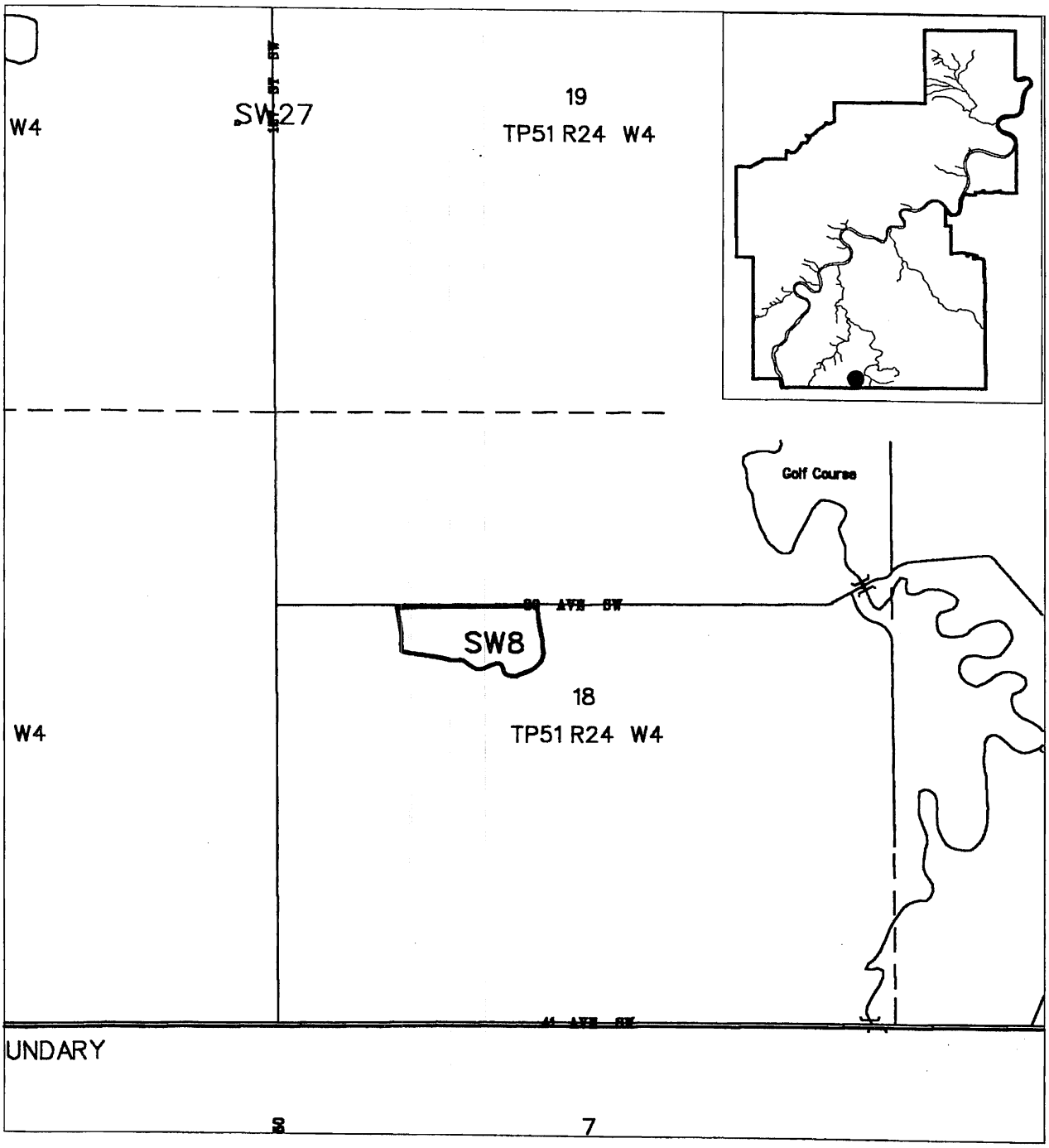
Sensitivity Low to moderate

Because of the relatively small size of the stand, any disturbances that would result in forest fragmentation (i.e. trails) will have a greater negative impact on wildlife than in larger stands such as SW 6001.

Management Considerations

Because the site is used by white-tailed deer, small mammals and songbirds, attempts should be made to maintain the site in its current condition.

SOUTHWEST DECIDUOUS WOODLAND



Site Name **UNIVERSITY OF ALBERTA FARM WOODLAND**

Site Reference No SW 26 **Size** 5.36 ha

Significance **Significant Natural Area**

Site Location South of Ellerslie Road between 127 Street SW and 141 Street SW [NE 24 TP51 R 25 W4M]

Description

Healthy, but narrow remnant balsam poplar-aspen stand with dense understorey thickets of red-osier dogwood; other shrub species include rose, honeysuckle, gooseberry, snowberry, wild raspberry, saskatoon and cherries; good vertical structure within stand; 18 - 22 m canopy height; approximately 100 m wide by 0.6 km long.

Moderately well drained Orthic Black Chernozems developed on level glaciolacustrine materials; loams and silt loams overlying clay loams and clay; no evidence of perched water tables.

"Hedging"" of young aspen saplings and red-osier dogwood suggests that this site is a critical travel corridor for white-tailed deer between other tableland sites (especially SW6001, Southwest Mixedwood Woodlot) and Whitemud Creek; extensive evidence of deer tracks observed along edges of stand.

Surrounding land uses include the University of Alberta Research Farm and Ellerslie Road.

Criteria

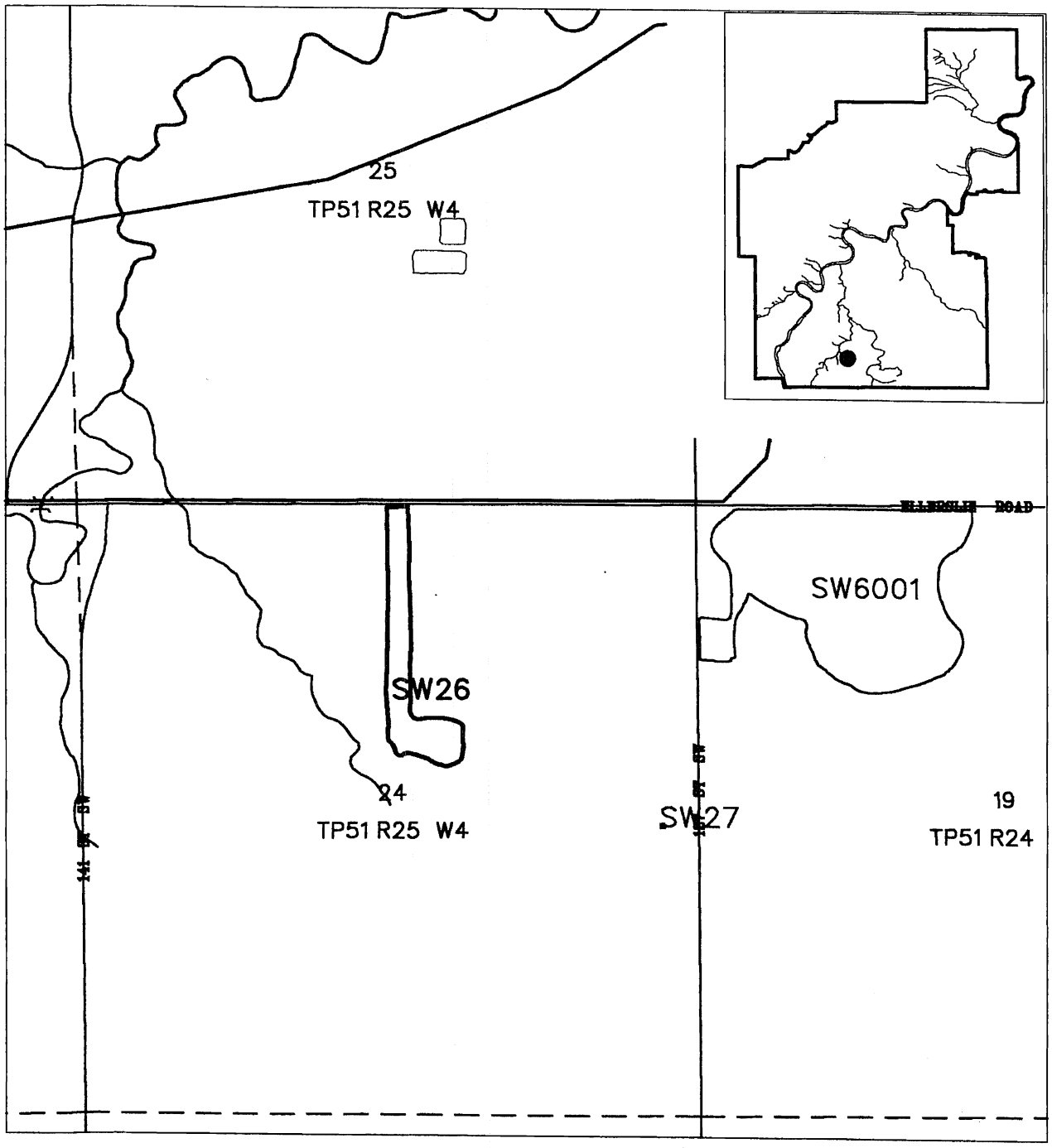
- provides habitat for local wildlife, especially white-tailed deer
- provides linkages between ESA/SNAs within the tablelands and to the North Saskatchewan River Valley and Ravine System

Sensitivity Low

Management Considerations

Any alteration to this stand would result in significant changes in the movement patterns of white-tailed deer who appear to be moving between the Southwest Mixedwood Woodlot (SW 6001) and Whitemud Creek by means of this irregular-shaped stand; attempts should be made to maintain this woodlot in its current condition and shape.

UNIVERSITY OF ALBERTA FARM WOODLAND



Environmentally Sensitive Areas and Significant Natural Areas of Northwest Edmonton

5.4 Northwest Edmonton

The northwest portion of the city has the greatest number of environmentally sensitive areas and significant natural areas within the city limits. Some 28 sites have been designated, of which 20 are classed as environmentally sensitive. The sites are as follows:

- Kinokamau Lake
- Winterburn Woodland
- Grocery People Wetland
- Glendale Wetland
- Stony Industrial Complex
- Normandeau Gardens Natural Area
- 23 Avenue Wetland
- East Winterburn Natural Area
- Triple 5 Farm Wetland
- Hillview Natural Area
- Potter Green South Natural Area
- Triple Acres Natural Area
- Winterburn School Natural Area
- McDonagh Peatland
- Henry Singer Sports Field
- North Poundmaker Industrial Complex
- 167 Ave. - 112 Street Wetland Complex
- Northwest Mature Woodland
- 167 Avenue Wetlands
- Northwest Wetland
- Woodbend Ravine Woodland
- Section 19 Woodland
- Kinokamau Lake Woodland
- Northwest Boundary Complex
- 215 Street Natural Area
- 156 St. - St. Alberta Trail Natural Area
- Freeman Woodland
- Winterburn Crossing Wetlands

The relatively large number of site compared to other portions of the city is a reflection of the diversity that occurs within the region. The uniqueness of the area is found in its landforms, hydrology and resulting vegetation structure and diversity.

Kinokamau Lake and Winterburn Woodland have been designated as regionally significant environmentally sensitive areas. The remaining 18 ESAs have been classed as locally significant.

The northwest portion of the city is perhaps the most fragmented quadrant of all, with land uses including agriculture, light and heavy industrial, and country residential. A significant number of sites occur within the Restricted Development Area (RDA), but have been excluded for the purpose of this study. The high level of development and subsequent disturbance found throughout the northwest heightens the need for immediate protection of remnant native lands.

Of importance to the northwest is its adjacency to the nationally significant North Saskatchewan River Valley and Ravine System and to the provincially significant Big Lake within the Municipal District of Sturgeon. A significant number of ravines carve their way into the northwest area and hence provide critical travel corridors for local wildlife populations. Big Lake is a provincially significant waterfowl area; any disturbance in the adjacent northwest portion of Edmonton is sure to have negative impacts upon the hydrology of Big Lake.

A number of sites are currently threatened by ongoing and future developments, including the Kinokamau Lake, Winterburn Woodland, Glendale Wetland, McDonagh Peatland, Stony Industrial Complex, Triple 5 Farm Wetland and Northwest Wetland. These seven ESAs warrant immediate attention otherwise their survival and contribution to the overall ecology of the northwest will be severely jeopardized.

Site Name **KINOKAMAU LAKE**

Site Reference No NW 7026 **Size** 43.15 ha

Significance **Regional Environmentally Sensitive Area**

Site Location North of Yellowhead Trail between 170 St and 184th Street [Sec 16 TP53 R25 W4M]

Description

Kinokamau Lake is the largest permanent water body in Edmonton; it is characterized by a wide diversity of emergent and aquatic vegetation; some mudflat development has occurred in recent years because local hydrological cycles are low.

Ducks Unlimited states that Kinokamau Lake is "the most important single wetland for wetland-related wildlife within the city of Edmonton." It is an important waterfowl breeding, moulting and staging area and is used in conjunction with "provincially significant" Big Lake and smaller "locally significant" wetlands within the city limits to provide critical nesting habitat; waterfowl species observed during field survey included green-winged and blue-winged teal, northern shovelers, mallard, lesser scaup, Canada goose, American wigeon, redhead, and gadwalls; in addition, Ducks Unlimited estimate that the site provides habitat for American bittern, 2000 - 3000 blackbirds, 500 coots, 150 grebes, 100 gulls, 150 terns, 50 phalaropes, 10 yellowlegs, 10 snipe, and up to 2000 muskrat; a survey of the lake by Ducks Unlimited in the fall of 1992 estimated 2000 staging ducks plus up to 200 Canada geese. Ducks Unlimited estimates that Kinokamau Lake supports "at least 32 bird species."

Surrounding land uses include heavy industrial (cement plant), roadways (Yellowhead Trail), CNR tracks and cultivated fields.

Criteria

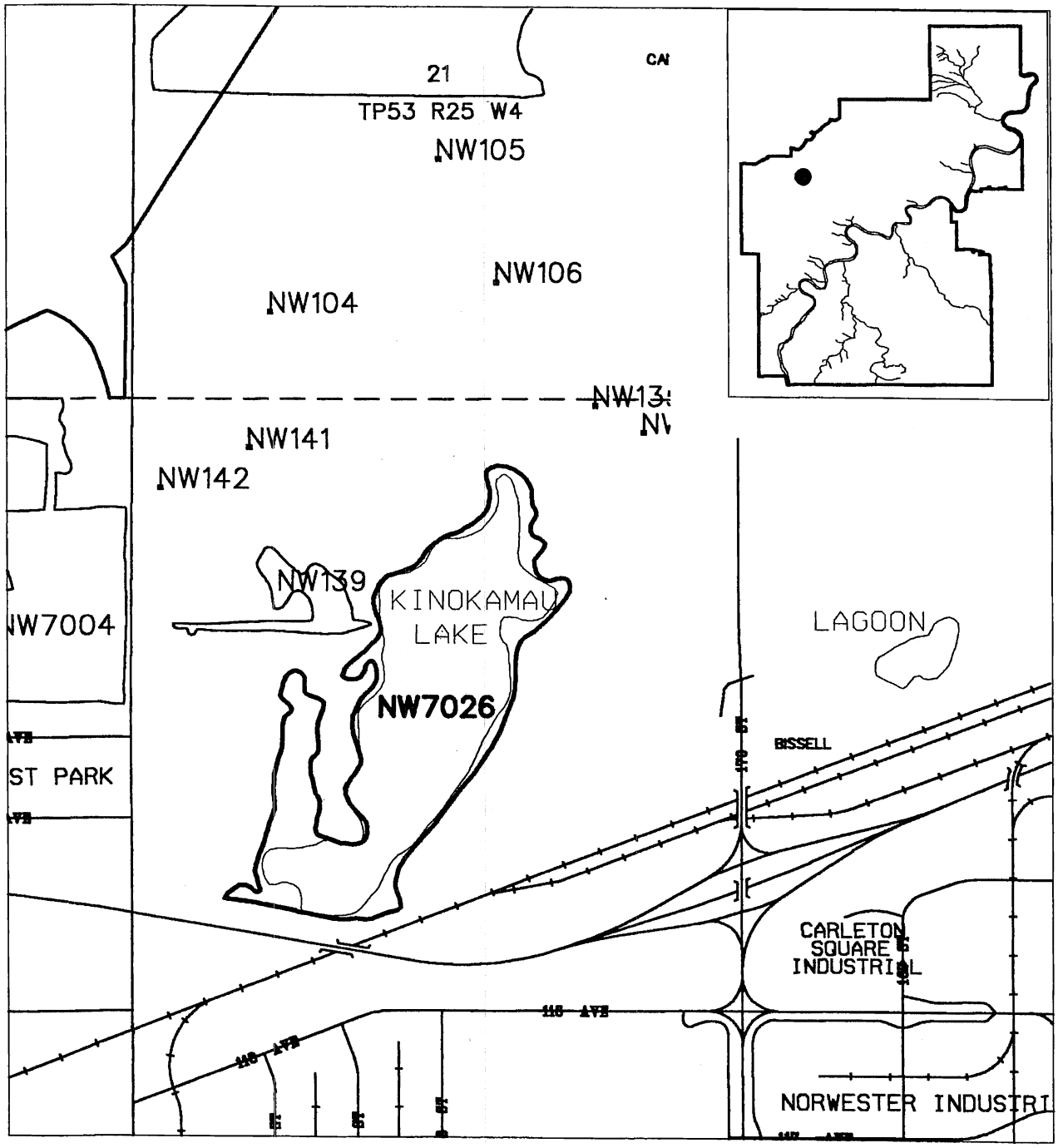
- best example within Edmonton of a major waterfowl producing lake
- high plant species diversity
- high habitat diversity
- provides critical waterfowl habitat for maintenance of all or a significant component of life cycle stages
- permanent water body
- provides critical function in maintaining or balancing area hydrology
- significant landform (significant marl deposits underlay lake)

Kinokamau Lake is classed as a "regionally" significant environmentally sensitive area because it represents the most important single wetland for wetland-related wildlife within the city - it is important for waterfowl breeding, moulting and staging and is used in conjunction with "provincially" significant Big Lake and numerous other "locally" significant wetlands.

Sensitivity High

Because of the size of Kinokamau Lake and the diversity of aquatic, emergent and

KINOKAMAU LAKE



shoreline vegetation, it is particularly sensitive to any disturbances, especially those that would alter the long-term hydrological cycle in the area. Considerable interest has been expressed about mining the marl resources underneath the lake from the north end of the lake.

Management Considerations

Because of the importance of Kinokamau Lake for waterfowl, the city must make all attempts to either secure the wetland to prevent any marl extraction or industrial expansion along its eastern edge. The city should work cooperatively with Ducks Unlimited, which is particularly interested in securing this wetland for conservation purposes. In a recent Ducks Unlimited (1992) report, they state, "of critical importance is to simply secure the wetland." Attempts should be made to develop a "waterfowl/wetland" interpretative program at the site. This program may include the development of a boardwalk, which would significantly reduce any disturbances to the emergent and aquatic vegetation. Such a program would significantly improve wetland/waterfowl conservation within the city and provide an educational site for local students and naturalists.

Site Name **WINTERBURN WOODLAND**

Site Reference No NW 302 **Size** 46.51 ha

Significance **Regional Environmentally Sensitive Area**

Site Location 2.4 km south of Whitemud Drive along Winterburn Road (215 Street) [SW 18 TP52 R25 W4M]

Description

The Winterburn Woodlot is perhaps the most significant upland site within the tablelands of the city of Edmonton; the site consists of a number of highly diversified vegetation communities, ranging from black spruce-larch and willow/sedge communities in depressional wetland areas to balsam poplar-white birch-white spruce mixedwood stands to balsam poplar-aspen stands on upland sites; pioneer seral shrublands have developed on disturbed landscapes; excellent white spruce regeneration found throughout upland portions of site; very rich and diverse understories found throughout both the upland and wetland sites; upland understories shrub layers consists of varying amounts of low-bush cranberry, raspberry, rose, beaked-hazelnut, snowberry, Manitoba maple, red-osier dogwood, and mountain ash; wetland areas characterized by black spruce, larch and paper birch with extensive occurrences of lady fern and oak fern, honeysuckle, red-osier dogwood, raspberry, gooseberry, willow, elderberry, sedges and horsetail; wetland areas characterized by extensive amounts of blowdown.

Orthic Black Chernozems have developed on moderately well drained coarse-textured upland glaciolacustrine materials; loamy sand over sands; poorly drained Orthic Gleysols have developed in depressional areas where the water table is at or near the surface for a significant portion of the year; topography is very gently to gently undulating.

The diversity of vegetation communities found within the Winterburn Woodlot is unparalleled within the cities tableland area. More importantly, is the presence of significant plant species such as lady and oak ferns; both species are indicative of the richness of the site. In addition, the richness of the site is also seen in the diversity of plant species, the excellent growth of the stand in terms of height (tree canopy at 16-18m) and the very size of many of the leaves, in particular, low-bush cranberry. The richness of the site is primarily a function of local hydrology and to a much lesser extent, the parent materials. In most instances, finer-textured parent materials provide for excellent nutrient regimes within stands, however, the Winterburn Woodlot occurs on relatively coarse-textured materials that are generally considered to be nutrient poor.

The diversity of vegetation results in critical wildlife habitat for ungulates, small mammals and avian species. The site is heavily used by white-tailed deer as is indicated by the "hedging" of red-osier dogwood and extensive trails and tracks throughout the site. Some 33 bird species were observed and recorded during the survey. Of particular importance is the

occurrence of two Cooper's hawks, a species that has been placed on the "Blue" list as an uncommon species and is considered a vulnerable species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The site also had the largest western wood-pewee population (5 individuals observed) of any site visited within the table lands; other species observed included red-tailed hawks, yellow-bellied sapsucker, hairy woodpecker, northern flicker, alder and least flycatchers, eastern kingbird, tree swallow, blue jay, black-billed magpie, common raven, boreal chickadee, house wren, American robin, cedar waxwing, warbling and red-eyed vireos, yellow and mourning warblers, rose-breasted grosbeak, savannah, song, clay-colored and white-throated sparrows, dark-eyed junco, brown-headed cowbird, northern oriole, American goldfinch, ovenbird, gray catbird and ruby-crowned kinglet.

Because the site occurs immediately adjacent the forested Stony Plain Indian Reserve, it provides a critical corridor for wildlife movement between the reserve to the west and other natural areas to the east. This corridor is well demonstrated in the number of well-developed game trails throughout the stand.

Surrounding land uses include the Stony Plain Indian Reserve No 135 to the west, cultivated fields to the north and east and country residential (Triple Acres) to the south.

The site appears to be used quite extensively for outdoor recreational pursuits, including hiking, picnicking, cross-country skiing, wildlife viewing and even horse-back riding. A number of well-developed trails, horse corrals and "stations" have been developed within the stand.

Criteria

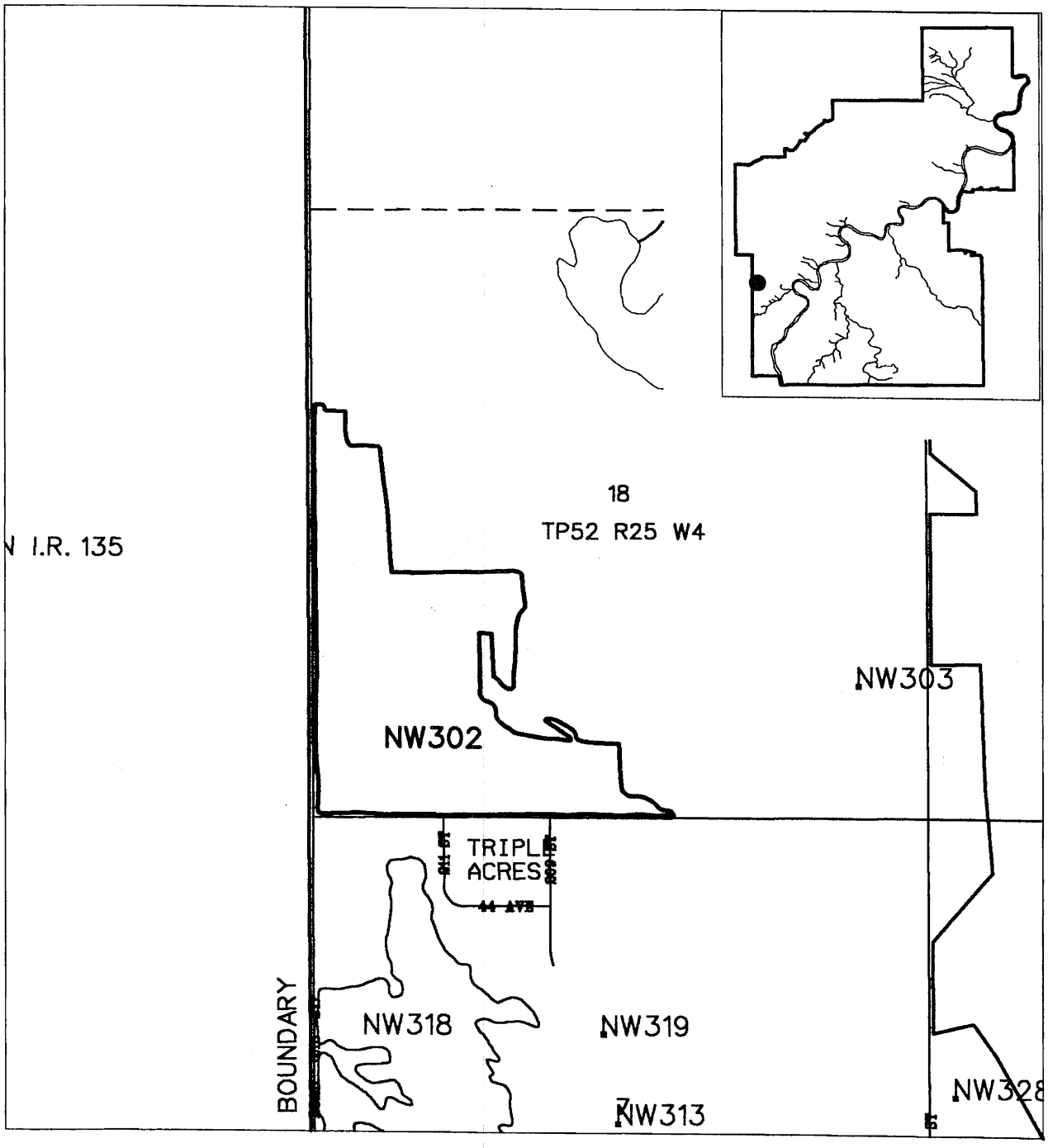
- good example of a number of different vegetation communities, including black spruce-larch, willow/sedge, balsam poplar-white birch-white spruce mixedwood and balsam poplar-aspen types
- high plant species diversity
- significant plant species, including oak and lady fern
- provides critical habitat for maintenance of all or significant components of life cycle stages
- critical linking function to ESA/SNAs within city and outside of city
- sensitive wildlife species, including the vulnerable Cooper's hawk
- provides critical function in maintaining or balancing local hydrology

The Winterburn Woodland has been classed as a "regionally" significant environmentally sensitive area because of the presence of the uncommon and vulnerable Cooper's hawk (a species that is at risk because of either low numbers or restricted range and therefore, although not in immediate danger, could be at any time (COSEWIC). This species was not observed within any of the other sites visited during the study.

Sensitivity High

This site is particulary sensitive to further disturbances, especially any disturbance that would affect the natural hydrology and vegetation composition of the site. The sites diversity is largely a function of the permesotrophic conditions that have arisen as a result of groundwater conditions - any disturbance to this already sensitive balance may result in severe impacts to existing vegetation, in particular, the presence of fern species.

WINTERBURN WOODLAND



Significant portions of the site have previously been cleared for sand and gravel extractions and for rights-of-way. Today, portions of this cleared area is used as a dumping area for garbage. Signs have been posted warning against such dumping of materials.

Management Considerations

Because of the regional significance of this site, attempts must be made to maintain and enhance the site. It is imperative that previously disturbed areas be reclaimed and that reclamation includes the removal of recent "garbage." Because the area appears to be heavily used by local residents for recreational interests, a "stewardship" program is encouraged to ensure proper functioning of the site. It is imperative that the ecological integrity of the site is maintained and enhanced because the site offers such a unique set of environmental conditions for education and research.

Site Name **GROCERY PEOPLE WETLAND**

Site Reference No NW 110 **Size** 2.71 ha

Significance **Local Environmentally Sensitive Area**

Site Location Approximately 2.0 km north of Yellowhead Trail on west side of 170 Street; site located south of CNR tracks between Grocery People and the IXL Brickyard to north.
[NE 21 TP53 R25 W4M]

Description

This relatively small wetland is sandwiched between the Grocery People warehouse to the south and a brickyard to the north; it occurs adjacent to a large stand that has been partially removed and is now regenerating to shrubs; it is composed of open water with significant cattail growth, dense willow thickets, and a small aspen-balsam poplar stand in the northwest corner; water body appears to be permanent in nature with excellent development of cattails and rushes; water depths appear to be in excess of 3 m and water has a quite clear appearance; willow species quite diverse and consists of *Salix bebbiana, S. interior, S. discolor* and other species; shrub species found with aspen-balsam poplar stand include willow, rose, mountain ash, beaked hazelnut, snowberry, and buffaloberry.

Poorly drained Orthic Gleysols developed on gently undulating glaciolacustrine materials; organic veneers overly glaciolacustrine materials adjacent open water; perched water tables common within upland soils.

The diversity of vegetation that occurs within this very small site is quite extraordinary and combined with the permanent water body provides some of the best wildlife habitat for its size in Edmonton and area; one of only four sites within the tablelands where black-crowned night herons were observed; up to eight individuals recorded at site and nests found along the northern side of site in dense willow thickets; area heavily used by white-tailed deer, coyote and numerous waterfowl species including green-winged and blue-winged teal, northern shoveler, American wigeon, lesser scaup; other bird species include American cout, spotted sandpiper, alder flycatcher, tree swallow, magpies, American crow, black-capped chickadee, house wren, common yellowthroat, cliff swallow, clay-colored sparrow, song sparrow, Lincoln's sparrow, red-winged and yellow-headed blackbirds, and American goldfinch; heavy use of area by white-tailed deer; evidence of heavy use includes extensive game trails along the CNR tracks, "hedging" of palatable browse species such as wild rose and aspen regeneration and feces; bark stripped off many of the willows, especially *S. bebbiana*; and deer beds within the tall shrub thickets.

Surrounding land uses include light industrial, railway right-of-way, 170 Street

and the Restricted Development Area (RDA).

Criteria

- good example of a permanent wetland
- high plant species diversity
- permanent water body
- high habitat diversity
- high wildlife species diversity
- significant black-crowned night heron rookery (northwest edge of species range)
- critical waterfowl and terrestrial bird habitat

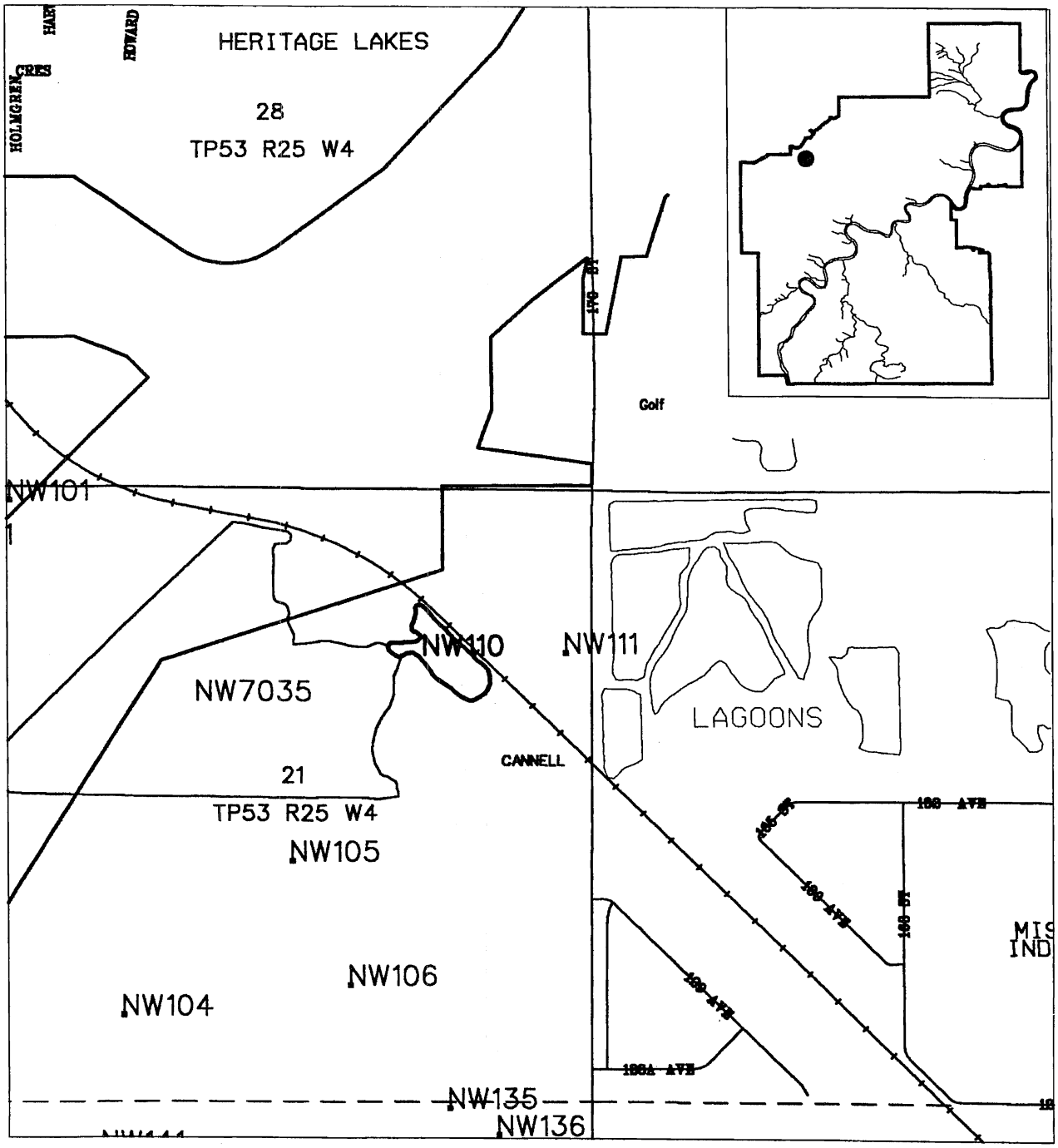
Sensitivity High

Because of the complex nature of this site and its extremely small size, it is extremely sensitive to any disturbances, particularly any disturbances that would alter local hydrology or water quality. Because this site is located between two industrial sites and adjacent to railway tracks, it stands an excellent chance of being disturbed to some extent. Any alterations to the site would negatively impact the critical balance of this site that has given rise to its significance. The presence of the CNR railway always raises the possibility of train wrecks and subsequent spills of hazardous materials which would essentially "kill" the site. In addition, it appears that some dumping of concrete has occurred along the south shore as well as scraping of soils materials.

Management Considerations

Attempts must be made to ensure the survival of the site, otherwise critical habitat for black-crowned night herons will be permanently lost. Because the site is situated between two industrial plants, it is already protected to some extent, however, any expansion plans by the Grocery People would possibly see the infilling of this site and the loss of critical habitat. Clearing of the adjacent RDA would also severely reduce the importance of this site to white-tailed deer and coyotes. It is suggested that the Planning and Development Department of the City of Edmonton inform the Grocery People and the owners of the IXL Brickyard as to the significance of the site and try to develop some conservation measures to ensure its survival.

GROCERY PEOPLE WETLAND



Site Name **GLENDALE WETLAND**

Site Reference No NW 132 **Size** 2.37 ha

Significance **Local Environmentally Sensitive Area**

Site Location Southeast of Horsehill Lake and immediately east of the Glendale Golf and Country Club; approximately 1.5 km north of Yellowhead Trail on 198 Street.
[NW 17 TP53 R25 W4M]

Description

A series of three beaver ponds in remnant meltwater channel surrounded by well-developed ring of aspen-balsam poplar; well-developed shrub layer of willow, Manitoba maple, red-osier dogwood, rose, raspberry, snowberry, saskatoon and white birch; relatively poorly developed herb layer; water levels considerably low; beaver dams appear to have been "blown" in an attempt to remove beaver from site; considerable deadfall as a result of beaver activity, especially aspen and to a much lesser extent white birch.

Gently to moderately undulating and hummocky morainal materials; loams and silty clay loams; moderately well to imperfectly drained Dark Gray Luvisols on side slopes; poorly drained Orthic Gleysols adjacent open water.

This site represents the only active beaver ponds within the city of Edmonton's tablelands and also provides critical feeding and perhaps nesting and breeding habitat for , mallards and gadwalls; 2 black-crowned night herons observed at site.

Surrounding land uses include the Glendale Golf and Country Club and parking lot, 198th Street and cultivated fields; dumping activities by the Glendale Golf and Country Club has resulted in considerable disturbance along the western edge of the wetland; considerable "garbage" has collected between the parking lot and the wetland.

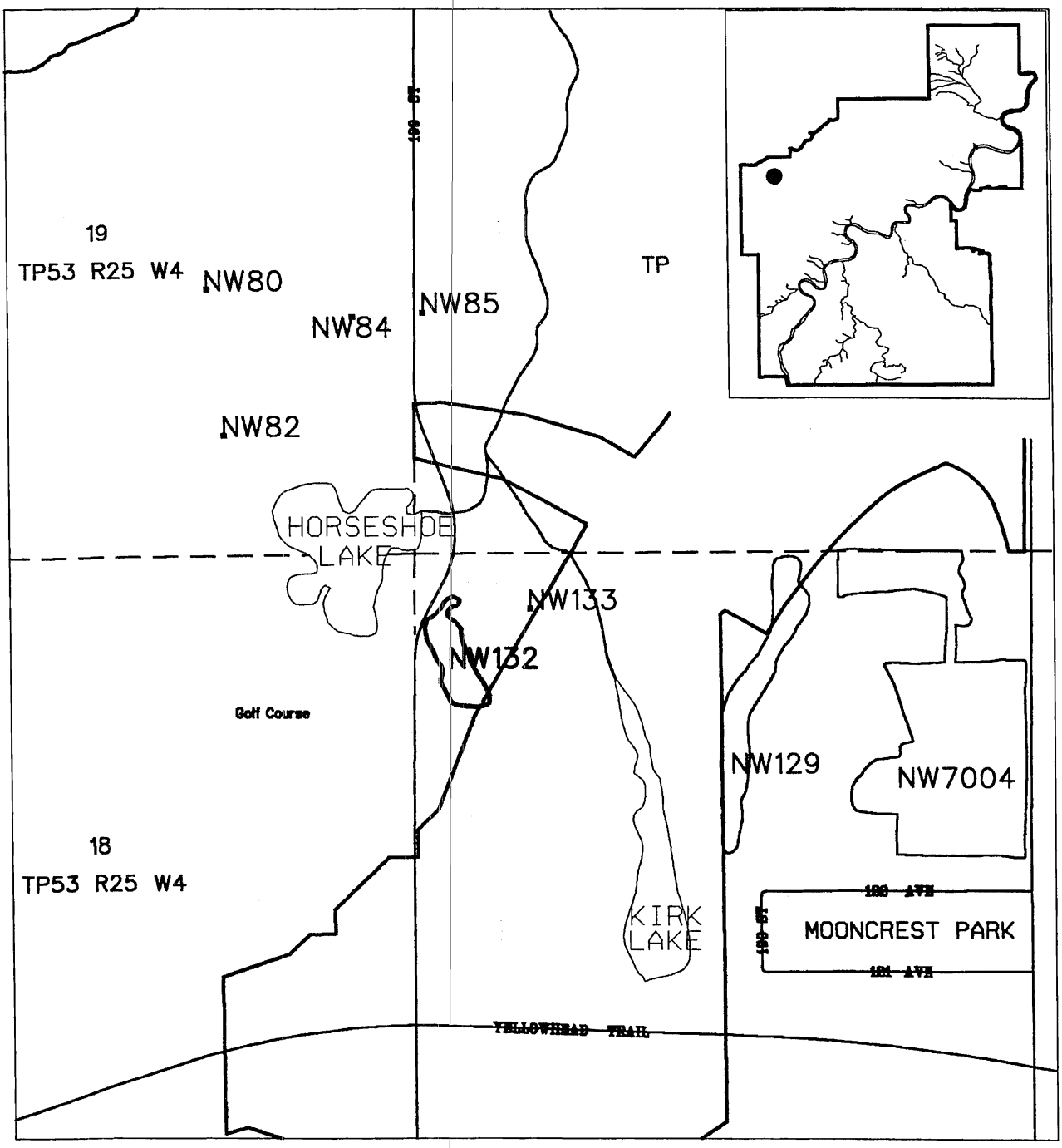
Criteria

- only active beaver ponds within city of Edmonton's tablelands
- important waterfowl habitat
- permanent open water
- furbearer (beaver) habitat
- provides critical function in maintaining or balancing local hydrology

Sensitivity High

Because this site has already been impacted by the "blowing" of beaver dams and the disposal of waste materials from the adjacent Glendale Golf and Country Club, it is highly sensitive to any further disturbances, especially those that will impact the local hydrology and water quality.

GLENDALE WETLAND



Management Considerations

Attempts should be made by the city of Edmonton and the Glendale Golf and Country Club to ensure the long-term survival and maintenance of the site for wildlife, especially beaver. Water levels must be maintained at sufficient levels to ensure its usefulness for beaver and other aquatic furbearers such as muskrat. Because this site represents the only active beaver pond in the tablelands, it is imperative that efforts be made to enhance and protect this sensitive wetland. This site is in immediate need of attention otherwise it may be lost forever.

Site Name **STONY INDUSTRIAL COMPLEX**

Site Reference No NW 7012 **Size** 4.95 ha

Significance **Local Environmentally Sensitive Area**

Site Location Between 107 Ave and 110 Avenue on the west side of 199 St. [NE 6 TP53 R25 W4M]

Description

Relatively healthy and undisturbed portion of the Winterburn Bog that does not fall within the Restricted Development Area (RDA); site consists of three distinct community types, including balsam poplar-aspen, black spruce-larch and willow/sedge; the balsam poplar-aspen type accounts for approximately 75% of the vegetation at the site; some white birch clumps throughout stand; good diversity of shrub species including low-bush cranberry, rose, saskatoon, beaked hazelnut, red-osier dogwood, gooseberry, river alder and raspberry; lady ferns occur in southern portion of stand where moisture regime is subhydric; the black spruce-larch type occurs in the extreme southeast corner of the site and is composed of many significant plant species including lady fern; some white birch clumps within stand; very closed canopy with well-developed moss layer; mosses occur extensively around small marl pools; willow/sedge community occurs adjacent 199th St.; willow/sedge has developed adjacent open water bodies.

Soils within this site reflect the high water table and the high moisture holding capacity of the glaciolacustrine parent materials. They consist mainly of poorly drained Orthic Gleysols within upland deciduous stands and to a lesser extent, very poorly drained Typic Mesisols under the black spruce-larch type; high water tables combined with the clay-rich glaciolacustrine materials result in poorly drained conditions throughout the site.

The diverse vegetation communities that occur within this site are not found elsewhere within the city's tablelands. Similar vegetation communities, particularly the black spruce-larch type occurs mainly within the adjacent RDA lands to the east. The occurrence of lady fern also makes this area rather unique as it was only encountered in two other sites within the city's tablelands (NW 302 and NW 7011); this species is particularly important because it indicates the richness of this site. The diverse vegetation communities provide excellent wildlife habitat, especially for small mammals including red squirrel and shrews; 23 species of bird observed at site during surveys including red-tailed hawk, common snipe, alder and least flycatcher, black-billed magpie, American crow, black-capped chickadee, house wren, American robin, cedar waxwing, yellow warbler, chipping sparrow, savannah sparrow, song sparrow, Lincoln's sparrow, white-throated sparrow, red-winged blackbird, brown-headed cowbird, American goldfinch, and clay-colored sparrow; blue-winged and green-winged teal and mallard are likely nesting in the wetland component.

A number of small marl pools are found within the black spruce-larch component; these pools give rise to unique and often quite rare plant species such as lady ferns.

Surrounding land uses include RDA land to the west, 199th Street,industrial land uses to the south and hayland to the north and west.

Criteria

- high plant species diversity
- significant plant species (Lady ferns)
- high habitat diversity
- critical wildlife habitat
- significant landform features including marl pools
- provides critical function in maintaining or balancing local hydrology

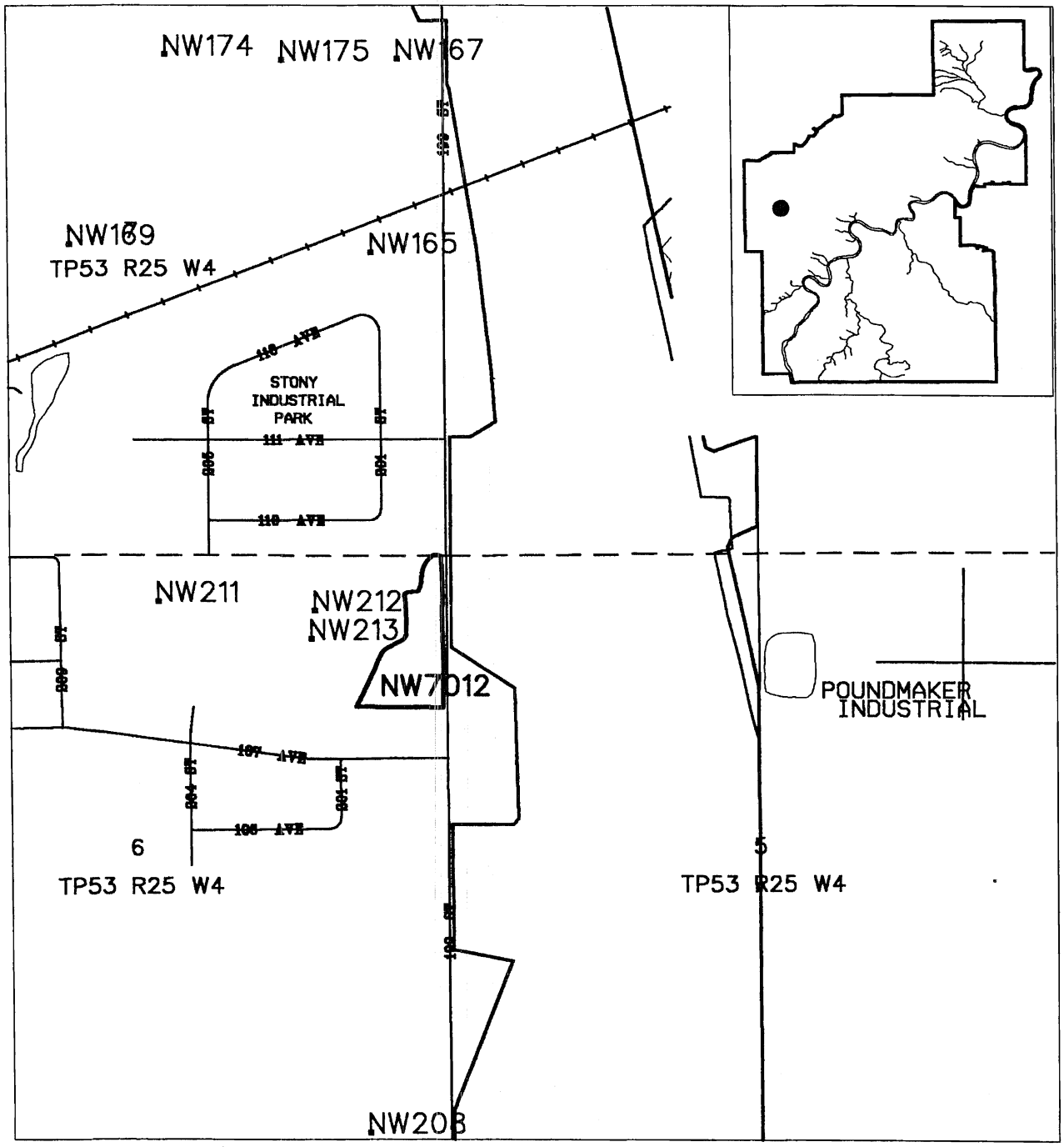
Sensitivity High

Any additional disturbances that would alter the natural hydrological conditions within the site would have a very severe negative impact upon the health and composition of the stands and the use of the area by waterfowl species. The natural hydrology of the site has already been impacted by the presence of 199th Street. The overall hydrology of the area is being impacted by clearing within the RDA lands to the east and by road development.

Management Considerations

Because the much larger black spruce-larch stand to the east is within RDA lands and is currently being altered by clearing and filling, it is extremely important for the city to move to protect this very diverse and important piece of land. Attempts must be made to incorporate this site into any further land developments and to maintain or enhance the hydrological regime within the area. The relatively small nature of this site combined with adjacent land uses poses serious threats to its long-term survival and ecological integrity.

STONY INDUSTRIAL COMPLEX



Site Name **NORMANDEAU GARDENS NATURAL AREA**

Site Reference No NW 254 **Size** 7.60 ha

Significance **Local Environmentally Sensitive Area**

Site Location Immediately east of 209 Street south of Stony Plain Road [NE 31 TP52 R25 W4M]

Description

Mature, relatively healthy mixedwood stand; balsam poplar-white spruce is the dominant cover type with significant portions of white birch, black spruce and aspen; extremely diverse shrub and herb layer results from variable canopy densities; shrub species include Manitoba maple, rose, willow, red-osier dogwood, mountain ash, saskatoon, snowberry, gooseberry, raspberry honeysuckle, and river alder; richness of site indicated by abundance of oak ferns in several places; white spruce to 22 m in height and aspen and balsam poplar to 18 m; decadent balsam poplar provide excellent snag habitat.

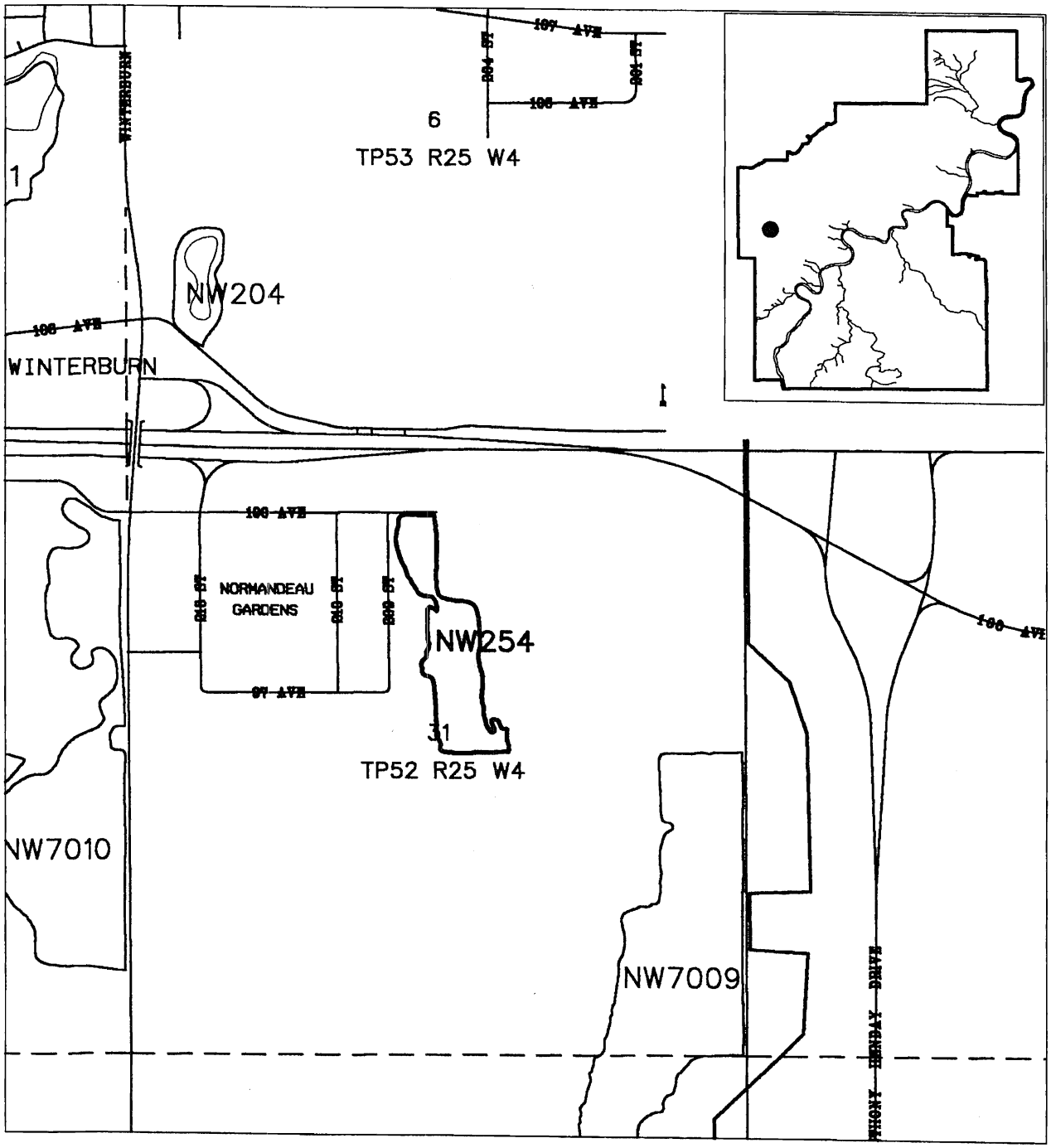
Poorly drained Orthic Gleysols occur throughout the area and have developed on glaciolacustrine materials in response to high water tables and the high water holding capacity of the clay-rich materials; silty clays over clays; water table within 1 m of surface for most of year.

The diversity of vegetation within this relatively small stand is almost unparalleled within the city's tableland area. The diversity and composition of plant species is a function of the variable overstorey canopy combined with nutrient-rich parent materials. The richness of the site is indicated by the presence of oak ferns and mountain ash and Manitoba maple to nearly 8 m in height. In addition, mature white spruce is providing an excellent seed source for white spruce regeneration.

Although the site contains a significant number of palatable browse species, the site does not appear to be extensively used by white-tailed deer or other wildlife species. The diversity of habitats existing within the overall stand results, however, in excellent bird habitat. 200 different bird species were noted during the survey, including mallard, western wood-pewee, least flycatcher, eastern phoebe, black-billed magpie, black-capped chickadee, house wren, American robin, warbling vireo, red-eyed vireo, yellow warbler, and chirping, song, Lincoln's, clay-colored and white-throated sparrows, red-winged blackbird, brown-headed cowbird, northern oriole, and pine siskin. Pine siskin was only observed at one other site within the tablelands (NW 7010). A dead great-horned owl was also found at this site.

Surrounding land uses include country residential and the Restricted Development Area (RDA) area to the east.

NORMANDEAU GARDENS NATURAL AREA



Criteria

- presence of significant plant species
- high habitat diversity
- high plant species diversity
- terrestrial bird habitat
- provides critical function in maintaining or balancing local hydrology

Sensitivity High

Any disturbances that would result in changes to the natural hydrological cycle for this area would negatively impact upon the diversity of vegetation and resulting species found at this site. Significant clearing has occurred to the east and this may ultimately be affecting local water tables. If water tables go up, then it is speculated that moisture conditions will increase and possibly flood some of the vegetation.

Management Considerations

Attempts must be made to conserve this unique landscape. Any land use changes must take into account the sensitive nature and balance of this site. Changes in the upland/wetland stands to the south (NW 7009, Lewis Estates) will ultimately affect the hydrological conditions at this site.

Site Name **23 AVENUE WETLAND**

Site Reference No NW 355 **Size** 12.37 ha

Significance **Local Environmentally Sensitive Area**

Site Location Southeast corner of Winterburn Road and 23 Avenue
[NE 31 T 51 R 25 W4M]

Description

Major wetland complex consisting of open water with a well-developed cattail fringe, willow/sedge and a small island of balsam poplar-aspen; water levels very low during 1993; core wetland area consists of cattails, marsh ragwort, yellow water crowfoot, yellow cress and various sedge species; willow fringe consist of various willow species including *Salix discolor* and *S. exigua*, balsam poplar and a number of sedge species; small balsam poplar-aspen stand is quite young and has a well-developed understorey of red-osier dogwood, saskatoon, rose, gooseberry, snowberry, bracted honeysuckle and buffalo-berry; weedy species such as dandelion are common throughout the site.

Poorly drained Orthic Gleysols have developed on level to very gently undulating lacustrine materials; loamy sands over sandy loams.

The diversity of vegetation communities combined with open water provide critical waterfowl habitat. The nature of this habitat is highly dependent upon water levels; the greater the water level the higher the value of the habitat for waterfowl production. The site would most certainly be used during spring migration; however, if water levels are low or non-existent, then the site would be abandoned. The site may also be used by white-tailed deer for temporary cover and food while they travel between the North Saskatchewan River Valley and the adjacent forested Stony Plain Indian Reserve.

Surrounding land uses include mainly pastureland and an Edmonton Power microwave tower; some evidence of cattle grazing within wetland.

Criteria

- permanent open water
- high diversity of wildlife habitat
- important waterfowl habitat
- high plant species diversity

Sensitivity High

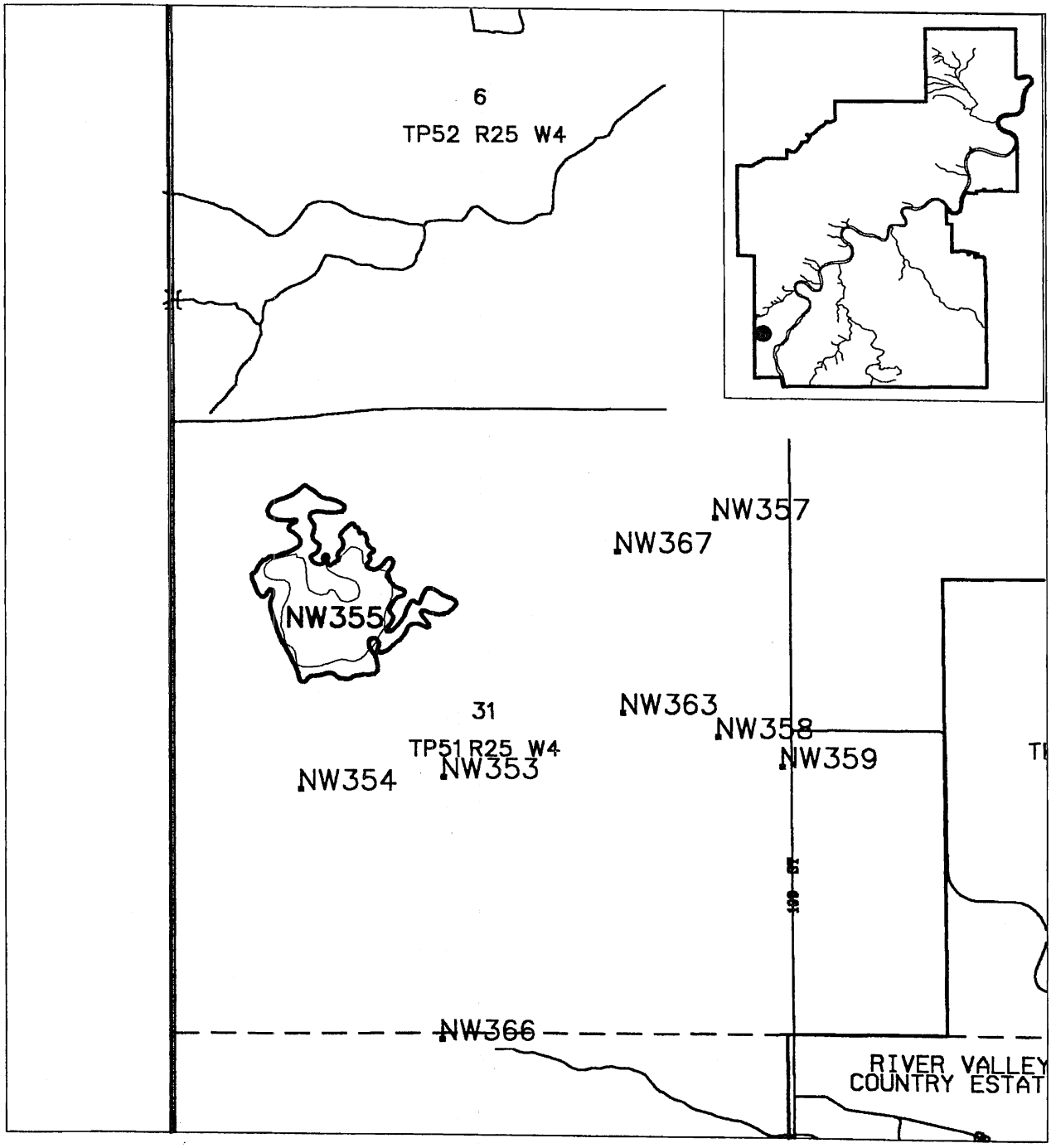
Because of the sensitive nature of wetlands, this site is particularly sensitive to any disturbances that would ultimately affect water levels. In addition, any alterations to the existing vegetation communities would also have a severe negative impact on the importance of this site to not only waterfowl species but also ungulates (i.e., white-tailed deer) and raptors (i.e., red-tailed hawk).

Management Consideration

To secure this site's value, it should not be altered in any way, in particular, the hydrological regime of the area. It is imperative that some water is maintained

throughout the year, otherwise the site is of importance only during spring migration. It is also important to ensure that the remnant deciduous fence rows to the north and south are maintained, otherwise the site will be abandoned by wildlife such as white-tailed deer which may use the site for temporary shelter and food. Grazing pressures must also be monitored to ensure that overgrazing of sedge and grass species does not occur thereby limiting the area for nesting and feeding habitat by waterfowl.

23 AVENUE WETLAND



Site Name **EAST WINTERBURN NATURAL AREA**

Site Reference No NW 204 **Size** 3.33 ha

Significance **Local Environmentally Sensitive Area**

Site Location 103 Avenue and Winterburn Road
[SW 6 T P3 R25 W4M]

Description

Permanent water body with well developed fringe of willow/sedge and an upland balsam poplar stand with a dense understorey of red-osier dogwood and mountain ash and raspberry; water levels quite low in 1993; good development of cattails along fringe of open water; poplar stand rather open with some snags and a significant amount of deadfall on the forest floor; some white birch is also found within the stand; site is rather small and isolated.

Poorly to very poorly drained Orthic Gleysols and Typic Mesisols occur adjacent the open water; moderately well drained Dark Gray Luvisols have developed in upland areas within gently undulating glaciolacustrine materials; sandy loams over sandy clay loams.

Although this site is rather small and isolated, it is significant from a local perspective because it provides a diversity of wildlife habitats. The open water/cattails, willow/sedge and balsam poplar communities provide excellent habitat for waterfowl, small mammals and birds. Waterfowl species using the site for nesting, breeding and feeding habitat include northern shoveler, blue-winged teal and American wigeon; red-winged blackbird, spotted sandpiper and common snipe occur around the wetland; a coyote den was found within the upland forest and the coyote was seen hunting within the cattail fringe.

Surrounding land uses include the Cypress Hills Driving Range to the east, and cultivated fields to the north and west.

Criteria

- good example of wetland vegetation
- high plant species diversity
- high habitat diversity
- permanent open water
- provides critical habitat for maintenance of all or significant components of life cycle stages
- permanent wetland

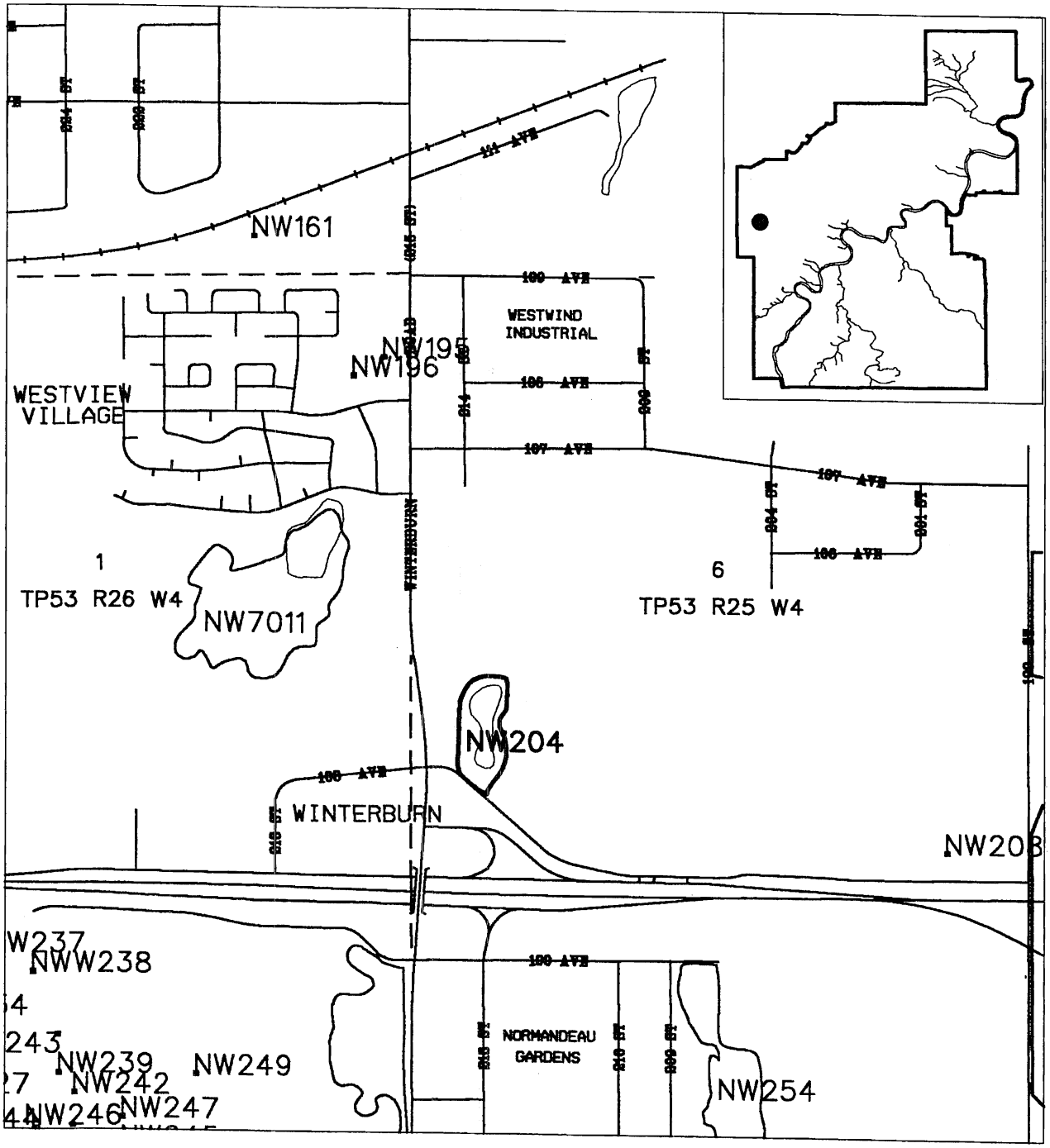
Sensitivity High

Any disturbances that would ultimately influence the hydrology of this site would severely impact the site's ecological integrity. The significance of the site for waterfowl and birds is highly dependent upon the existing water levels and vegetation.

Management Considerations

Because this site is relatively small and isolated, any developments within the area must consider the sensitive nature of this site. Water must not withdrawn from this wetland for irrigation for the adjacent golfing range. It does not appear that any portion of the site would be cleared for additional agricultural acreage.

EAST WINTERBURN NATURAL AREA



Site Name **TRIPLE 5 FARM WETLAND**

Site Reference No NW 288 **Size** 8.90 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.5 km south of Whitemud Drive on west side of 199th Street [SE 19 TP52 R25 W4M]

Description

This rather large and permanent wetland occurs approximately 0.5 km west of 199th Street and is well protected by the surrounding undulating landscape; it cannot be seen from either 199th or 215th Streets; in addition, the site is protected by a 2.5 m high fence with the following signage - "Warning No Trespassing, No Dumping - Violators Will Be Prosecuted." As a result, the following description is based solely on air photo interpretation.

The wetland appears to have extensively developed areas of emergent aquatic vegetation with open water areas; emergent vegetation consists primarily of cattails and to a lesser extent rushes; willow/sedge communities occur around the fringe with some balsam poplar/willow along the western edge; large balsam poplar provide excellent snag habitat for raptors.

Imperfectly to poorly drained soils predominate around the edges of the wetland; soils include Orthic Gleysols and gleyed phases of Dark Gray Luvisols.

This rather large wetland consists of a variety of vegetation communities that result in critical waterfowl habitat, including nesting, breeding and feeding habitat.

Surrounding land uses appear to be mainly hayland and several farm structures. It appears that portions of this site have been in-filled by fill materials.

Criteria

- permanent wetland
- critical waterfowl habitat

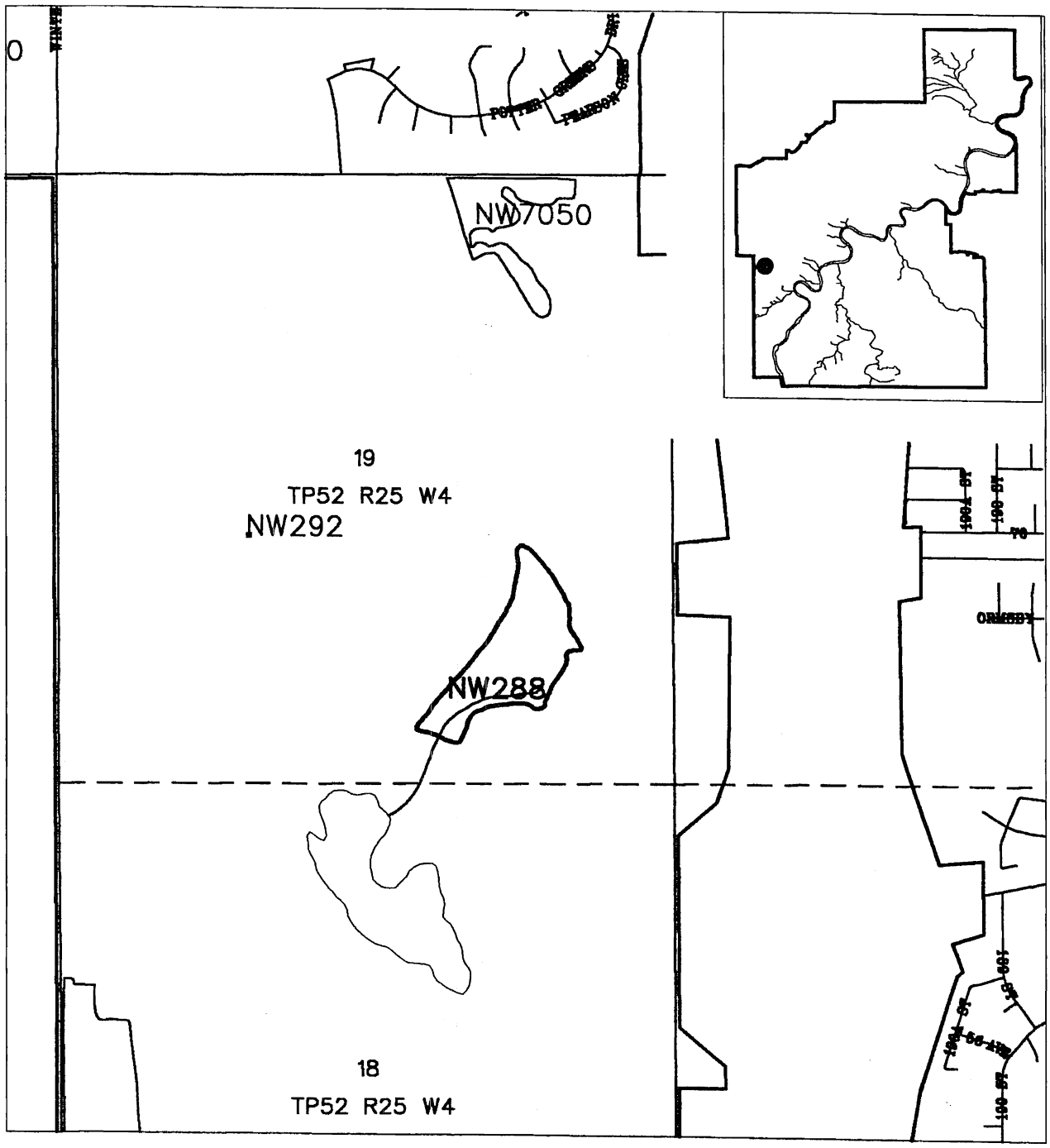
Sensitivity High

Because this site's existence is highly dependent upon local hydrology, it is highly sensitive to any disturbances that would impact local water tables. Any additional in-filling of the site would ultimately reduce the site's significance for waterfowl habitat.

Management Considerations

If this wetland is to be conserved, the city should deal with the landowners to prevent any additional in-filling of this site. Attempts should be made to reclaim or enhance portions of this wetland as well.

TRIPLE 5 FARM WETLAND



Site Name **HILLVIEW NATURAL AREA**

Site Reference No NW 275 **Size** 4.68 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.7km south of Stony Plain Road on east side of 231 Street (Hillview Road) [NW 25 TP52 R26 W4M]

Description

Permanent water body surrounded by well-developed and extensive margins of sedge, and balsam poplar with lesser amounts of aspen and white birch; some cattails occur within water; well-developed shrub understorey with upland deciduous stand composed of Manitoba maple, river alder, beaked hazel, gooseberry, rose, willow, mountain ash, cherry, honeysuckle, raspberry, and paper birch; mature balsam poplar provide excellent snag habitat for raptors.

Poorly drained Orthic Gleysols have developed within sedge fringe area while moderately well drained Dark Gray Luvisols have developed on upland areas; topography varies from nearly level around the wetland areas to moderately and strongly sloping along wetland fringe (15-30% slopes); loams over clay loams; water levels have lowered resulting in exposed lacustrine mineral soils; landform appears to be a "kettle".

The open water body combined with the diverse vegetation species both along the shoreline and upland forest result in critical wildlife habitat for both waterfowl, avian, small mammal and ungulate species. Open water plus good shoreland habitat provides excellent nesting, breeding and feeding habitat for ducks, including mallard and blue-winged and green-winged teal. Small mammals such as muskrat are common along the shoreline.

Red-tailed hawks use the balsam poplar snag habitat for nesting and perch sites. Some browsing has occurred within the upland stands by white-tailed deer.

Surrounding land uses include country residential, a horse farm and cultivated fields.

Criteria

- high plant species diversity
- provides habitat for local wildlife species
- high habitat diversity
- permanent water body
- good example of a "kettle" landform
- provides critical function in maintaining or balancing local hydrology

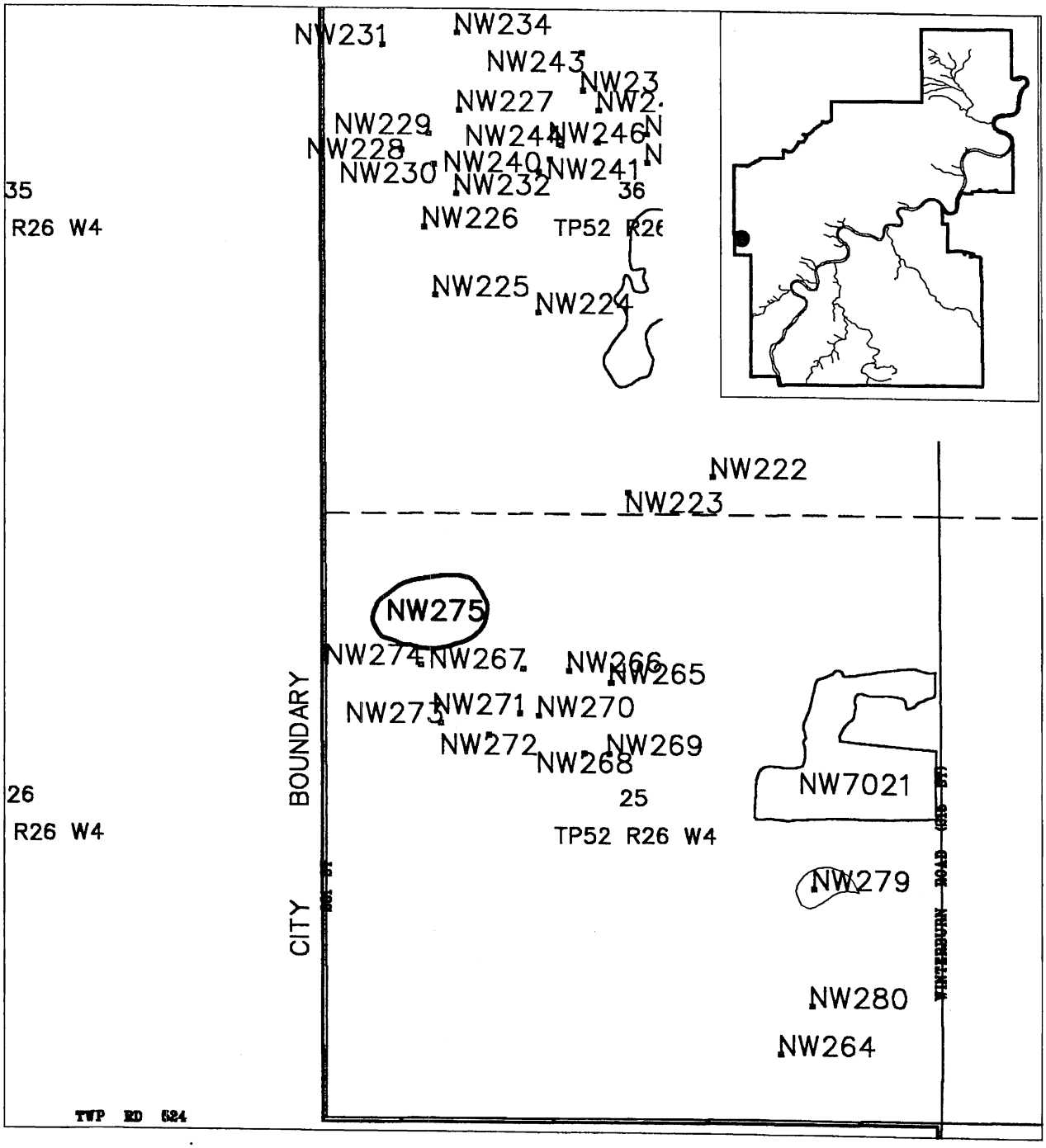
Sensitivity High

The site is highly sensitive to any disturbance that would alter the natural hydrology of the site.

Management Considerations

Attempts must be made to work with the existing landowners to ensure that this natural area is maintained. It is the unique combination of open water, wetland fringe and deciduous vegetation that provides critical wildlife habitat; without this combination of attributes, the significance of the site will be reduced significantly.

HILLVIEW NATURAL AREA



Site Name **POTTER GREEN SOUTH NATURAL AREA**

Site Reference No NW 7050 **Size** 4.34 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.4 km west of 198 Street on south side of Whitemud Drive [NE 19 TP52 R25 W4M]

Description

Remnant upland/wetland complex immediately adjacent Whitemud Drive; wetland component consists of two types, one being a significant open water/cattail/sedge-rush/willow area with a well developed ring of balsam poplar and the other being a very well developed willow/sedge community; upland forest consists of balsam poplar-aspen with a well developed understorey of rose, red-osier dogwood, honeysuckle and saskatoon.

Moderately well drained Orthic Black Chernozems have developed under the upland forests while poorly drained Orthic Gleysols and very poorly drained Typic Mesisols have developed within wetlands and areas immediately adjacent open water; variable topography with slopes ranging from level to very gently undulating within depressional wetlands to gently sloping topography in the upland/wetland transitional areas; loams over sandy loam.

The unique combination of upland forest with open water and a well-developed emergent aquatic and wetland fringe provides excellent nesting, breeding and feeding habitat for waterfowl, including northern shovelers. Palatable shrub species within the uplands forest component have been extensively browsed by white-tailed deer. Other wildlife species using this site include coyote (waterfowl nests and eggs destroyed by coyote), squirrels and muskrat.

Surrounding land uses include Whitemud Drive to the north, country residential to the east and cultivated fields to the south.

Criteria

- permanent water body
- critical waterfowl habitat

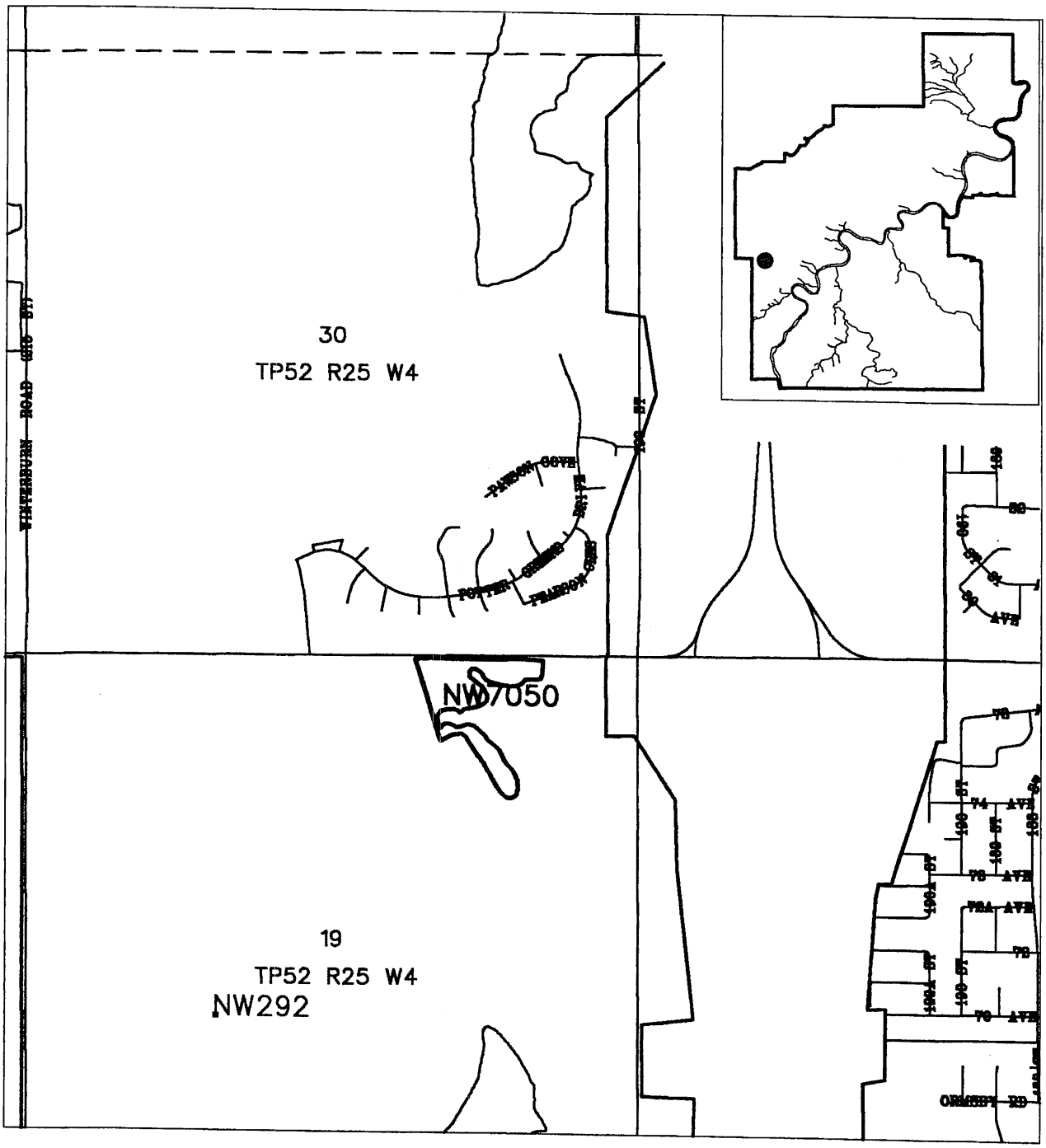
Sensitivity High

The unique nature of this site coupled with its close proximity to Whitemud Drive threatens the sites long-term survival. The open water portion of this site extends to Whitemud Drive. Any alteration or disturbances to the sites current hydrological regime will severely reduce the usefulness of the site to waterfowl and white-tailed deer.

Management Considerations

Given the location of this site adjacent to one of the city's major transportation routes, it is doubtful if this site will exist in the near future. Intensive development pressures are currently happening to the north (Lewis Farms Estates) and will possibly have a negative impact on the survival of the site. If the site is to be maintained in its current condition, the City should act quickly to ensure that the site is not altered in any way.

POTTER GREEN SOUTH NATURAL AREA



Site Name **TRIPLE ACRES NATURAL AREA**

Site Reference No NW 318 **Size** 25.64 ha

Significance **Local Environmentally Sensitive Area**

Site Location Southeast corner of Winterburn Road (215 Street) and 45th Avenue [W 7 TP52 R25 W4M]

Description

Mixedwood forest area with a mixture of conifers and deciduous trees growing on perhaps the best-developed sand dune complex within the city of Edmonton; relatively open tree canopy results in diverse shrub species including rose, choke cherry, mountain ash, twining honeysuckle, saskatoon, snowberry and blueberry.

Well drained Orthic Eutric Brunisols have developed on very gently undulating to moderately ridged eolian landforms; loamy sands over sand; stabilized sand dune complex.

This site represents the best example within the city's boundary of a stabilized sand dune of significant size. A number of smaller, less-developed sand dunes occur in the vicinity, but none are characterized by the size and diversity of this particular sand dune complex.

The site also provides a critical link between ESA/SNAs both within and outside the city's limits for wildlife, in particular, white-tailed deer. Like site NW 302 to the north, the site occurs immediately adjacent the Stony Plain Indian Reserve and thus provides an excellent corridor for deer movement to and from the North Saskatchewan River.

The site is not provide suitable year-round wildlife habitat considering the degree of country residential development within and adjacent to this site; however, it likely provides good winter shelter for bird species that make extensive use of the numerous local bird feeders.

Surrounding land uses include country residential (Triple Acres), the Stony Plain Indian Reserve No 135 and rough pasture.

Criteria

- significant landform feature
- critical linking function to ESA/SNAs within and outside city boundary

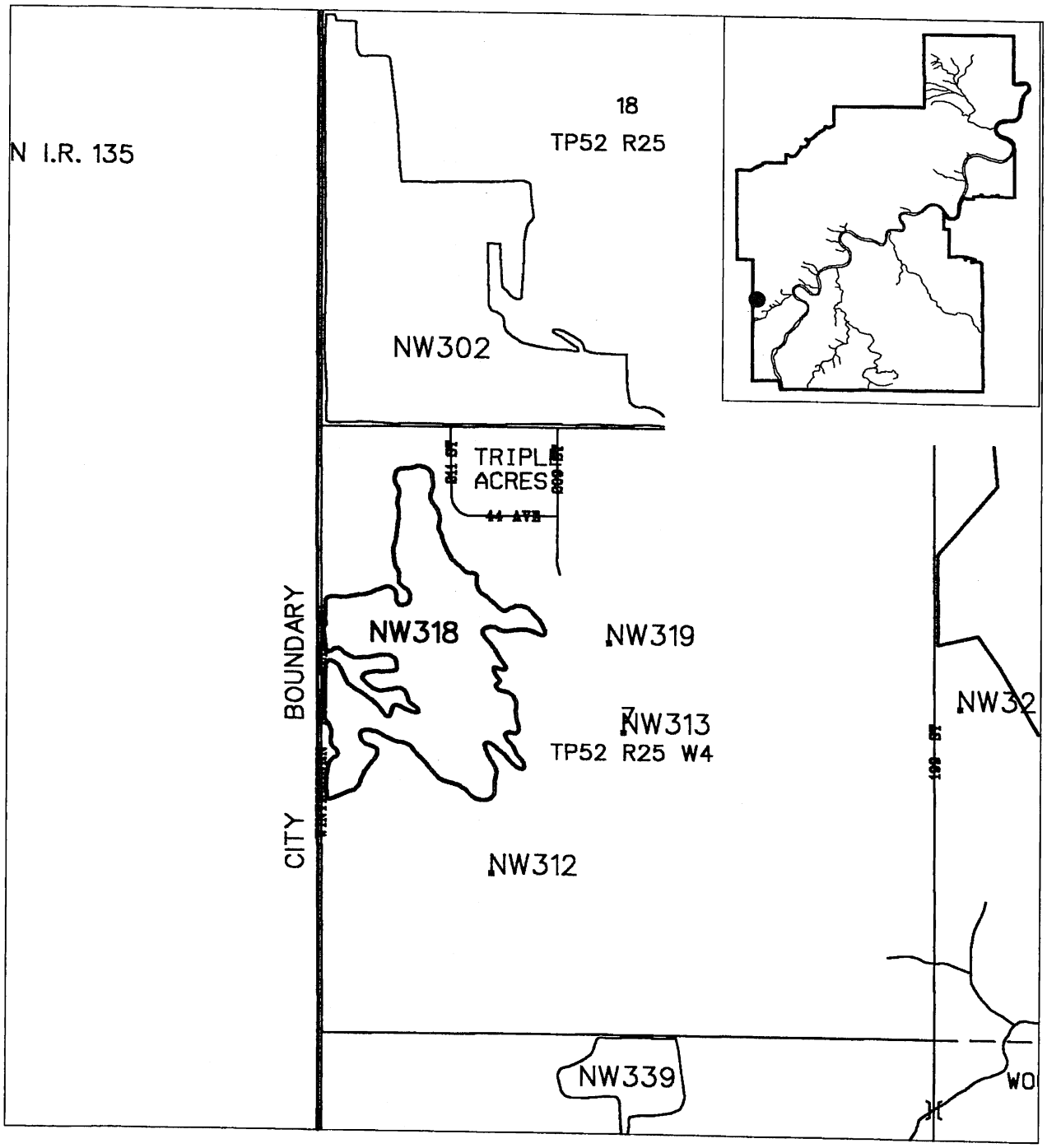
Sensitivity High

The site is highly sensitive to any disturbance that would remove the ground vegetation and expose the coarse-textured parent materials. When the sands become exposed, they are particularly sensitive to increased erosion with the dune becoming less stabilized with every disturbance.

Management Considerations

Considering the sensitive nature of the sand dunes, attempts must be made to discourage further subdivision of land parcels or subsequent clearing is minimized.

TRIPLE ACRES NATURAL AREA



Site Name **WINTERBURN SCHOOL NATURAL AREA**

Site Reference No NW 7010 **Size** 38.04 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.6 km south of Stony Plain Road on west side of Winterburn Road [NE 36 TP52 R26 W4M]

Description

Major balsam poplar-aspen woodlot with one significant water body and a smaller, ephemeral wetland; diverse shrub layer composed of include tall-bush cranberry, red-osier dogwood, gooseberry, raspberry, rose, choke cherry, Manitoba maple and bracted honeysuckle; healthy, mature appearance; open water area surrounded by willow and balsam poplar; balsam poplar provides excellent snag habitat; lots of fallen timber within forested area; ephemeral wetland area covered with well-developed fringe of willow/sedge. The large pond is probably spring fed.

Moderately well to imperfectly drained Dark Gray Luvisols have developed on very gently undulating glaciolacustrine materials; loams over silty clay loams; thin band of fine sandy loam materials at 23 cm depth; faint mottling at 40 cm.

The diversity of vegetation communities found within this site combined with permanent water and a very well-developed shrub understorey produce critical wildlife habitat to white-tailed deer, small mammals, waterfowl and terrestrial songbirds. Numerous ducks including mallards, gadwalls, redheads, blue-winged and cinnamon teals and shovelers were observed, however, with the exception of feeding habitat, the area provides limited nesting and breeding habitat; 30 bird species observed including seven black-crowned night herons; high proportion of aerial flycatching bird species, including 23 least flycatchers; large yellow warbler population; other species include red-tailed hawk, yellow-bellied sapsucker, northern flicker, western wood-pewee, eastern phoebe, eastern kingbird, tree and barn swallows, black-billed magpie, black-capped chickadee, house wren, American robin, cedar waxwing, warbling and red-eyed vireo, vesper and song sparrow, white-throated sparrow, red-winged blackbird, brown-headed cowbird, northern oriole, pine siskin, and American goldfinch; a porcupine was also observed at the site.

Surrounding land uses include country residential, cultivated fields, rough pasture and an oil well.

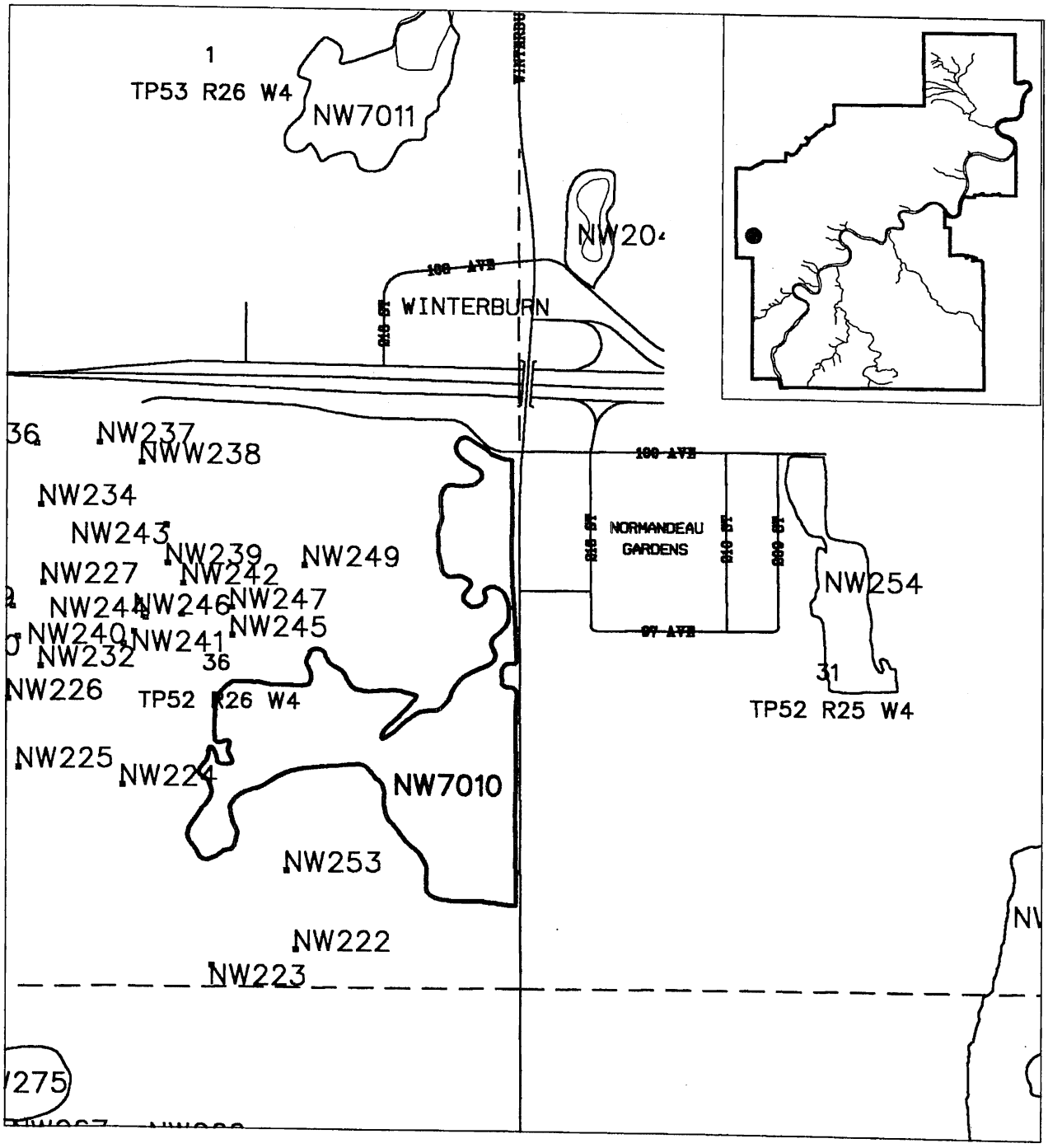
Criteria

- high plant species diversity
- high habitat diversity
- permanent water body
- critical wildlife habitat, especially for terrestrial songbirds
- natural springs

Sensitivity Moderate to high

The open water as well as the ephemeral wetland are highly sensitive to any forms of disturbance, especially those that would alter the natural hydrology of the area.

WINTERBURN SCHOOL NATURAL AREA



With the exception of total removal of the forest, the upland area is less sensitive to most disturbances. The flora and faunal composition of the upland would be particularly sensitive to any disturbances that would result in forest fragmentation.

Management Considerations

Attempts must be made to ensure that the site is maintained in its current condition and that the two wetlands, in particular the large open pond is not altered with in any fashion.

Site Name **McDONAGH PEATLAND**

Site Reference No NW 7009 **Size** 35.51 ha

Significance **Local Environmentally Sensitive Area**

Site Location West of 199th Street between Whitemud Drive and Stony Plain Rd [NE 30 TP52 R25 W4M; SE 31 TP52 R 25 W4M]

Description

Rather large and relatively healthy woodlot composed mainly of black spruce-larch communities with lesser amounts of balsam poplar and willow/sedge communities; part of the Winterburn Bog area that is not within the Restricted Development Area (RDA); numerous marl pools of variable size found throughout site; black spruce-larch stands characterized by poorly developed shrub and herb layers but well-developed sphagnum moss layers; occasional birch found within black spruce-dominated stands; shrubs consist mainly of Labrador tea and, to a much lesser extent, gooseberry and bracted honeysuckle; numerous violets found in understorey; balsam poplar communities generally occur along the western edge of the site and are characterized by rich shrubby understories of red-osier dogwood, bracted honeysuckle and willow; willow/sedge community occurs in a narrow strip between the balsam poplar and the black spruce-larch type; rare or significant plants are generally found in association with marl pools.

Very poorly drained Mesisols have developed in this area in response to year-round high water tables; organic veneers and blankets overlie clay-rich glaciolacustrine materials; a dominant feature of the area is the occurrence of numerous marl pools of variable size; most marl pools are rather small (1 m^2), however, the site has two rather large (1-2 ha) marl pools within SE 31; (marl deposits are derived from freshwater sediments that contain 50 percent calcium carbonate equivalent or greater, are friable and soft and generally consist of a mixture of silt-sized or smaller particles and larger shell fragments; they are generally associated with groundwater discharge areas, areas of poor drainage, occur adjacent to highly permeable recharge areas, and are associated with groundwaters having a high concentration of Ca^{+2} and HCO_3^- ions (MacDonald 1982)).

Extensive evidence was noted during the survey of the use of the area by white-tailed deer; significant browse is available from the willow/sedge and balsam poplar stands while the very dense black spruce-larch community provides excellent thermal and escape cover; deer pellets and tracks common throughout area; aquatic invertebrates noted within marl pools; other species noted during survey included red squirrel, chipping sparrow, and boreal chorus frogs; adjacent land-owners have seen coyote, black bear and porcupine within stand.

The stand is currently undergoing significant disturbances that will ultimately result in its demise; significant portions of

this stand have already been highly altered by dumping; surrounding land uses include country residential, oil wells, cultivated fields and 199th Street.

Criteria

- only example of a black spruce-larch community within the tablelands that is not within the RDA lands
- presence of rare and/or sensitive plant
- high plant species diversity
- "old growth" black spruce-larch
- habitat for local wildlife, including aquatic invertebrates
- unique landform feature (marl pools)
- provides critical function in maintaining or balancing area hydrology
- groundwater discharge area

If it was not for the extensive disturbances that have already occurred within and adjacent to this site, it would be classed as a "*regionally environmentally sensitive area.*"

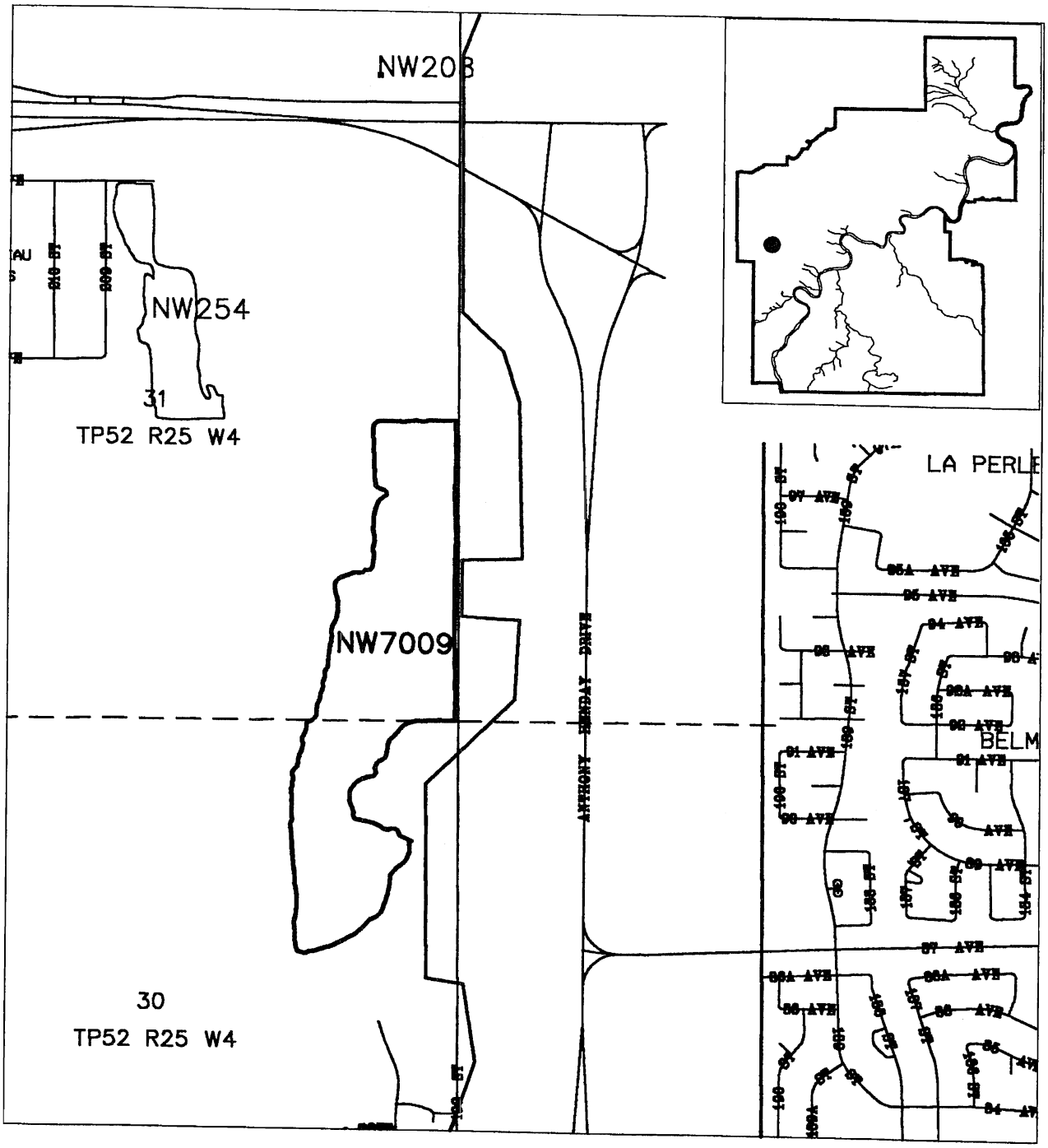
Sensitivity High

This site is very sensitive to any disturbances, especially those that would alter the natural hydrological conditions of the site; any alteration to the natural hydrology will have deleterious effects upon the flora and fauna of the site; because the site is classed as "old growth" black spruce, it has reached a certain level of equilibrium that will be negatively impacted by any changes or disturbances.

Management Considerations

Attempts should be made as soon as possible by the City to ensure that this site is not further impacted. Discussions with the current land owners suggested that the site is to be levelled and cleared for development. It is quite obvious from the site inspection that past actions have already had serious impacts upon the two marl pools within Sec. 31 -- both pools are dry and have fill materials along their edges. It is imperative that the city act immediately, otherwise the site's local importance for hydrology will be reduced. Reclamation efforts must deal with all fill materials that have been "dumped" at the site. The current developments within Lewis Farms area to the south will ultimately have a negative impact upon the long-term survival of the stand.

McDONAGH PEATLAND



Site Name **HENRY SINGER SPORTS FIELD**

Site Reference No NW 7060 **Size** 18.5 ha

Significance **Local Environmentally Sensitive Area**

Site Location Approximate 1.0 km north of 137 Avenue on west side of 142nd Street [NE 26 TP53 R25 W4M]

Description

Series of five variable-sized wetlands occurring primarily within the Henry Singer Sports Field complex on the west side of 142nd Street; a small wetland occurs on the east side of 142 Street as a result of the splitting of a wetland by 142nd Street; these wetlands consist primarily of open water with well-developed sedge meadows; the larger wetlands are also characterized by well-developed emergent aquatic fringes composed mainly of cattails; some willow clumps are also found; water levels are quite variable with most ponds being only seasonal in nature; these sites were visited twice during the survey, once on May 12 and approximately one month later -- the healthy water levels present on May 12 were virtually gone by the time of the second visit.

Poorly drained Orthic Gleysols and very poorly drained Mesisols have developed on clay-rich glaciolacustrine materials and in areas where thin organic veneers have accumulated over the glaciolacustrine materials. Local groundwater table at or very near the surface for a significant portion of the year.

Open water and well-developed cattail and sedge meadows have combined to provide prime nesting and foraging habitat for waterfowl, shorebirds and a variety of "edge-dependent" species; species noted during the survey included mallard, blue - winged teal, northern pintail, American wigeon, red-winged and yellow-headed blackbirds, barn swallow, a sandpiper, Wilson's phalarope, red-tailed hawk, American robin, common crow, and black-billed magpie; evidence of boreal chorus frogs, white-tailed deer and coyote were also noted at the sites.

Surrounding land uses include a number of sports fields and associated buildings, a major transmission right-of-way, 142nd Street and cultivated fields. These wetlands occur within the Rampart Industrial Area.

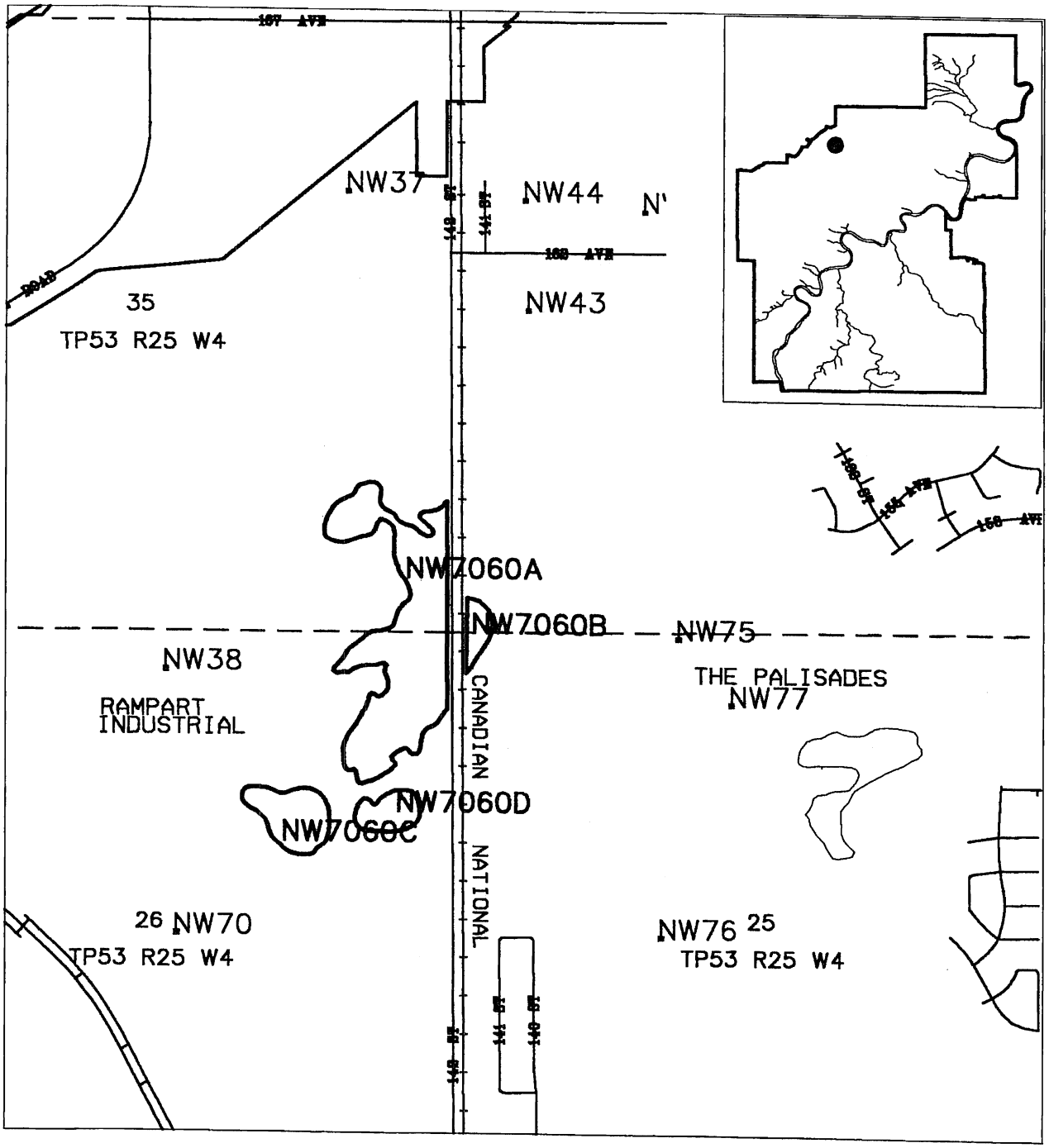
Criteria

- good example of wetland communities
- provides habitat for waterfowl, avian and ungulate species
- good example of transitional wetlands (permanent to ephemeral)
- important in maintaining local hydrological regime

Sensitivity High

These wetlands are highly sensitive to any disturbances and have already been significantly altered and disturbed by the building of 142nd Street. Any changes to the natural landscape that would ultimately impact the local hydrological regime would

HENRY SINGER SPORTS FIELD



severely impact the permanence and structure of these wetlands. Encroachment from industrial, agricultural and recreational sources is posing a threat to these wetlands which are currently providing pockets of critical habitat for numerous species.

Management Considerations

The close proximity of these wetlands to major roads and developments (Henry Singer Sports Center, Canadian Athletic Club, Rampart Industrial Park) result in easy access to the wetland complexes and they should, thus, be considered for protection as wildlife viewing areas if possible. The City must also ensure that the local hydrological regime within this area is not impacted in any way, otherwise the survival of this critical wetland complex will be seriously jeopardized.

Site Name **NORTH POUNDMAKER INDUSTRIAL COMPLEX**

Site Reference No NW 7051 **Size** 33.95 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.6 km north of Stony Plain Road and south of the Canadian National Railway line between 184 and 199th Streets
[E 1/2 8 TP53 R25 W4M]

Description

Large and rather significant site composed of an unnamed lake and upland forested area; water levels within the lake are very low resulting in extensive mudflats; emergent aquatic vegetation fringe of cattails; upland forest comprised of young to medium aspen-balsam poplar with lesser amounts of white spruce, black spruce and white birch adjacent the shoreline area; spruce-dominated areas have well-developed understories of labrador tea and feathermoss, indicating rather acidic and moist growing conditions; young to mature deciduous stands have diverse shrub understories of red-osier dogwood, low-bush cranberry, choke cherry, beaked-hazelnut, snowberry, rose and saskatoon; no white spruce regeneration within deciduous stands; willow fringe with balsam poplar snags occur extensively along northern side of lake.

Poorly drained Orthic Gleysols have developed within and adjacent the mudflats that surround the lake, including the spruce-dominated areas;moderately well to imperfectly drained Dark Gray Luvisols have developed on nearly level to very gently undulating glaciolacustrine materials; silt loams over silty clay loams and clay loams.

Exposed mudflats provide excellent habitat for shorebirds, including killdeer and snipe; only a few waterfowl species were observed on the open water, including mallards, blue-winged teal, northern shoveller and gadwalls; red-winged blackbirds and brown-headed cowbirds observed near mudflat/forest interface; the diversity of shrub species present within the aspen-balsam poplar stand provide excellent food and cover habitat for white-tailed deer.

Surrounding land uses include light industrial developments to the north and south, the Restricted Development Area (RDA) to the west and cultivated hayland to the east. The Canadian National Railway line runs along the northern boundary of the lake.

Criteria

- good example of young to medium-aged deciduous stand
- good example of wetland transition
- permanent open water that provides critical function in maintaining or balancing area hydrology
- provides linkages and corridors to other ESA/SNAs, particulary sites located within the RDA

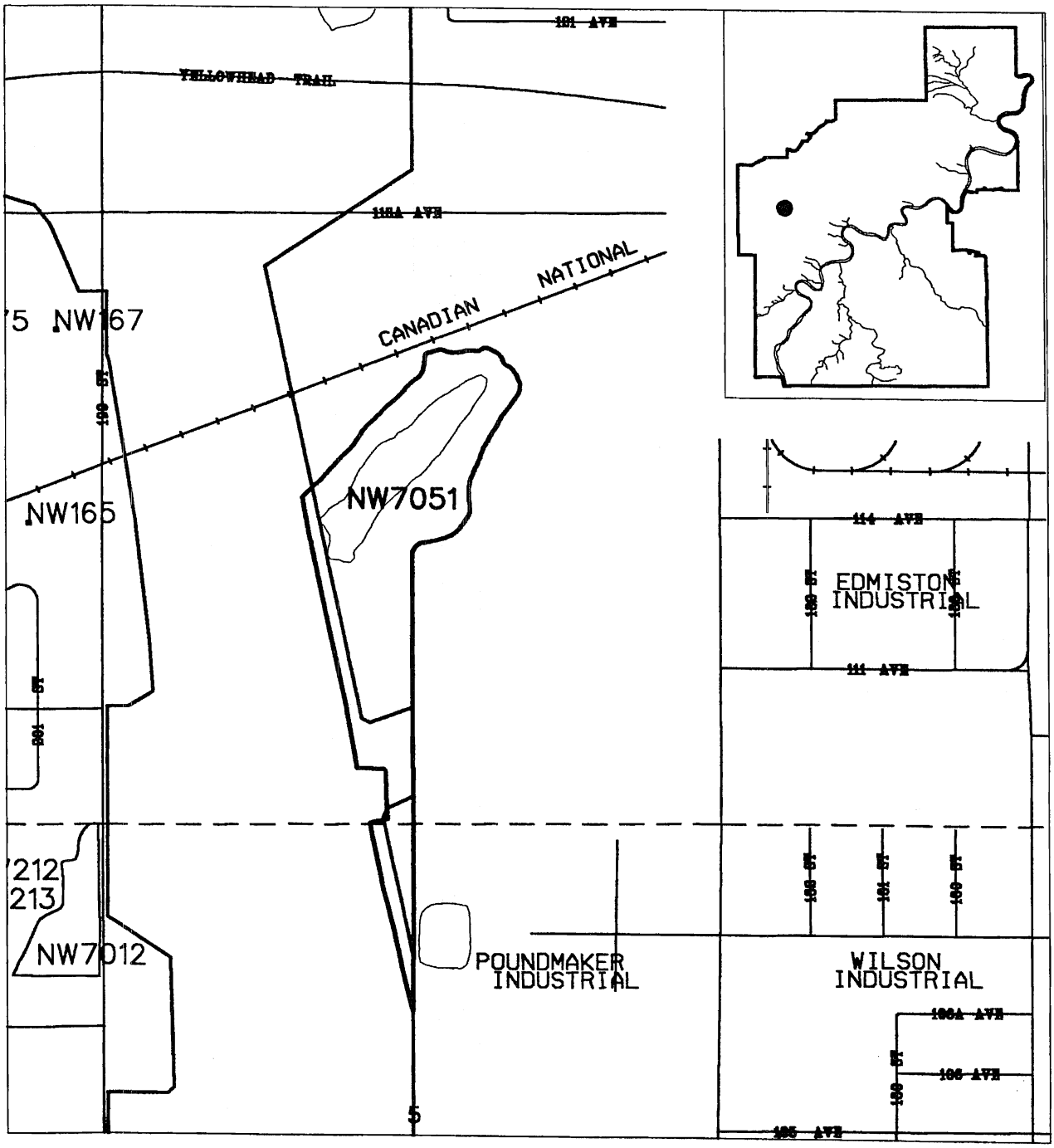
Sensitivity High

The wetland component of this site is highly sensitive to any forms of disturbance that would ultimately affect the local hydrology of the area; water levels are already at a critical level as lowered water levels have resulted in large expanses of mudflats. Any developments along the adjacent RDA lands to the west will certainly affect the natural hydrology of the site. The upland deciduous and mixedwood component of this site are less sensitive to disturbance, unless significant portions of the stands are removed for development.

Management Considerations

It is imperative that attempts be made to conserve this unique and rather large complexed site. It is particularly important to conserve this particular site as a similar site to the north, Kirk Lake, occurs within the RDA lands and has been designated for other land uses. Consideration must be given to this site when land use changes occur along the RDA lands.

NORTH POUNDMAKER INDUSTRIAL COMPLEX



Site Name **167th AVENUE - 112 STREET WETLAND COMPLEX**

Site Reference No NW 7017 **Size** 22.12 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.5 km northwest of 167 Avenue and 112 Street
[SE 6 TP54 R24 W4M]

Description

Significant wetland complex that is tied indirectly to other significant wetlands to the north through the local hydrological regime; site consists mainly of open willow/sedge communities with a minor component of balsam poplar-aspen along the fringes; only a few pockets of open water found as local water tables are quite low; extensive snags occur adjacent open willow/sedge areas; various willow species noted at site; red-osier dogwood common under mature to over-mature balsam poplar fringe; significant woodlot (NW 7016) occurs immediately to the west of this site.

Poorly drained Orthic Humic Gleysols have developed in response to seasonally high water tables; depressional glaciolacustrine landscape; loams over clay loams.

A number of songbirds were observed at the site as well as boreal chorus frogs and signs of white-tailed deer use; bird species included black-capped chickadee, red-winged and yellow-headed blackbirds, savannah sparrow, house wren and black-billed magpie; balsam poplar snags provide excellent perch and nesting sites for red-tailed hawks; the site would most likely provide critical winter habitat for upland game birds such as ruffed grouse and hungarian partridge.

Surrounding land uses include cultivated fields and a new residential development to the east.

Criteria

- good example of a well-developed willow/sedge community
- ephemeral wetland
- provides linkages to other ESA/SNAs to the northwest and west

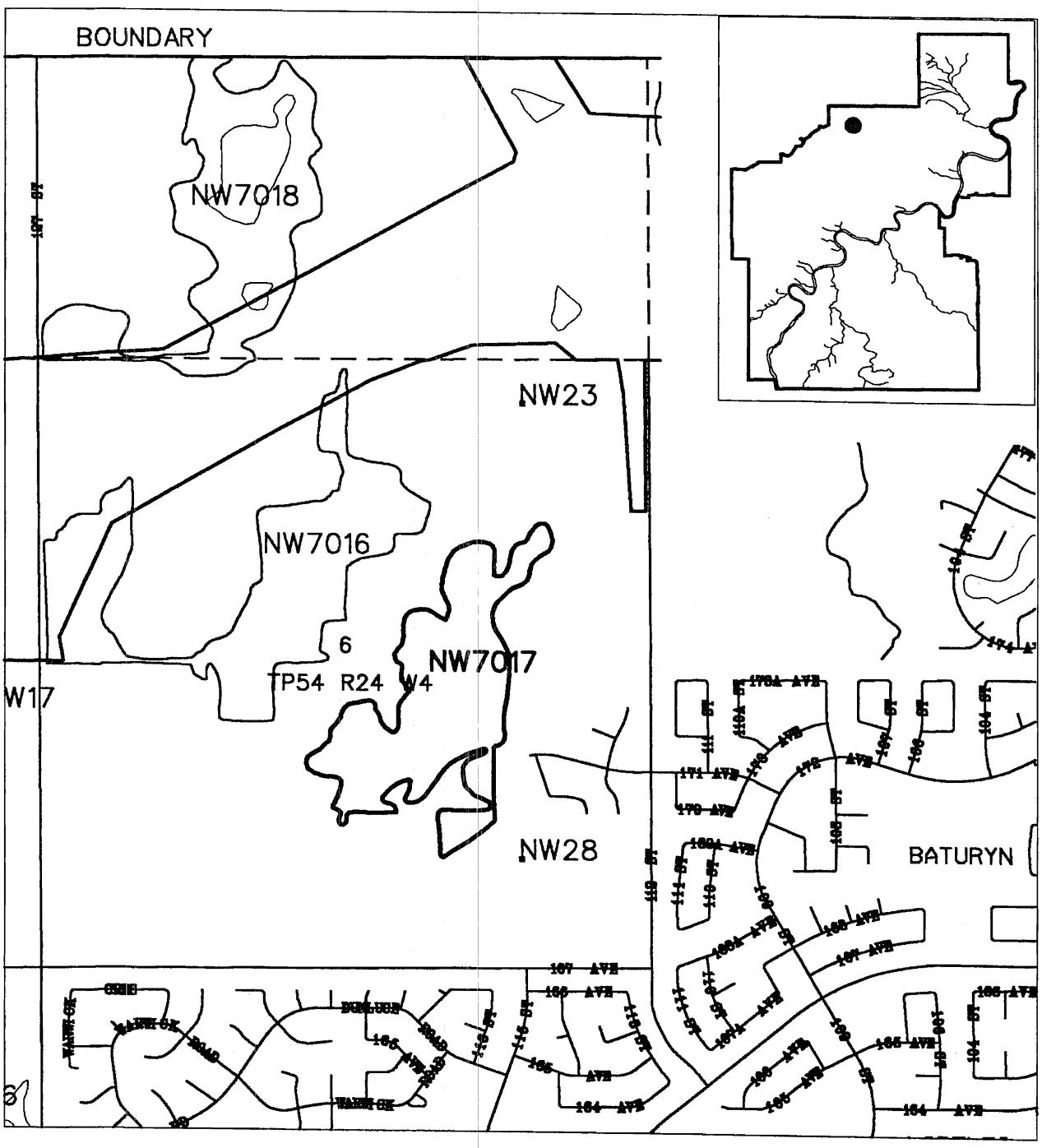
Sensitivity High

Any changes to the natural hydrological regime of the area will severely impact this site; the site is only ephemeral in nature and the willow/sedge communities have developed in response to seasonally high water tables; any lowering of local water tables will result in the "drying-out" of the site; the clearing of the adjacent upland forests to the east for residential development during the summer of 1993 will certainly have a negative effect on the local groundwater levels.

Management Considerations

Attempts should be made to maintain this rather large wetland. The site is an excellent opportunity to develop set of trails or interpretative centre in conjunction with the adjacent residential areas. This wetland, in combination with the adjacent upland forested sites would provide a significant "natural" environment for the adjacent residential community.

167th AVENUE - 112 STREET WETLAND COMPLEX



Site Name **NORTHWEST MATURE WOODLAND**

Site Reference No NW 7016 **Size** 27.44 ha

Significance **Local Environmentally Sensitive Area**

Site Location 0.8 km north of 167 Avenue between 112 Street and 127 Street [NW 6 TP54 R24 W4M]

Description

Relatively large, homogeneous and healthy deciduous stand comprised mainly of aspen and to a lesser extent, balsam poplar; well-developed shrub understorey of red-osier dogwood; rich herbaceous layer comprised of wild sarsaparilla, meadow rue, dewberry, northern bedstraw, bishop's cap, sweet-scented bedstraw, fireweed, cow parsnip, and a number of violets and germanium species; aspen and balsam poplar to 18 m.

Moderately well drained Dark Gray Luvisols and imperfectly drained Gleyed Dark Gray Luvisols have developed on nearly level to very gently undulating glaciolacustrine materials; silty clay loams over clay and heavy clay; heavy clay content of soils results in high availability of nutrients for plant growth.

Well-developed shrub understorey provides excellent browse for white-tailed deer; evidence of deer include heavy browsing on red-osier dogwood and other palatable shrub species such as beaked willow, saskatoon and to a lesser extent, rose, and a number of well-defined deer "beds" and game trails; songbirds noted during the survey included northern oriole, black-capped chickadee, yellow warbler, American robin, least flycatcher and common crow; evidence of woodpeckers was also noted; boreal chorus frogs were also seen in a small wet meadow.

Surrounding land uses consist of cultivated fields; the site has a number of well-defined trails that appear to be used by local residents for recreational pursuits such as hiking and bow hunting.

Criteria

- good example of mature aspen stand with well-developed understorey
- provides habitat for local wildlife
- provides links to other adjacent ESA/SNAs (NW 7017, NW 7024)

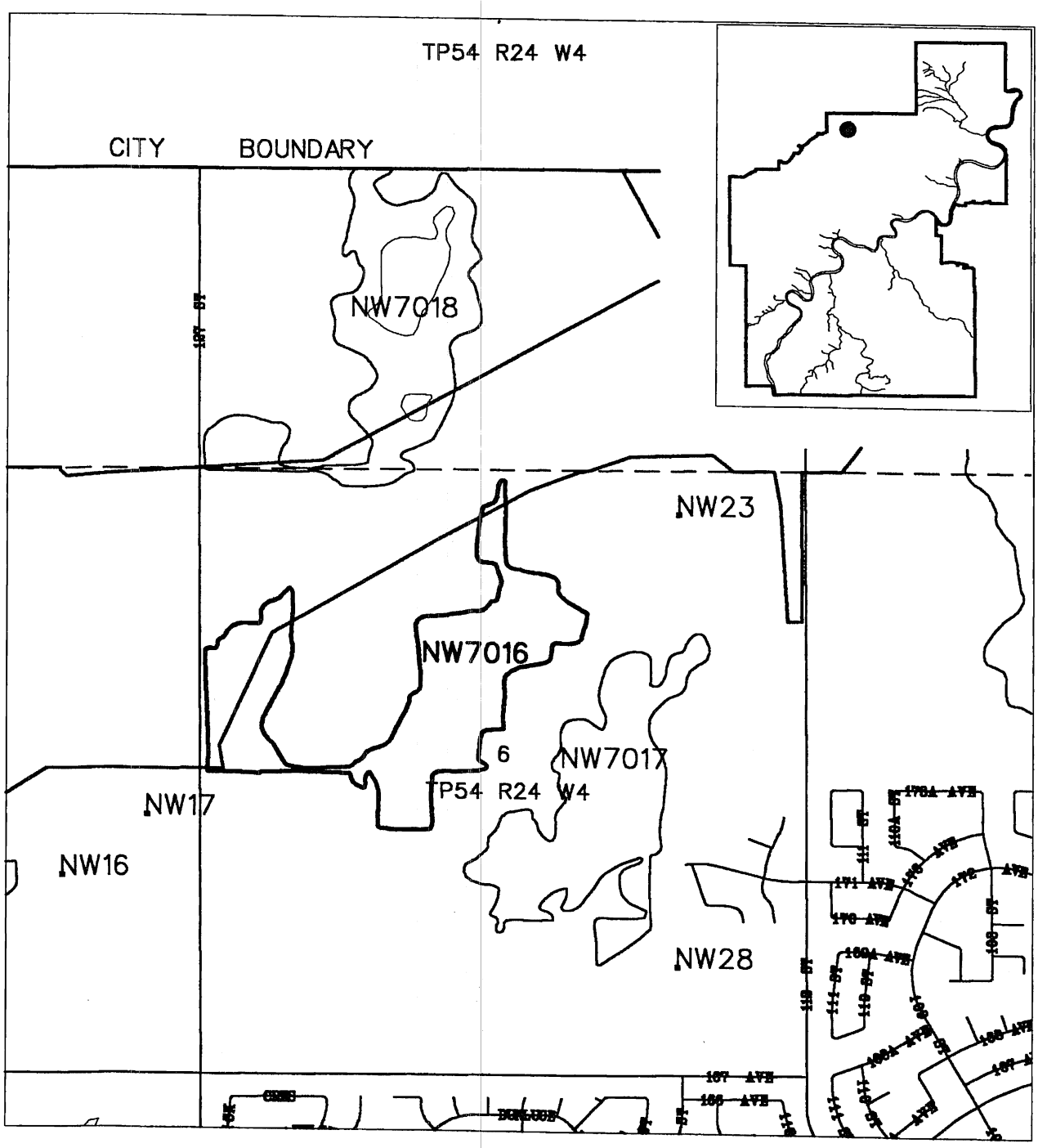
Sensitivity Low

Because this stand is quite uniform in composition and structure, it is not very sensitive to most forms of disturbance. Only significant removal of portions of the stand would have serious negative impacts upon the importance of the stand for wildlife.

Management Considerations

Because of the closeness of this relatively homogeneous aspen stand in relation to two other significant wetland areas (NW 7017 and NW 7024), it is suggested that these areas be managed together. This area of the city provides rather critical habitat for a variety of waterfowl and upland wildlife species.

NORTHWEST MATURE WOODLAND



Site Name **167 AVENUE WETLANDS**

Site Reference No NW 7024 **Size** 13.53 ha

Significance **Local Environmentally Sensitive Area**

Site Location North of 167 Avenue between 127th and 142nd Streets [SE 1 TP54 R25 W4M]

Description

Relatively large wetland complex with open water; excellent emergent aquatic fringe of cattails and marsh ragwort around perimeter of open water; poorly defined willow/sedge community occurs within wet meadow component of site; area consists mainly of sedges and grasses with very little willow; water levels quite low during June 1993; adjacent upland deciduous stands of balsam poplar-aspen quite disturbed by cattle grazing.

Poorly drained Orthic Gleysols and, to a lesser extent, very poorly drained Mesisols have developed in wetland areas adjacent to the open water; thin organic veneers have accumulated where water levels have lowered in recent years; silt loams and silty clay loams over clays and heavy clays; very fine textured nature of lacustrine and glaciolacustrine parent materials results in seasonally high water tables.

The excellent emergent aquatic vegetation combined with the open water and sedge-grass fringes provide excellent nesting and rearing habitat for waterfowl; however, with the low water levels experienced in recent years, the attractiveness of this site has been reduced considerably; with the current water levels, the site appears to be of value mainly for spring migration and possibly only breeding and rearing habitat for a few ducks; mallard, redhead and blue-winged teal observed at site; bird species noted included killdeer, red-winged blackbird and European starling; boreal chorus frog habitat.

Criteria

- good example of a permanent wetland in transition
- provides important waterfowl habitat, including spring staging, nesting and possibly rearing
- provides critical function in maintaining or balancing area hydrology
- provides linkages to adjacent ESA/SNAs

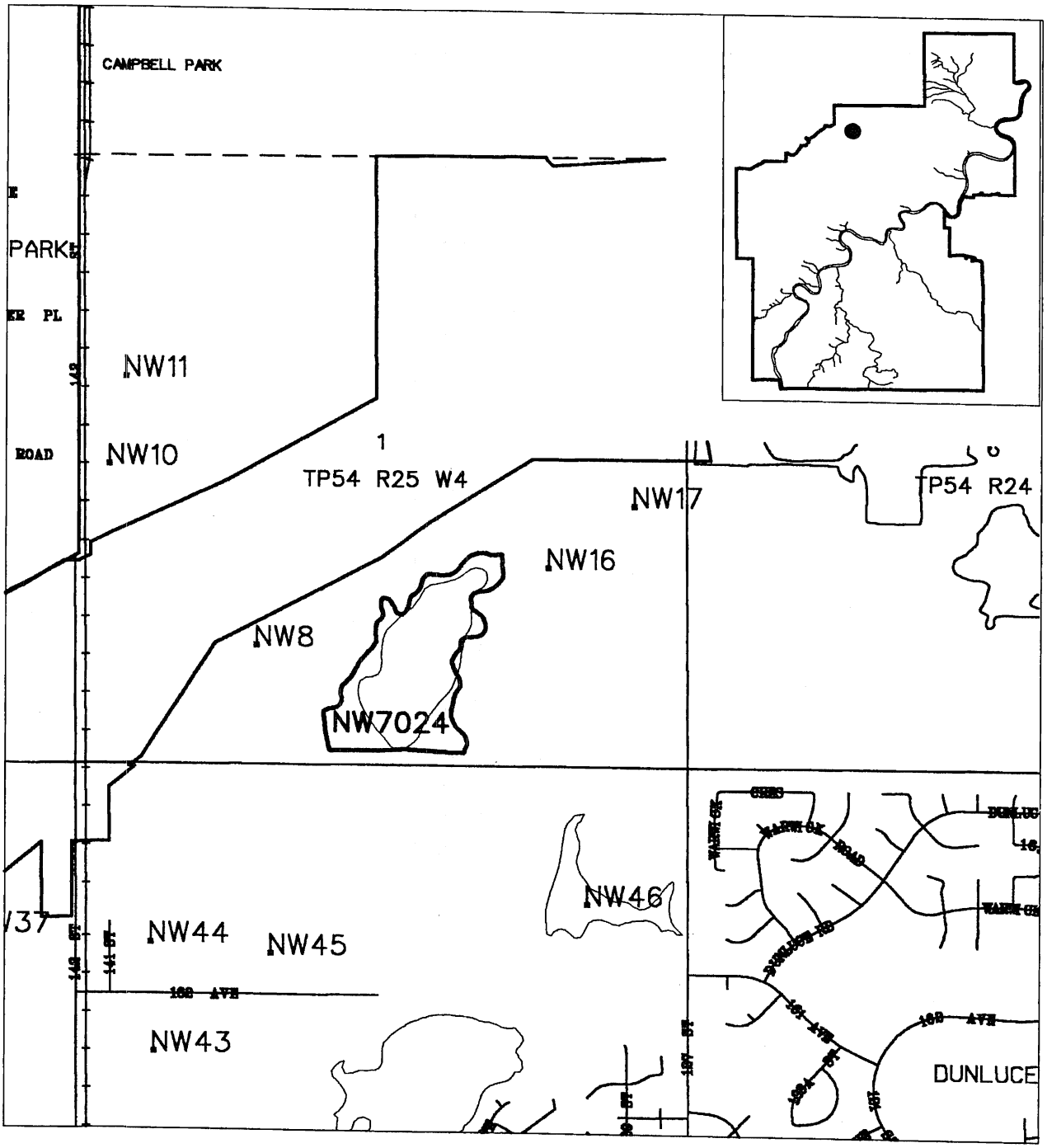
Sensitivity High

Because of the unique nature of this site, it is highly sensitive to any disturbances that would alter the natural hydrology of the area. In addition, because of its relative closeness to 167 Avenue and residential developments within the Oxford area to the south, the area is threatened by additional pressures.

Management Considerations

Because this site is so near 167 Avenue and the Oxford residential area to the south, it is imperative that it be identified early in all planning activities and conservation strategies should be developed. This site is important in that it provides waterfowl habitat and is used by wildlife like white-tailed deer in conjunction with the adjacent woodland area to the northeast (NW 7016). The site must be considered in a "regional context."

167 AVENUE WETLANDS



Site Name **NORTHWEST WETLAND**

Site Reference No NW 7018 **Size** 25.18 ha

Significance **Local Environmentally Sensitive Area**

Site Location 1.7 km north of 167 Avenue on east side of 127 Street [SW 7 TP54 R24 W4M]

Description

Large wetland complex that has been significantly disturbed by recent cultivation, grazing and reduced precipitation levels; water levels very low, probably less than 50 cm in depth in middle; significant exposed mineral materials; numerous sedge species, few willows; well-developed balsam poplar fringe along portion of eastern side.

Poorly drained Orthic Gleysols and Orthic Humic Gleysols have developed on recently exposed lacustrine materials; silty clay loams; water table at or near the surface for a significant portion of the year.

The low water levels and the amount of disturbance along the fringe has reduced the value of this particular wetland for waterfowl; it is perhaps of limited value during the spring migration and early nesting periods; several mallards, shovelers and blue-winged teal observed on the water in mid June; extensive mudflats of value for common snipe, killdeer and spotted sandpiper; decadent balsam poplar along eastern fringe provides excellent perch and nesting sites for raptors such as red-tailed hawk; red-winged and yellow-headed blackbirds observed along with boreal chorus frogs; extensive coyote tracks throughout wetland; dead cattle remains scattered around site.

Criteria

- provides critical function in maintaining or balancing local hydrological regime
- permanent wetland

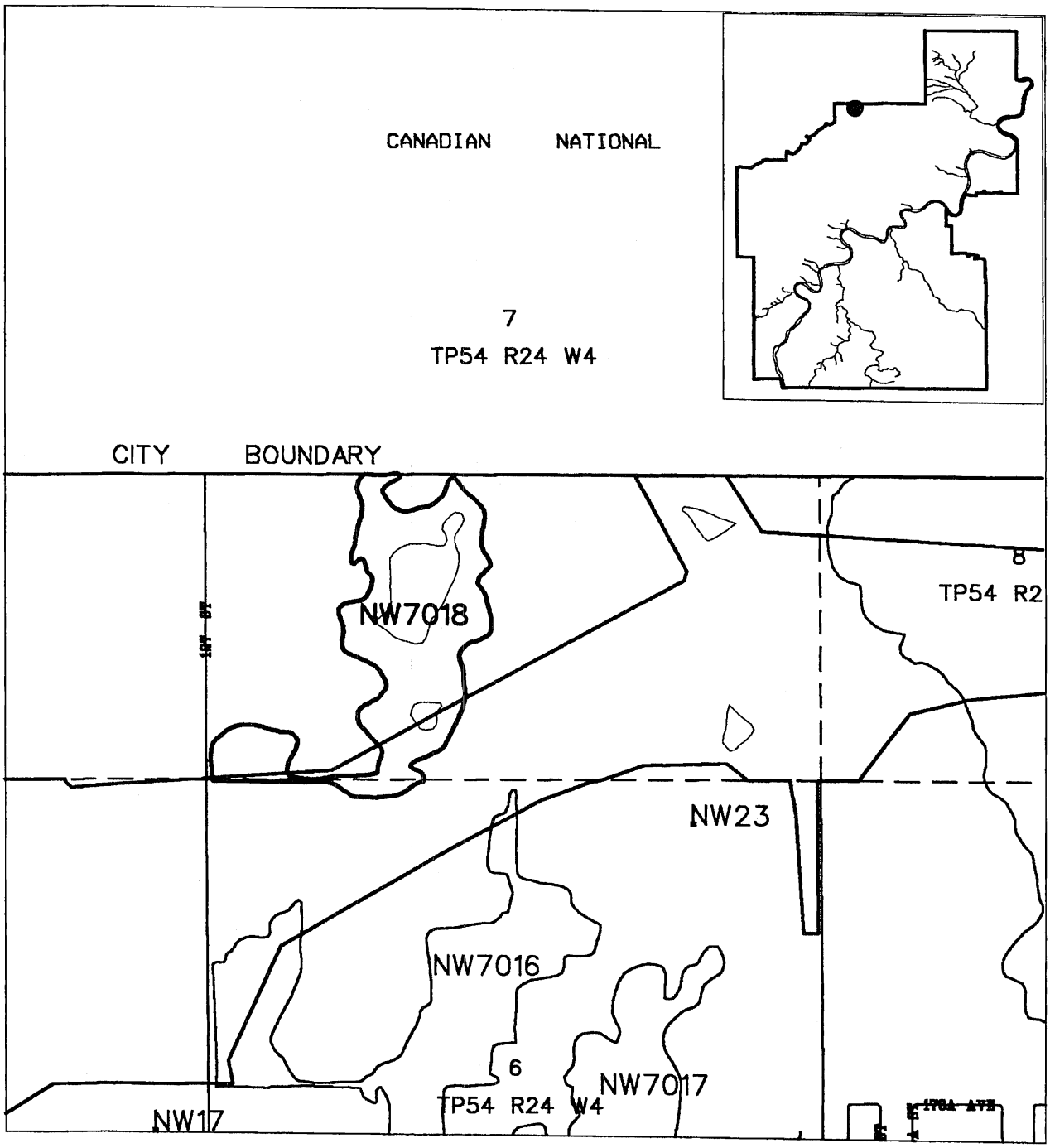
Sensitivity High

The site has already been negatively impacted by the land use activities and changes to the hydrological cycle; reduced annual precipitation combined with cultivation and grazing pressures has had severe negative impacts upon the natural functioning of this wetland; any further disturbance are sure to reduce this sites importance for waterfowl and for the surrounding hydrological regime.

Management Considerations

It is important that the City take measures to ensure the survival of this "highly threatened" wetland. Cultivation of the fringe and grazing of the grass and sedge vegetation must be reduced to ensure that the site is of value for wildlife. In addition, because the site is of value in terms of the local hydrological regime, it is imperative that measure be taken immediately to protect the site.

NORTHWEST WETLAND



Site Name **WOODBEND RAVINE WOODLOT**

Site Reference No NW 339 **Size** 8.93 ha

Significance **Significant Natural Area**

Site Location 4.8 km south of Whitemud Drive on Winterburn Road and 0.8 km east on 35 Avenue
[NE 6 TP52 R25 W4M]

Description

Healthy aspen-balsam poplar-dominated woodlot with a minor component of white spruce; well-developed shrub understorey of low-bush cranberry, red-osier dogwood, saskatoon, rose, beaked willow, bracted honeysuckle and snowberry; good tree growth with 14 - 16 m canopy; few standing dead trees.

Well drained Orthic Black Chernozems have developed on very gently undulating glaciolacustrine materials; loams over loamy sand and sand.

Although there was no extensive evidence of wildlife usage (i.e., browsing on palatable browse species) in this stand, the site may act as a critical travel corridor for wildlife moving between Woodbend Ravine and the North Saskatchewan River Valley and the forested Stony Plain Indian Reserve to the west.

Surrounding land uses are primarily cultivated fields.

Criteria

- provides critical linking function to North Saskatchewan River Valley

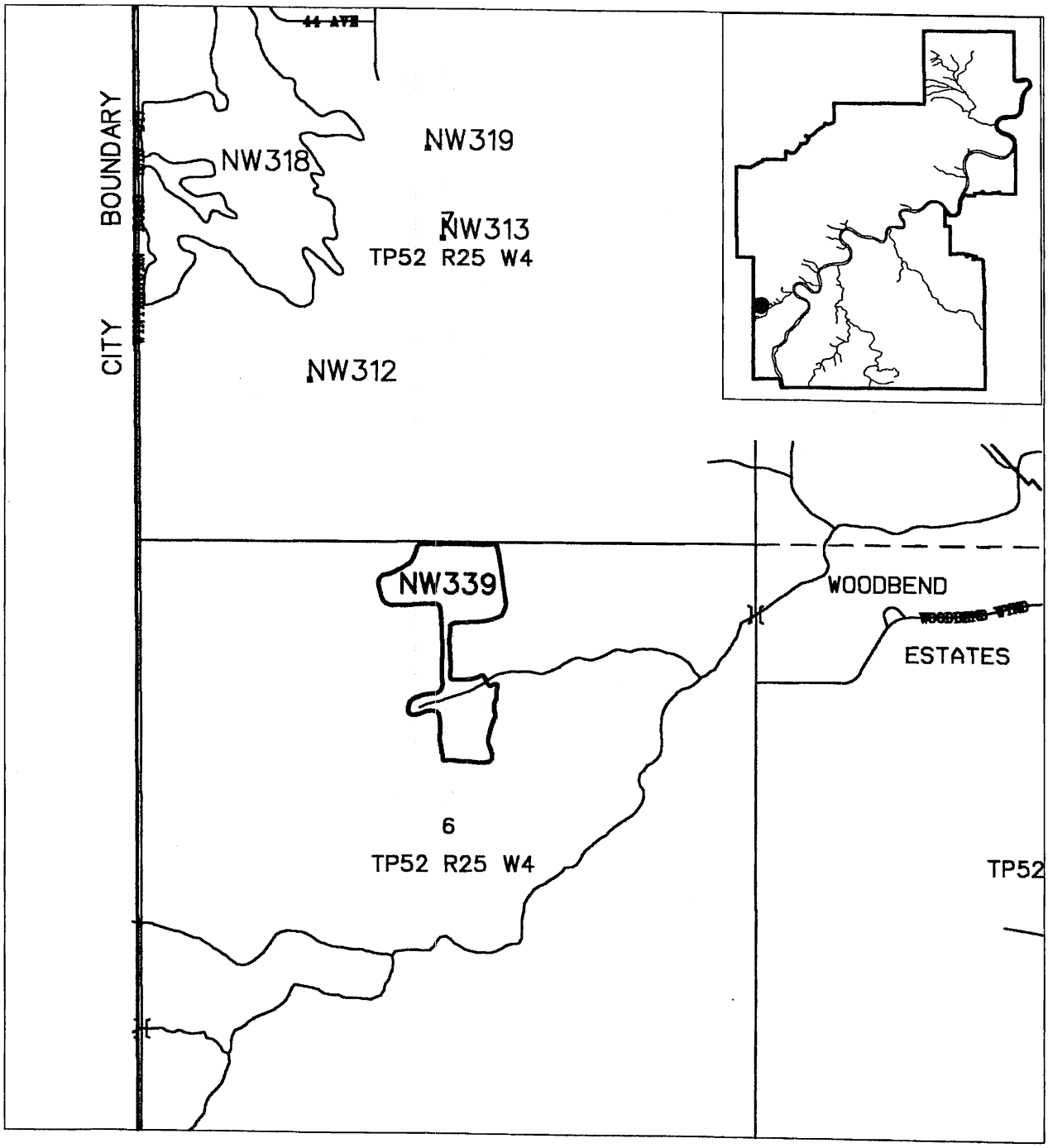
Sensitivity Low

With the exception of totally clearing this stand, it is not very sensitive to most forms of disturbance.

Management Considerations

Although this site does not appear to be used extensively by wildlife, its value relies on maintenance of its current size, shape and position in the landscape. The adjacent deciduous fence rows provide critical travel corridors to this site, while this site may be used more for temporary cover and food.

WOODBEND RAVINE WOODLOT



Site Name **KINOKAMAU LAKE WOODLAND**

Site Reference No NW 139 **Size** 3.73 ha

Significance **Significant Natural Area**

Site Location 0.8 km north of Yellowhead Trail between Kinokamau Lake and 184 Street
[NW 16 TP53 R25 W4M]

Description

This woodlot is situated immediately west of the northwest corner of Kinokamau Lake and consists predominately of aspen with lesser amounts of balsam poplar; small willow/sedge wetland located in northwest corner; well-developed understorey of saskatoon and beaked hazelnut, willow, rose, honeysuckle, gooseberry, snowberry and wild raspberry as a result of relatively open canopy; dense shrub layer results in poorly developed herb layer; decadent balsam poplar providing good snag habitat; quite a bit of fallen timber.

Imperfectly to poorly drained Gleyed Gray Luvisols and Orthic Gleysols have developed on level glaciolacustrine materials; clay loams over clay. High water table throughout the area promotes lush shrub understories.

The heavy use of the area by white-tailed deer suggests that this stand is used as a corridor for movement between Kinokamau Lake and the Big Lake area to the northwest. Extensive deer tracks and "hedged" red-osier dogwood and lightly browsed willow all suggest that the area is used extensively by deer. Other species noted at the site include red-tailed hawk and numerous songbirds.

Surrounding land uses include country residential and cultivated fields.

Criteria

- good example of mature aspen-dominated stand
- provides habitat for local wildlife, especially white-tailed deer
- critical linking function to other ESA/SNAs within tablelands and the Big Lake area

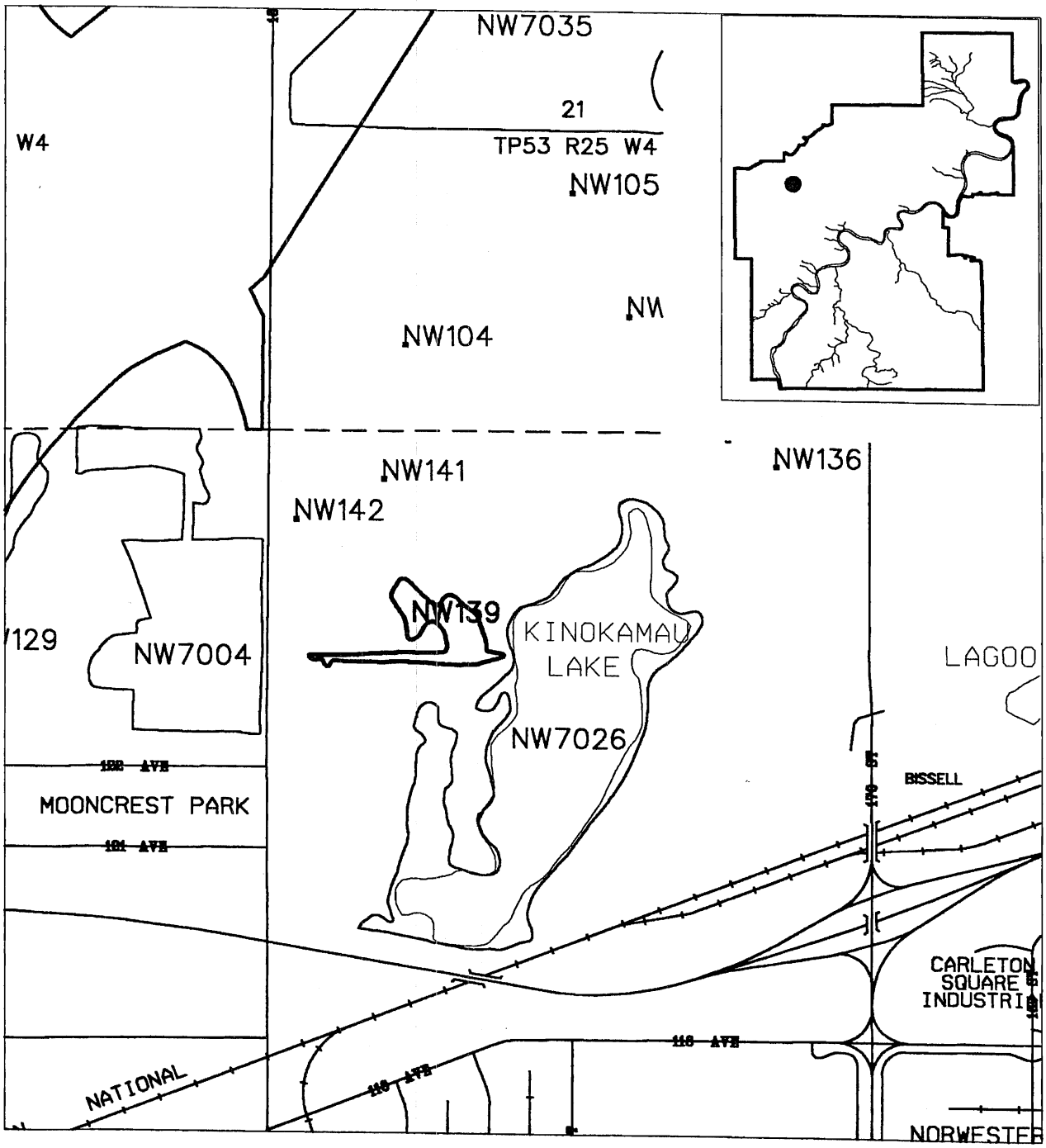
Sensitivity Low

With the exception of the total removal of the stand, the site is not really sensitive to disturbances; the significance of the site for wildlife would be severely curtailed if any or all of it was removed.

Management Considerations

Because of the importance of this site and adjacent fence rows for wildlife movement corridors, it is imperative that any development maintain the existing stands in their current configuration and composition.

KINOKAMAU LAKE WOODLAND



Site Name **NORTHWEST BOUNDARY COMPLEX**

Site Reference No NW 89 **Size** 8.09 ha

Significance **Significant Natural Area**

Site Location 137 Avenue, 0.5 km west of 184 Street
[NE 20 TP53 R25 W4M}

Description

Open deciduous stand with small ephemeral wetland; upland stand comprised mainly of aspen with lesser amounts of balsam poplar; well-developed shrub understorey result of open canopy; beaked hazelnut is dominant shrub with lesser amounts of saskatoon, cherry, rose, gooseberry, snowberry and Canada buffaloberry; dense shrub layer limits productivity of herb layer; wetland consists of two components, one being a relatively dry mud-flat with mineral soils exposed, the other portion consisting of dense willow thickets; water may occur within wetland component during early to late spring; stand is relatively healthy; some cutting with chain saws of aspen and balsam poplar along wetland fringe.

Moderately well drained Dark Gray Luvisols occur on upland sites while poorly drained Orthic Gleysols have developed in wetland areas; very gently to gently undulating and hummocky morainal deposits; silty clays over clay and clay loams; water table at or near the surface in wetlands for most of the year.

This site is large enough to be of significance for white-tailed deer who move between adjacent tablelands sites near Kinokamau Lake and "provincially significant" Big Lake to the north. It appears that the young aspen regeneration and saskatoon have been browsed extensively by white-tailed deer; extensive deer tracks throughout and around the wetlands; deer bedding sites occur on lower slopes within upland aspen forests.

Surrounding land uses include the Municipal District of Sturgeon and cultivated fields. The Restricted Development Area (RDA) occurs immediately to the west.

Criteria

- good example of upland deciduous vegetation
- habitat for local wildlife
- temporary wetlands
- provides critical linking function to the Big Lake area

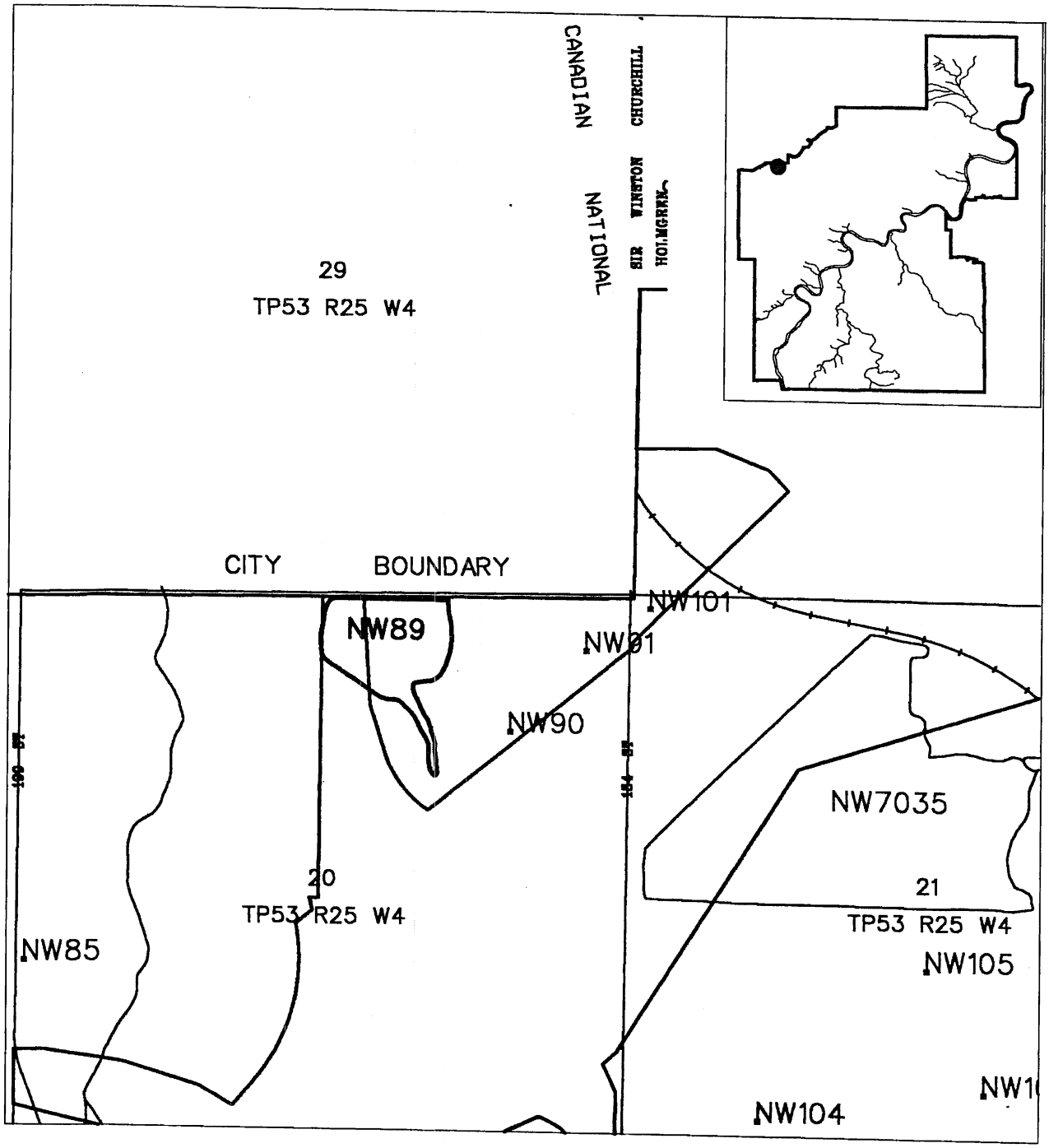
Sensitivity Moderate

The upland component of the site is not very sensitive to disturbances, unless it is partially or wholly removed. The wetland component appears to be seasonal in nature and does not provide critical nesting, breeding or feeding habitat for waterfowl.

Management Considerations

Although the area is not very sensitive to disturbances, this site provides a critical travel corridor for white-tailed deer, and as such, it is necessary to maintain this stand as an important movement corridor. Attempts should be made to work with the current landowner to ensure its survival.

NORTHWEST BOUNDARY COMPLEX



Site Name **SECTION 19 WOODLOT**

Site Reference No NW 384 **Size** 17.56 ha

Significance **Significant Natural Area**

Site Location 11.2 km south of Whitemud Drive on east side of Winterburn Road [SW 19 TP51 R25 W4M]

Description

Large remnant woodlot that is composed mainly of white birch and to a lesser extent, balsam poplar; some areas of pure white birch within stand; some balsam poplar to 24 m in height; few scatterered large white spruce; understorey characterized by high shrub cover and high shrub diversity; dominant shrub species include beaked hazelnut, raspberry, gooseberry, red-osier dogwood, high-bush cranberry, snowberry, bracted honeysuckle and wild red currant.

Moderately well to well drained Orthic Black Chernozems have developed on very gently to gently undulating and hummocky eolian deposits; loams over sand and sandy loams.

This stand is one of only a few white birch -dominated stands found within the tablelands of Edmonton; within the tablelands, white birch usually occurs as a subdominant species. It does, however, occur quite extensively in pure stands within the North Saskatchewan River Valley.

Heavily browsed shrub species indicate the relative importance of this site for white-tailed deer. In addition, a number of well-developed game trails and tracks were also observed during the survey. An intermittent, unnamed stream forms the north boundary of this site and would be used by deer for movement between the North Saskatchewan River valley and the forested lands to the west.

Considering the high level of disturbance that has occurred during 1992 and 1993 to construct the Edmonton Petroleum Golf and Country Club, this site has taken on additional importance for wildlife in the area.

Surrounding land uses include the Edmonton Petroleum Golf and Country Club to the west, a tree farm to the north and cultivated fields to the east and south.

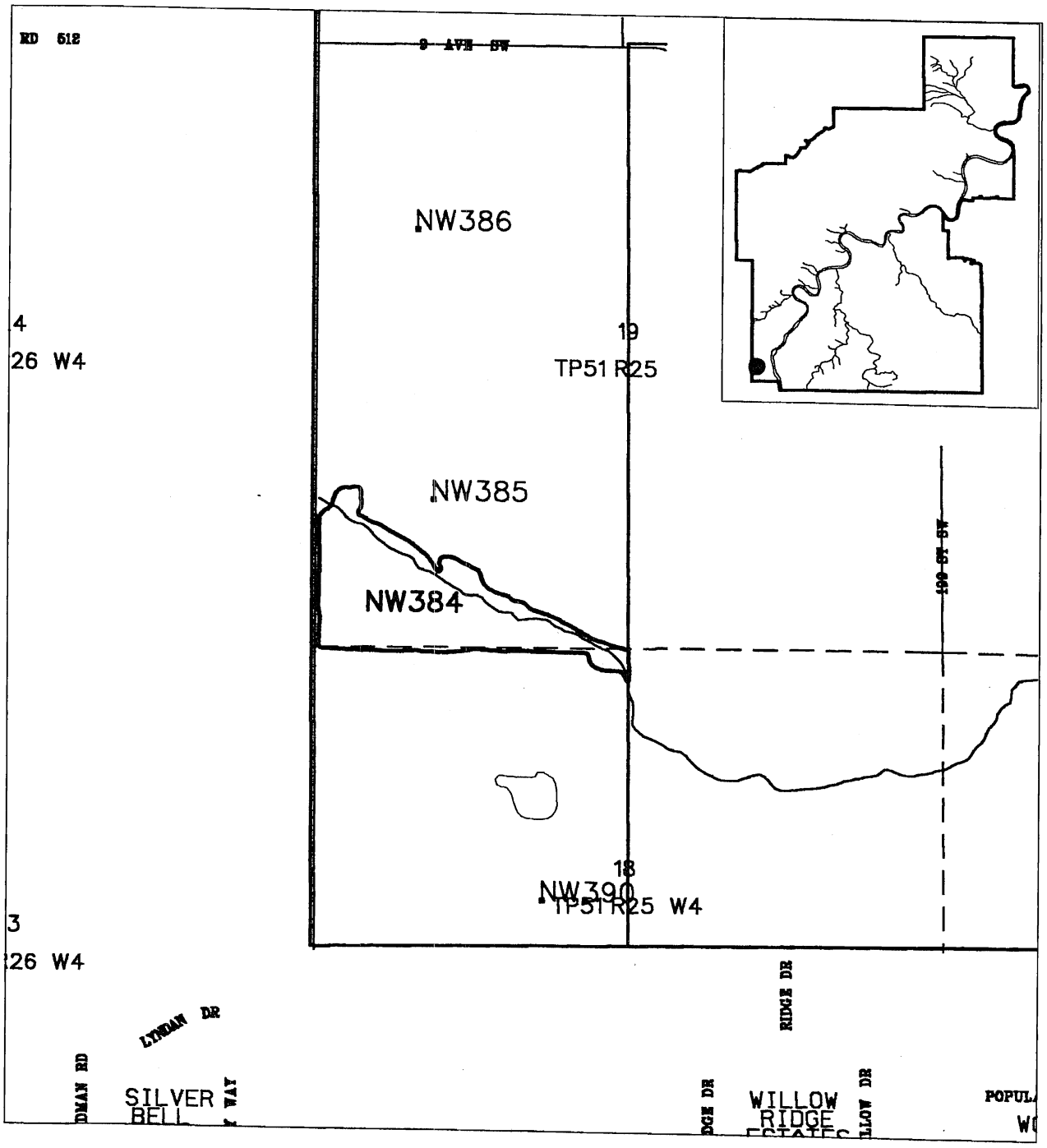
Criteria

- one of the best examples of upland white birch within the tablelands
- provides habitat for white-tailed deer
- provides link to North Saskatchewan River Valley

Sensitivity Moderate

This site would be negatively impacted by alterations to it's composition or the removal of forest overstorey. If the vegetation is removed, the site would be highly sensitive to wind erosion as most materials are coarse-textured in nature.

SECTION 19 WOODLOT



Management Considerations

Attempts should be made to conserve this rather unique upland white birch community. Any additional land use changes within the area only serve to heighten the importance of this particular stand for wildlife in a regional/local context.

Site Name **215 STREET NATURAL AREA**

Site Reference No NW 7021 **Size** 12.08 ha

Significance **Significant Natural Area**

Site Location 0.8 km north of Whitemud Drive on west side of 215 Street (Winterburn Road)
[SE 25 TP52 R26 W4M]

Description

Healthy, undisturbed upland site with two small wetland complexes; upland area comprised of two-aged aspen stand with variable shrub densities; older open areas have considerable snags present with dense shrubby understories and poorly developed herb layers; areas with younger aspen are characterized by more closed canopies with poorer developed shrub layers and better developed herb layers; shrub species include beaked hazelnut, honeysuckle, rose, snowberry, red-osier dogwood, cherry, saskatoon, willow, and raspberry; small wetland areas may have open water during the early to late spring period and are characterized by well-developed willow/sedge communities; some balsam poplar occurs around the perimeters of the wetland.

Moderately well drained Dark Gray Luvisols and Dark Brown Chernozems have developed under upland forests; poorly drained Orthic Gleysols occur extensively within wetlands and along lower slopes; soils have developed within very gently undulating glaciolacustrine materials; loams over sandy clay loams; water table at or near the surface for a significant portion of the year in wetland areas.

The diversity of vegetation found within this site results in good wildlife habitat, unfortuneatly, the stand is not significance in size to provide year-round habitat for species like white-tailed deer; the site does provide essential cover and food for travel between other adjacent sites in the area; shrub species not overly browsed; the seasonal nature of the wetlands provides only temporary habitat for some waterfowl species.

Surrounding land uses include country residential, cultivated fields, a sour gas well and Lewis Farms golf course to the east.

Criteria

- good example of two-aged aspen stand
- provides habitat for local wildlife
- provides linkages to other ESA/SNAs within the tablelands

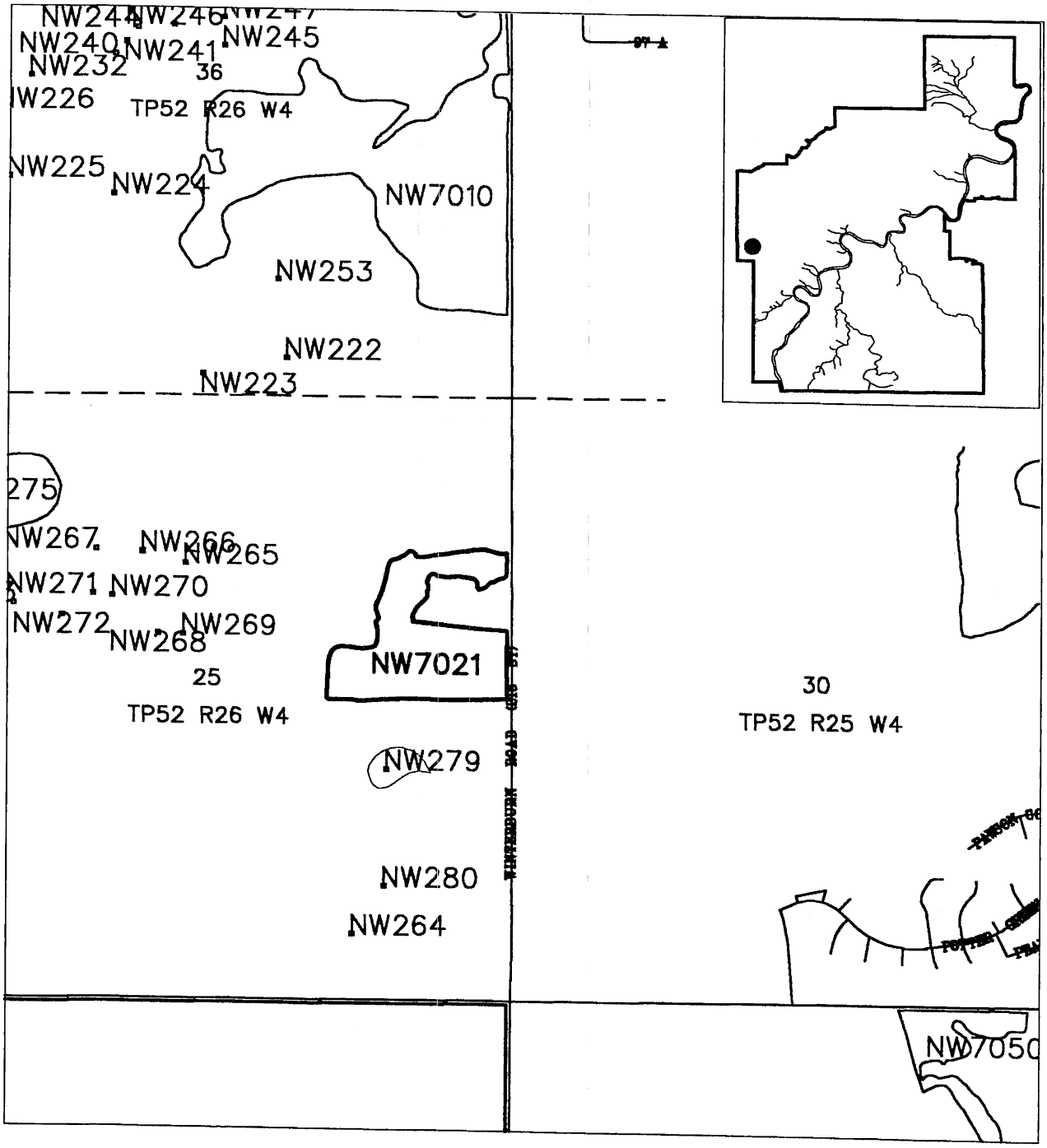
Sensitivity Moderate

With the exception of the wetlands, this site is not overly sensitive to most forms of disturbance. Any release of sulphur from the adjacent sour gas well would result in a significant negative impact upon the vegetation and the resulting habitat.

Management Considerations

Attempts must be made to conserve this significant natural area otherwise a critical wildlife corridor may be lost. It is important to note the extensive developments occurring immediately to the east in the Lewis Estates area. Critical habitat is being lost within the area, hence the significance of this site.

215 STREET NATURAL AREA



Site Name **156 STREET- ST ALBERTA TRAIL NATURAL AREA**

Site Reference No NW 65 **Size** 13.54 ha

Significance **Significant Natural Area**

Site Location Immediately southwest of the intersection of St Albert Trail and 156 Street

[NE 27 TP53 R25 W4M]

Description

Mature balsam poplar-aspen forest; excellent shrub growth results from rather open canopy tree layer; shrub understorey comprised of red-osier dogwood, cherry, beaked-hazelnut, raspberry, honeysuckle, rose, snowberry and gooseberry; herb layer less well developed due to dense shrub layer; two relatively small willow/sedge wetlands.

Poorly drained Orthic Gleysols and Gleyed Black Chernozems are common throughout the area and reflect the generally high water tables; water table generally within 200 cm of surface; nearly level to very gently undulating glaciolacustrine materials; loams and clay loams over clays and heavy clay; prominent mottling at 20 cm.

Possible "old growth" balsam poplar occur at this site. The mature nature of this stand provides unique habitat for many bird species.

Surrounding land uses include light industrial/commercial and agriculture.

Criteria

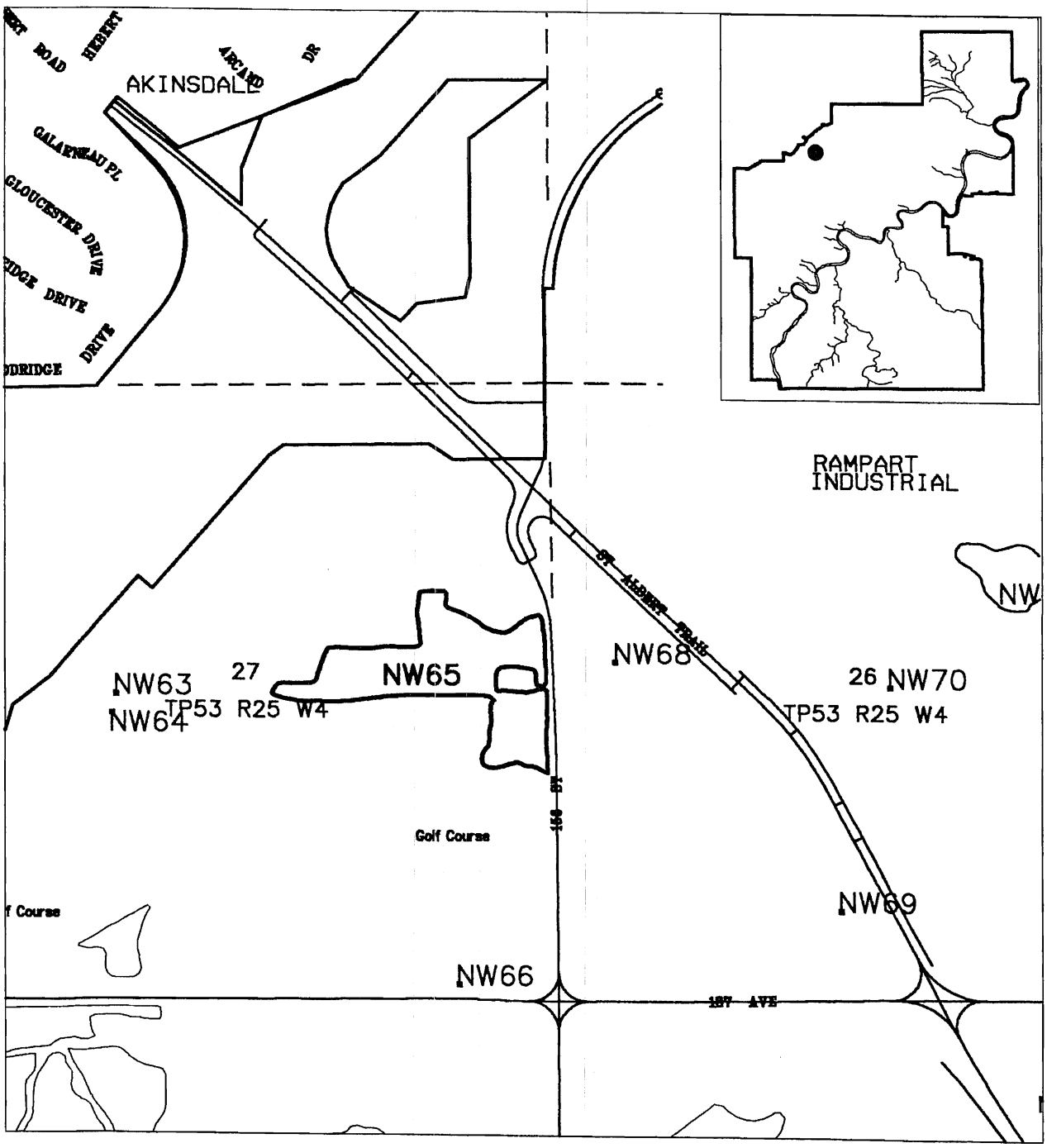
- good example of mature balsam poplar-aspen stand
- possible "old growth" balsam poplar
- terrestrial bird habitat

Sensitivity Low

Management Considerations

Because this site represents possible "old growth" balsam poplar stands, it is imperative that attempts be made to maintain this site in its current condition. Fragmentation of the site would severely threaten its survival as any reduction in the size of the stand would increase the possibility of windthrow.

156 STREET- ST ALBERTA TRAIL NATURAL AREA



Site Name **FREEMAN WOODLAND**

Site Reference No NW 7004 **Size** 22.93 ha

Significance **Significant Natural Area**

Site Location North of 122 Avenue and west of 184 Street
[NE 17 TP53 R25 W4M]

Description

Relatively large and healthy aspen-balsam poplar mixedwood stand situated between 184 Street and Kirk Lake; some white spruce in the overstorey; common shrub species include red-osier dogwood, snowberry, beaked willow, rose, saskatoon, choke cherry and gooseberry; overstorey vegetation between 15 and 20 m in height; mature white spruce providing good seed source for spruce regeneration; small meltwater channel occur at northern end of unit and appears to be natural drainage channel towards Kirk Lake to the west; willow/sedge communities have developed within this area but appear to have been disturbed by dumping.

Imperfectly to poorly drained Black Chernozems and Orthic Gleysols have developed on nearly level to very gently undulating glaciolacustrine materials; silt loams and silty clay loams.

The unique diversity of vegetation that occurs within this stand provides significant habitat for white-tailed deer and a variety of songbirds; red-osier dogwood heavily browsed; ephemeral wetlands along northern fringe may provide temporary nesting habitat for waterfowl.

Surrounding land uses include cultivated fields and pasture land.

Criteria

- good example of mature mixedwood stand
- provides habitat for local wildlife species
- provides linking function to Big Lake area

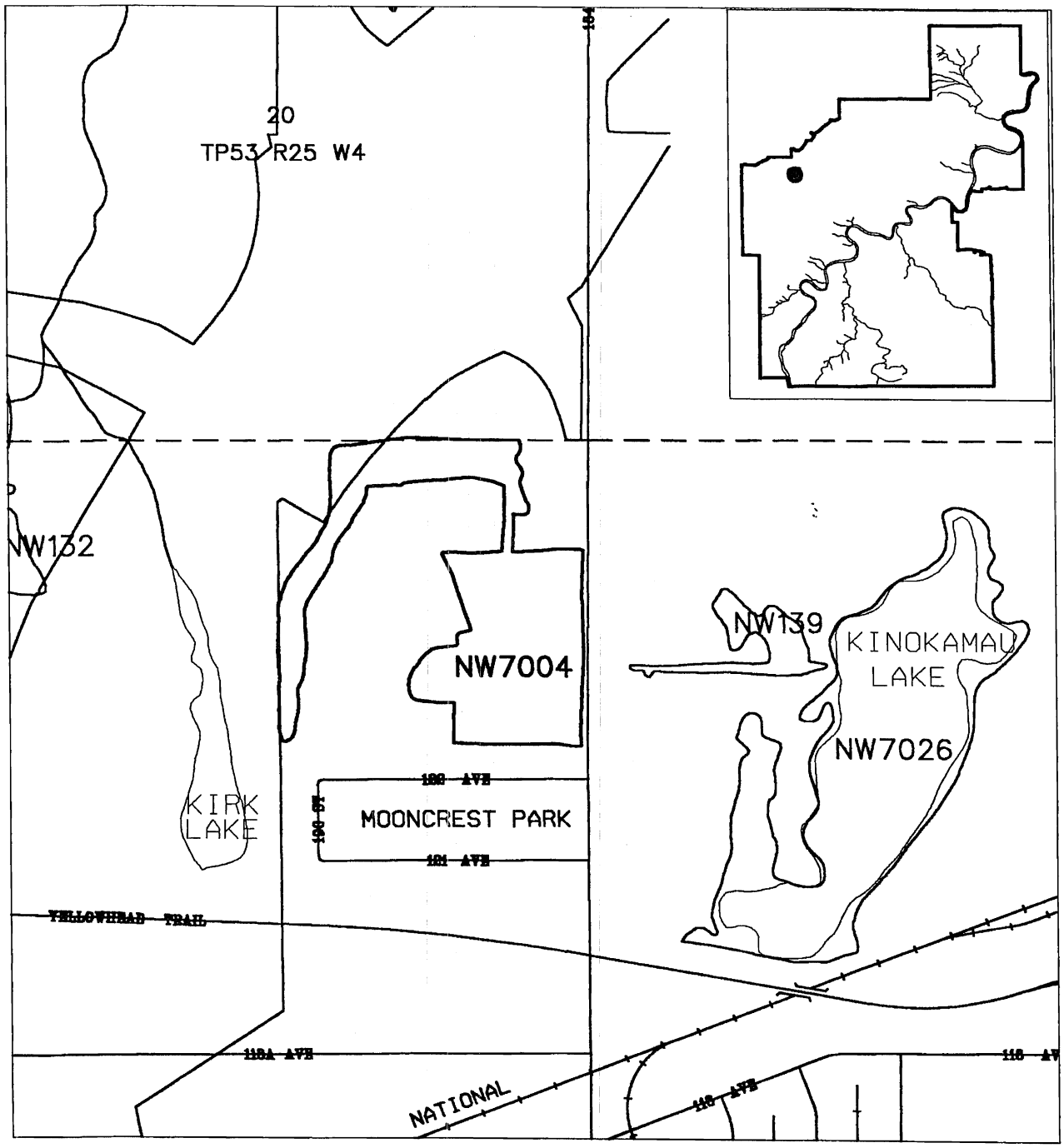
Sensitivity Moderate

Any changes to the landscape that would alter the natural hydrology of the area would have impacts on the vegetation composition of the stand, especially the ephemeral wetland components along the northern fringe. Further fragmentation of the forest would result in changes to the diversity and composition of the vegetation and wildlife.

Management Considerations

Because the area is tied directly into Kirk Lake by a series of natural drainages, it is imperative that further disturbances be minimized. The stand has already been partially fragmented by country residential development and by dumping along the northern fringe. It is suggested that the "dump" areas be reclaimed so as not to damage the natural hydrological conditions of Kirk Lake.

FREEMAN WOODLAND



Site Name **WINTERBURN CROSSING WETLANDS**

Site Reference No NW 7011 **Size** 11.77 ha

Significance **Significant Natural Area**

Site Location West of Winterburn Rd between 103 Avenue and Westview Village [SE 1 TP53 R26 W4M]

Description

A series of four permanent wetlands with open water with well-developed perimeters of sedge, rush, cattails and willows; some scrubby balsam poplar-aspen stands with significant amounts of introduced weedy species; water levels appear to be considerably lower than historical regimes (some small ponds appear to have been drained by man-made ditches).

Because the landscape has been significantly altered over the past decade with topsoil being removed and fill being dumped at the site in the past several years, the site has been downgraded from an *environmentally sensitive area* to a significant natural area.

Imperfectly drained Gleyed Gray Luvisols and poorly drained Orthic Gleysols have developed along the perimeters of the wetlands; moderately well drained Dark Gray Luvisols have developed under scrubby upland deciduous stands; loams and clay loams over silty clay loams; gently undulating and hummocky glaciolacustrine materials; perched water tables near wetlands.

The four wetlands work together to provide important nesting, breeding and feeding habitat for waterfowl species including blue-winged and green-winged teal, and Canada goose; 21 species of birds were observed during the inventory, including a black-crowned night heron, Canada goose, mallard, lesser scaup, killdeer, tree and barn swallows, black-billed magpie, American crow, black-capped chickadee, house wren, European starling, warbling vireo, yellow warbler, song, clay-colored, and savannah sparrows, red-winged blackbird, brown-headed cowbird, northern oriole, and American goldfinch; individually, none of these wetlands would be significant, however, when combined, they provide important waterfowl habitat.

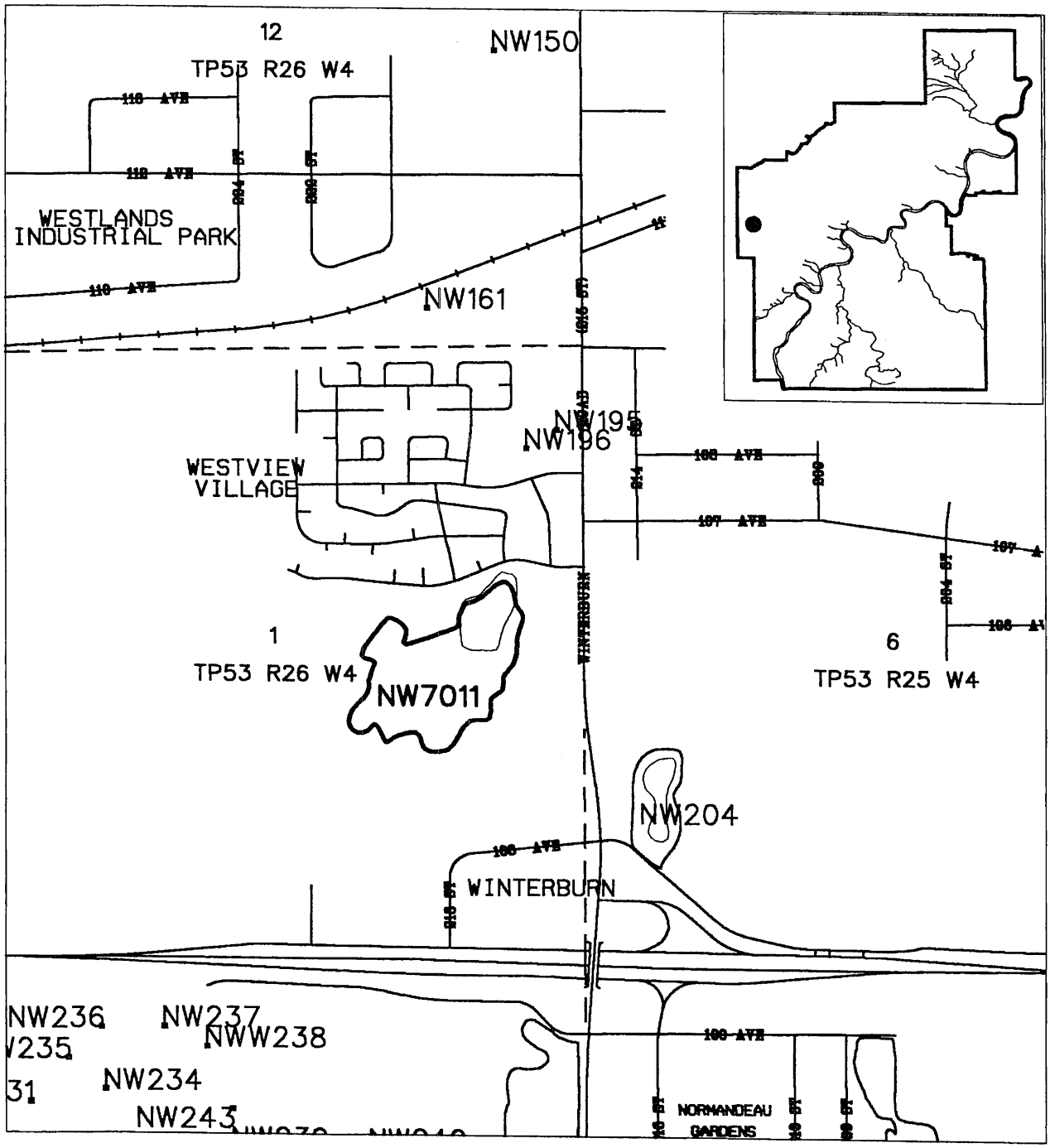
Shallow, but relatively stable nature of the water has provided critical muskrat habitat; numerous muskrat runs are found adjacent to these wetlands.

Surrounding land uses are mainly native pasture and the Westview Village Trailer Park to the north.

Criteria

- high plant species diversity
- high habitat diversity
- critical waterfowl nesting, breeding and feeding habitat
- aquatic furbearer habitat
- permanent water bodies

WINTERBURN CROSSING WETLANDS



Sensitivity High

These sites are particularly sensitive to any man-made disturbances; any disturbance that would affect the natural hydrology of these wetlands will severely curtail the significance of these sites for waterfowl and aquatic furbearer habitat; portions of the site and surrounding area have been disturbed, resulting in the abandonment of sites by waterfowl species for habitat.

Management Considerations

Any management of these sites must consider all sites as they function together to create significant waterfowl habitat. By themselves, the individual wetlands are of moderate significance, hence attempts must be made to ensure the maintenance of the natural processes that maintain these wetlands and reduce any subsequent infilling or drainage that may occur.

Site Name **GROCERY PEOPLE WOODLAND**

Site Reference No NW 7035 **Size** 46.34 ha

Significance **Significant Natural Area**

Location Immediately south of 137 Avenue between 170 St. and 184 St. [N 1/2 21 TP53 R 25 W4M]

Description

This aspen-dominated woodlot occurs immediately south of 137 Avenue and occurs partially within the Restricted Development Area; aspen dominated overstorey with minor amounts of balsam poplar; well-developed understorey of red-osier dogwood, wild rose, raspberry, saskatoon and cherry; eastern portion of site considerably younger than central portion due to past land use practices.

Moderately well to imperfectly drained Orthic and Gleyed Gray Luvisols developed on nearly level to gently undulating glaciolacustrine materials; clay loams over clay.

Extensive evidence of use by white-tailed deer in conjunction with the adjacent Grocery People Wetland (NW

110);numerous game trails and extensive browsing on palatable browse species; red-tailed hawk and numerous song birds observed at site.

Surrounding land uses include light industrial development, CNR right-of-way and major roads including 170 St., 184 St. and 137 Avenue. The RDA occurs along the western edge of the site.

Criteria

- provides habitat for local wildlife species, especially white-tailed deer
- provides critical link between adjacent RDA lands and locally significant Grocery People Wetland (NW 110)

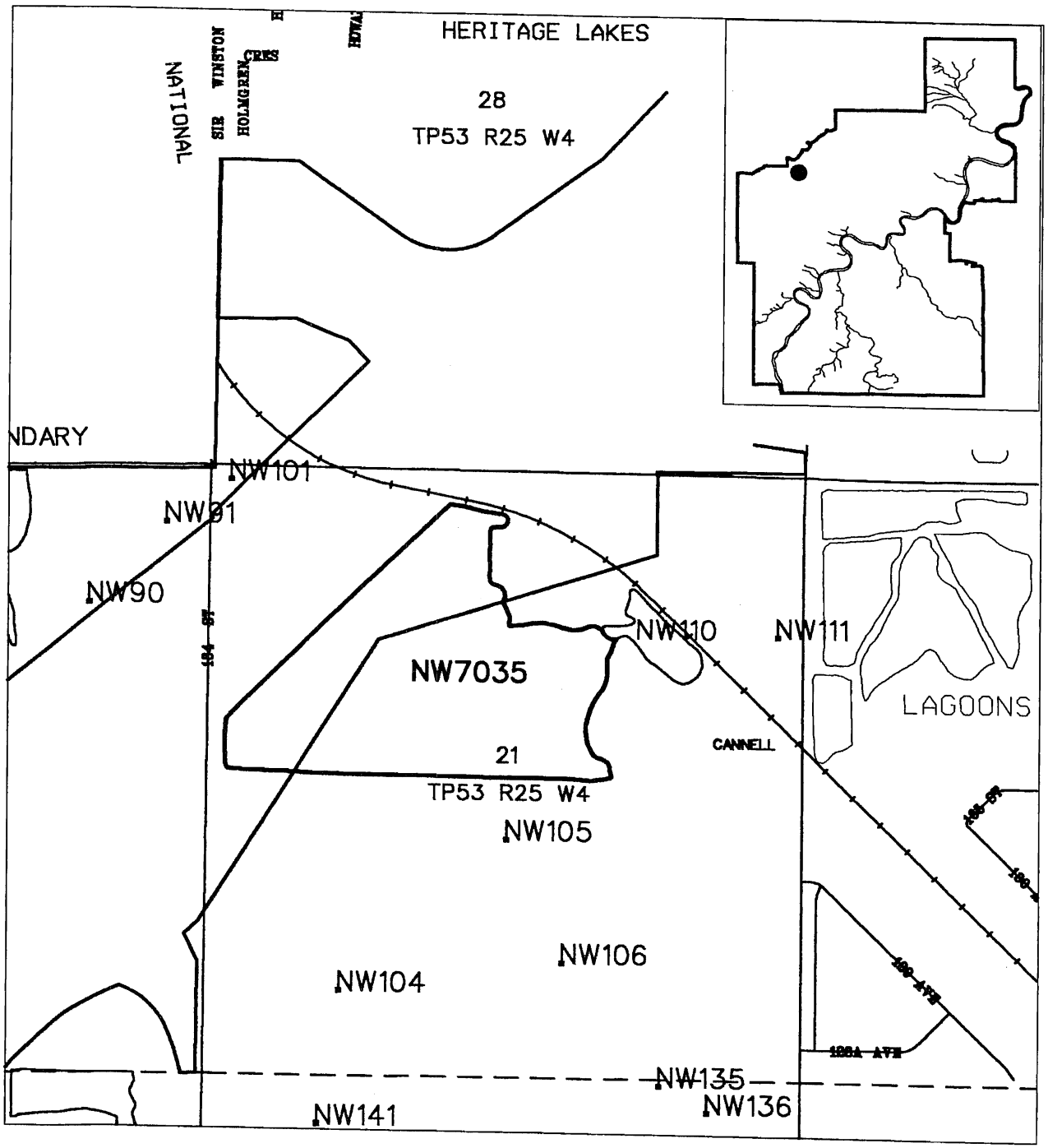
Sensitivity Low

The site will only be negatively impacted by further development within the RDA.

Management Considerations

Special attention must be paid to any development or clearing within the RDA as this is certainly bound to have a negative impact not only upon this site but also upon the locally significant Grocery People Wetland (NW 110). If the RDA lands to the west are cleared and developed, the corridor function that this sites provides will be lost.

GROCERY PEOPLE WOODLAND



ENVIRONMENTALLY SENSITIVE AREAS OF THE NORTH SASKATCHEWAN RIVER VALLEY AND RAVINE SYSTEM

5.5 North Saskatchewan River Valley and Ravine System

Based upon the review of the literature for the North Saskatchewan River Valley and Ravine System, 17 sites have been identified from the literature for designation as environmentally sensitive areas; one of national significance (North Saskatchewan River Valley), two of provincial significance (Lower Whitemud Creek, Big Island), three of regional significance (Big Lake Area, Moran Lake and Riverbend) and 11 of local significance (Table 6).

No field investigations were undertaken to support these evaluations.

The City of Edmonton, Department of Parks and Recreation have classified the North Saskatchewan River Valley and Ravine System within the Ribbon of Green Master Plan (1992). The proposed resource management planning units of significance to this study are preservation and conservation zones.

• Conservation areas are characterized by moderate ecological sensitivity and high accessibility as a result of adjacent urban development. Some original regrowth forests and wildlife habitats remain intact.

• Preservation areas are characterized by high ecological sensitivity and some degree of physical development constraint. Areas contain original stands of native vegetation which often shelter significant wildlife populations. Visitor impact must be carefully monitored and managed.

These terms are used where applicable in describing particular sites.

The sites are ordered below based upon level of significance from national to local.

Table 9. List of Environmentally Sensitive Areas Within the North Saskatchewan River Valley and Ravine System and their Corresponding Significance Level.

Significance Level	Site Name
National	North Saskatchewan River Valley
Provincial	Lower Whitemud Creek Big Island
Regional	Big Lake Area Riverbend Moran Lake
Local	Lower Mill Creek Ravine Upper Mill Creek Ravine Whitemud/Blackmud Creeks Horsehills Creek Horsehills Creek Headwater Lake Lower Oldman Creek Other Ravines South-end Ravine and Channel Banks Complex Unnamed Creek - Northeast Corner Fulton Creek Wedgewood Ravine

Site Name **NORTH SASKATCHEWAN RIVER VALLEY**

Significance NATIONAL ENVIRONMENTALLY SENSITIVE AREA

Site Location Crosses diagonally from southwest corner to northeast corner of city

Description:

The North Saskatchewan River Valley is a distinct regional landform and is a focal point within the city of Edmonton.

Highly variable vegetation depending upon slope and aspect; vegetation varies from mature coniferous communities on north-facing valley walls to deciduous forests, shrublands and grasslands on south-facing slopes.

The valley consists of steep, highly erodible slopes with exposed bedrock to level terraces adjacent the river; slopes range from nearly level on the terraces to very steep on the valley walls; good example of contorted bedrock of the Edmonton Formation occurs along valley walls in Section 33 Twp 51 Rge 25 W4M; provides a glimpse of the climate in Edmonton during glacial times; landsliding recognized as major geological hazard; 56 percent of land in river valley (active fluvial and inactive channel banks) have serious problems for development, including active flooding, surface erosion and slumping.

The valley provides habitat for a number of rare species including hoary and northern long-eared bat, red-sided garter snake and porcupine; both bat species are considered transient or rare summer residents to Edmonton; historical nest site for peregrine falcon at confluence of Whitemud Creek and North Saskatchewan River; between Groat and Quesnel bridges, 182 bird species recorded during spring/summer and 98 during the winter period; 30 mammals, 36 butterflies and skippers and up to five herptiles (Mowat 1992); warblers and vireos pass through the river valley in good numbers during the fall (Smith and Assmann 1980); about 1,500 individuals in total of 22 species of warblers and vireos were recorded in fall of 1979 along a stretch of the south side of the river valley between the University of Alberta up to and including Mill Creek (lower); provides year-round habitat for white-tailed deer; nine species of sportfish and several species of nongame fish; these fish vary widely in abundance and distribution within the river at various times of the year; supports resident pike, walleye and sauger populations as well as seasonal goldeye (R.L. & L. Ltd. 1988).

It has previously been identified as a provincially significant environmentally sensitive area in both the counties of Leduc and Strathcona and the Municipal District of Sturgeon; classed as mainly conservation and preservation zones; developed terraces such as Hawrelak and Emily Murphy parks classed as intensive use (Parks and Recreation1992).

The valley is characterized by variable scenic values, including vegetated valley walls (highly preferred), steep valley walls that are completely exposed or have little

vegetation cover to disturbed valley walls and denuded areas (least preferred) (Hutchinson 1978).

In addition, the valley provides a critical linking function with provincially significant Lower Whitemud Creek and a number of regionally significant sites, including Big Island and Riverbend, and a number of locally significant sites; also provides critical link to table land sites; it also provides critical wildlife movement corridor.

Provincially and interprovincially important waterway; one of two major drainages within the Edmonton area; highest expected groundwater yields within area; acts as a line sink inducing groundwater flow toward itself (Ceroici 1979); numerous contact springs and seepages found along valley.

A number of regionally significant dinosaur finds occur along the North Saskatchewan River valley, especially on remnant terraces, notably in the Clover Bar area (Andy Neuman, Royal Tyrrell Museum, pers. comm.; Jim Burns, Provincial Museum, Edmonton, pers. comm.); on the river bank opposite Fort Edmonton Park, bones of a large hadrosaur have been noted weathering out of the bank; a large partial skull of one of these plant-eating dinosaurs was recovered from the gravels at Hawrelak Park (Roed 1978).

Some 70-80 regionally significant archaeological finds also occur within the river valley (Milt Wright, Alberta Culture, Edmonton, pers. comm.)

There are a number of highly important cultural and historical sites within the valley; 44 sites of cultural significance including four agricultural sites, 20 coal mining sites, 10 recreational sites and 10 trails, roads, fords, bridges and railroad sites have been identified; highly important as a focal point of Native culture and as a transport corridor during the fur trade.

Criteria

- high community and plant species diversity
- high habitat diversity
- critical wildlife habitat
- habitat for rare species
- high species diversity
- resident fish populations
- recognized or documented historical sites of significance
- recognized or documented archaeological sites of significance
- recognized or documented palaeotological sites of significance
- provides critical hydrological function
- groundwater discharge/springs
- provides critical linking function to ESAs identified outside of city
- provides critical linking function to ESAs identified within the city
- wildlife corridor
- unique geological or landform feature
- landform diversity
- hazard lands

The entire North Saskatchewan River Valley within the city limits has been classed as a "nationally" significant environmentally sensitive area. It represents the best example in Canada of a major river valley system that is relatively undisturbed in a major urban setting; other significant river valleys such as the Fraser (Vancouver), South Saskatchewan (Saskatoon), Red River (Winnipeg), Bow (Calgary), Ottawa (Ottawa), St. Lawrence (Montreal, Quebec City) and St. John (Fredericton) rivers have intensive residential, recreational and commercial development within the valley; with the exception of Montreal and Vancouver, areas mentioned above have lesser populations (Edmonton 600,000+) and significantly developed commercial and

business areas on terraces subject to periodic flooding; most of North Saskatchewan River Valley within Edmonton remains in natural condition with exception of limited recreational developments (intensive and extensive) and residential development in the downtown area. The valley itself provides a unique combination of vegetation, wildlife, landform features as well as providing critical corridors and linkages to adjacent table lands within the city of Edmonton.

Sensitivity High

The steep valley walls that characterize most of the valley are highly sensitive to most forms of disturbances due to instability; fragile vegetation communities (poor rooting due to nature of parent materials); terraces such as Hawrelak, Laurier, Emily Murphy, Cloverdale, Rossdale, Buena Vista and Goldbar are moderately sensitive to occasional flooding; increased river sedimentation due to any disturbances.

References:

Bibby (1974); Bowser *et al.* (1962); Ceroici (1979); Dudley (1991 a,b); Ealey (1986); EPEC Consulting Western Ltd (1981, 1982); Hutchinson (1978); I.D. Systems Ltd. (1983); Infotech Services and Associates (1989 a,b), Marshall Macklin Monoghan Western Ltd. (1983); Mowat (1992); Edmonton Parks and Recreation (1990 a,b; 1992); Strong *et al.* (1985); Strong and MacCallum (1984); Roed (1978); Westworth & Associates (1991); Smith, A.R. and P.F. Assman (1980); R.L. & L. Ltd. (1988); Andy Neuman, Royal Tyrrell Museum, Drumheller, Alberta; Jim Burns, Provincial Museum, Edmonton, Alberta; Milt Wright, Alberta Culture, Edmonton, Alberta.

Site Name **LOWER WHITEMUD CREEK**

Significance **Provincial Environmentally Sensitive Area**

Site Location Downstream from 23rd Avenue to confluence with North Saskatchewan River; portions of Sections 1, 12, 13 and 24 Twp 52 Rge 25 W4M; includes confluence of Whitemud and Blackmud creeks.

Description

This tract of land extends a distance of 6.3 km and is largely undeveloped; the only facility developments occur at Rainbow Valley and Whitemud Creek parks; numerous footpaths have been created along valley floor and walls; valley is rugged, picturesque and has a variety of plant and animal species.

It is characterized by a high vegetation diversity including nine distinct vegetation communities--grasslands occur on disturbed and south-facing slopes; shrublands on dry south-facing slopes, streambanks and forest edge; balsam poplar-white spruce on moist slopes and valley bottoms; white spruce-white birch on old stream terraces; white spruce on cool, moist north-facing slopes; balsam poplar and/or aspen along ravine edges, terraces and floodplains; white birch-balsam poplar on moist northeast-facing slopes; white birch along streams in moist areas; and aquatic communities in streams, ponds and marshy areas; nine plant species considered to be rare, uncommon or of occasional occurrence in Edmonton including *Rhytidiadelphyus triquetus* (rare), western wood lily (uncommon), blue-eyed grass (occasional), Drummond's rock cres (uncommon), sticky alum-root (uncommon), slender milk vetch (uncommon), long-spurred violet (rare), Indian pipe (uncommon) and false dragon head (uncommon).

Distinct local landform; much of the areas within the lower reach of Whitemud Creek would be classed as "hazard lands" due to steep, unstable nature of landform; slope failure and active landsliding a major concern of Parks and Recreation; springs and seeps common throughout lower reach of Whitemud Creek.

The lower reach of Whitemud Creek provides critical habitat for a number of wildlife species, including white-tailed deer, small mammals, songbirds and fish; 10 wildlife species classed as either rare, uncommon, or status unknown possibly inhabit this ravine; boreal chorus frog (status unknown); great blue heron (rare), northern goshawk (hypothetical; thought to occur but not confirmed), northern saw-whet owl (unknown), pileated woodpecker (uncommon), northern three-toed woodpecker (rare), golden-crowned kinglet (uncommon), western tanager (rare), Canada lynx and northern flying squirrel (hypothetical); rare nesting record of barred owl; 91 species of birds including merlins,belted kingfisher, black-backed woodpecker, boreal chickadee, hairy and downy woodpeckers, great-horned owl, 33 species of mammals, four species of herptiles and 11 species of fish.

Provincially significant palaeotological finds along the lower reach of Whitemud Creek; locality has produced a wealth of material including part of a hadrosaur (duckbill dinosaur) skeleton, lots of isolated hadrosaur

bones and isolated tyrannosaur (meat-eating dinosaur) teeth (Andy Neuman, Royal Tyrrell Museum, Drumheller).

The lower reach of Whitemud Creek has been classed mainly as preservation zone, except for Rainbow Valley (Parks and Recreation 1992).

Criteria

- high community and plant species diversity
- rare/endangered plant species
- critical habitat for rare/uncommon wildlife species
- high wildlife species diversity
- high habitat diversity
- groundwater discharge
- unique landform feature
- steep, usually unstable slopes (hazard lands)
- provides critical linking function to ESAs identified within the city
- recognized or documented palaeotological sites of significance

Lower Whitemud Creek has been classed as a "provincially" significant environmentally sensitive area because of the presence of provincially significant palaeotological finds and the occurrence of rare wildlife and plant species.

Sensitivity High

Highly sensitive to disturbance because of steep, relatively unstable valley walls; fragile ecosystem dependent upon unique conditions (slope, aspect, seepage, valley width, etc.) within valley; increased siltation may result from any disturbances.

References:

Ealey (1986); Gretzinger (1992); Marshall Macklin Monaghan Western Ltd. (1983); Edmonton Parks and Recreation (1990 a,b); Roed (1978); McNicoll (1973); Salt and Salt (1976); Andy Neuman, Royal Tyrrell Museum, Drumheller, Alberta.

Site Name **BIG ISLAND**

Significance **Provincial Environmentally Sensitive Area**

Site Location Southwest corner of city; north side of North Saskatchewan River Valley; can be accessed from of 199 St. south of 23rd Avenue; includes portions of Sections 29 and 32, Twp 51, Rge 25 W4M

Description

A 139-ha site including Big Island and adjacent wooded slopes; large terrace/oxbow complex adjacent the North Saskatchewan River.

Four distinct vegetation communities including mature open balsam poplar with heavily grazed understorey; aspen-dominated slopes with occasional white birch; balsam poplar-white spruce; and emergent aquatics within shallow ponds; site of largest known balsam poplar in Alberta (39.6 m.); largest living plant specimen in Alberta (Sellers, pers comm.); old balsam poplar component is described as "very old non-regenerating forest."

Critical wildlife production area; species include deer (year-round habitat); great blue heron (rare), Canada geese (staging area); ducks including bufflehead, ring-necked duck and lesser scaup; black-billed magpie (nine nests observed); woodpeckers (cavities in dead and dying balsam poplar); active beaver lodge in relic oxbow; and black wood ants (a dozen or more mounds in dense concentration in open woodland near river); particularly valuable for deer as a refuge from hunters during the fall; up to 30 deer in area.

Particularly valuable as an example of very old non-regenerating forest.

Criteria

- high community and plant species diversity
- old growth forest
- critical wildlife habitat

Big Island has been classed as a "provincially" significant environmentally sensitive area as it is the site of the largest known balsam poplar in Alberta.

Sensitivity High

Highly sensitive to disturbances such as grazing and recreation (already evidenced by reduced understorey vegetation); slopes highly sensitive to disturbances due to instability of materials; oxbows especially sensitive to any form of disturbance, especially land-filling.

References

Ealey (1986); EPEC Consulting Western Ltd. (1982); Alberta Forestry Association (1984)

Site Name **BIG LAKE AREA**

Significance **Regional Environmentally Sensitive Area**

Site Location Northwest Edmonton adjacent (immediately south of) Big Lake and St. Albert; includes portions of Sections 17, 18, 19 and 20 Twp 53 Rge 25 W4M and portions of Section 13 and 24 Twp 53 Rge 26 W4M; includes Kirk and Horseshoe Lakes; occurs within Big Lake Area Structure Plan.

Description

Adjacent to the provincially significant Big Lake (recognized as one of the twenty most important waterfowl units in Alberta; proximity to a large urban centre adds to its importance since the area is easily accessed and has very significant tourist, interpretative and educational potential).

Highly diverse area consisting of upland vegetation and two permanent water bodies (Kirk and Horseshoe lakes) including willow shrub along shorelines, balsam poplar-aspen stands along the banks, mature aspen forests on the slopes, mature balsam poplar-white spruce communities and black spruce forests on upland sites; isolated pockets of white birch; rare and/or unusual plant species may be found in bog habitats (Russel and Speirs 1984)

High wildlife species diversity; mammals include snowshoe hare, lynx, mule deer, mice, meadow vole, coyote, mink, weasel and white-tailed deer; most of the marsh and woodland bird species occurring in the Edmonton area can be found in the Big Lake area; self-sustaining pheasant population.

Kirk Lake is an open, deep-water lake with flooded trees along shoreline; not very attractive for waterfowl but good for aquatic furbearers including beaver and muskrat and cavity-nesting birds; good peripheral wetlands that appear to be attractive to breeding ducks; Horseshoe Lake is seasonal in nature with a narrow band of mudflats leading to cattails and bush beyond; peripheral wetlands are abundant between Kirk and Horseshoe lakes, all are very low or dry and several have beaver lodges and runs present (Ducks Unlimited 1992, unpublished).

Both Kirk and Horseshoe lakes are maintained by freshwater springs; important in maintaining the hydrological integrity of Big Lake.

Provides critical linking function to provincially significant Big Lake (recognized as one of the 20 most important waterfowl units in Alberta).

"Barkley Barn" of historical significance (S.E. 1/4 Section 13, Twp 53 Rge 26 W4M).

Surrounding land uses are mainly agricultural with minor amounts of recreational (Glendale Golf Course) and country residential.

Local efforts to remove beaver ponds pose a hazard to the stability of Big Lake's water levels.

Criteria

- high community and plant species diversity

- rare and unusual plant species
- critical wildlife habitat
- habitat for rare or endangered species
- high species diversity
- high habitat diversity
- groundwater discharge/springs
- provides critical function in maintaining or balancing local hydrology, including Big Lake
- permanent water bodies and wetlands
- provide critical linking function to ESAs outside of the city of Edmonton
- recognized historical site of significance

The Big Lake area has been classed as a "regionally" significant environmentally sensitive area because it serves a critical role in maintaining and balancing of the hydrology of the "provincially" significant Big Lake.

Sensitivity High

While being an upland area, this particular natural area is critical in preserving the hydrological integrity of Big Lake; any disturbances in this area will be manifested in Big Lake; highly sensitive to disturbances; most soils in this area are formed on glaciolacustrine materials that have a high runoff factor and are susceptible to water erosion; the vegetation band on the steeply sloped south shore of Big Lake are critical to maintaining waterfowl production and staging functions; Horseshoe Lake is considered a groundwater recharge area while also having the potential to overflow 199th Street in a 1:50 year or greater storm; all low-lying areas have a high water table; significant changes to the vegetation cover could impact surface drainage, soil stability and wildlife habitat.

References

Ducks Unlimited (1992, unpubl.); Ealey (1986); IMC Consulting Group Inc. (1991); Infotech Services and Associates (1989 a,b); Pedocan Land Evaluation Ltd. (1990); Penner and Associates Ltd. (1990).

Site Name **RIVERBEND**

Significance **Regional Environmentally Sensitive Area**

Site Location Northeast Edmonton, between Manning Freeway and North Saskatchewan River valley; portions of Sections 14, 15 and 22 Twp 54 Rge 23 W4M.

Description

Major tract of mature woodland (65 ha) on a river terrace of the North Saskatchewan River; largest stand of riparian forest in Restricted Development Area.

Vegetation cover consists largely of balsam poplar-aspen forests, some balsam poplar-white spruce forests and a narrow band of willow scrub lines the North Saskatchewan River; well-developed understorey of red-osier dogwood, saskatoon, rose, high-bush cranberry and low-bush cranberry.

High vegetation diversity leads to high species diversity within area; critical habitat for a large variety of birds and mammals, including moose, deer, rabbit, weasel, muskrat, great blue heron (rare), belted kingfisher, numerous ducks including mallard, bufflehead, mergansers, American robin, warblers, blue jay, sparrow, junco, chickadees and black-billed magpie; supports large population of deer on a year-round basis.

Relatively untouched area with limited gravel extraction and clearing; remnant clearings regenerating to aspen, balsam poplar and willow.

Varied topography and biotic communities and scenic.

Criteria

- high community and plant species diversity
- high habitat and species diversity
- provides critical habitat for maintenance of all life cycle stages

The Riverbend area has been classed as a "regionally" significant environmentally sensitive area as it represents the largest stand of riparian forest within the Restricted Development Area (RDA).

Sensitivity High

Terrace susceptible to flooding and stream bank erosion; typical levee pattern to vegetation adjacent stream banks; coarse textured parent materials make seed establishment difficult following disturbances.

References

Ealey (1986); I.D. Systems Ltd. (1983); Strong *et al.* (1985).

Site Name **MORAN LAKE**

Significance **Regional Environmentally Sensitive Area**

Location Northeast Edmonton adjacent the Manning Freeway and the Alberta Hospital and Provincial Tree Nursery
[Section 6 TP54 R23 W4M].

Description

One of relatively few lakes in northeast Edmonton; approximately 21 ha in areal extent; relatively shallow; also includes two adjacent wetlands; narrow margin of dense emergent vegetation including cattails, bulrushes and several sedge species; excellent example of lake margin succession - emergent plants that extends through dense willow to balsam poplar and aspen communities; spruce and pine plantations along the east side of Moran Lake are part of the Provincial Hospital's grounds and complement the natural habitat.

A total of 67 bird species recorded during early 1970's survey; species include 15 species of ducks, tundra swan, Canada goose, great horned owl, American coot, three species of hawks, eight species of sparrows, two species of gulls, three species of vireo, three species of warbler, four species of grebes and yellow-headed blackbird, the latter has a sizeable colony on the lake; other fauna include red-sided garter snake, frogs, dragonflies, butterflies and aquatic invertebrates; travel corridor for many species of birds and mammals.

Moderately high waterfowl capability (staging and production) identified by Alberta Energy and Natural Resources (1982); southwest wetland provides good pair space for waterfowl; northwest wetland has narrow band of aspen and willow along south and western edges that provide excellent upland nesting cover (Ducks Unlimited, unpublished).

Significant for providing year-round habitat for many species of birds and mammals; stable water levels produce excellent muskrat habitat.

Intensively cultivated beyond; effort should be made to secure wetland (Ducks Unlimited 1992).

The lake has fresh underground springs which maintain its relatively constant water level.

Criteria

- permanent open water
- groundwater discharge/springs
- high community and plant species diversity
- high wildlife species diversity
- provides critical habitat for a number of wildlife species
- travel corridor

Moran Lake has been classed as a "regionally" significant environmentally sensitive area as it has unusually high wildlife species diversity and provides a critical function in maintaining or balancing local hydrology.

Sensitivity High

Highly sensitive to any disturbances such as drawdown (withdrawal of water for agricultural, domestic and industrial uses) because vegetation is highly dependent upon stable water levels; aquatic macrophytes and nesting ducks strongly affected by any form of pollution; surrounding wet meadows highly sensitive to disturbances such as grazing and trampling by cattle.

References

Ealey (1986); Ducks Unlimited (1992, unpubl); Alberta Energy and Natural Resources (1982).

Site Name LOWER MILL CREEK RAVINE

Significance Local Environmentally Sensitive Area

Location Extends southeasterly from Cloverdale (Conners Road and 99th Street) to Argyll Road

Description

Deeply incised ravine with steep valley walls with limited valley floor; Classed as conservation zone (Parks and Recreation, 1992).

White spruce predominates on slopes with aspen in valley floor; balsam poplar occurs in some abundance, white birch is only occasional on slopes.

Highly diverse wildlife species including forest tent catapillar, eastern tiger swallowtail butterfly and white admiral butterfly; 54 bird species, nine mammals and four herptiles; no fish species.

Active slumping in parts of Mill Creek; significant portions mapped as "hazard lands."

Provides important linking function, both physically and visually, between table lands and the North Saskatchewan River valley; important movement corridor for wildlife species.

Surrounding land uses include mainly residential and recreational development; Heavily used for outdoor recreation and nature watching.

Criteria

- high community and plant species diversity
- high habitat and wildlife species diversity
- unique landform feature
- steep, usually unstable slopes (hazard lands)
- provides critical linking function to ESAs within the city

Sensitivity High

The lower reaches of Mill Creek are highly sensitive to disturbances; lower reach more susceptible to slope failure due to steep, relatively unstable slopes; upper reaches also sensitive but for other reasons such as industrial pollution, stream bank erosion and local dumping; increased siltation results from any disturbances; upper reach cannot withstand any further fragmentation of habitat.

References

Besko (1992); Ealey (1986); Edmonton Parks and Recreation (1992);EPEC Western Consulting Ltd.(1982); Marshall Macklin Monaghan Western Ltd. (1983).

Site Name **UPPER MILL CREEK RAVINE**

Significance **Local Environmentally Sensitive Area**

Site Location Extends east from 75 Street near Wagner Road to Highway 14 (Section 32 Twp 51 Rge 23 W4M)

Description

Partially fragmented valley with a variety of surrounding land uses including industrial, agricultural, recreational, commercial and residential; some portions more deeply incised including stretch between 50 Street and 34 Street (Minchau Park); reach between Whitemud Drive and 34 Street classed as conservation zone.

Diverse vegetation composition; communities vary from white spruce-dominated slopes in the Minchau area to mixedwood- and deciduous-dominated communities elsewhere; deciduous and shrubland communities dominate on narrow valley floor.

Although vegetation is relatively diverse, not many wildlife species have been recorded within this portion of Mill Creek; species include black-billed magpie, downy woodpecker, American robin, black-capped chickadee and pine grosbeak; mice/vole tracks observed; no evidence of deer or rabbit; great horned owl nested in area in early 1980s.

Provides critical linking function between table lands and the lower reach of Mill Creek Ravine; provides critical linking function between ESAs identified within the city and several sites within the county of Strathcona.

Heavy use by local residents for hiking and observing nature.

Criteria

- high community and plant species diversity
- high wildlife habitat diversity
- provides critical linking function to ESAs identified within city
- provides critical linking function to ESAs identified outside the city

Sensitivity High

The lower reaches of Mill Creek are highly sensitive to disturbances; lower reach more susceptible to slope failure due to steep, relatively unstable slopes; upper reaches also sensitive but for other reasons such as industrial pollution, stream bank erosion and local dumping; increased siltation results from any disturbances; upper reach cannot withstand any further fragmentation of habitat.

References

Besko (1992); Ealey (1986); Edmonton Parks and Recreation (1992); EPEC Western Consulting Ltd.(1982); Marshall Macklin Monaghan Western Ltd. (1983).

Site Name

WHITEMUD - BLACKMUD CREEKS
(Upstream from 23rd Ave.)

Significance Local Environmentally Sensitive Area

Site Location Upper reaches of Whitemud Creek (upstream from confluence with Blackmud Creek, south of 23rd Avenue) and all of Blackmud Creek; Whitemud Creek reach begins in Section 36 Twp 51 Rge 25 W4M, while Blackmud Creek begins in Section 31 Twp 51 Rge 24 W4M and extends south to 41st Avenue S.W. (County of Leduc).

Description

Diverse vegetation communities varying from deciduous to coniferous-dominated mixed stands within valley bottoms; Ealey (1986) previously identified 30 significant sites within both stream courses; 24 within Whitemud Creek totalling nearly 170 ha of balsam poplar-aspen forest; six within Blackmud Creek totalling approximately 62.5 ha of balsam poplar-aspen and balsam poplar-white spruce communities.

Significant landform feature in southwest Edmonton; both creeks have downcut to local bedrock; erosional activity is more lateral in nature resulting in meandering stream courses.

Provides important physical linkage for wildlife, including white-tailed deer, small mammals and birds, between table lands and lower reaches of Whitemud Creek.

Many isolated carnosaur and seratopsian teeth have been picked up in outcrops of the Edmonton Formation along both Whitemud and Blackmud creeks; 3000-4000 year old beaver dam (radiocarbon dated) on Blackmud Creek.

Surrounding land uses are mainly agricultural with minor amounts of country residential and recreation (7 Oaks Golf Course).

Criteria

- high community and plant species diversity
- unique landform feature
- provides critical linking function to ESAs identified within the city
- provides critical linking function to ESAs identified outside the city
- recognized or documented palaeotological sites of significance

Sensitivity High

Highly sensitive to disturbances; exposed bedrock and parent materials along stream courses more susceptible to erosion; increased siltation due to any disturbances reduces fish habitat quality; removal of vegetation results in loss of key wildlife habitat which is critical due to surrounding predominately agricultural land use.

References

Ealey (1986); Parks and Recreation (1990 a,b); Roed (1978); Dr. Bruce Rains, University of Alberta, Edmonton; Jim Burns, Provincial Museum, Edmonton, Alberta.

Site Name **HORSEHILLS CREEK**

Significance **Local Environmentally Sensitive Area**

Site Location Northeast corner of Edmonton; enters North Saskatchewan River valley ta Section 4 Twp 54 Rge 23 W4M.

Description

Originates in the Horsehills area of northeast Edmonton; extensive drainage system; while much of Horsehills Creek is rather non-descript, the lower reaches are particularly significant from an aesthetic point of view - they are characterized by steeply incised, relatively unstable slopes that have given rise to high plant community diversity which supports a high number of wildlife species; similar to other ravines within Edmonton, though very shallow throughout most of its length.

Productive mosaic of intact native vegetation in lower reaches (Evergreen Mobile Park to North Saskatchewan River); unusually high number of biological communities.

Important habitat for wintering birds; excellent owl habitat; numerous beaver dams and lodges; significant wintering deer yard.

Lower reaches characterized by steeply inclined slopes susceptible to erosion and slumping; active landsliding; "hazard lands"; upper reaches less steep and more susceptible to sidecutting resulting in a more meandering pattern.

Provides important linking function, both visual and physical, between table lands in northeast Edmonton and Municipal District of Sturgeon and the North Saskatchewan River valley.

Previously identified by Ealey (1986), I.D. Systems Ltd. (1983) and Strong *et al.* (1985) as a potential environmentally sensitive area.

Visually attractive; actively used by local residents for hiking and nature observation.

Criteria

- high community and plant species diversity
- high wildlife habitat diversity
- unique landform feature
- "hazard lands"
- provides critical linking function to North Saskatchewan River Valley

Sensitivity High

Highly sensitive to disturbances; lower reaches (between Evergreen Mobile Park and North Saskatchewan River) particularly susceptible to slope failure; upper reaches more prone to stream bank erosion, local dumping and pollution from surrounding agricultural land uses; increased siltation results from any disturbances; further fragmentation of remaining vegetated parcels would lead to disruption of corridor and linking functions with North Saskatchewan River valley; water quality susceptible to increased nutrient loading from adjacent agricultural activities.

References

Ealey (1986), I.D. Systems Ltd. (1983) and Strong *et al.* (1985).

Site Name HORSEHILLS CREEK HEADWATER LAKE

Significance Local Environmentally Sensitive Area

Site Location Northeast Edmonton
[Sec 20 TP54 R23 W4M]

Description

Ephemeral wetland (12.4 ha) forms part of the headwaters for Horsehills Creek (locally significant watercourse); one of only a few ephemeral wetlands within the northeast portion of Edmonton.

Slough covered with emergent vegetation including sedges and small aquatic plants; no cattails; few open water areas; cattle grazing has impacted vegetation.

Potentially important waterfowl staging and production area (Alberta Energy and Natural Resources 1982).

Surrounding land use is agricultural.

Criteria

- high habitat diversity
- important waterfowl staging and production area

Sensitivity High

Highly sensitive to any disturbances such as drawdown, grazing or trampling; aquatic and emergent vegetation highly dependent upon stable water levels.

References

Ealey (1986); Alberta Energy and Natural Resources (1982).

Site Name **LOWER OLDMAN CREEK**

Significance **Local Environmentally Sensitive Area**

Site Location East Edmonton, north of 137 Avenue between city boundary and North Saskatchewan River;
[Sec 27 TP53 R23 W4M]

Description

Portions of Oldman Creek in county of Strathcona previously identified by Infotech Services and Associates (1989 a,b) as being locally significant.

Lower Oldman Creek composed of diverse vegetation communities consisting mainly of mixedwood stands of aspen, balsam poplar and white spruce; limited grassland/shrubland communities on south-facing slopes; some cattails have developed where water is more stagnant and slopes less steep.

Interesting ravine feature in east Edmonton; steep valley walls, probable "hazard lands."

Significant as a physical and visual linkage from adjacent table lands and county of Strathcona ESAs to the North Saskatchewan River valley; it provides a key corridor between the "locally significant" upper Oldman Creek in the county of Strathcona and the North Saskatchewan River valley.

Important travel/movement corridor for a variety of bird and mammal species.

Criteria

- high community and plant species diversity
- unique landform feature
- "hazard lands"
- provides critical linking function to North Saskatchewan River valley from adjacent sites within the table lands and within the county of Strathcona

Sensitivity High

Highly sensitive to disturbances as slopes are prone to failure; unique vegetation communities and resultant habitat is highly dependent upon maintenance of ecosystem balance; increased stream siltation due to any surface disturbances; possible pollution from adjacent agricultural and industrial land uses.

References

Infotech Services and Associates (1989 a,b).

Site Number **WEDGEWOOD RAVINE**

Significance **Local Environmentally Sensitive Area**

Site Location Extends southwest from the North Saskatchewan River (Section 9 TP52 R25 W4M) to Stony Plain I.R. 135 (Section 6 TP52 R25 W4M)

Description

Approximately 100 ha of diverse ravine habitat with slopes ranging from gentle to strongly sloping (9-45%); narrow ravine system with limited adjacent upland habitat; Ealey (1986) previously identified seven sites within this ravine system.

Vegetation strongly reflects microclimates within valley; balsam poplar-aspen communities on south-facing valley walls; white spruce-dominated communities on north-facing slopes.

Notable winter bird population and numerous mammal tracks observed during Christmas Bird Counts; of particular significance is the occurrence of great horned owl and merlins within the ravine; significant beaver activity (dams, ponds and lodges) occur in upper reaches where slopes not as significant.

Provides critical physical linkage for ungulates between North Saskatchewan River valley and uplands within Stony Plain Indian Reserve.

It is used extensively by local citizens for outdoor recreation.

Criteria

- high community and plant species diversity
- high bird species diversity
- provides critical linking function to North Saskatchewan River valley

Sensitivity High

Highly sensitive to disturbances especially slope failure; beaver populations adversely affected by drainage; roads act as partial barriers to restrict movement by ungulates; water quality impacted by adjacent agricultural land uses.

References

Ealey (1986)

Site Name OTHER RAVINES

Significance Local Environmentally Sensitive Area

Location Numerous ravines located throughout Edmonton, including Wolf Willow, Patricia, McKenzie, McKinnon, Kennedale and Capilano ravines.

Description

A number of smaller, but equally important ravines that are used extensively by local citizens for outdoor recreation; Wolf Willow, Patricia, McKenzie and portions of Kennedale ravines classed as preservation zones; McKinnon, Capilano and portion of Kennedale ravines classed as conservation zones (Edmonton Parks and Recreation 1992).

Diverse vegetation communities resulting from slope, aspect and moisture differences; aspen, balsam poplar and white spruce dominate with lesser amounts of white birch.

Steep valley walls; probable "hazard lands"

Locally significant as physical and visual linkages between table lands and North Saskatchewan River valley; movement corridors for a number of bird and mammal species.

Surrounding land uses vary from residential to country residential, commercial, industrial and agricultural.

Most ravines used for outdoor recreation and nature viewing.

Criteria

- high community and plant species diversity
- "hazard lands"
- provide critical linking function to North Saskatchewan River Valley

Sensitivity High

Highly sensitive ravines as all are susceptible to slope failure; increased stream siltation and destruction of critical habitat.

References

Edmonton Parks and Recreation (1992).

Site Name **SOUTH-END RAVINE AND CHANNEL BANK COMPLEX**

Significance **Local Environmentally Sensitive Area**

Site Location North of Clover Bar Industrial Park; between 17th Street N.E. and city boundary to the east; includes portions of Sections 22 and 27, TP53 R 23 W4M.

Description

A series of small, deeply incised, intact ravines and remnant terrace walls; composed of a number of sites previously identified by Ealey (1986) as being significant; approximately 85 ha in size.

Vegetated with a mix of aspen, balsam poplar and white spruce communities; occasional white birch.

Adjacent wetlands (gravel pits) identified by Ducks Unlimited (1992, unpubl) as being important within city environment; shorelines are very irregular; emergent vegetation sparse due to steep banks; gulls abundant; many islands occur, which attract gulls and nesting ducks; possible wetland enhancement project.

Provides critical habitat along remnant terrace walls approximately 1 km back from the North Saskatchewan River valley; area supports an abundant population of wintering deer; significant pheasant signs observed; great horned owl occur in the ravines and several raptor nests observed (Strong *et al.* 1985).

Provides key physical linkage between adjacent table lands and the North Saskatchewan River valley.

Travel corridor for birds and small mammals including deer.

Criteria

- high community and plant species diversity
- critical wildlife habitat
- provides critical linking function to North Saskatchewan River valley

Sensitivity High

Critical habitat highly susceptible to disturbances from adjacent gravel extraction, agricultural and industrial land uses; slopes less prone to failure as underlying materials consist mainly of coarse gravels.

References

Ducks Unlimited (1992, unpubl.); Ealey (1986); Strong *et al.*(1985)

Site Name **UNNAMED CREEK - NORTHEAST CORNER**

Significance **Local Environmentally Sensitive Area**

Site Location Northeast Edmonton, north of Manning Freeway; includes portions of Section 33 and 34 Twp 54 Rge 23 W4M.

Description

Drains portions of Municipal District of Sturgeon; narrow, shallowly entrenched stream channel, approximately 16.5 ha in size and is continuous.

Vegetation composition includes mainly balsam poplar and aspen with lesser amounts of willow scrub.

Important travel corridor for a number of species including deer, small mammals and birds.

Provides physical linkage between adjacent tablelands within the city and M.D. of Sturgeon and the North Saskatchewan River valley.

The lower reaches may have some appeal to local residents for outdoor recreation pursuits.

Surrounding land uses are mainly agricultural.

Criteria

- high community and plant species diversity
- provides critical linking function between adjacent tableland sites and the M.D. of Sturgeon and the North Saskatchewan River valley

Sensitivity High

Stream banks highly sensitive to disturbances; increased siltation reduces fish habitat; water quality susceptible to nutrient loading from agricultural fertilizers.

References

Ealey (1986).

Site Name **FULTON CREEK**

Significance **Local Environmentally Sensitive Area**

Location Southeast Edmonton; originates in Davies Industrial East Park (50th Street and 68 Avenue) and runs southeast to Section 8 Twp 52 Rge 23 W4M and flows into the County of Strathcona.

Description

Identified by Ealey (1986) as a natural area site within Edmonton; complex of 12 naturally vegetated sites totalling 15.1 ha along and adjacent Fulton Creek; highly fragmented.

A number of important wetlands occur adjacent creek, especially north of Whitemud Creek and west of 17th Street.

Provides critical linking function to a "locally significant" site within the county of Strathcona (Sec 3 and 10, TP52 R23 W4M); site is a Ducks Unlimited project and has good wetland habitat for production of waterfowl; provides a travel corridor for a number of birds, small mammals and deer.

Because of its location and degree of fragmentation, it is not used as extensively by local citizens as other ravines.

Surrounding land uses are mainly industrial and agricultural with minor amounts of residential development; it is crossed five times by road and three times by railway lines; highly disturbed.

Criteria

- provides critical linking function to ESAs identified outside of city

Sensitivity High

Highly sensitive; this already fragmented stream course cannot withstand any further pressures from development; stream banks susceptible to erosion; water quality strongly affected by adjacent industrial and agricultural land uses.

References

Ealey (1986); Westworth & Associates (1989).

6.0 REFERENCES

Alberta Energy and Natural Resources, 1982. *Edmonton Annexation - Fish and Wildlife Concerns*. Unpublished report submitted to City of Edmonton.

Alberta Forestry Association. 1984. *Alberta Trees of Renown - An Honour Roll of Alberta Trees*. Edmonton. 31 p.

Besko, M. 1992. *A naturalist's guide to Mill Creek Ravine*. Edmonton Natural History Club Report No. 2.

Bibby, R. 1974. *Hydrogeology of the Edmonton Area (Northwest Segment), Alberta*. Report No. 74-10. Alberta Research Council. Edmonton.

Bowser, W.E., A.A. Kjearsgaard, T.W. Peters and R.E. Wells. 1962. *Soil Survey of Edmonton Sheet (83*-H). Canada Department of Agriculture. Alberta Soil Survey Report No.l 21. 66 p.

Burns, Jim. Provincial Museum, Edmonton, Alberta. *pers. comm.* 1993.

Ceroici, W. 1979. *Hydrogeology of the Southwest Segment, Edmonton Area, Alberta.* Earth Science Report 78-5. Research Council of Alberta. Edmonton.

Ducks Unlimited. 1992. *City of Edmonton Wetland Reconnaissance*. (unpubl).

Dudley, K. 1991. The natural history of Edmonton (Part 3). *Edmonton Naturalist* 19(2):5-10.

Dudley, K. 1991. The natural history of Edmonton (Part 4). *Edmonton Naturalist* 19(3):5-11.

Ealey, D.M. 1986. *Urban Natural History Interpretive Sites in and Adjacent Edmonton*. Prepared for John Janzen Nature Centre. 220 pp.

Edmonton Parks and Recreation. 1990. *Ribbon of Green, North Saskatchewan River Valley and Ravine System Concept Plan*. City of Edmonton, Alberta. 54 p.

Edmonton Parks and Recreation. 1992. *Ribbon of Green, North Saskatchewan River Valley and Ravine System Master Plan*. City of Edmonton.

Edmonton Parks and Recreation. 1990 (a).*Whitemud & Blackmud Ravines Trails Development Plan*. City of Edmonton.

Edmonton Parks and Recreation. 1990 (b). *Whitemud Ravine Nature Reserve, Phase 1 Trails Construction Environmental Impact Assessment*. City of Edmonton.

Environment Canada. 1993. *Canadian Climate Normals 1961-1990 - Prairie Provinces.* Atmospheric Environment Services.

EPEC Consulting Western Ltd. 1981. *North Saskatchewan River Valley & Ravine System Biophysical Study.* Prepared for City of Edmonton, Parks and Recreation Department.

EPEC Consulting Western Ltd. 1982. *The Edmonton - Devon Restricted Development Area Biophysical Inventory.* Prepared for Alberta Environment, Land Assembly Division, Restricted Land Use Branch.

Finlay, J., and C. Finlay. 1992. Naturalist hotspots around Edmonton. *Alberta Naturalist* 22(2):2-4.

Gretzinger, L. 1992. *A naturalist's guide to Whitemud Ravine.* Edmonton Natural History Club Report No. 3.

Hutchinson, R.A. 1978. *Scenic assessment and landscape protection: The Edmonton - Devon Restricted Development Area.* University of Alberta, Department of Geography, M.S.c Thesis.Edmonton.

I.D. Systems Ltd. 1983. *Edmonton - Fort Saskatchewan Restricted Development Area Study. Phase One Initial Environmental Assessment.* Prepared for Alberta Environment, Restricted Land Use Branch. Edmonton. 113 p + append.

IMC Consulting Group Inc. 1991. *Big Lake Area Structure Plan.* Prepared for Carrington and Liberty Joint Venture Ltd. 20 pp.

Infotech Services and Associates. 1989a,b. *Environmentally sensitive areas: County of Strathcona and M.D. of Sturgeon.* Phase Two and Phase Three reports. Prepared for Edmonton Metropolitan Regional Planning Commission. 216 pp. + xxiii + Maps.

Macdonald, C., W.E. Roberts and D.M. Ealey. 1993. The vertebrate species of Alberta. *Alberta Naturalist* 23(3):Supplement.

Marshall Macklin Monaghan Western Ltd. 1983. *North Saskatchewan River Valley and Ravine System Resource Analysis: Technical Report.* Prepared for the City of Edmonton, Parks and Recreation Department, Policy and Planning Branch. 130 p.

McNicholl, M.K. 1973. Whitemud and Woodpeckers. *Edmonton Naturalist* 12(7).

Mowat, C. 1992. *An inventory of access routes, trails, vegetation and wildlife on the north bank of the North Saskatchewan River, within the city of Edmonton, between Groat and Quesnell bridges, 1992.* Draft, unpubl. report, Edmonton Natural History Club.

Nelson, J.S., and M.J. Paetz. 1992. *The fishes of Alberta.* University of Alberta Press, University of Calgary Press, Edmonton. 437 pp.

Neuman, Andy. Royal Tyrrell Museum, Drumheller, Alberta. *pers. comm.*, 1993.

Pedocan Land Evaluation Ltd. 1990. *Red Willow Park Ecological Land Classification and Significant Natural Areas*. Prepared for the City of St. Albert.

Penner and Associates Ltd. 1990. *Environmental Evaluation of the Big Lake Area Structure Plan*. Prepared for IMC Consulting Group Inc.

Planning and Development Department. 1985. *North Saskatchewan River Valley Area Redevelopment Plan, Bylaw No. 7188*. The City of Edmonton.

Planning and Development Department. 1990. *Edmonton General Municipal Plan, Bylaw 9076*. The City of Edmonton.

R.L. & L. Ltd. 1988. *Urban Fishing Brochure for the City of Edmonton*. Coldham Press. Edmonton.

Rains, Dr. Bruce. University of Alberta, Edmonton. *pers. comm.*

Roberts, W.E. 1992a. A key to amphibians of Alberta. *The Steward*, Issue 18:5-6.

Roberts, W.E. 1992b. A key to reptiles of Alberta. *The Steward*, Issue 19:5-6.

Roed, M.A. 1978. *A Guide to Geologic Features of Edmonton Alberta*. Geo-Analysis Ltd. Ottawa.

Salt, W.R. and J.R. Salt. 1976. *The Birds of Alberta with Their Ranges in Saskatchewan and Manitoba*. Hurtig Publishers. Edmonton.

Saxena, Amit, Senior Wildlife Biologist, **GEOWEST** Environmental Consultants Ltd. Edmonton, *pers. comm.*, 1993.

Sellers, Harold. Past President, Alberta Forestry Association, Edmonton, *pers. comm.*, 1992.

Semenchuk, G. (ed.). 1992. *The atlas of breeding birds of Alberta.* Federation of Alberta Naturalists, Edmonton. 391 pp.

Smith, H.C. 1993. *Alberta mammals: an atlas and guide*. Provincial Museum of Alberta, Edmonton. 250 pp.

Smith, A.R. and P.F. Assman. 1980. Notes on the Fall Migration of Warblers and Vireos in Edmonton. *Alberta Naturalist* 10(2):43-49

Strong, W.L. 1992. *Ecoregions and Ecodistricts of Alberta*. Prepared for Alberta Forestry, Lands and Wildlife, Land Information Services Division, Resource Information Branch by W.L. Strong Ecological Land Surveys Ltd.

Strong, W.L., J.L. Kansas, K.J. Van Tighem and B. MacCallum. 1985. *A Biophysical Inventory and Analysis of the Fort Saskatchewan and Devon Restricted Development Areas*.

Prepared for Environmental Planning Section, Restricted Land Use Branch, Alberta Environment. Edmonton. 172 p.

Strong W.L. and B. MacCallum. 1984. *A Preliminary Vegetation and Wildlife Analysis of the Edmonton - Fort Saskatchewan Restricted Development Area*. Prepared for Environmental Planning Section, Restricted Land Use Branch, Alberta Environment. Edmonton. 107 p.

Westworth, D.A. and Associates Ltd. 1991. *Environmentally sensitive areas study: County of Leduc.* Report prepared for Edmonton Metropolitan Regional Planning Commission. Volume II-Technical Report. 154 pp.

Wright, Milt. Alberta Culture, Edmonton, Alberta. *pers. comm.* 1993.

APPENDIX A

GLOSSARY OF TERMS

Table A-1 Glossary of Terms

Criteria	Sub-criteria	Key Terms
Size	• more than 2 ha for forested areas	**Forested Area** - healthy or relatively undisturbed stands; these areas have overstories made up of aspen, balsam poplar, spruce or birch; relatively undisturbed understories characterize these areas; stands grazed by cattle or horses eliminated from further classification; remnant fence lines or shelter belts not included unless they connect two or more larger forested areas.

Vegetation	• presence of rare plant species	**Rare Plant Species** - one that has a small population within Alberta; it may be restricted to a small geographical area or occur sparsely over a wide area; it need not be restricted to the province (Packer & Bradley 1984).
	• high plant species diversity	**Plant Species** - includes any member of the plant kingdom, including algae, fungi, mosses, liverworts, ferns and seed plants identified to the specific level of taxonomy (Harrington & Durrell 1957). **Plant Species Diversity** - a measure of the number of species of living organisms in a particular ecosystem (Kimmins 1992); can be measured at three levels including ecosystem, species and genetic diversity; measures of diversity are seen as indicators of the health of ecological systems (Magurran 1988).
	• "old growth" forests	**Old Growth** - is one successional stage in the continuum of successional stages in a forest cycle; it is however the most stable stage - where stability is defined as the ability of the community to withstand catastrophe (Margalef 1969) or to return to its "original" state after severe alteration (Maser 1990); old growth forests differ significantly from young growth forests in species composition, structure and function; they are characterized by large live trees, large snags (standing dead trees), large fallen trees on the land and fallen trees in streams (Franklin *et al.* 1981); could include both deciduous and coniferous stands; related directly to periodicity of fire; stands generally greater than 100 years of age.

Wildlife	• habitat for vulnerable, threatened or endangered species	**Vulnerable Wildlife** - species that are at risk because of low numbers or restricted range and therefore, although not in immediate danger, could be at any time (Committee on the Status of Endangered Wildlife in Canada, COSEWIC). **Threatened Wildlife** - species are likely to become endangered if the pressures from human or natural causes making them vulnerable are not reversed (COSEWIC). **Endangered Wildlife** - species that are threatened with immediate extirpation (species are no longer found in the wild in Canada, although they exist elsewhere) (COSEWIC).
	• high habitat diversity	**Habitat** - the kind of biotic community, or set of biotic communities, in which an animal or population lives; suitable habitat provides all requirements of a species for one year-round season (Bailey 1984). **Habitat Diversity** - is the measure of the number of differing habitats within a particular ecosystem (for example, a particular site may be characterized by both forested and wetland habitats, thus providing a high degree of habitat diversity).
	• high wildlife species diversity	**Wildlife Species** - includes all free-ranging vertebrates in their naturally associated environments; other definitions are much broader and may include all animals in wild ecosystems (Bailey 1984).
	• provides critical habitat for maintenance of all or significant component of life cycle stages	**Critical Habitat** - various types of food, cover and other factors needed by a wildlife species for survival and reproduction success (Bailey 1984).

Landform	• unique geological or landform feature • landforms highly sensitive to disturbance	**Landform Features** - any natural feature of the earth's surface; a dimensional landscape feature that presents definite characteristics such as relief, size and composition (i.e., river valleys, hummocky moraine, sand dunes, outwash plains, kames, eskers, wetlands, mountains, etc.). **Highly Sensitive Landforms** - landforms such as sand dunes or recent fluvial deposits that are susceptible to human disturbance because of their relative instability caused by non-compact, coarse-textured parent materials.
Hydrology	• permanent wetlands • permanent open water	**Wetlands** - a wetland is land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activities which are adapted to a wet environment; wetlands include bogs, fens, marshes, swamps and shallow water (usually 2 meters deep or less) (The Canadian Wetland Classification System 1987). **Open Water** - areas of water usually greater than 2 meters deep.
Corridors/ Linkages	• provides critical linking function to ESAs identified outside the City of Edmonton • provides critical linking function to ESAs identified within the North Saskatchewan River Valley and Ravine System	**Critical Linking Function** - urgently needed habitat connecting two larger, more continuous habitats or areas used by wildlife (i.e., narrow fence rows or remnant forested lands that by themselves do not provide adequate habitat for maintenance of all or significant components of life cycle stages); corridors used to connect two areas (for example, an upland forested area and the North Saskatchewan River Valley and Ravine System); disruption of such habitat may alter use of the area or the vulnerability of the wildlife species.

Ability to Sustain Use	• highly sensitive to all forms of disturbance	**Highly Sensitive** - because of its inherent properties, the feature in question (i.e., landform, wildlife, plants or water) has the ability to be severely affected by minimal amounts of disturbance (e.g., clearing of forest from sand dunes reduces the stability of the dunes and leads to erosion problems and loss of habitat).

APPENDIX B

DATABASE DESIGN

Database Structures

The purpose of this appendix is to provide background information on the nature and structure of the databases for this study. As mentioned in Section 4.0 (Database Design), a number of databases have been created including graphical and non-graphical, attribute databases. The two non-graphical databases include an ESA database and a Biophysical database. In both of these databases, the first field (SITENUMB) is the key which identifies the polygon number and allows the user to relationally access both databases.

ESA Database

The ESA database is intended to be as flexible as possible. The structure of the ESA database is presented in Table B-1. For presentation purposes, the structure presented has fields for only three sensitivity codes, five keycodes, three land use, three surrounding land uses and three historical land uses. The study team recognized that in some instances, some environmentally sensitive areas, especially large complexed areas, may have more than five key codes or more than three land uses, etc; as such, more fields can be added to the database to reflect the appropriate data.

Biophysical Database

The biophysical non-graphical (attribute) database contains all biophysical data that was recorded at each site. The structure of the biophysical database is presented in Table B-2.

Secondary Databases

A number of secondary databases are available to provide a full explanation of all codes used within this study. This database contains two fields, the first is KEYCODE, which is used to link the appropriate keycode field in the ESA database. The second field provides a full description of the code. This approach is used for the fields presented in Table B-3.

Table B-1 ESA Database Structure

	Field	Explanation	Type	Width
1.	SITENUMB	Site Number	Numeric	3
2.	SITENAME	Site Name	Character	25
3.	EALEYNUM	Ealey Number	Character	5
4.	DATE	Date of database	Numeric	10
4.	TOWNSHIP	Township	Numeric	2
5.	RANGE	Range	Numeric	2
6.	SECTION	Section	Numeric	2
7.	QUARTSEC	Quarter Section	Numeric	2
8.	PHOTONUM	Air Photo Number	Character	8
9.	AREASPLN	Area Structure Plan	Character	15
10.	AREA	Area (ha)	Numeric	6.2
11.	EDGE	Edge	Character	1
12.	SENSITVT	Sensitivity Rating	Character	1
13.	SENSCOD1	Sensitivity1 Code	Character	2
14.	SENSCOD2	Sensitivity2 Code	Character	2
15.	SENSCOD3	Sensitivity3 Code	Character	2
16.	SIGNLEVL	Significance Level	Character	4
17.	KEYCODE1	Significance Keycode1	Character	3
18.	KEYCODE2	Significance Keycode2	Character	3
19.	KEYCODE3	Significance Keycode3	Character	3
20.	KEYCODE4	Significance Keycode4	Character	3
21.	KEYCODE5	Significance Keycode5	Character	3
22.	OWNERSHP	Land Ownership	Character	3
23.	LANDUSE1	Current Land Use1	Character	3
24.	LANDUSE2	Current Land Use2	Character	3
25.	LANDUSE3	Current Land Use3	Character	3
26.	SURRUSE1	Surrounding Land Use	Character	3
27.	SURRUSE2	Surrounding Land Use	Character	3
28.	SURRUSE3	Surrounding Land Use	Character	3
29.	HISTLNDU1	Historical Land Use	Character	3
30.	ACCESS	Access to Site	Character	15
31.	LVINT	Level of Interest	Character	1
32.	PLANMNGM	Planning/Management	Character	2
33.	PROXRV	Proximity to River Valley	Numeric	6.2
33.	PROXESA	Proximity to nearest ESA	Numeric	6.2
34.	FLAGF	Flag field	Numeric	1

Table B-2 Biophysical Database Structure

	Field	Explanation	Type	Width
1.	SITENUMB	Site Number	Numeric	3
2.	COMP1PER	Component 1 - Percent[1]	Numeric	3
3.	VEGTNT1	Vegetation1	Character	2
4.	STNDCON1	Stand condition1	Character	2
5.	PRNTMAT1	Parent Material1	Character	2
6.	SURFEXP1	Surface Expression1	Character	1
7.	SLOPE1	Slope Class1	Character	1
8.	DRAIN1	Drainage1	Character	1
9.	SOIL1	Soil1	Character	7
10.	SOILSER1	Soil Series1	Character	3
11.	SRFTEXT1	Surface Texture1	Character	4
12.	PMTEXT1	Parent Material Texture1	Character	4
13.	COMP2PER	Component 2 - Percent	Numeric	2
14.	VEGTNT2	Vegetation2	Character	2
15.	STNDCON2	Stand condition2	Character	2
16.	PRNTMAT2	Parent Material2	Character	2
17.	SURFEXP2	Surface Expression2	Character	1
18.	SLOPE2	Slope Class2	Character	1
19.	DRAIN2	Drainage2	Character	1
20.	SOIL2	Soil2	Character	7
21.	SOILSER2	Soil Series2	Character	3
22.	SRFTEXT2	Surface Texture2	Character	4
23.	PMTEXT2	Parent Material2 Texture	Character	4
24.	COMP3PER	Component 3 - Percent	Numeric	2
25.	VEGTNT3	Vegetation3	Character	2
26	STNDCON3	Stand condition3	Character	2
27.	PRNTMAT3	Parent Material3	Character	2
28.	SURFEXP3	Surface Expression3	Character	1
29.	SLOPE3	Slope Class3	Character	1
30.	DRAIN3	Drainage3	Character	1
31.	SOIL3	Soil3	Character	7
32.	SOILSER3	Soil Series3	Character	3
33.	SRFTEXT3	Surface Texture3	Character	4
34.	PMTEXT3	Parent Material3 Texture	Character	4
35.	WATER	Water Permanence	Character	1
36.	DATATYPE	Type of Data	Character	1

1. Component 1: refers to the dominant component within any complexed or grouped significant natural or environmentally sensitive area, component $_{n-1}$ to the smallest component; e.g., a particular site may consist of 4 different community types, Component 1 would be the largest in terms of aerial extent, Component 4 would be the smallest in aerial extent.

Table B-3 Secondary (Linking) Databases

Field	Database	Linking Database
EDGE	ESA	EDGE
SENSITVT	ESA	SENSITVT
SENSCODEx	ESA	SENSCODE
SIGNLEVL	ESA	SIGNLEVL
KEYCODEx	ESA	KEYCODE
LANDUSE	ESA	LANDUSE
SURRUSE	ESA	LANDUSE
HISTLNDU	ESA	LANDUSE
LVINT	ESA	LVINT
FLAGF	ESA	FLAGF
VEGTNTx	BIOPHYSCAL	VEGTNT
STNDCNx	BIOPHYSCAL	STNDCON
PRNTMATx	BIOPHYSCAL	PRNTMAT
SURFEXPx	BIOPHYSCAL	SURFEXP
SLOPEx	BIOPHYSCAL	SLOPE
DRAINx	BIOPHYSCAL	DRAIN
SOILx	BIOPHYSCAL	SOIL
SOILSERx	BIOPHYSCAL	SOILSER
SRFTEXTx	BIOPHYSCAL	SRFTEXT
PMTEXTx	BIOPHYSCAL	PMTEXT

"x" refer to fields where there is more than one field with the same name e.g. KEYCODEx, there are five significance keycodes (1-5) within the primary non-graphical database. For a complete listing of all fields within the primary non-graphical database, see discussion below.

The following secondary databases provide definitions and a listing of codes for the two primary (ESA and Biophysical) databases. The two primary databases use only element codes. While the codes presented below represent the current understanding, additional codes may need to be developed to reflect changes as the project progresses. For example, notes will be taken in the field regarding visible site disturbances. This information may be input into the database via codes (secondary database) or through comment fields elsewhere.

Edge Code Database (EDGE)

Edge is defined as the transitional habitat that occurs along the perimeter of two or more contrasting cover types; for example, the edge habitat occurring between a cultivated field and a wetland complex usually consists of a ring of willow shrubland. Conversely, edge habitat is not as distinct between a deciduous stand and a deciduous-dominated mixed stand.

H - High, an area characterized by high interspersion (a measure of heterogeneity for both food and cover attributes within a landscape) of cover types; in most instances, high edge would be characterized by polygons having a minimum of three different cover types.

M - Moderate, an area characterized by having a moderate amount of interspersion; this would include a minimum of two contrasting cover types within a polygon.

L - Low, an area characterized by low amounts of interspersion; polygons are generally homogeneous in cover types.

Sensitivity Ratings Database (SENSITVT)

H - High, an area that is highly sensitive to either man- made or natural disturbances.

M - Moderate, an area that is relatively sensitive to either man-made or natural disturbances.

L - Low, an area that is relatively insensitive to either man-made or natural disturbances.

Sensitity Codes Database (SENSCODE)

se - surface erosion
f - flooding
wt - windthrow
p - pollution
dp - development pressure
w - wetness
sp - sensitive plants
ia - increased access
sc - soil compaction
br - buffer reduction
ad - altered drainge pattern
wd - wildlife disturbance

Significance Level Database (SIGNLEVL)

N - National; natural landscapes or features that are of limited distribution or are the best examples of a feature in Canada.

P - Provincial; natural landscapes or features that are of limited distribution at a provincial level or are the best examples of a feature in Alberta.

R - Regional; natural landscapes or features that are of limited distribution at a regional level or are the best examples of a feature in the region.

L - Local; natural landscapes or features that are of limited distribution or the best examples of a feature in the city of Edmonton.

Key Code Database (KEYCODE)

V - Vegetation

DV - High community diversity
RS - Rare plant species
OG - Old growth
SP - Significant plant species

W - Wildlife

UH - Ungulate habitat
UC - Ungulate corridor
WN - Waterfowl nesting
WS - Waterfowl staging, moulting and/or migration
WF - Waterfowl feeding
WA - Waterfowl all (nesting, staging and feeding)
FH - Furbearer habitat
BH - Terrestrial bird habitat
SH - Shorebird habitat
DV - High habitat diversity
RS - Rare species

L - Landform

MH - Moraine hummocky
SD - Sand dunes/eolian features
FM - Fluvial meander scars
FO - Fluvial oxbows
BO - Bedrock outcrops/exposures
SS - Steep slopes
SL - Slumps/bedrock landform failure
WB - Wetland bog
WW - Willow wetland
OW - Open water/pond (permanent water body)
GD - Groundwater discharge (springs, seeps)
DV - Landform diversity
GR - Groundwater recharge

C - Corridor/Linkages

PR - Physical link with River Valley and Ravine System
VR - Visual link with North Saskatchewan River Valley and Ravine System
PB - Physical link with Big Lake
VB - Visual link with Big Lake
PL - Physical link with lakes or stormwater retention ponds
VL - Visual link with lakes or stormwater retention ponds
PE - Physical link with environmental reserves
VE - Visual link with environmental reserves
PO - Physical link with ESAs outside the City
VO - Visual link to ESAs outside the City
VI - Visual link to other ESAs/SNAs within City

H - Historical Resources

FD - Federally designated
PD - Provincially designated
MD - Municipally designated
HR - On the City of Edmonton's inventory of heritage resources

A - Archaeological/Prehistoric Resources

PC - Prehistoric campsites
TR - Tipi rings
SF - Spiritual features (medicine wheels, cairns)
P - Paleontological Resources
Pl - Plants/invertebrates
DM - Marine vertebrates, dinosaurs, mammals
US - Unconsolidated sediments

Ownership Database (OWNERSHP)

Pri - Private
Cm - Crown
Mix - Mixed
Cty - City

A comment field will accompany the Ownership Database to allow for identification of particular owners if known or agencies/ departments to contact.

Present Land Use Database (LANDUSE)

Bw - bird watching
Hik - hiking
Nat - natural
Gra - grazing
Ccs - cross-country skiing
Wk - walking
Wv - wildlife viewing
Uc - utility corridor

A comment field will be part of this database to allow for comments regarding information such as intensity of use, duration and time of use.

Surrounding Land Use Database (SURRUSE)

CR - Country Residential
AGR - Agricultural Cropland
RS - U of A Research Station
SCH - School
RDS - Roads
RES - Residential
COM - Light commercial development
IND - Industrial development
UC - Utility corridor

Level of Interest Database (LVINT)

H - High; responses regarding particular site received from three or more individuals.

M - Moderate; responses regarding particular site received from one or two individuals.

L - Low; no responses received regarding particular site.

A comment field will exist which will identify groups or individuals who are interested in the site, e.g. agency, City Department or special interest group.

Flag Database (FLAGF)

0 - no access allowed to database record
1 - access permitted to all users

A comment field will exist that will provide information on directing the user to person/agency with authority to permit access to specific database record.

Vegetation Codes Database (VEGTNT)

The vegetation codes used in this database are taken from Ealey (1986) to ensure consistency between studies. These codes originated with Russel and Spiers (1984) in their study of Big Lake.

Codes for native grassland, rough pasture, open water/ponds and exposed mineral soil are taken from Alberta Vegetation Inventory Standards Manual, Version 2.1, Alberta Forestry, Lands and Wildlife, Resource Information Branch.

DW - Deciduous Woodland

DW1 - Aspen forest
DW2 - Aspen/Balsam poplar forest
DW3 - Balsam poplar forest
DW4 - Balsam poplar/willow scrub
DW5 - Deciduous scrub
DW6 - Paper (white) birch forest

MW - Mixedwood

MW1 - Poplar/White spruce
MW2 - Riparian complex
MW3 - Paper (white) birch/White spruce

CF - Coniferous Forest

CF1 - Spruce forest
CF2 - White spruce forest
CF3 - Black spruce forest
CF4 - Black spruce/Tamarack
CF5 - Black spruce/willow

WW - Willow Wetland

WW1 - Willow scrub
WW2 - Slough complex/Willow scrub
WW3 - Slough complex
WW4 - Sedge/Bulrush/Cattail marsh

Other

HG - Native grassland
CPR - Rough Pasture
NWL - Open water/ponds
NMS - Exposed mineral soil (e.g., sand)

Stand Condition Database (STNDCON)

As per Alberta Vegetation Inventory Standards Manual, Version 2.1, 1991 (Alberta Forestry, Lands and Wildlife, Resource Information Branch).

HL - Healthy
CC - Clearcut/partial cut
BU - Burn/partial burn
WF - Windfall
CL - Clearing
DI - Disease
IK - Insect kill
UK - Unknown kill
WE - Weather (e.g., red belt)
DT - Discoloured/dead tops
BT - Broken tops
SN - Snags
ST - Scattered timber
DR - Dried wetland
GR - Grazed/partially grazed

A comment field will exist which will allow for additional data on state of degradation, possible mitigation measures, etc.

Parent Materials Database (PRNTMAT)

As per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

A - Anthropogenic
B - Bog
C - Colluvium
E - Eolian
F - Fluvial
GF - Glaciofluvial
GL - Glaciolacustrine
M - Moraine
N - Fen
O - Organic
U - Undifferentiated
X - Residual

Surface Expression Database (SURFEXP)

As per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

Mineral Component

a - apron	**b** - blanket
f - fan	**h** - hummocky
i - inclined	**l** - level
m - rolling	**r** - ridged
s - steep	**t** - terraced
u - undulating	**v** - veneer

Organic Component

b - blanket	**h** - horizontal
o - bowl	**p** - plateau
d - domed	**r** - ribbed
f - floating	**s** - sloping

Slope Database (SLOPE)

As per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

Slope Class	Percent Slope
1	0-0.5
2	0.5-2.5
3	2.0-5.0
4	6.0-9.0
5	10-15
6	16-30
7	31-45
8	45+

Drainage Database (DRAIN)

As per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

Drainage Class	Terminology
1	Very rapid
2	Rapid
3	Well
4	Moderately well
5	Imperfect
6	Poor
7	Very poor

Soil Database (SOIL)

Soil are classified to the subgroup level as per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

O.EB	-	Orthic Eutric Brunisol
E.EB	-	Eluviated Eutric Brunisol
GL.EB	-	Gleyed Eutric Brunisol
GLE.EB	-	Gleyed Eluviated Eutric
O.BL	-	Orthic Black Chernozem
E.BL	-	Eluviated Black Chernozem
GL.BL	-	Gleyed Black Chernozem
O.HG	-	Orthic Humic Gleysol
R.HG	-	Rego Humic Gleysol
O.G	-	Orthic Gleysol
R.G	-	Rego Gleysol
O.LG	-	Orthic Luvic Gleysol
HU.LG	-	Humic Luvic Gleysol
O.GL	-	Orthic Gray Luvisol
D.GL	-	Dark Gray Luvisol
BR.GL	-	Brunisolic Gray Luvisol
SZ.GL	-	Solonetzic Gray Luvisol
GL.GL	-	Gleyed Gray Luvisol
TY.M	-	Typic Mesisol
T.M	-	Terric Mesisol

O.R - Orthic Regosol
CU.R - Cumulic Regosol
BL.SZ - Black Solonetz
BL.SS - Black Solodized Solonetz
DG.SS - Dark Gray Solodized Solonetz
BL.SO - Black Solod
A.SZ - Alkaline Solonetz

Soil Series Database (SOILSER)

Soil series are given as per Soil Survey of Edmonton Sheet (83-H). Canada Department of Agriculture, Alberta Soil Survey Report No. 21 (1962).

Ar - Angus Ridge
Av - Alluvium
Cam - Camrose
Cv - Carvel
Du - Duagh
Fth - Ferintosh
Kv - Kavanagh
Le - Leith
Mc - Mico
Mo - Malmo
O - Organic soils
Pe - Penhold
Ph - Peace Hills
Pk - Ponoka
Pr - Prestville
UR - Undifferentiated
Wb - Winterburn
Wkn - Wetaskiwin

Surface Texture Database (SRFTEXT)

As per The Canadian System of Soil Classification. Canada Department of Agriculture, Canada Soil Survey Committee (1987).

Mineral Component

C - Clay
HC - Heavy clay
LS - Loamy sand
SiC - Silty clay
SiL - Silt loam
SCL - Sandy clay loam
SL - Sandy loam
CL - Clay loam
L - Loam
Si - Silt
SiCL - Silty clay loam
SC - Sandy clay
S - Sand

Organic Component

f - fibric
m - mesic
h - humic

Parent Material Texture Database (PMTEXT)

Codes are identical to those presented within the Surface Texture Database (SRFTEXT)

Water Permanence Database (WATER)

p - permanent water body
s - seasonal water body

Type of Data (DATATYPE)

r - reports
f - field work
i - interviews
p - aerial photographs

APPENDIX C

Sample Data Sheets

Site Form

Name of Site: _____ Ealey Reference No: _____

QTR: _____ SECT: _____ TP: _____ RGE: _____ W4M

Flight Line: _____ Photo Number: _____ Size: _____ ha

Location: _____

Owner: _____
Address: _____

Photos: Roll No: _____ Picture No: _____

General Site Description: _____

Main Land Uses: _____

Vegetation Types: _____

Soils/Landform: _____

Wildlife Observations: _____

General Comments: _____

Alberta
FORESTRY, LANDS AND WILDLIFE

VEGETATION FORM LISD 14B (Rev. 3/91)

Project ID

Page ______ of ______

Crew: ______

Agency: ______

Record Type ①	Project ID ③	Group / Series ⑥	Plot No. ⑫	Year ⑯	Month ⑱	Day ⑳
0 4						

PLOT AREA (ha) ㉒	SHAPE
.	

Record Type	Field Name	Main Canopy Tree		Understory Tree		Tree Total		Tall Shrub		Low Shrub		Total Shrub		Forb		Grass		Moss / Lichen	
①	③	% ⑩	Vigor	% ⑬	Vigor	% ⑯	Vigor	% ⑲	Vigor	% ㉒	Vigor	% ㉕	Vigor	% ㉘	Vigor	% ㉛	Vigor	% ㉞	Vigor
0 5																			
	TOT%COV																		
	STRATHT																		

Record Type	Comments
4 C	BROWSING & GRAZING -
4 C	DISEASE > 20%
4 C	OTHER -

APPENDIX D

LIST OF COMMON WILDLIFE SPECIES

IN THE EDMONTON AREA

The following checklist of vertebrate species for Edmonton has been based on distributions in Smith (1993) for mammals, Semenchuk (1992) for nesting birds, Roberts (1992a,b) for amphibians and reptiles, and Nelson and Paetz (1992) for fish. One could add several bird species if one were to include those species that are strictly migrants or winter visitors. For each species, the Latin name is adjacent the English name. The list follows accepted taxonomic order and nomenclature, as presented in Macdonald et al. (1993).

Total vertebrate species (226) to occur within Edmonton's boundaries include 49 mammals, 143 breeding birds, 2 reptiles, 5 amphibians, and 27 fish.

Class: *MAMMALIA*--MAMMALS

Order: *INSECTIVORA* (insectivores)

Family: *SORICIDAE* (shrews)

Sorex cinereus	masked shrew
Sorex haydeni	prairie shrew
Sorex monticolus	dusky shrew
Sorex palustris	water shrew
Sorex arcticus	Arctic shrew
Sorex hoyi	pygmy shrew

Order: *CHIROPTERA* (bats)

Family: *VESPERTILIONIDAE* (smooth-faced bats)

Myotis lucifugus	little brown bat
Myotis septentrionalis	northern long-eared bat
Lasionycteris noctivagans	silver-haired bat
Eptesicus fuscus	big brown bat
Lasiurus cinereus	hoary bat

Order: *LAGOMORPHA* (pikas, hares, rabbits)

Family: *LEPORIDAE* (rabbits, hares)

Lepus americanus	snowshoe hare
Lepus townsendii	white-tailed jack rabbit

Order: *RODENTIA* (rodents)

Family: *SCIURIDAE* (squirrels)

Tamias minimus	least chipmunk
Marmota monax	woodchuck
Spermophilus richardsonii	Richardson's ground squirrel
Spermophilus tridecemlineatus	thirteen-lined ground squirrel
Spermophilus franklinii	Franklin's ground squirrel
Tamiasciurus hudsonicus	red squirrel

Family: *GEOMYIDAE* (pocket gophers)

Thomomys talpoides	northern pocket gopher

Family: *CASTORIDAE* (beavers)

Castor canadensis	beaver

Family: *CRICETIDAE* (New World mice, allies)

Peromyscus maniculatus	deer mouse
Neotoma cinerea	bushy-tailed woodrat
Clethrionomys gapperi	southern red-backed vole
Microtus pennsylvanicus	meadow vole
Microtus ochrogaster	prairie vole
Ondatra zibethicus	muskrat
Synaptomys borealis	northern bog lemming

Family: *MURIDAE* (Old World mice, allies)

Rattus rattus	black rat
Rattus norvegicus	Norway rat
Mus musculus	house mouse

Family: *ZAPODIDAE* (jumping mice, allies)

Zapus hudsonius	meadow jumping mouse
Zapus princeps	western jumping mouse

Family: *ERETHIZONTIDAE* (New World porcupines)

Erethizon dorsatum	porcupine

Order: *CARNIVORA* (carnivores)

Family: *CANIDAE* (dogs)

Canis latrans	coyote
Canis lupus	gray wolf
Vulpes vulpes	red fox

Family: *URSIDAE* (bears)

Ursus americanus	black bear

Family: *PROCYONIDAE* (raccoons, allies)

Procyon lotor	raccoon

Family: *MUSTELIDAE* (weasels, allies)

Mustela erminea	ermine
Mustela nivalis	least weasel
Mustela frenata	long-tailed weasel
Mustela vison	mink
Taxidea taxus	badger
Mephitis mephitis	striped skunk

Family: *FELIDAE* (cats)

Lynx canadensis	Canada lynx

Order: ARTIODACTYLA (ungulates)

Family: CERVIDAE (deer)

Odocoilens hemionns	mule deer
Odocoilens virginianus	white-tailed deer
Alces alces	moose

Class: *AVES*--BIRDS

(Species marked with an * were recorded as nesting during field surveys and not in Semenchuk [1992])

Order: *GAVIIFORMES* (loons)

Family: *GAVIIDAE* (loons)

Gavia immer	common loon

Order: *PODICIPEDIFORMES* (grebes)

Family: *PODICIPEDIDAE* (grebes)

Podiceps auritus	horned grebe
Podiceps grisegena	red-necked grebe
Podiceps nigricollis	eared grebe
Aechmophorus occidentalis	western grebe

Order: *CICONIIFORMES* (herons, egrets and ibises)

Family: *ARDEIDAE* (herons, bitterns)

Botaurus lentiginosus	American bittern
Ardea herodias	great blue heron
Nycticorax nycticorax *	black-crowned night-heron

Order: *ANSERIFORMES* (screamers, swans, geese, ducks)

Family: *ANATIDAE* (swans, geese, ducks)

Tribe: *Anserini*

Branta canadensis	Canada goose

Tribe: Anatini

Anas crecca	green-winged teal
Anas platyrhynchos	mallard

Anas acuta	northern pintail
Anas discors	blue-winged teal
Anas cyanoptera	cinnamon teal
Anas clypeata	northern shoveler
Anas strepera	gadwall
Anas americana	American wigeon

Tribe: *Aythyini*

Aythya valisineria	canvasback
Aythya americana	redhead
Aythya collaris	ring-necked duck
Aythya affinis	lesser scaup

Tribe: *Mergini*

Bucephala clangula	common goldeneye
Bucephala albeola	bufflehead
Mergus merganser	common merganser

Tribe: *Oxyurini*

Oxyura jamaicensis	ruddy duck

Order: *FALCONIFORMES* (diurnal birds of prey)

Family: *ACCIPITRIDAE* (ospreys, kites, eagles, hawks, aies)

Circus cyaneus	northern harrier
Accipiter striatus	sharp-shinned hawk
Accipiter cooperii	Cooper's hawk
Buteo platypterus	broad-winged hawk
Buteo swainsoni	Swainson's hawk
Buteo jamaicensis	red-tailed hawk

Family: *FALCONIDAE* (falcons)

Falco sparverius	American kestrel
Falco columbarius	merlin
Falco peregrinus	peregrine falcon

Order: *GALLIFORMES* (pheasants, grouse, ptarmigan and turkey)

Family: *PHASIANIDAE* (partridges, pheasants, grouse)

Perdix perdix	gray partridge
Phasianus colchicus	ring-necked pheasant
Dendragapus canadensis	spruce grouse
Bonasa umbellus	ruffed grouse

Order: *GRUIFORMES* (rails, coots and cranes)

Family: *RALLIDAE* (rails, coots)

Porzana carolina	sora
Fulica americana	American coot

Order: *CHARADRIIFORMES* (plovers, sandpipers, phalaropes, jaegers, gulls and terns)

Family: *CHARADRIIDAE* (plovers)

Charadrius vociferus	killdeer

Family: *RECURVIROSTRIDAE* (avocets, stilts)

Recurvirostra americana	American avocet

Family: *SCOLOPACIDAE* (sandpipers, phalaropes, allies)

Tringa flavipes	lesser yellowlegs
Tringa solitaria	solitary sandpiper
Catoptrophorus semipalmatus	willet
Actitis macularia	spotted sandpiper
Limosa fedoa	marbled godwit
Gallinago gallinago	common snipe
Phalaropus tricolor	Wilson's phalarope

Family: *LARIDAE* (gulls, terns)

Larus pipixcan	Franklin's gull
Larus philadelphia	Bonaparte's gull
Larus delawarensis	ring-billed gull
Larus californicus	California gull
Larus argentatus	herring gull
Sterna hirundo	common tern
Sterna forsteri	Forster's tern
Chlidonias niger	black tern

Order: *COLUMBIFORMES* (doves and pigeons)

Family: *COLUMBIDAE* (doves and pigeons)

Columba livia	rock dove
Zenaida macroura	mourning dove

Order: *STRIGIFORMES* (owls)

Family: *STRIGIDAE* (owls)

Bubo virginianus	great horned owl
Asio otus	long-eared owl
Asio flammeus	short-eared owl
Aegolius acadicus	northern saw-whet owl

Order: APODIFORMES (swifts and hummingbirds)

Family: *TROCHILIDAE* (hummingbirds)

Archilochus colubris	ruby-throated hummingbird

Order: *CORACIIFORMES* (kingfishers)

Family: *ALCEDINIDAE* (kingfishers)

Ceryle alcyon	belted kingfisher

Family: *SITTIDAE* (nuthatches)

Sitta canadensis	red-breasted nuthatch
Sitta carolinensis	white-breasted nuthatch

Family: *CERTHIIDAE* (creepers)

Certhia americana	brown creeper

Family: *TROGLODYTIDAE* (wrens)

Troglodytes aedon	house wren
Cistothorus palustris	marsh wren

Family: *MUSCICAPIDAE* (kinglets, bluebirds and thrushes)

*Regulus satrapa**	golden-crowned kinglet
Regulus calendula	ruby-crowned kinglet
Catharus fuscescens	veery
Catharus ustulatus	Swainson's thrush
Catharus guttatus	hermit thrush
Turdus migratorius	American robin

Family: *MIMIDAE* (catbirds and thrashers)

Dumetella carolinensis	gray catbird
Toxostoma rufum	brown thrasher

Family: *BOMBYCILLIDAE* (waxwings)

Bombycilla cedrorum	cedar waxwing

Family: *STURNIDAE* (starlings)

Sturnus vulgaris	European starling

Family: *VIREONIDAE* (vireos)

Vireo solitarius	solitary vireo

Vireo gilvus	warbling vireo
Vireo philadelphicus	Philadelphia vireo
Vireo olivaceus	red-eyed vireo

Family: *EMBERIZIDAE* (wood-warblers, buntings, sparrows, blackbirds, and allies)

Subfamily: *Parulinae*

Vermivora peregrina	Tennessee warbler
Vermivora celata	orange-crowned warbler
Dendroica petechia	yellow warbler
Dendroica coronata	yellow-rumped warbler
Setophaga ruticilla	American redstart
Seiurus aurocapillus	ovenbird
Oporornis philadelphia	mourning warbler
Geothlypis trichas	common yellowthroat

Subfamily: *Thraupinae*

Piranga ludoviciana	western tanager

Subfamily: *Cardinalinae*

Pheucticus ludovicianus	rose-breasted grosbeak

Subfamily: *Emberizinae*

Spizella passerina	chipping sparrow
Spizella pallida	clay-colored sparrow
Pooecetes gramineus	vesper sparrow
Passerculus sandwichensis	savannah sparrow
Ammodramus leconteii	Le Conte's sparrow
Melospiza melodia	song sparrow
Melospiza lincolnii	Lincoln's sparrow
Melospiza georgiana	swamp sparrow
Zonotrichia albicollis	white-throated sparrow
Zonotrichia leucophrys	white-crowned sparrow
Junco hyemalis	dark-eyed junco

Subfamily: *Icterinae*

Dolichonyx oryzivorus	bobolink
Agelaius phoeniceus	red-winged blackbird

Sturnella neglecta	western meadowlark
Xanthocephalus xanthocephalus	yellow-headed blackbird
Euphagus carolinus	rusty blackbird
Euphagus cyanocephalus	Brewer's blackbird
Quiscalus quiscula	common grackle
Molothrus ater	brown-headed cowbird
Icterus galbula	northern oriole

Family: *FRINGILLIDAE* (finches and grosbeaks)

Carpodacus purpureus	purple finch
Loxia leucoptera	white-winged crossbill
Carduelis pinus	pine siskin
Carduelis tristis	American goldfinch
Coccothraustes vespertinus	evening grosbeak

Family: *PASSERIDAE* (weaver finches)

Passer domesticus	house sparrow

Class: *REPTILIA*--REPTILES

Order: *SQUAMATA* (lizards, snakes)

Family: *COLUBRIDAE* (typical harmless snakes)

Subfamily: *NATRICINAE* (water snakes, allies)

Thamnophis sirtalis parietalis	red-sided garter snake
Thamnophis radix haydeni	western plains garter snake

Class: *AMPHIBIA*--AMPHIBIANS

Order: *CAUDATA* (amphibians with tails)

Family: *AMBYSTOMATIDAE* (mole salamanders)

Ambystoma tigrinum	tiger salamander

Order: *ANURA* (amphibians without tails)

Family: *BUFONIDAE* (true toads)

Bufo boreas boreas	boreal toad
Bufo hemiophrys	Canadian toad

Family: *HYLIDAE* (tree frogs)

Pseudacris triseriata maculata	boreal chorus frog

Family: *RANIDAE* (true frogs)

Rana sylvatica	wood frog

Class: *OSTEICHTHYES*--FISHES

Order: *ACIPENSIFORMES* (sturgeons, paddlefishes)

Family: *ACIPENSERIDAE* (sturgeons)

Acipenser fulvescens	lake sturgeon

Order: *OSTEOGLOSSIFORMES* (bony tongues)

Family: *HIODONTIDAE* (mooneyes)

Hiodon alosoides	goldeye
Hiodon tergisus	mooneye

Order: *CYPRINIFORMES* (minnows, suckers, allies)

Family: *CYPRINIDAE* (minnows)

Couesius plumbeus	lake chub
Notropis atherinoides	emerald shiner
Notropis blennius	river shiner
Notropis hudsonius	spottail shiner
Phoxinus eos	northern redbelly dace
Phoxinus neogaeus	finescale dace
Pimephales promelas	fathead minnow
Platygobio gracilis	flathead chub
Rhinichthys cataractae	longnose dace

Family: *CATOSTOMIDAE* (suckers)

Subfamily: *ICTIOBINAE* (buffalos, quillbacks)

Carpiodes cyprinus	quillback

Subfamily: *CATOSTOMINAE* (shortfinned suckers)

Catostomus catostomus	longnose sucker
Catostomus commersoni	white sucker
Catostomus platyrhynchus	mountain sucker
Moxostoma anisurum	silver redhorse
Moxostoma macrolepidotum	shorthead redhorse

Order: *SALMONIFORMES* (trouts, allies)

Family: *ESOCIDAE* (pikes)

Esox lucius	northern pike

Family: *SALMONIDAE* (trouts, allies)

Subfamily: *COREGONINAE* (whitefishes)

Prosopium williamsoni	mountain whitefish

Subfamily: *SALMONINAE* (trouts, salmons, chars)

Oncorhynchus mykiss	rainbow trout

Order: *PERCOPSIFORMES* (trout-perches, allies)

Family: *PERCOPSIDAE* (trout-perches)

Percopsis omiscomaycus	trout-perch

Order: *GADIFORMES* (codfishes, allies)

Family: *GADIDAE* (codfishes)

Lota lota	burbot

Order: *GASTEROSTEIFORMES* (sticklebacks, allies)

Family: *GASTEROSTEIDAE* (sticklebacks)

Culaea inconstans	brook stickleback

Order: *SCORPAENIFORMES* (mailcheeked fishes)

Family: *COTTIDAE* (sculpins)

Cottus ricei	spoonhead sculpin

Order: *PERCIFORMES* (perchlike fishes)

Family: *PERCIDAE* (perches)

Etheostoma exile	Iowa darter
Stizostedion canadense	sauger

APPENDIX E

LIST OF COMMON PLANTS SPECIES

IN THE EDMONTON AREA

The following list of plant species for the Edmonton area was compiled from field work undertaken during this project and from lists compiled by Ealey (1986), Cotterill (1993) and Ducks Unlimited (n.d.). Scientific names taken from Alberta Plants and Fungi - Master Species List and Species Group Checklists (Alberta Environmental Protection 1993).

Family: ACERACEAE

Acer negundo	Manitoba maple

Family: ALISMATACEAE

Alisma plantago-aquatica	broad-leaved water-plantain
Sagittaria cuneata	arum-leaved arrowhead

Family: AMBLYSTEGIACEAE

Drepanocladus sp.	brown moss

Family: ANACARDIACEAE

Rhus radicans	poison ivy

Family: APOCYNACEAE

Apocynum androsaemifolium	spreading dogbane

Family: ARALIACEAE

Aralia nudicaulis	wild sarsaparilla

Family: BALSAMINACEAE

Impatiens capensis	spotted touch-me-not

Family: BETULACEAE

Alnus crispa	green alder
Alunus tenuifolia	river alder

Betula occidentalis	water birch
Betula papyrifera	white birch
Betula pumila	dwarf birch
Corylus cornuta	beaked hazelnut

Family: BORAGINACEAE

Lappula squarrosa	bluebur
Mertensia paniculata	tall lungwort

Family: CAMPANULACEAE

Campanula rotundifolia	harebell

Family: CAPRIFOLIACEAE

Linnaea borealis	twinflower
Lonicera dioica	twining honeysuckle
Lonicera involucrata	bracted honeysuckle
Sambucus racemosa	red elderberry
Symphoricarpos albus	snowberry
Symphoricarpos occidentalis	buckbrush
Viburnum edule	low-bush cranberry
Viburnum opulus	tall-bush cranberry

Family: CARYOPHYLLACEAE

Cerastium arvense	field mouse-eared chickweed
Moehringia laterifolia	blunt-leaved sandwort
Stellaria longifolia	long-leaved chickweed
Stellaria longipes	long-stalked chickweed

Family: CHENOPODIACEAE

Atriplex prostrata	prostrate saltbrush
Axyris amaranthoides	Russian pigweed
Chenopodium album	lamb's quarters
Chenopodium capitatum	strawberry blight

Family: COMPOSITAE

Achillea millefolium	common yarrow
Achillea sibirica	many-flowered yarrow
Artemisia absinthium	absinthe wormwood
Artemisia biennis	biennial sagewort
Artemisia frigida	pasture sagewort
Artemisia ludoviciana	prairie sagewort
Aster borealis	marsh aster
Aster ciliolatus	Lindley's aster
Aster conspicuus	showy aster
Aster hesperius	western willow aster
Bidens cernua	nodding beggarticks
Chrysanthemum leucanthemum	ox-eye daisy
Cirsium arvense	Canada thistle
Crepis runcinata	scapose hawk's beard
Crepis tectorum	annual hawk's beard
Erigeron glabellus	smooth fleabane
Erigeron philadelphicus	Philadelphia fleabane
Hieracium umbellatum	narrow-leaved hawkweed
Matricaria matricarioides	pineappleweed
Matricaria perforata	scentless chamomile
Matricaria recutita	wild chamomile
Petasites palmatus	palmate-leaved coltsfoot
Petasites sagittatus	arrow-leaved coltsfoot
Senecio congestus	marsh ragwort
Senecio pauperculus	balsam groundsel
Solidago canadensis	Canada goldenrod
Solidaga gigantea	late goldenrod
Sonchus arvensis	perennial sow-thistle
Sonchus asper	prickly annual sow-thistle
Sonchus uliginosus	smooth perennial sow-thistle
Tanacetum vulgare	common tansy
Taraxacum officinale	common dandelion
Tragopogon dubius	common goat's-beard

Family: CONVOLVULACEAE

Convolvulus sepium	wild morning-glory

Family: CORNACEAE

Cornus canadensis	bunchberry
Cornus stolonifera	red-osier dogwood

Family: CRUCIFERAE

Brassica kaber	wild mustard
Capsella bursa-pastoris	shepherd's purse
Descurainia sophia	flixweed
Erysimum cheiranthoides	wormseed mustard
Rorippa palustris	marsh yellow cress
Thlaspi arvense	stinkweed

Family: CYPERACEAE

Carex aquatilis	water sedge
Carex atherodes	awned sedge
Carex aurea	golden sedge
Carex bebbii	Bebb's sedge
Carex brunnescens	brownish sedge
Carex capillaris	hair-like sedge
Carex concinna	beautiful sedge
Carex deweyana	Dewey's sedge
Carex diandra	two-stamened sedge
Carex disperma	two-seeded sedge
Carex gynocrates	northern bog sedge
Carex interior	inland sedge
Carex lanuginosa	woolly sedge
Carex leptalea	bristle-stalked sedge
Carex limosa	mud sedge
Carex livida	livid sedge
Carex prairea	prairie sedge
Carex rostrata	beaked sedge
Carex viridula	green sedge
Eleocharis acicularis	needle spike-rush
Eleocharis palustris	creeping spike-rush
Eleocharis quinqueflora	few-flowered spike-rush
Eriophorum polystachion	tall cotton grass
Scirpus acutus	great bulrush
Scirpus cespitosus	tufted bulrush
Scirpus validus	common great bulrush

Family: DROSERACEAE

Drosera rotundifolia	round-leaved sundew

Family: ELAEAGNACEAE

Elaeagnus commutata	silverberry
Shepherdia canadensis	Canada buffaloberry

Family: EMPETRACEAE

Empetrum nigrum	crowberry

Family: EQUISETACEAE

Equisetum arvense	common horsetail
Equisetum fluviatile	swamp horsetail
Equisetum pratense	meadow horsetail
Equisetum sylvaticum	woodland horsetail

Family: ERICACEAE

Andromeda polifolia	bog rosemary
Arctostaphylos uva-ursi	common bearberry
Ledum groenlandicum	common Labrador tea
Oxycoccus microcarpus	small bog cranberry
Oxycoccus quadripetalus	small bog cranberry
Vaccinium myrtilloides	common blueberry
Vaccinium vitis-idaea	bog cranberry

Family: GENTIANACEAE

Gentianella crinita	fringed gentian

Family: GERANIACEAE

Geranium bicknellii	Bicknell's geranium
Geranium richardsonii	wild white geranium
Geranium viscosissimum	sticky purple geranium

Family: GRAMINEAE

Agropyron pectiniforme	crested wheat grass
Agropyron repens	quack grass
Agrostis scabra	rough hair grass

Agrostis stolonifera	redtop
Alopecurus aequalis	short-awned foxtail
Arctagrostis arundinacea	polar grass
Avena fatua	wild oat
Beckmannia syzigachne	slough grass
Bromus ciliatus	fringed brome
Bromus inermis ssp. inermis	awnless brome
Bromus inermis ssp. pumpellianus	awnless brome
Calamagrostis canadensis	bluejoint
Calamagrostis inexpansa	northern reed grass
Calamagrostis stricta	narrow reed grass
Cinna latifolia	drooping wood-reed
Dactylis glomerata	orchard grass
Elymus innovatus	hairy wild rye
Festuca rubra	red fescue
Glyceria grandis	common tall manna grass
Glyceria pulchella	graceful manna grass
Glyceria striata	fowl manna grass
Heirochloe odorata	sweet grass
Hordeum jubatum	foxtail barley
Muhlenbergia glomerata	bog muhly
Phalaris arundinacea	reed canary grass
Phleum pratense	timothy
Phragmites australis	reed
Poa compressa	Canada bluegrass
Poa palustris	fowl bluegrass
Poa pratensis	Kentucky bluegrass
Puccinellia nuttalliana	Nuttall's salt-meadow grass
Schizachne purpurascens	purple oat grass
Scolochloa festucacea	spangletop

Family: GROSSULARIACEAE

Ribes americanum	wild black currant
Ribes glandulosum	skunk currant
Ribes hirtellum	wild gooseberry
Ribes hudsonianum	northern black currant
Ribes lacustre	bristly black currant
Ribes oxyacanthoides	northern gooseberry
Ribes triste	wild red currant

Family: HALORAGACEAE

Myriophyllum exalbescens	spiked water-milfoil

Family: HIPPURIDACEAE

Hippuris vulgaris	common mare's-tail

Family: HYLOCOMIACEAE

Hylocomium splendens	stair-step moss
Pleurozium schreberi	Schreber's moss

Family: IRIDACEAE

Sisyrinchium montanum	blue-eyed grass

Family: JUNCACEAE

Juncus alpinoarticulatus	alpine rush
Juncus balticus	wire rush
Juncus nodosus	knotted rush
Juncus tenuis	slender rush

Family: JUNCAGINACEAE

Triglochin maritima	seaside arrow-grass
Triglochin palustris	slender arrow-grass

Family: LABIATAE

Agastache foeniculum	giant hyssop
Galeopsis tetrahit	hemp nettle
Mentha arvensis	wild mint
Monarda fistulosa	wild bergamot
Scutellaria galericulata	marsh skullcap

Family: LEGUMINOSAE

Caragana arborescens	common caragana
Glycyrrhiza lepidota	wild licorice
Hedysarum alpinum	alpine hedysarum
Lathyrus ochroleucus	cream-colored vetchling
Lathyrus venosus	purple peavine
Medicago lupulina	black medick

Melilotus alba	white sweet-clover
Melilotus officinalis	yellow sweet-clover
Oxytropis monticola	late yellow locoweed
Trifolium hybridum	alsike clover
Trifolium pratense	red clover
Trifolium repens	white clover
Vicia americana	wild vetch

Family: LEMNACEAE

Lemna minor	common duckweed
Lemna trisulca	ivy-leaved duckweed

Family: LENTIBULARIACEAE

Pinguicula vulgaris	common butterwort
Utricularia vulgaris	common bladderwort

Family: LILIACEAE

Allium cernuum	nodding onion
Disporum trachycarpum	fairybells
Lilium philadelphicum	western wood lily
Maianthemum canadense	wild lily-of-the-valley
Smilacina racemosa	false Solomon's-seal
Smilacina stellata	star-flowered Solomon's-seal
Streptopus amplexifolius	clasping-leaved twisted-stalk
Tofieldia glutinosa	sticky false asphodel

Family: LYCOPODIACEAE

Lycopodium complanatum	ground-cedar

Family: MNIACEAE

Mnium sp.	moss

Family: ONAGRACEAE

Epilobium angustifolium	common fireweed
Epilobium ciliatum	northern willowherb
Epilobium palustre	marsh willowherb

Family: ORCHIDACEAE

Calypso bulbosa	Venus'-slipper
Corallorhiza maculata	spotted coralroot
Corallorhiza trifida	pale coralroot
Cypripedium calceolus	yellow lady's-slipper
Habenaria hyperboria	northern green bog orchid

Family: PARNASSIACEAE

Parnassia palustris	northern grass-of-parnassus

Family: PINACEAE

Larix laricina	tamarack
Picea glauca	white spruce
Picea mariana	black spruce

Family: PLANTAGINACEAE

Plantago major	common plantain

Family: POLYGONACEAE

Polygonum amphibium	water smartweed
Rumex acetosella	sheep sorrel
Rumex britannica	water dock
Rumex maritimus ssp. *fueginus*	golden dock
Rumex occidentalis	western dock
Rumex triangulivalvis	narrow-leaved dock

Family: POLYPODIACEAE

Gymnocarpium dryopteris	oak fern
Matteuccia struthiopteris	ostrich fern

Family: POTAMOGETONACEAE

Potamogeton filiformis	thread-leaved pondweed
Potamogeton pectinatus	sago pondweed

Family: PRIMULACEAE

Dodecatheon pulchellum	saline shooting star
Lysimachia ciliata	fringed loosestrife
Lysimachia thyrsiflora	tufted loosestrife
Primula incana	mealy primrose

Family: PYROLACEAE

Moneses uniflora	one-flowered wintergreen
Orthilia secunda	one-sided wintergreen
Pyrola asarifolia	common pink wintergreen
Pyrola minor	lesser wintergreen

Family: RANUNCULACEAE

Actaea rubra	red and white baneberry
Anemone canadensis	Canada anemone
Anemone cylindrica	long-fruited anemone
Anemone multifida	cut-leaved anemone
Aquilegia brevistyla	blue columbine
Caltha palustris	marsh-marigold
Clematis occidentalis	purple clematis
Delphinium glaucum	tall larkspur
Ranunculus cardiophyllus	heart-leaved buttercup
Ranunculus circinatus	firm white water crowfoot
Ranunculus cymbalaria	seaside buttercup
Ranunculus gmelinii	yellow water crowfoot
Ranunculus macounii	Macoun's buttercup
Ranunculus rhomboideus	prairie buttercup
Ranunculus sceleratus	celery-leaved buttercup
Thalictrum venulosum	veiny meadow rue

Family: ROSACEAE

Agrimonia striata	agrimony
Amelanchier alnifolia	saskatoon
Cotoneaster lucidus	cotoneaster

Crataegus douglasii	Douglas hawthorn
Crataegus rotundifolia	round-leaved hawthorn
Fragaria vesca	woodland strawberry
Fragaria virginiana	wild strawberry
Geum aleppicum	yellow avens
Geum macrophyllum	large-leaved yellow avens
Geum rivale	purple avens
Geum triflorum	three-flowered avens
Potentilla anserina	silverweed
Potentilla fruticosa	shrubby cinquefoil
Potentilla gracilis	graceful cinquefoil
Potentilla norvegica	rough cinquefoil
Potentilla rivalis	brook cinquefoil
Prunus pensylvanica	pin cherry
Prunus virginiana	choke cherry
Rosa acicularis	prickly rose
Rosa woodsii	common wild rose
Rubus arcticus	dwarf raspberry
Rubus idaeus	wild red raspberry
Rubus pubescens	dewberry
Sorbus aucuparia	European mountain-ash
Sorbus scopulina	western mountain-ash
Spiraea alba	narrow-leaved meadowsweet

Family: RUBIACEAE

Galium boreale	northern bedstraw
Galium labradoricum	Labrador bedstraw
Galium trifidum	small bedstraw
Galium triflorum	sweet-scented bedstraw

Family: SALICACEAE

Populus balsamifera	balsam poplar
Populus tremuloides	aspen
Salix athabascensis	Athabasca willow
Salix bebbiana	beaked willow
Salix candida	hoary willow
Salix discolor	pussy willow
Salix exigua	sandbar willow
Salix lucida	shining willow
Salix lutea	yellow willow
Salix maccalliana	velvet-fruited willow
Salix myrtillifolia	myrtle-leaved willow
Salix petiolaris	basket willow
Salix planifolia	flat-leaved willow

Salix pseudomonticola	false mountain willow
Salix serissima	autumn willow

Family: SANTALACEAE

Comandra umbellata	bastard toadflax

Family: SAXIFRAGACEAE

Mitella nuda	bishops's-cap

Family: SCROPHULARIACEAE

Linaria vulgaris	butter-and-eggs
Pedicularis groenlandica	elephant's-head
Rhinanthus minor	yellow rattle

Family: SPARGANIACEAE

Sparganium angustifolium	narrow-leaved bur-reed

Family: TYPHACEAE

Typha latifolia	common cattail

Family: UMBELLIFERAE

Heracleum lanatum	cow parsnip
Osmorhiza longistylis	smooth sweet cicely
Sium suave	water parsnip
Zizia aptera	heart-leaved Alexanders

Family: URTICACEAE

Urtica dioica	common nettle

Family: VALERIANACEAE

Valeriana dioica	northern valerian

Family: VIOLACEAE

Viola adunca	early blue violet
Viola canadensis	western Canada violet
Viola renifolia	kidney-leaved violet

Family: ZANNICHELLIACEAE

Zannichellia palustris	horned pondweed

INVENTORY OF ADDITIONAL ENVIRONMENTALLY SENSITIVE AND SIGNIFICANT NATURAL AREAS

City of Edmonton

Prepared for

Planning and Development
City of Edmonton

Prepared by

Dennis O'Leary[1]
Jerry Bentz[1]
David Ealey[2]
Andre Schwabenbauer[3]

1. **GEOWEST** Environmental Consultants Ltd.
2. David M. Ealey Environmental Services
3. Schwabenbauer Ross and Associates, Landscape Architects

December 1993

Table of Contents

List of Figures

1.0 INTRODUCTION

In late August 1993, the Planning and Development Department of the City of Edmonton extended the terms of reference for the Inventory of Environmentally Sensitive and Significant Natural Areas project to include four areas that are currently facing serious development pressures. Three of the four areas occur within the table lands area, while the fourth occurs within the North Saskatchewan River Valley and Ravine System. The four areas include:

- Mistamin Industrial Park
- Pylypow Industrial Park
- Clover Bar Terrace
- Castle Downs Extension

Because these areas do not occur within the original study area (those suburban and agricultural lands outside the North Saskatchewan River Valley and Ravine System, which were annexed to the city in 1982), the Planning and Development Department asked that the results be presented within a separate document with accompanying graphical and attribute databases.

2.0 METHODS

The methodology used to identify and classify environmentally sensitive and significant natural areas within the Mistamin and Pylypow Industrial Parks, the Clover Bar Terrace and the Castle Downs Extension area are identical to those presented in Inventory of Environmentally Sensitive and Significant Natural Areas City of Edmonton Technical Report (O'Leary *et al.* 1993).

3.1 Definitions

In order to identify, evaluate and classify the relative significance of sites, it is necessary to first define the different types of sites, to provide rationale for grouping previously identified sites and to discuss rationale for establishing a minimum viable polygon size. The definitions proposed in this study were revised through consultation with the public and approved by City Council on August 24, 1993. The criteria used to identify natural areas, significant natural areas and environmentally sensitive areas are outlined in Table 3.

Natural Areas

The Planning and Development Department of the City of Edmonton recently produced a document entitled Environmentally Sensitive and Natural Area Protection Within Edmonton's Table Lands: Policy and Implementation Background Study (1992). This report draws heavily upon the work of Eagles (1984) in providing a definition of natural areas. It states:

Natural areas are defined by the "presence of vegetation, water or natural features." In other words, a natural area may have no special features, other than the presence of vegetation or unusual features of importance to Edmonton. It some instances, natural areas may be partially disturbed.

Significant Natural Areas

Significant natural areas are generally larger than natural areas. These areas are defined as "natural sites that have the potential to remain sustainable within an urban environment and are significant from an environmental perspective to the community of Edmonton because of their size or features on the site."

They usually contain a diverse blend of common species or habitat and function as a linkage between other significant natural areas or environmentally sensitive areas. They can withstand various degrees of human use.

Environmentally Sensitive Areas

Environmentally sensitive areas are defined as "undisturbed or relatively undisturbed sites which, because of their natural features have some value to society and ecosystems worth protecting, but are susceptible to further disturbance." This definition is similar to that presented by Veitch (1978). The aim of identifying an environmentally sensitive area is to preserve and maintain the natural

conditions and functions of a natural area by prohibiting, managing or integrating those activities that would have a harmful effect on the natural environment.

3.2 Criteria Used in This Study

The criteria used to evaluate individual sites included site size, vegetation composition, wildlife, landform, hydrological function, corridors and linkages, the sites ability to sustain use, the sites present use and the presence of recognized palaeotological, archaeological, prehistoric or historic resources. Table 1 presents key criteria that were stringently applied to evaluate individual sites.

3.3 Levels of Significance

Westworth *et. al.* (1991) stated that "the level of significance is primarily a function of rarity and geographic scale.... areas that provide habitat for species that have been identified as threatened or endangered in Canada may have national significance whereas key habitat areas for common or abundant wildlife species might have regional or local significance." They further stated that "significance levels often reflect the geographic context of the site... the complex of wetlands found on the Cooking Lake moraine may have national or international significance because of the importance of the region as a breeding and staging area for continental waterfowl production, however, individual lakes within this complex may only be significant at a provincial, regional or local level."

Four levels of significance are used in this study and are defined below:

Local Significance

Natural features that are considered sensitive or significant from a local perspective. These include sites that have intrinsic appeal due to community interest.

Regional Significance

Natural landscapes or features that are of limited distribution or are the best examples of a feature in the region.

Provincial Significance

Natural landscapes or features that are of limited distribution at a provincial level or are the best examples of a feature in Alberta.

National Significance

Natural landscapes or features that are of limited distribution or are the best examples of a feature in Canada

Wallis (1991), Westworth (1991), Sweetgrass (1989) and Infotech (1989) all stated that evaluating areas in terms of levels of significance requires a considerable knowledge of significant features outside the jurisdiction under study. This knowledge is facilitated by lists of rare, threatened and endangered species (COSEWIC 1988; Wallis 1977; and Packer and Bradley 1984) or evaluations of natural ecosystem complexes

Table 1. Detailed Decision Structure for the Identification of Natural Areas, Significant Natural Areas and Environmentally Sensitive Areas (Approved by City Council August 24, 1993)

Criteria	Natural Area	Significant Natural Area	Environmentally Sensitive Area
Size	• more than 0.1 ha for wetlands • more than 1.0 ha for forested areas	• more than 1.0 ha for wetlands • more than 2.0 ha for forested areas	• more than 1.0 ha for wetlands • more than 2.0 ha for forested areas
Vegetation	• existing natural vegetation	• good example of one or more types of vegetation	• presence of rare plant species • high plant species diversity • old-growth forest
Wildlife	• existing vegetation provides potential habitat for wildlife • may provide habitat for only a portion of a species life cycle	• habitat for local wildlife • habitat for only a portion of a species life cycle	• habitat for vulnerable, threatened or endangered species • high habitat diversity • high wildlife species diversity • provides critical habitat for maintenance of all or significant component of species life cycle
Landform	Not applicable	• good example of local landform	• unique geological or landform feature • steep, usually unstable slopes, slumps, bedrock or landform failure (hazard lands) • landforms highly sensitive to disturbances
Hydrology	Not applicable	• temporary (ephemeral) wetlands	• provides critical function in maintaining or balancing local hydrology • permanent wetlands • permanent open water • groundwater discharge/springs

Corridors/ Linkages	Not applicable	• provides linkages between ESAs and SNAs within the table lands	• provides critical linking function to ESAs identified outside the city • provides critical linking function to ESAs identified within the North Saskatchewan River Valley and Ravine System
Ability to Sustain Use	Not applicable	• highly sensitive to intensive forms of disturbance (e.g. major access routes, industrial, commercial and residential development) • low to moderate levels of sensitivity to less intensive disturbances (e.g. cross-country ski trails)	• highly sensitive to all forms of disturbance
Present Use	• used by residents for recreational purposes	• used by communities and organizations for educational purposes	• site recognized for its value by scientific organizations; used for research purposes because of its unique qualities
Palaeontolgical/ Archaeological/ Prehistoric	Not applicable	Not applicable	• recognized or documented site of significance
Historical Resource	Not applicable	Not applicable	• recognized or documented site of significance by a federal, provincial or municipal government

or landscapes (Cottonwood Consultants 1983), which are available at provincial, national and international levels.

Boundaries of environmentally sensitive and significant natural areas were digitized and provided to the Planning and Development Department in graphical files. Site attributes were coded and also provided to the city as attribute files.

3.0 RESULTS

Fourty-three sites have been identified and classed as either natural areas, significant natural areas or as environmentally sensitive areas within the four extension areas. Of the 43 sites, 16 were classed as environmentally sensitive areas, four as significant natural areas, and 23 as natural areas. Table 2 presents the results of the survey.

Table 2. Environmentally Sensitive and Significant Natural Areas of the Mistamin and Pylypow Industrial Parks, the Clover Bar Terrace and the Castle Downs Extension Area.

Area	Natural Areas	Environmentally Sensitive Areas		Significant Natural Areas		Total	
	No. of Sites	No. of Sites	Area (ha)	No. of Sites	Area (ha)	No. of Sites	Area (ha)
Mistamin Industrial	4	1	39.78	-	-	5	39.78
Pylypow Industrial	11	3	34.18	1	4.48	15	38.66
Clover Bar Terrace	-	6	160.01	-	-	6	160.01
Castle Downs Extension	8	6	96.25	3	34.55	17	130.80
Total Sites	23	16	330.22	4	39.03	43	369.25

The total area classed as environmentally sensitive includes 330.22 ha of primarily wetland topography and steep slopes. All environmentally sensitive areas have been classed as being of "local" significance only. Most of the sites identified provide habitat for local wildlife and are important because they provide corridors or linkages to the North Saskatchewan River Valley and Ravine System. All 16 environmentally sensitive areas are highly sensitive to disturbance as the removal of existing vegetation will alter the structural and functional diversity within the stand and hence alter the importance of the areas for wildlife habitat. In addition, many of the sites, especially those identified within the Clover Bar Terrace area are potential "hazard lands" and hence the removal of vegetation may have severe implications for mass wasting or slumping.

Only four significant natural areas were identified during the course of the study. They account for 39.03 ha of mainly forested land. Three of these occur within the Castle Downs Extension area where significant parcels of forest have remained untouched by development. These sites will only be severely impacted if they are removed completely for residential or industrial development.

3.1 CASTLE DOWNS EXTENSION

Seventeen sites (130.80 ha) within the Castle Downs Extension area have been identified and classed as environmentally sensitive areas, significant natural areas or as natural areas. Of these 17 sites, six have been classed as locally significant environmentally sensitive areas, 3 as significant natural areas and the remaining eight as natural areas.

The six environmentally sensitive areas include 96.25 ha of wetland topography, including two significant water bodies as well as a number of important wetlands. The three significant natural areas include 34.55 ha of mainly forested land.

Site No **NE 8084**

Significance **Local Environmentally Sensitive Area**

Size 13.01 ha

Location Between 82nd Street and 97 Street south of 167 Avenue [Sec 33 TP53 R24 W4M]

Description

A series of three wetlands surrounded by native pasture that is used for horse rides; site hydrology appears to have been strongly impacted by past developments, including a major transmission line that runs east-west and a gas pipeline that runs north-south through the site; northern wetland is quite dry and is heavily vegetated by sedges and weed specie; two southern wetlands better developed, especially the most eastern wetland; southern wetlands have better developed wetland vegetation, including sedges, cattails and willows; southeastern wetland has water year-round.

Numerous magpies observed during inventory.

Numerous manholes observed throughout site as it appears to have been previously impacted by sewer development.

Criteria

- diverse wetland vegetation
- provides seasonal waterfowl habitat
- provides critical function in maintaining and balancing local hydrology

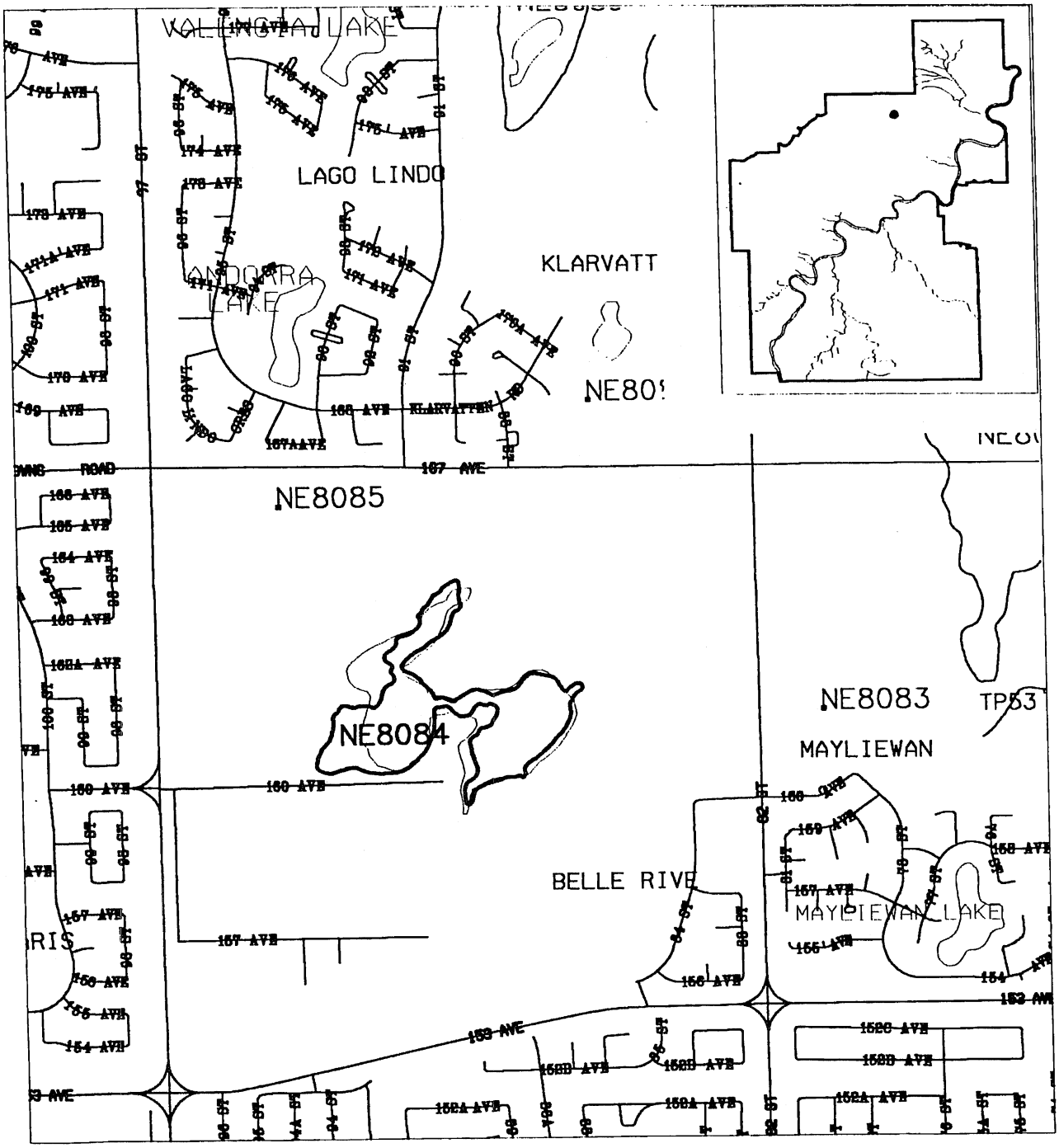
Sensitivity High

Although this site already appears to have been impacted by past developments, any further alterations to the existing land surface, especially any changes that would impact local hydrological conditions would certainly have very negative impacts upon the usefulness of these wetlands.

Management Considerations

Attempts should be made to ensure the long-term survival of this site as it provides seasonal waterfowl habitat and is critical in balancing local hydrological conditions. The passive nature of the current land uses appears not to have a very negative impact upon the hydrology of the three wetlands.

The long-term survival of this site is in immediate need of direct intervention by city planners. Should the site be developed any further, the survival of these wetlands would be severely threatened.


LAGO LINDO
KLARVATT
NE8085
NE8084
NE8083
MAYLIEWAN
BELLE RIVE
MAYLIEWAN LAKE
167 AVE
160 AVE
157 AVE
153 AVE

Site No **NE 8089**

Significance **Local Environmentally Sensitive Area**

Size 8.97 ha

Location Immediately east and south of 179 Avenue and 91 Street
[NE 4 TP54 R24 W4M]

Description

Rather diverse site comprised of upland deciduous woodland and well-developed permanent wetland; upland forests of variable age, ranging from young seral aspen/rose/grass (8-12 m. in height) to well-developed aspen-balsam poplar surrounding wetland; portions of young aspen stands strongly show aspen parkland conditions; numerous snags occur adjacent wetland; wetland has permanent open water with well-developed cattail fringe.

Numerous stick nests observed throughout site as well as a number of magpies; unique combination of open water with cattail fringe and upland aspen communities result in critical waterfowl habitat, especially for brood rearing; site probably used by waterfowl in conjunction with 82nd Street Lake to the east.

Surrounding land uses include residential development to the west and cultivated fields to the east. Land between residential development to the west and wetland to the east is being developed for future residential development.

Criteria

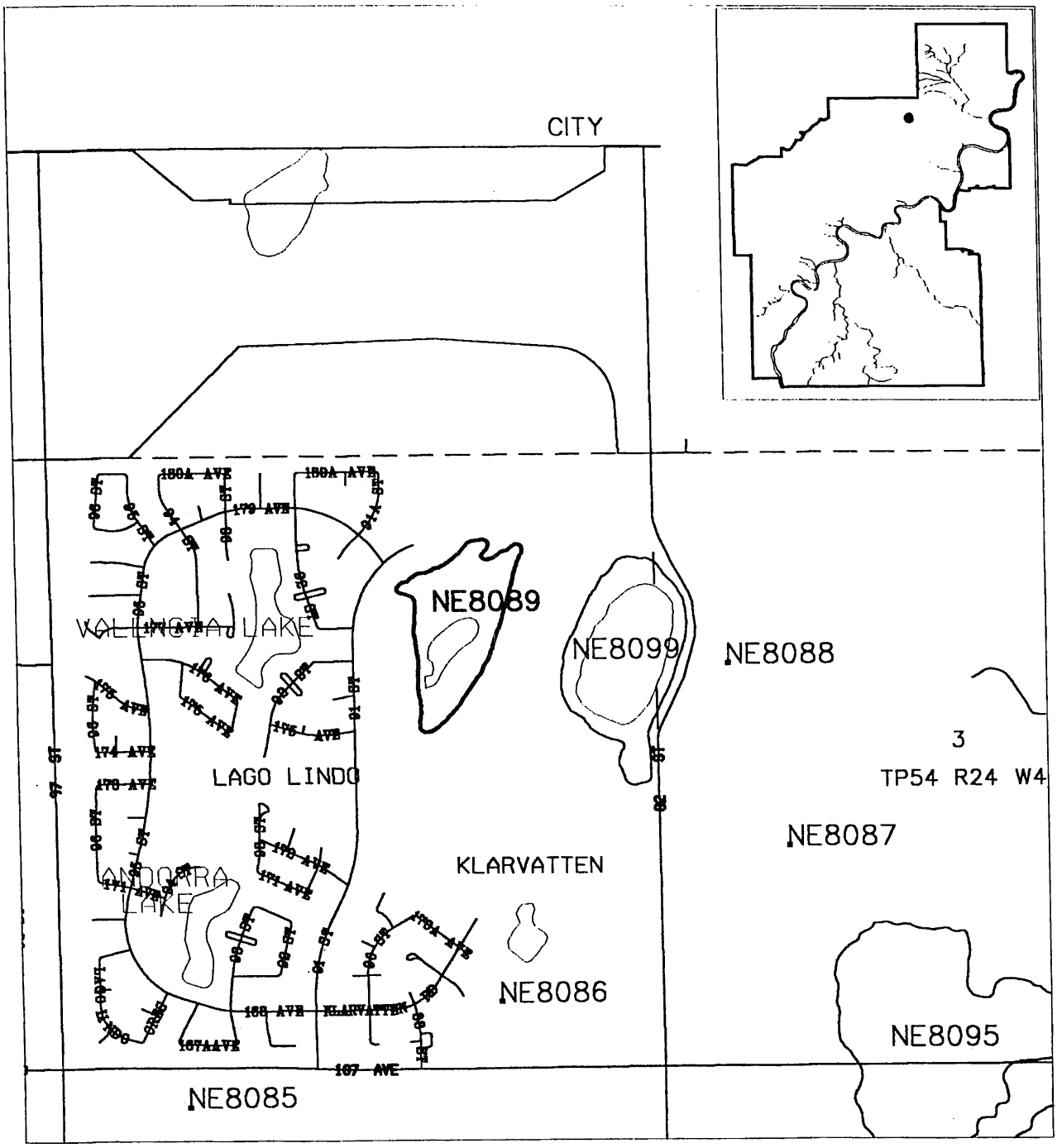
- good example of variable aged upland deciduous stands and wetland communities
- permanent open water
- provides critical balancing function for local hydrology
- critical waterfowl habitat, especially for brood rearing

Sensitivity High

Any changes to the nature of the surrounding landscape will ultimately have an impact upon both the upland and wetland communities. Changes that would alter local drainage conditions will have a negative impact upon the hydrological regime of the wetland and hence an impact upon the habitat function that the site serves.

Management Considerations

Attempts should be made to secure or protect this site from further development as it appears that it will be developed within the next few years. Protection of the site must include both the upland and wetland components as they combine to provide critical habitat for not only waterfowl but also songbirds such as red-winged blackbirds.


CITY
NE8089
NE8099
NE8088
VALLINGRAD LAKE
LAGO LINDO
ANDORRA LAKE
KLARVATTEN
NE8086
NE8087
3
TP54 R24 W4
NE8095
NE8085
180A AVE
179 AVE
176 AVE
175 AVE
174 AVE
173 AVE
171 AVE
170 AVE
169 AVE
KLARVATTEN
167A AVE
167 AVE
97 ST
96 ST
95 ST
94 ST
93 ST
92 ST
91 ST
90 ST

Site No **NE 8091**

Significance **Significant Natural Area**

Size 13.97 ha

Location 0.8 km north of 167 Avenue between 50 Street and 66 Street
[N 1/2 Sec 2 TP54 R24 W4M]

Description

Remnant woodlot parcel that extends for nearly 1.6 km between 50th Street and 66th Street; stand varies in age with younger even-aged aspen of 8-12 m occurring in the west and older, more mature aspen-balsam poplar occurring within the eastern portion; aspen and balsam poplar to 18 m along eastern edge; diversity of understorey increases from west to east with age of stand; stand approximately 50 - 75 m in width.

The narrow, continuous nature of this stand provides a critical corridor for wildlife movement within northern Edmonton. It provides habitat for local wildlife species such as white-tailed deer and songbirds.

Surrounding land uses include cultivated fields.

Criteria

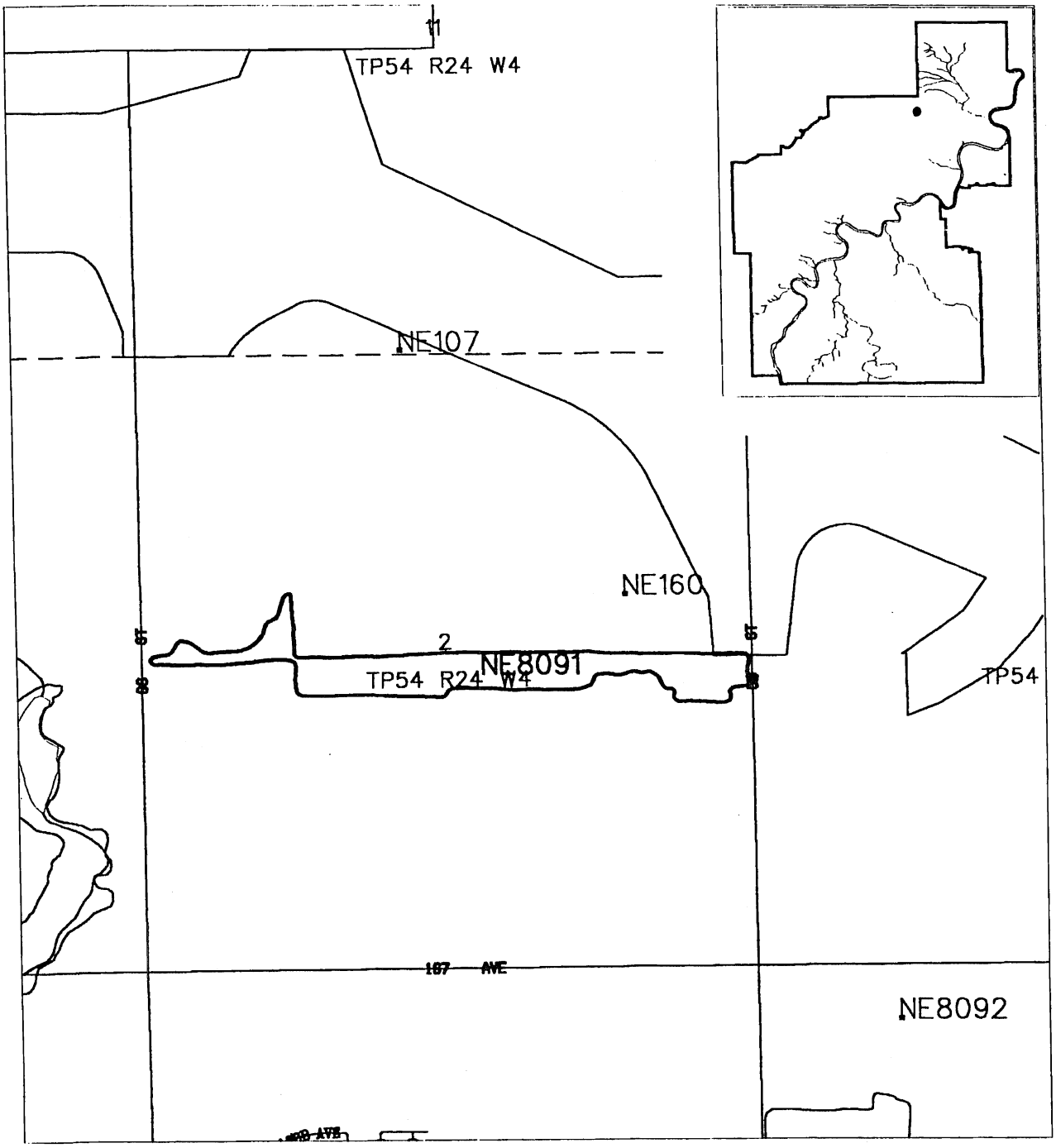
- good example of aspen and aspen-balsam poplar communities
- provides habitat for local wildlife
- provides a critical linking function to other ESA/SNAs within northeast Edmonton

Sensitivity Moderate

The relatively narrow nature of this site makes it moderately sensitive to any alterations. Any destruction of this stand may ultimately reduce its overall value for a travel corridor.

Management Considerations

Attempts should be made to ensure the survival of this rather unique stand. If the composition or structure of this stand is altered in any fashion, it is certainly bound to have a negative impact upon the utility of the stand as a movement corridor.


11
TP54 R24 W4
NE107
NE160
2
NE8091
TP54 R24 W4
TP54
167 AVE
NE8092

Site No **NE 8093 (*Little Mountain Natural Area*)**

Significance **Significant Natural Area**

Size 16.12 ha

Location 160th Avenue and 50 Street
[NW 36 TP53 R24 W4M]

Description

Remnant aspen dominated upland stand adjacent Little Mountain Cemetary; diverse shrub understorey of saskatoon and pin cherry with extensive amounts of Manitoba maple; canopy height varies between 12-15 m; largest remnant aspen stand in northeast Edmonton.

Numerous large stick nests observed at site along with a number of black-billed magpies. The isolated nature of this site probably prohibits the use of the site for ungulate habitat.

Surrounding land uses include Little Mountain Cemetary and cultivated fields.

"An early report of the Edmonton Natural History Club described Little Mountain as "a mature island remnant of pre-settlement aspen groveland, as it has never been cut or subject to grazing. Botanically speaking, the prairie portions to the east and northeast are of special interest. The showier of the typical prairie species include prairie buttercup, slender blue beardtongue, Richardson's alumroot, owl clover, meadow blazingstar, bergamot and narrow-leaved sunflower. In one small saline hollow much frequented by coyotes and deer grow Curly-cup Gumweed, Canby's bluegrass and a tiny annual, linear-leaved plaintain, that is well north of its range as given in the botany books. The only other site that I know of in the Edmonton area with a richer prairie flora is "Nisku Prairie," east of Nisku industrial site which is being maintained as a municipal reserve by the County of Leduc and is under private stewardship. As well, the persistence of Rough Fescue grass is a sure sign of the area's lack of disturbance.

The area is frequented by many of the common woodland bird species, a pair of Red-tailed Hawks every year and Great Horned Owls. The bedding sites of white-tailed deer can be observed everywhere, as well as evidence of coyotes; snowshoe hares are occasionally seen...I do believe that the area, with proper stewardship, could retain its value for nature interpretation both informally and formally." (excerpt from July 29, 1995 letter from Patsy Cotterill, Edmonton Plant Study Group Coordinator/Urban Natural Areas Committee, Edmonton Natural History Club).

Criteria

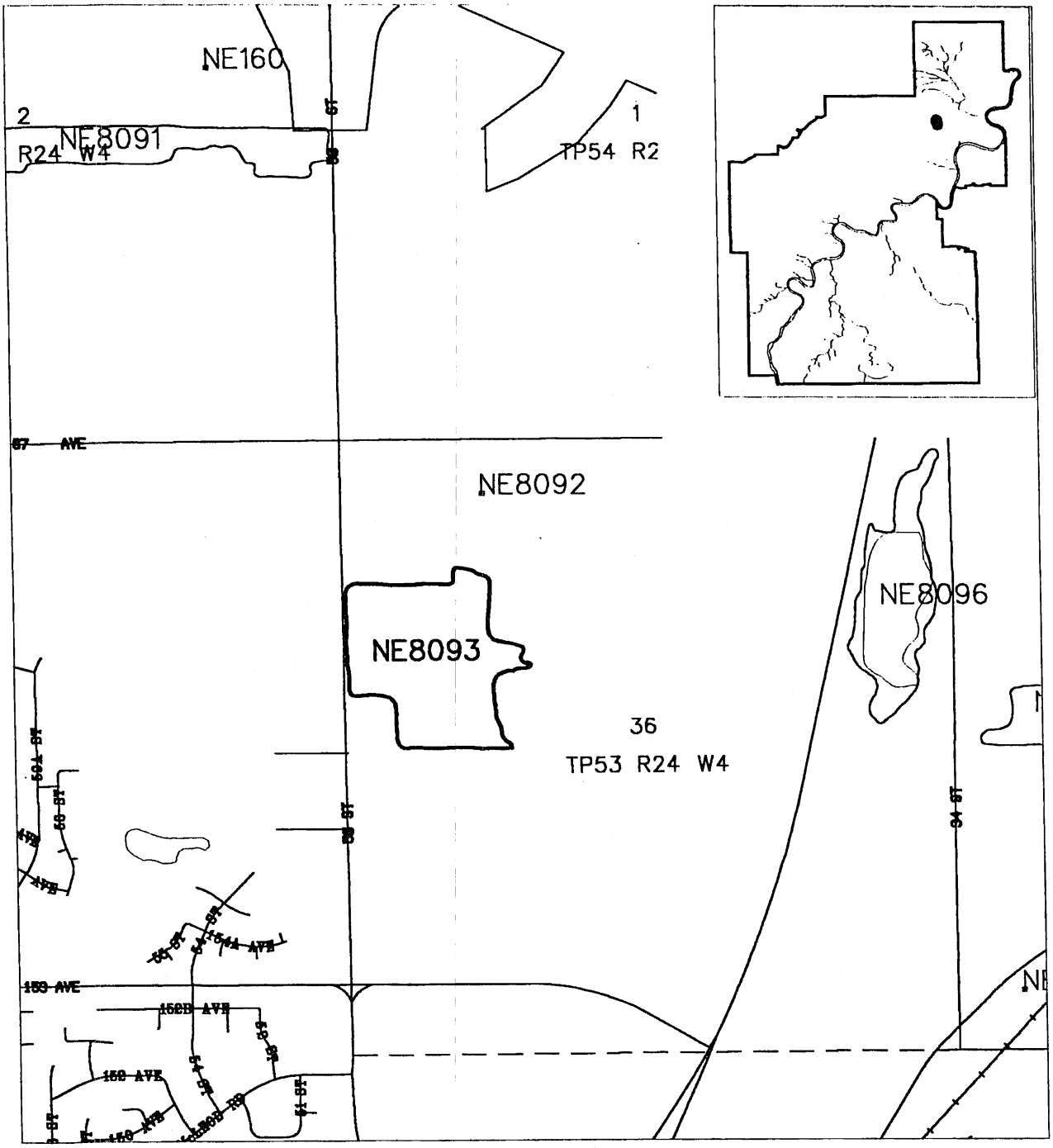
- good example of mature aspen-dominated upland forest

Sensitivity Low

With the exception of the total clearing of this stand, it is not very sensitive to most man-made disturbances.

Management Considerations

Because this site represents the largest continuous tract of undisturbed aspen in northeast Edmonton, attempts should be made to ensure its survival and maintenance.


NE160
2
NE8091
R24 W4
1
TP54 R2
87 AVE
NE8092
NE8096
NE8093
36
TP53 R24 W4
34 ST
153 AVE
152B AVE
152 AVE

Site No **NE 8094/NE 8095**

Significance **Local Environmentally Sensitive Area**

Size 52.52 ha

Location Between 66th Street and 82nd Street, north and south of 167th Avenue [N 1/2 Sec 34 TP 53 R24; SE 3 TP54 R24 W4M]

Description

This unique stretch of relatively undisturbed native land appears to be the best example of Aspen Parkland within the city of Edmonton; a large sedge meadow occurs north of 167 Avenue, while the area to the south consists of better drained upland vegetation of willow and aspen; excellent example of parkland succession both on well drained and poorly drained topography.

Site does not appear to be negatively impacted by past development activities. Site remains in almost native conditions. 167 Avenue appears to have affected drainage within the site as cattails have developed on the north side where ponding of water appears to have occurred.

Site is valuable as wildlife habitat, especially for white-tailed deer, songbirds (i.e. savannah sparrow) and raptors. Wetland component may provide seasonal habitat for waterfowl.

Area north of 167 Avenue has been fenced to protect it from adjacent driving range (Castle Downs Driving Range).

Criteria

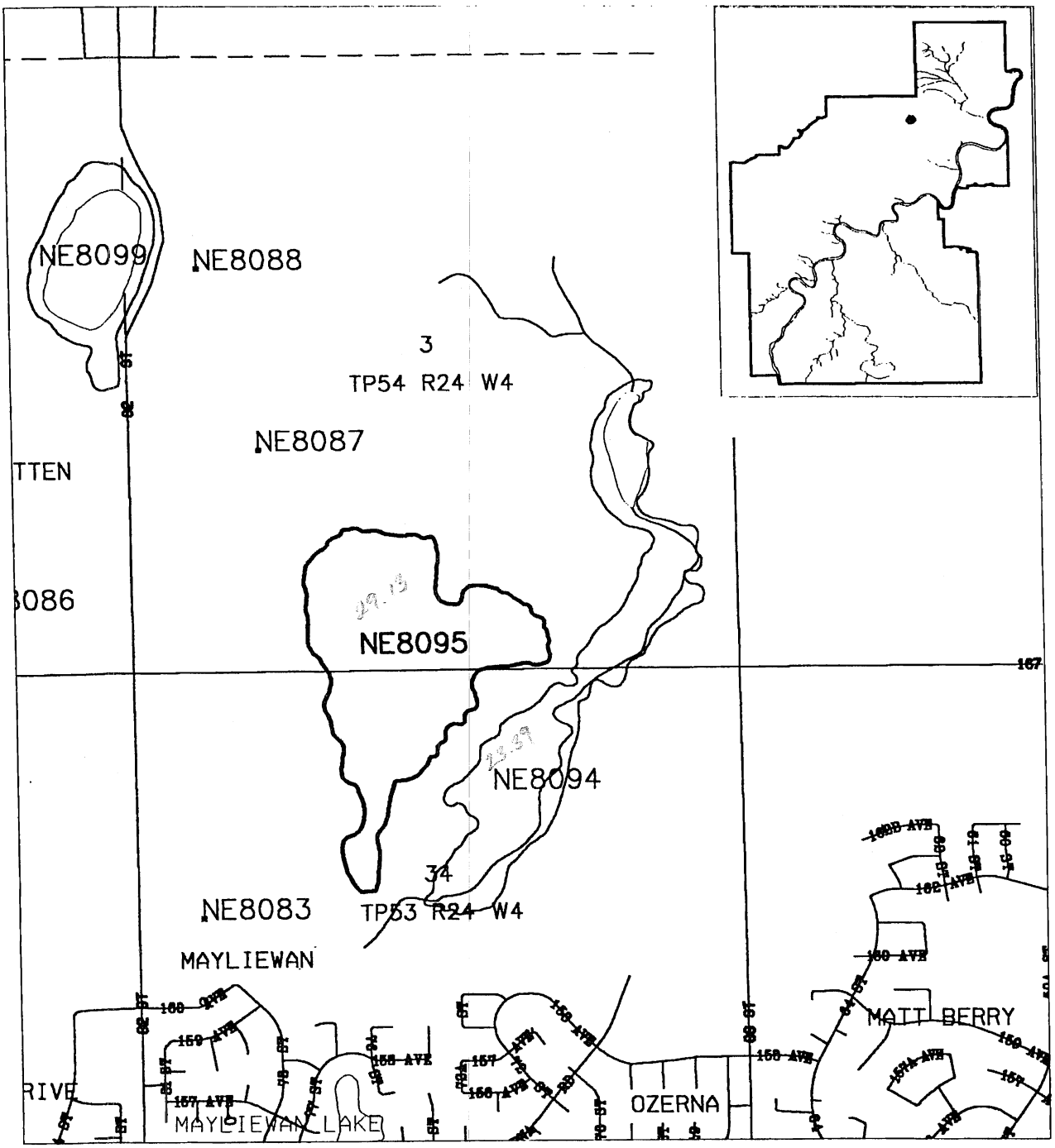
- best example within Edmonton of Aspen Parkland ecoregion
- good example of variable drainage regimes within the Aspen Parkland ecoregion
- provides significant wildlife habitat for local species
- provides critical function in balancing or maintaining local hydrology

Sensitivity High

The unique conditions that have given rise to the aspen parkland appearance of this site must not be disturbed otherwise the site will be severely impacted, including lost habitat. Any disturbances that would impact local hydrological conditions would almost certainly have negative implications for the wetland component of the site.

Management Considerations

Attempts should be made to conserve this rather unique parcel of land within Edmonton as it represents the best example of aspen parkland succession within the city.


NE8099
NE8088
3
TP54 R24 W4
NE8087
TTEN
3086
NE8095
NE8094
34
NE8083
TP53 R24 W4
MAYLIEWAN
MAYLIEWAN LAKE
OZERNA
MATT BERRY
RIVE

Site No **NE 8096**

Significance **Local Environmentally Sensitive Area**

Size 9.25 ha

Location Between 34 Street and Manning Freeway south of 167 Avenue
[NE 36 TP53 R24 W4M]

Description

Well-developed wetland with permanent open water with extensive cattail fringe; few willows.

Variable water levels reflected in current vegetation; open water with cattail fringe surrounded by exposed mineral soils and upland areas.

Open water combined with permanent open water results in critical nesting and rearing habitat for local waterfowl; Vriend Lake used with other larger, regional lakes for staging.

Surrounding land uses include pasture lands that appear to be used by cattle and horses.

Criteria

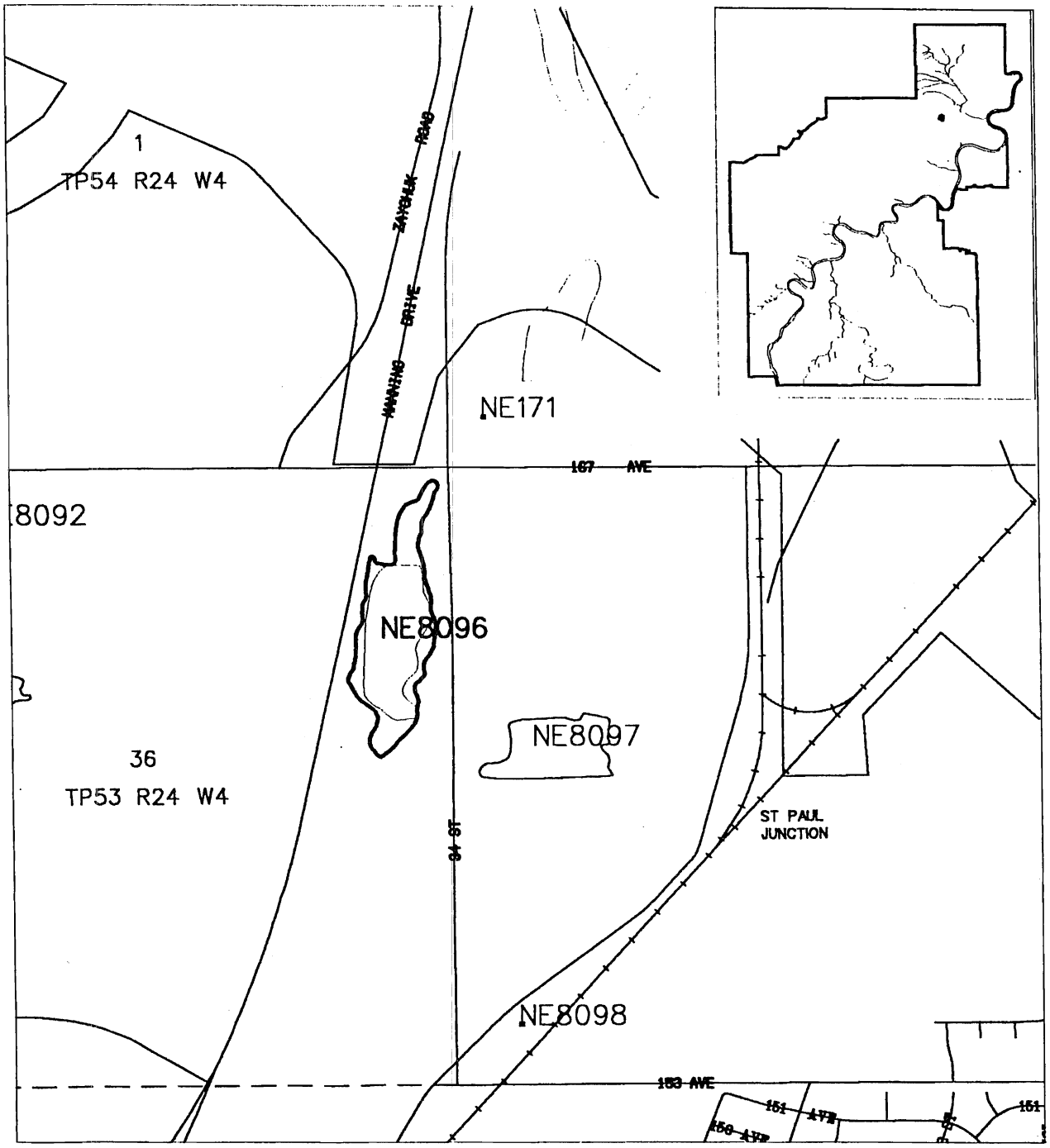
- provides good example of wetland vegetation communities
- permanent open water
- critical waterfowl habitat
- provides critical function in balancing and maintaining local hydrology

Sensitivity High

Any disturbances to the surrounding landscape that would ultimately impact the local hydrological conditions will certainly have a very negative impact upon the hydrological regime of the lake. In addition, because of the relative small size of the basin, water quality is also very susceptible to any input of contaminants. Any changes to the quality or quantity of water will have negative impacts upon the ecological integrity of the wetland and hence result in lost waterfowl habitat.

Management Considerations

Attempts should be made to ensure the long-term survival and maintenance of Vriend Lake as it provides local waterfowl habitat. Efforts should be made to ensure that water quality and quantity are maintained or even enhanced.


1
TP54 R24 W4
ZAHBLAK ROAD
MANNING DRIVE
NE171
187 AVE
8092
NE8096
NE8097
36
TP53 R24 W4
34 ST
ST PAUL
JUNCTION
NE8098
183 AVE
151 AVE
150 AVE
151

Site No **NE 8097**

Significance **Significant Natural Area**

Size 4.45 ha

Location Situated between 34 Street and Fort Road, 0.8 km north of 153 Avenue [NW 33 TP53 R23 W4M]

Description

Mature aspen-balsam poplar woodland with remnant dugout in centre; poplar and aspen to 15 m; diverse shrub understorey of red-osier dogwood, bracted honeysuckle, rose, aspen regeneration and snowberry;

Dugout provides year-round habitat for beaver; beaver lodges in banks; most aspen and balsam poplar within 5-10 m of dugout have been cut by beaver, resulting in heavy cover of regenerating aspen and fallen trees; dogwood heavily browsed by white-tailed deer; numerous stick nests; black-capped chickadee and black-billed magpies observed at site.

Surrounding land uses include the Evergreen Cemetery, a major transmission line to the south and market gardens to the north. The dugout in the center of the site appears to be used for irrigation purposes.

Criteria

- provides habitat for local wildlife, including beaver, white-tailed deer and a number of songbirds

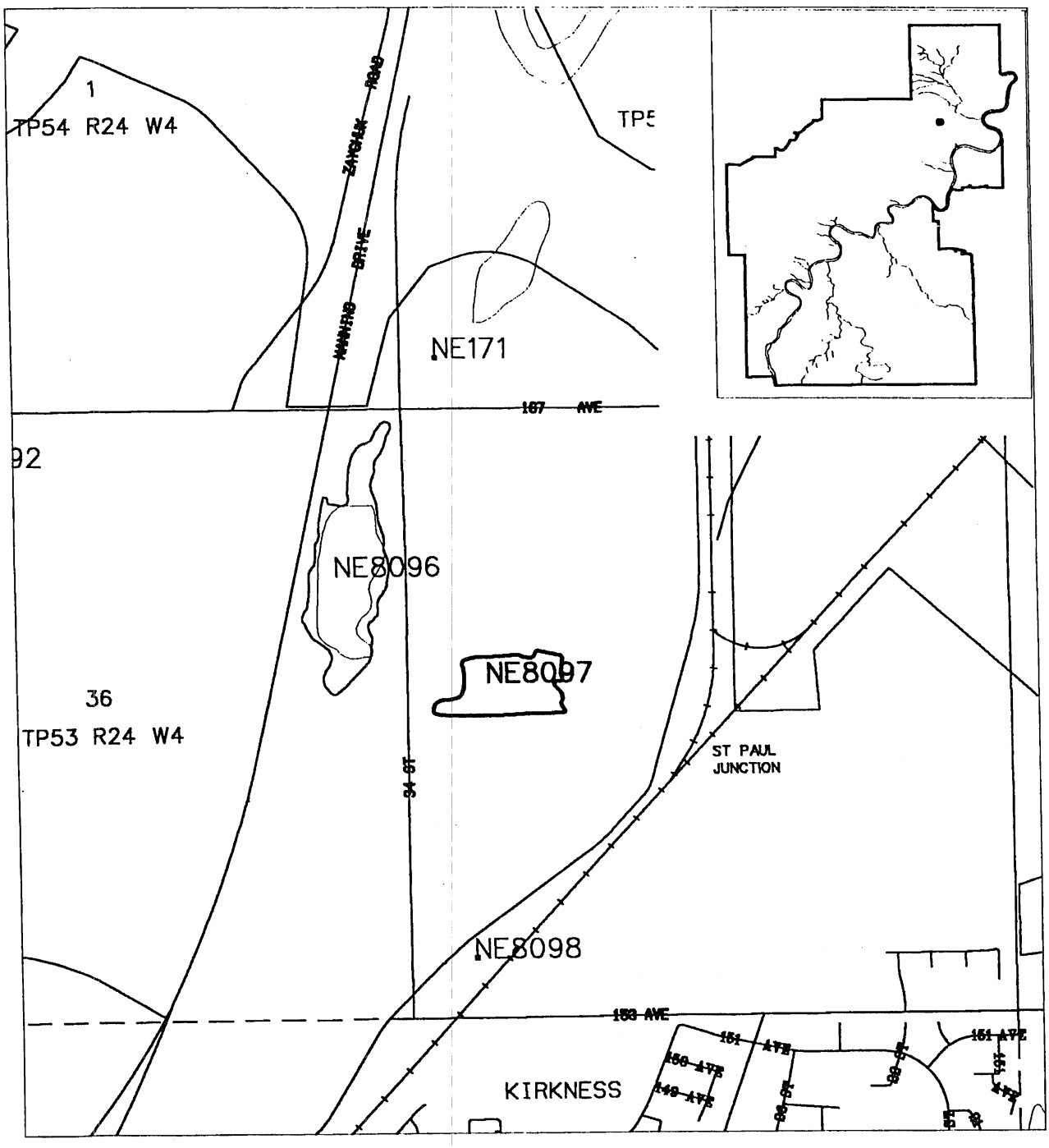
Sensitivity Moderate

Any major disturbance to the natural hydrology of the area will almost certainly have severe implications to local beaver populations.

Management Considerations

This site represents one of only two sites that were inventoried within the city (excluding the North Saskatchewan River Valley and Ravine System) where beaver were present. Beaver were also noted at the Glendale Wetland in northwest Edmonton. It is imperative that attempts be made to either maintain or even enhance the current ecological conditions at the site as beaver rely heavily upon stable water levels.

The transmission line to the south and the Evergreen Cemetery provide natural features to protect this site from further development.


1
TP54 R24 W4
ZAMBAK ROAD
MANNING DRIVE
TP5
NE171
187 AVE
92
NE8096
NE8097
36
TP53 R24 W4
94 ST
ST PAUL
JUNCTION
NE8098
183 AVE
KIRKNESS

Site No **NE 8099**

Significance **Local Environmentally Sensitive Area**

Size 12.50 ha

Location 1.3 km north of 167 Avenue on west side of 82nd Street
[NE 4 TP54 R24 W4M]

Description

Permanent lake with well developed, extensive and continual ring of cattails; water depth appears to be greater than 3 m; fringe of willow occurs between lake and 82nd Street; small aspen grove with an understorey of rose and native grasses occurs at northeast corner of lake.

Permanent nature of water coupled with well developed and extensive ring of cattails provides excellent waterfowl habitat, especially for nesting, feeding and rearing; lake used in conjunction with other, larger regional lakes for staging; numerous magpies observed at site.

Surrounding land uses include 82nd Street to the east, and cultivated fields to the north, south and west.

Criteria

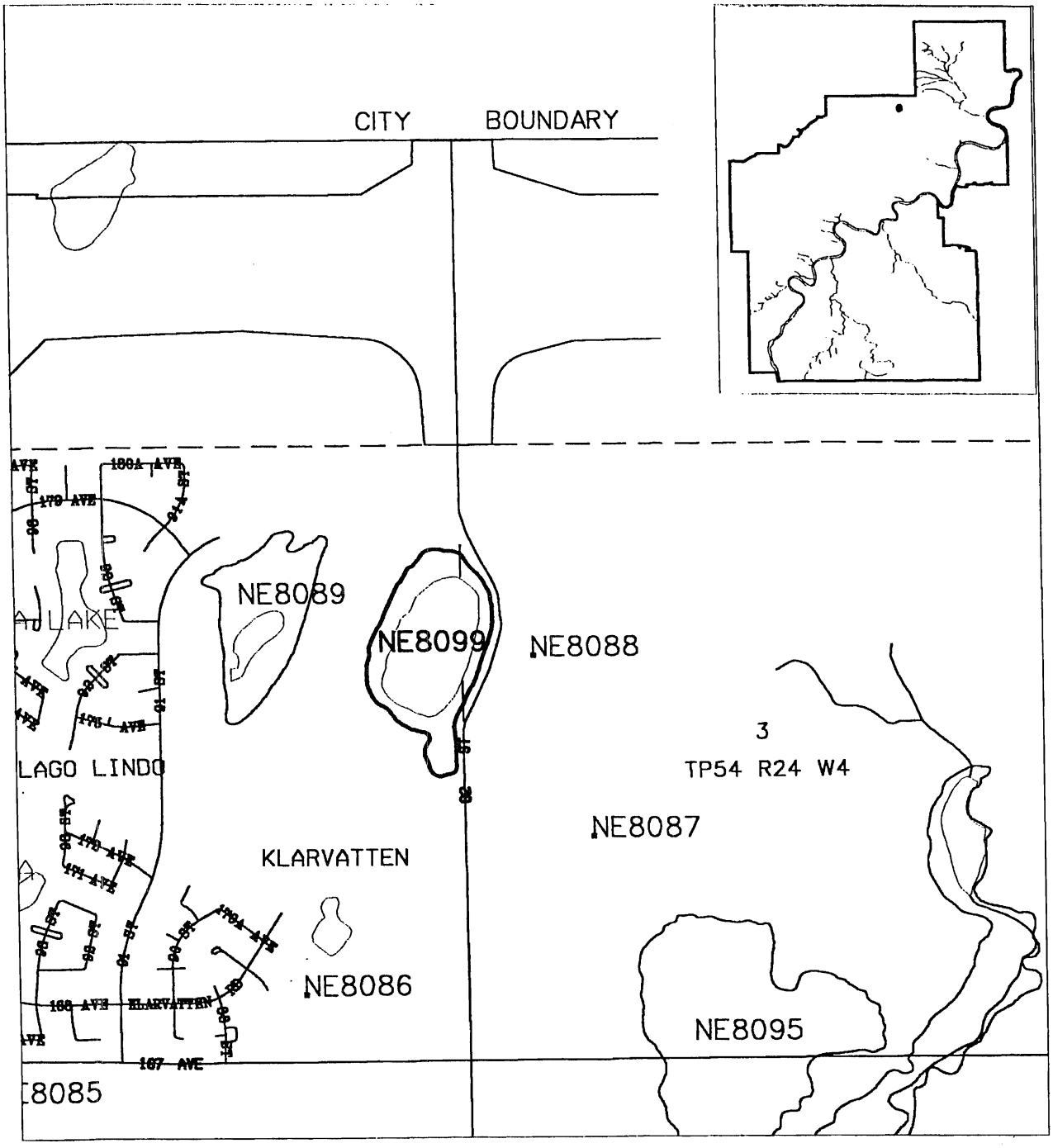
- provides good example of wetland vegetation
- open permanent water
- provides critical waterfowl habitat
- provides critical function in maintaining or balancing local hydrological conditions

Sensitivity High

Any alterations to adjacent lands that would impact the natural hydrology of the area would certainly have a very negative impact upon the water regime and quality of water within the lake. In addition, any disturbance to water levels will have negative impacts upon emergent aquatic vegetation, resulting in lost waterfowl habitat.

Management Considerations

Attempts must be made to ensure that this significant water body is not disturbed in any fashion. Any re-alignment of 82nd Street is certainly to have serious negative consequences for the overall ecological integrity of the site. Considerations must also be given to adjacent sites, including the remnant woodland parcels to the east as these sites combine to form an unique landscape within northeast Edmonton.


CITY BOUNDARY
NE8089
NE8099
NE8088
LAKE
LAGO LINDO
3
TP54 R24 W4
NE8087
KLARVATTEN
NE8086
NE8095
8085

3.2 MISTAMIN INDUSTRIAL AREA

A total of five sites were identified within the Mistamin Industrial Area. Of these five sites, one has been identified and classed as a local environmentally sensitive area, the other four meet the criteria of natural areas.

The Edcon Ponds has been identified and classed as a "locally" significant environmentally sensitive area. It is approximately 39.78 ha in size and is highly sensitive to any additional disturbances.

Site No **NW 7090**

Significance **Local Environmentally Sensitive Area**

Size 39.78 ha

Location 2.0 km north of Yellowhead Highway (Hwy 16X) on east side of 170 Street
[NW 22 TP53 R25 W4M]

Description

A cooperative venture between Consolidated and Ducks Unlimited; a sign at the entrance to the site off of 170 Street states that the site "provides excellent waterfowl nesting habitat within a major city."

Site consists of a minimum of 6 ponds of varying characteristics; several ponds appear to have been completed filled in with materials; Pond 1, perhaps the largest of the complex and occurring immediately east of 170 Street has contoured slopes with permanent open water; numerous nesting boxes established at site; up to 100 Canada geese observed on water along with several northern shoveler; Pond 2 occurs immediately south of Pond 1 along 170 Street and has the best developed emergent aquatic vegetation of any of the ponds; well-developed ring of cattails varying between 6-8 m around entire pond; willows occur in background, especially along southern and eastern shorelands; excellent waterfowl habitat although only 10 ducks observed on water; Pond 3 occurs southeast of 170 Street and 137 Avenue intersection; water appears to be considerably less than past water levels; considerable upland areas providing possible nesting habitat; 40-50 ducks present on water during inventory; Pond 4 is considerably smaller than what appears on the 1991 ariel photographs; good nesting habitat, however, less than 10 ducks observed on water; Pond 5 has been totally filled in with materials over the past two years as the 1991 air photographs show excellent open water; Pond 6 is the eastern most wetland and occurs immediately adjacent the industrial complex; appears to be mainly a cattail marsh.

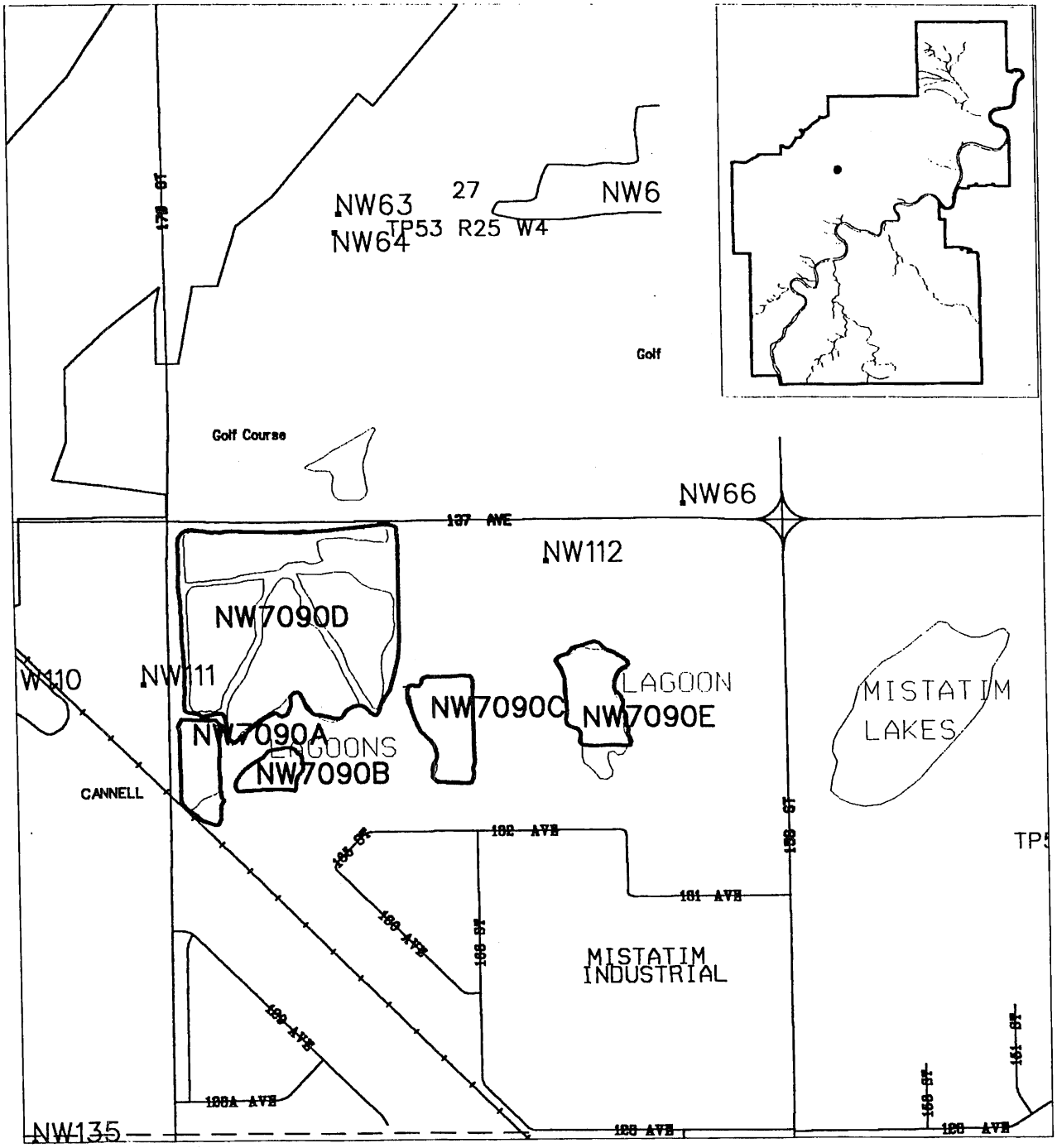
"Project heavily impacted by Edcon's (Consolidated) industrial activity yet is extremely well used by waterfowl... quality upland nesting cover is maintained by Edcon and the relatively deep permanent wetlands attract broods from the abundant nearby more disturbed or less permanent basins.... perhaps the greatest importance of this site is the high profile of these wetlands being adjacent to the heavily travelled 170th Street and 137 Avenue ... most of the wetlands are impacted by marl mining ...a good example of urban/industrial wildlife habitat (Ducks Unlimited, unpubl. 1992).

Criteria

- permanent open water
- "excellent waterfowl nesting habitat"

Sensitivity High

Because this site occurs within the Consolidated Cement plant, it is highly susceptible to any disturbances that may impact any of these wetlands; Ponds 1 - 3 are in excellent condition while ponds 4 - 6


NW63
27
NW6
NW64
TP53 R25 W4
Golf
Golf Course
NW66
137 AVE
NW112
NW7090D
W110
NW111
LAGOON
NW7090C
NW7090E
MISTATIM
LAKES
NW7090A
LAGOONS
NW7090B
CANNELL
182 AVE
181 AVE
MISTATIM
INDUSTRIAL
NW135

appear to be highly threatened by development; Pond 5, for example has been completely in-filled during the past two years, resulting in a significant loss of "excellent waterfowl nesting habitat."

As stated by Ducks Unlimited (1992), most of these ponds are affected by marl mining activities. Any further changes to the structure and composition of these wetlands will certainly have negative implications as to the importance of these sites for waterfowl habitat.

Management Recommendations

Attempts must be made to ensure the survival and maintenance of these ponds as they represent "excellent waterfowl nesting habitat within a major city." Any additional in-filling of these ponds will certainly have severe negative consequences for the entire wetland complex. These ponds function together to form excellent waterfowl habitat and as a result, attempts must be made to ensure that they remain intact.

3.3 CLOVE BAR TERRACE

The entire Clover Bar Terrace area has been identified by O'Leary *et al.* (1993) as a locally significant environmentally sensitive area as it provides critical wildlife habitat and provides a critical linking function to the North Saskatchewan River Valley and Ravine System to the north and west. The area has been referred to as the "South-End Ravine and Channel Bank Complex" and was previously identified as significant by Ealey (1986), Ducks Unlimited (1992) and Strong et al. (1985). All six sites identified have been classed as local environmentally sensitive areas. They account for 160.01 ha of primarily open water and steep slopes.

Site No **NE 8080**

Significance **Local Environmentally Sensitive Area**

Size 6.70

Location 1.0 km north of 137 Avenue NE along eastern city boundary [SE 27 TP53 R23 W4M]

Description

Lower portion of Oldman Creek that occurs within the city boundary; identified and classed as a local environmentally sensitive area by O'Leary et al. (1993) and Infotech (1989 a,b) deeply incised stream course with highly diversified vegetation communities that strongly reflect the influence of aspect; north-facing slopes heavily forested with varying amounts of aspen, balsam poplar and white spruce; south-facing slopes have considerable amount of grass and shrub vegetation (rose, saskatoon and snowberry) with open aspen and balsam poplar overstories.

Valley provides critical wildlife movement corridor between the County of Strathcona and the North Saskatchewan River Valley and Ravine System; used extensively by white-tailed deer; numerous blue jays, American crows and black-billed magpie observed at site.

Steep slopes are highly susceptible to mass wasting and slumping; slump scars observed.

Criteria

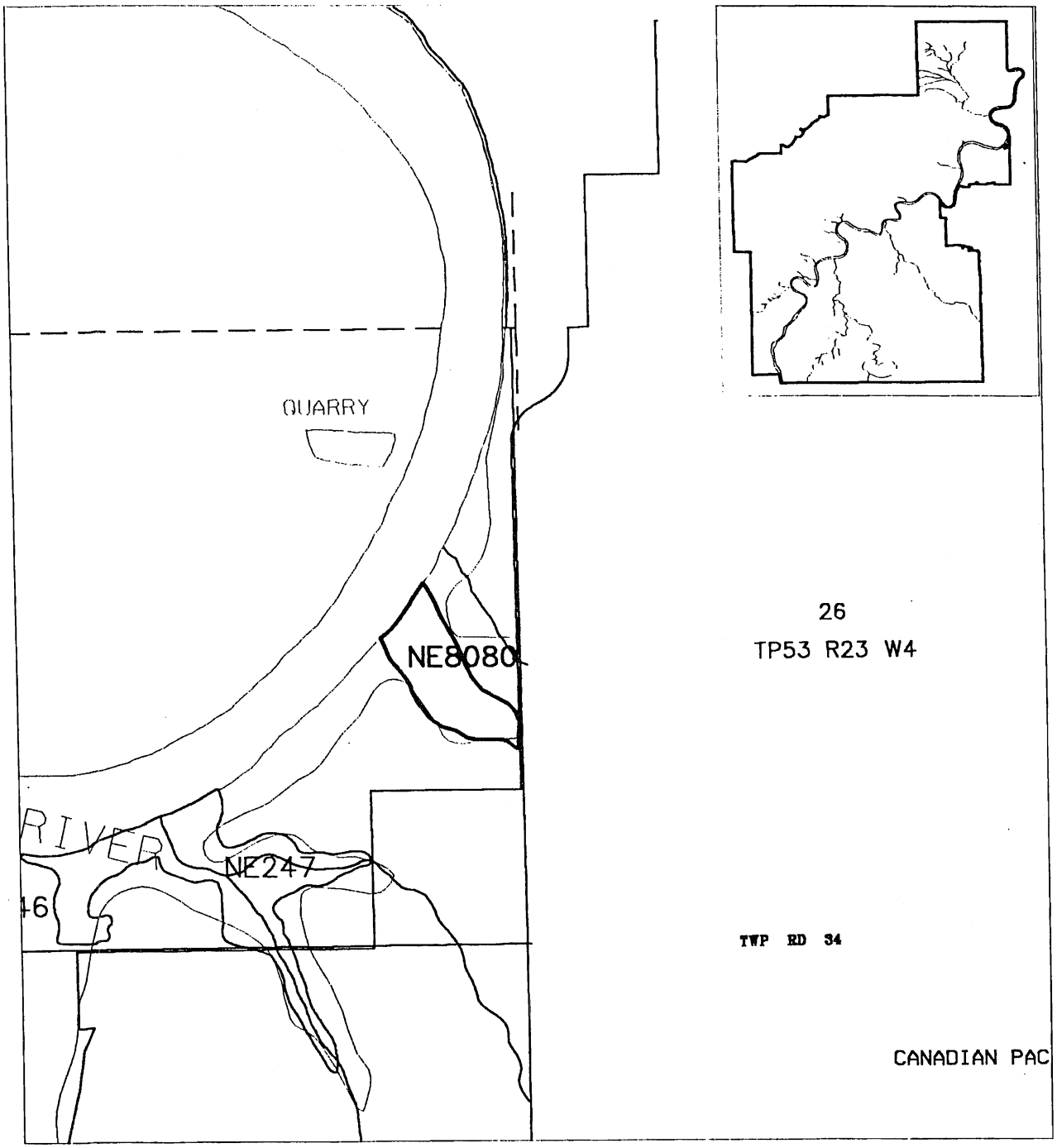
- high community and plant species diversity
- provides critical wildlife corridor between County of Strathcona and the North Saskatchewan River Valley and Ravine System
- steep, usually unstable slopes, slumps, bedrock or landform failure (hazard lands)
- groundwater discharge with numerous springs

Sensitivity High

The slopes are highly sensitive to disturbances that would reduce the stability of the slopes (i.e. vegetation removal, road construction, etc.); increased stream siltation due to any disturbances.

Management Considerations

Attempts must be made to ensure that the site remains untouched and that the sites importance to the overall ecological integrity be recognized.


QUARRY
NE8080
RIVER
NE247
46
26
TP53 R23 W4
TWP RD 34
CANADIAN PAC

Site Name **NE 8081**

Significance **Local Environmentally Sensitive Area**

Size 74.27 ha

Location Occurs extensively throughout the Clover Bar Terrace
[Portions of Sec 15, 16, 20, 21 and 22 TP53 R23 W4M]

Description

Site 8081 represents the upper valley wall and several tributaries valleys of the Clover Bar Terrace; aspen-dominated, north and west facing-slopes; occasional white spruce and balsam poplar, especially in seepage areas; 15-30 % slopes; aspen extends up over the valley walls where most of the aspen is relatively young and stunted (8 - 10 m in height); well-developed shrub understorey of wild rose, saskatoon, choke cherry, willow, and red-osier dogwood; deeply incised tributary valleys dominated by aspen-balsam poplar communities with occasional white spruce; overstorey vegetation to 20 m in height; slumping occurs extensively within tributary valleys where steep slopes and springs combine to produce relatively unstable topography; north-facing slopes more heavily forested; willow occurs extensively in valley bottoms where moisture conditions considerably higher.

Unique combination of mature overstorey aspen, balsam poplar and white spruce with well-developed shrub understories and steeply sloping topography provide critical wildlife habitat; numerous white-tailed deer observed throughout area; numerous stick nests seen throughout area; american crow, black-billed magpie and blue-jays observed throughout area.

Surrounding land uses include pasture lands and the Clover Bar Sludge Lagoons.

Criteria

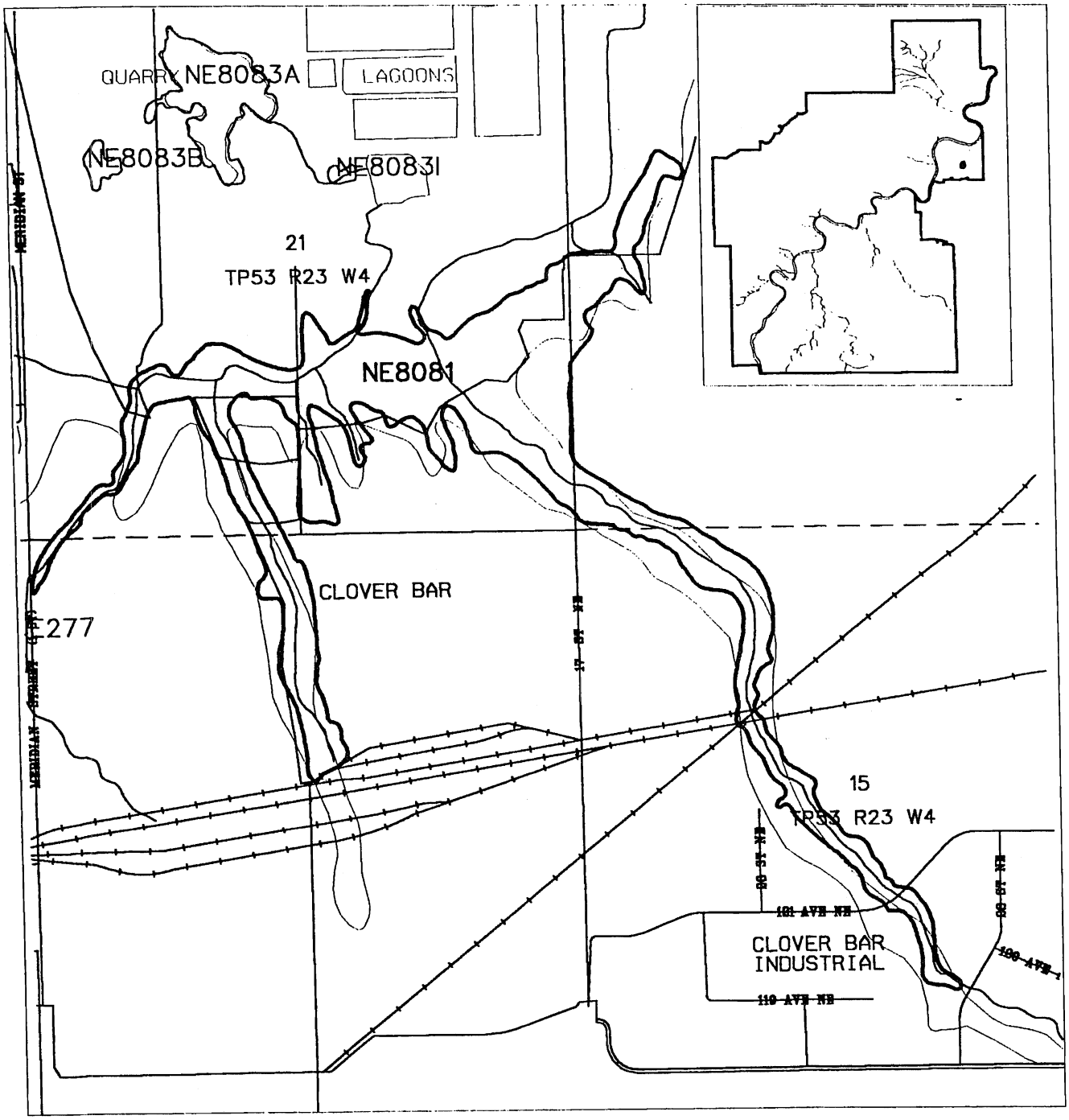
- good example of aspen and aspen-balsam poplar dominated forests
- high habitat diversity
- provides critical wildlife habitat
- steep, usually unstable slopes, slumps, bedrock or landform failure (hazard lands)
- provides critical linking function to North Saskatchewan River Valley and Ravine System

Sensitivity High

Because this unique landform occurs between the adjacent table lands to the south and the North Saskatchewan River Valley to the north, it provides a buffering or filtering effect for all groundwater movement throughout the area. As a result, any disturbance to this unique landscape will certainly have a very negative impact upon the wildlife resources of the area as well as hydrology of the area. Removal of current vegetation will likely have a negative impact upon terrain stability, resulting in possible slumping and slope failure.

Management Considerations

Attempts should be made to ensure that no further disturbances occur to these rather sensitive slopes as any disturbance will likely result in possible slope failure. It is also imperative that the slopes remain intact so as to maintain important wildlife habitat and corridor function that the site provides.


QUARRY
NE8083A
LAGOONS
NE8083B
NE8083I
21
TP53 R23 W4
NE8081
CLOVER BAR
E277
15
TP53 R23 W4
CLOVER BAR
INDUSTRIAL

Site Name **NE 8082**

Significance **Local Environmentally Sensitive Area**

Size 42.87 ha

Location 1.6 km north of Yellowhead Highway on west side of Meridian Street; extends north towards 137 Avenue and is partially dissected by 130 Avenue [E 1/2 Sec 20 TP53 R23 W4M]

Description

Extensive area of relatively young aspen between 6 - 12 m in height; area has previously been heavily impacted by pipeline developments resulting in a very diverse pattern of vegetation and topography; hummocky micro-topography results in varying shrub understories of saskatoon, choke cherry, snowberry, rose, red-osier dogwood, and willow; area has appearance of aspen parkland; some small wetlands were sedge and willow communities have developed.

Unique combination of young aspen communities with well-developed shrub understories and open grass-shrub areas provide excellent white-tailed deer and bird habitat; numerous white-tailed deer seen throughout site as well as blue jays and black-billed magpies; open grass-shrub areas provide excellent habitat for small mammals and hence prey habitat for birds of prey such as red-tailed hawks.

Surrounding land uses include industrial and pasture land. Area used extensively for motor-cross.

Criteria

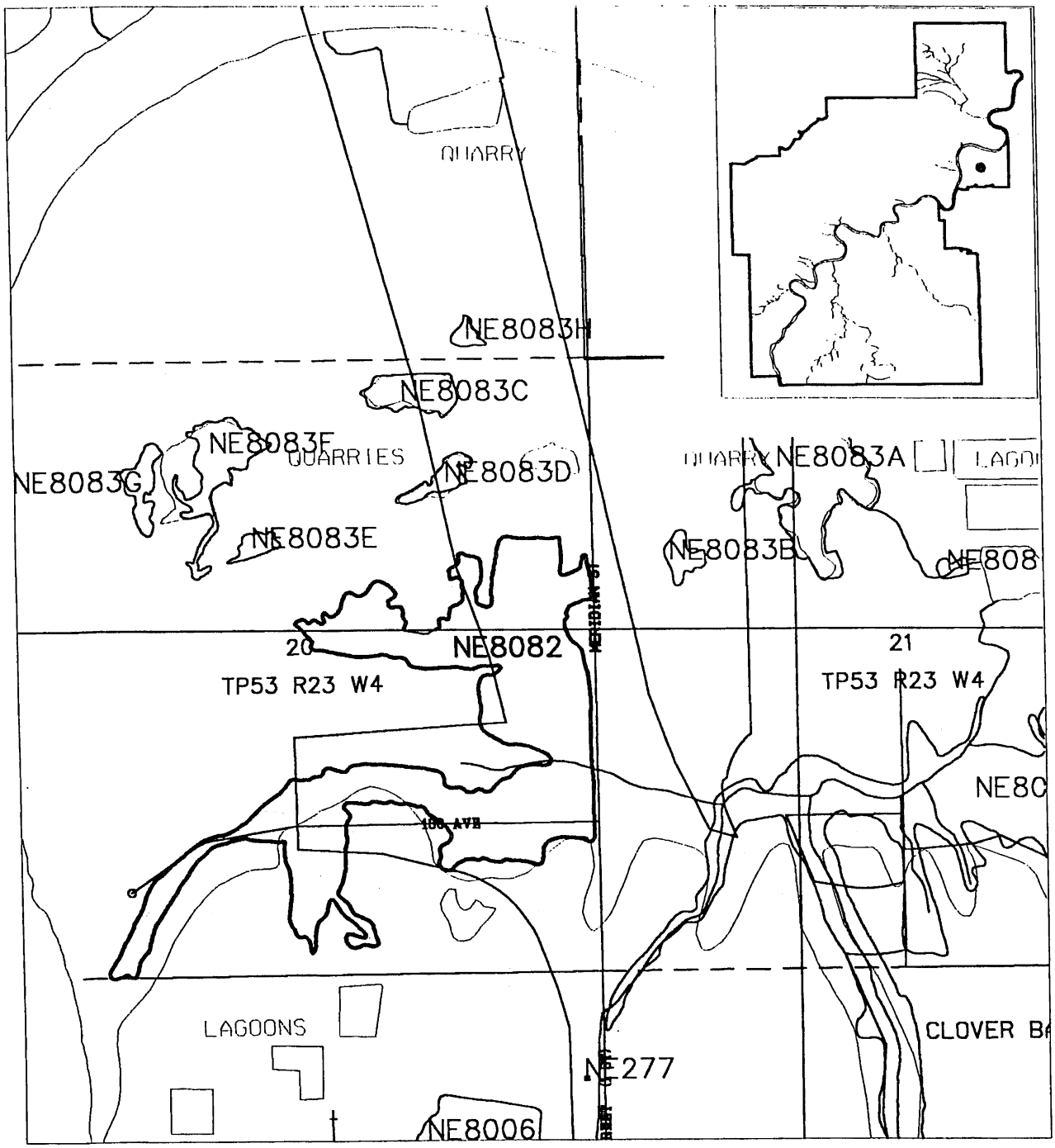
- good example of young regenerating aspen communities
- provides critical wildlife habitat for white-tailed deer and birds

Sensitivity High

Because the area has already been so negatively impacted by gravel extraction and pipeline development, it is imperative that measures be taken to ensure the survival and maintenance of the site. Any further disturbances to these relatively fragile aspen communities will have a very negative impact upon the utility of this area for white-tailed deer habitat.

Management Considerations

Attempts should be made to ensure the long-term survival of the site. This may mean limiting or banning motor-cross activities so as to preserve wildlife habitat and white-tailed deer populations.


QUARRY
NE8083H
NE8083C
NE8083F
QUARRIES
NE8083D
NE8083G
NE8083E
QUARRY
NE8083A
LAGO
NE8083B
NE808
20
NE8082
TP53 R23 W4
21
TP53 R23 W4
NE8C
LAGOONS
CLOVER B
NE277
NE8006

Site Name **NE 8083**

Significance **Local Environmentally Sensitive Area**

Size 17.65 ha

Location Approximately 3.0 km north of Yellowhead Highway west of Meridian Street
[NE 20 TP53 R23 W4M]

Description

A series of wetlands created by quarrying activities within the Clover Bar Terrace area; permanent open water; ponds generally have steep sides thereby limiting the development of emergent aquatic vegetation; shorelines very irregular with many islands within quarries.

Open water provides "decent habitat" (Ducks Unlimited 1992) for waterfowl and gulls; islands provide excellent nesting habitat for waterfowl.

Criteria

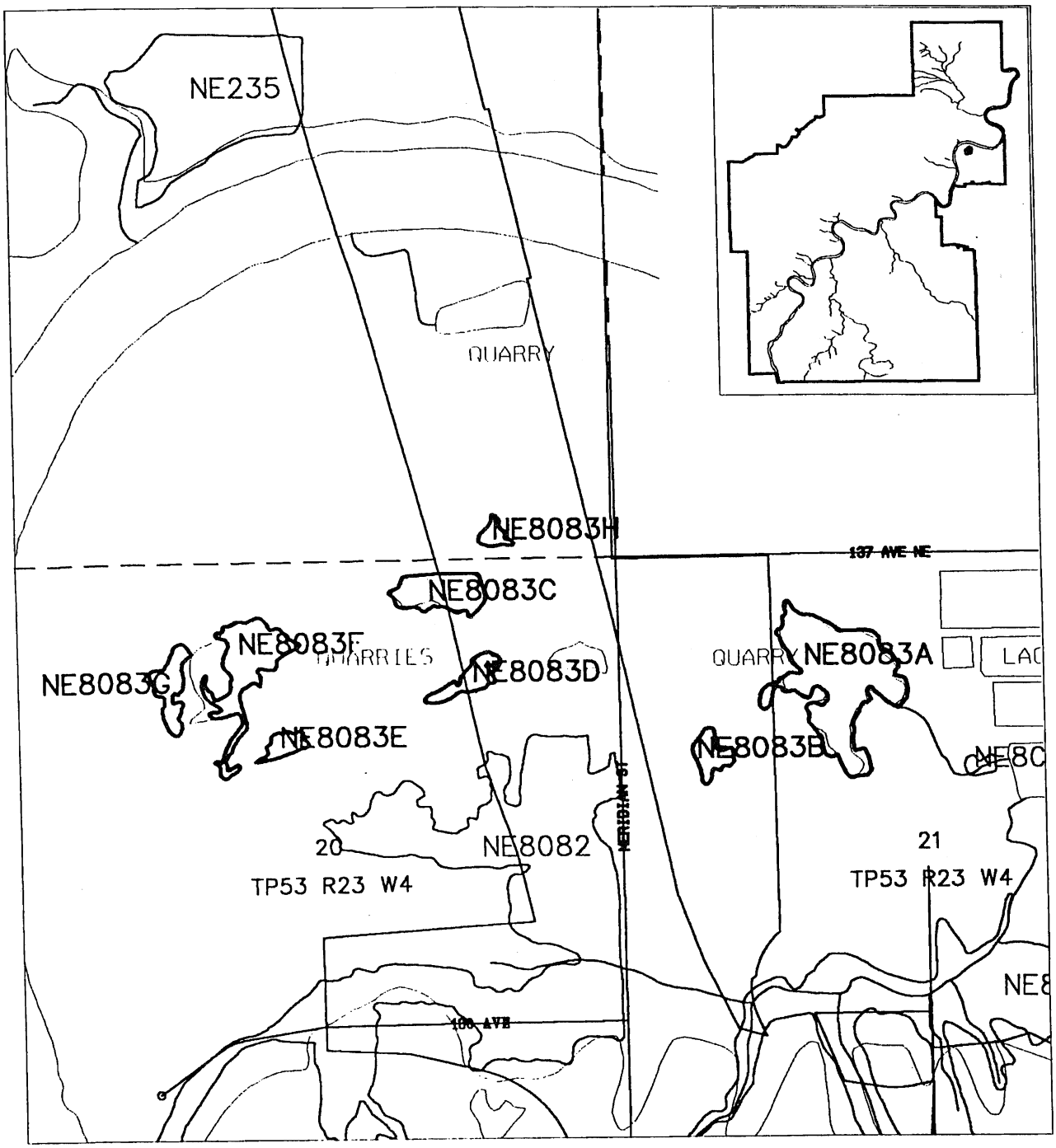
- permanent open water
- provides waterfowl habitat

Sensitivity High

Because these quarries have already been created as a result of disturbances, it is important that attempts be made to protect or even enhance their condition. Any in-filling of these quarries will render them of very little value for waterfowl habitat.

Management Considerations

According to Ducks Unlimited (1992) these quarries have good potential for wetland enhancement. Attempts should be made to either conserve these quarries or to work cooperatively with Duck Unlimited in enhancing the existing habitat for waterfowl. The entire Clover Bar Terrace represents an excellent example whereby a disturbed landscape could be reclaimed and enhanced to provide critical wildlife habitat. These quarries represent a component of a larger system.


NE235
QUARRY
NE8083H
137 AVE NE
NE8083C
NE8083F
QUARRIES
NE8083D
QUARRY
NE8083A
NE8083G
NE8083E
NE8083B
20
NE8082
21
TP53 R23 W4
TP53 R23 W4
100 AVE

Site Name **NE 246**

Significance **Local Environmentally Sensitive Area**

Size 2.58 ha

Location Northeast of 137 Avenue NE and 17 Street NE
[SW 27 TP53 R23 W4M]

Description

Remnant aspen-balsam poplar stand immediately adjacent the North Saskatchewan River Valley; has an definite "aspen parkland" type appearance; occasional white spruce, especially within stream channel; grasslands heavily grazed by horses; well-developed shrub understorey, especially along forest edge; overstorey vegetation to 12 m in height.

Stand provides important buffer for wildlife movement along the North Saskatchewan River and along an unnamed stream that runs southeast towards the Yellowhead Highway; numerous black-billed magpies observed at site along with a number of large stick nests.

Surrounding land uses include the Clover Bar Sludge Lagoons to the southwest, the North Saskatchewan River Valley to the north and pasture land to the east and west. Site has been double-fenced with barb wire and chain link fence.

Criteria

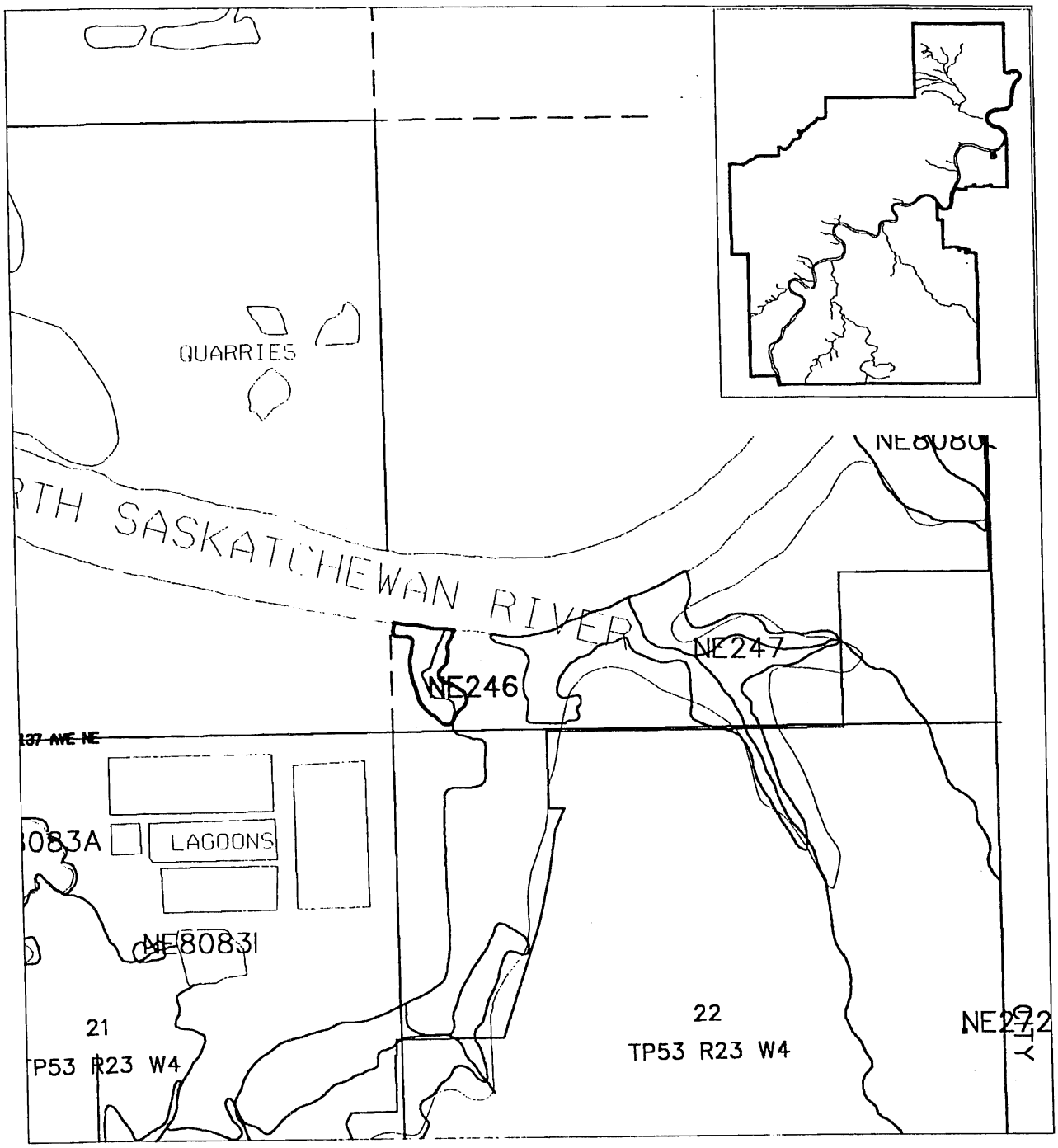
- provides critical linking function to the North Saskatchewan River Valley and Ravine System
- good example of an aspen parkland stand that has been grazed

Sensitivity High

Because the stand occurs immediately adjacent to the North Saskatchewan River Valley and is dissected by an unnamed stream, any changes to the structure of the stand will have severe implications to significance of the site as a corridor and buffer for wildlife.

Management Considerations

Attempts must be made to ensure that the site remains intact and that the structure and diversity of the site remain unchanged. It is imperative that the critical function of the site be recognized by planners and incorporated into any future development actions.


QUARRIES
RTH SASKATCHEWAN RIVER
NE247
NE246
137 AVE NE
083A
LAGOONS
NE8083I
21
TP53 R23 W4
22
TP53 R23 W4

Site Name **NE 247**

Significance **Local Environmentally Sensitive Area**

Size 15.94 ha

Location 3.2 km north of Yellowhead Highway at northeast corner of 137 Avenue [SW 27 TP 53 R 23 W4M]

Description

Deeply dissected tributary stream system of the North Saskatchewan River Valley and Ravine System; diverse riparian vegetation communities comprised of varying amounts of aspen, balsam poplar and white spruce; well-developed shrub understories of saskatoon , red-osier dogwood, rose, snowberry and choke cherry; willow to 10 m in height occurs extensively in valley bottoms; cattails have developed where drainage has been impeded by road development.

The deeply incised nature of the valley combined with the diverse overstorey and shrub vegetation provides excellent wildlife habitat; valley provides critical wildlife corridor for movement; blue jays, American crows and black-billed magpies observed at site.

Surrounding land uses include cultivated fields.

Criteria

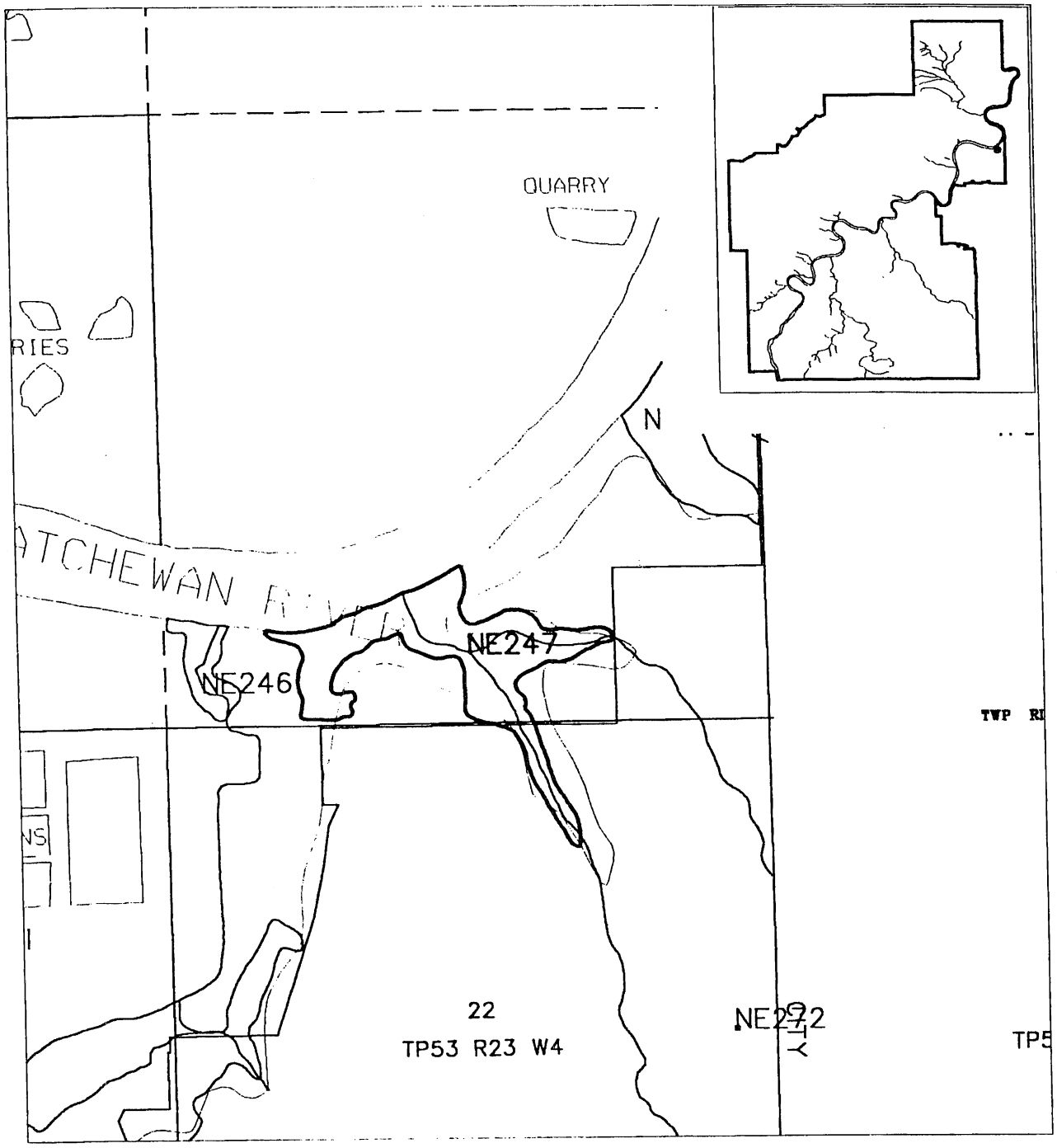
- good example of riparian vegetation communities
- provides habitat for local wildlife
- provides critical linking function between table lands and the North Saskatchewan River Valley and Ravine System
- possible "hazard lands"

Sensitivity High

Any removal of the current vegetation would result in terrain instability and possible slumping. In addition, any changes to the vegetation structure would possibly negate the usefulness of the valley for wildlife habitat.

Management Considerations

Attempts must be made to ensure that this tributary valley be maintained in its current condition to provide critical wildlife habitat.


QUARRY
RIES
N
ATCHEWAN
NE247
NE246
TWP
NS
22
TP53 R23 W4
NE272
TP5

3.4 PYLYPOW INDUSTRIAL PARK

Fifteen sites have been identified and classed as natural areas, significant natural areas or as environmentally sensitive areas within the Pylypow Industrial Park; three have been classed as locally significant environmentally sensitive areas, one as a significant natural area and the remaining 11 as natural areas.

Approximately 34.18 ha of mainly riparian land has been classed as environmentally sensitive areas, including both Fulton and Mill creeks. Both Fulton Creek and Mill Creek have previously been identified by O'Leary et al. (1993) as locally significant environmentally sensitive areas.

Site Name **SE 5090**

Significance **Local Environmentally Sensitive Area**

Size 17.54 ha

Site Location Mill Creek north of Whitemud Drive
[Sec 14 TP 52 R 24 W4M]
Roper Industrial Park

Description

Mill Creek Ravine is currently part of the North Saskatchewan River Valley and Ravine System and has previously been identified as a local environmentally sensitive area (O'Leary *et al.* 1993). This segment has been identified because of its location within an industrial complex.

Meandering stream channel that flows to the north; variable stream width, flood plain and valley configuration; vegetation varies from balsam poplar to aspen balsam poplar with consistent understorey of red-osier dogwood; canopy closure, stand density and composition function of time since disturbances; numerous snags along stream course.

Stream course and valley provide travel corridor for wildlife, especially terrestrial birds; numerous stick nests along stream course; very little evidence of use by white-tailed deer; evidence of use by beaver and muskrat in some portions of stream, especially north of 51 Avenue; magpies and blue jays observed during inventory of site.

Stream surrounded by industrial developments to the north, east (infrastructure developed but no buildings yet) and west; possible contamination from snow-dumping site on 51 Avenue, east of 66 Street; some dumping and disposal of waste noted along stream course during inventory.

Criteria

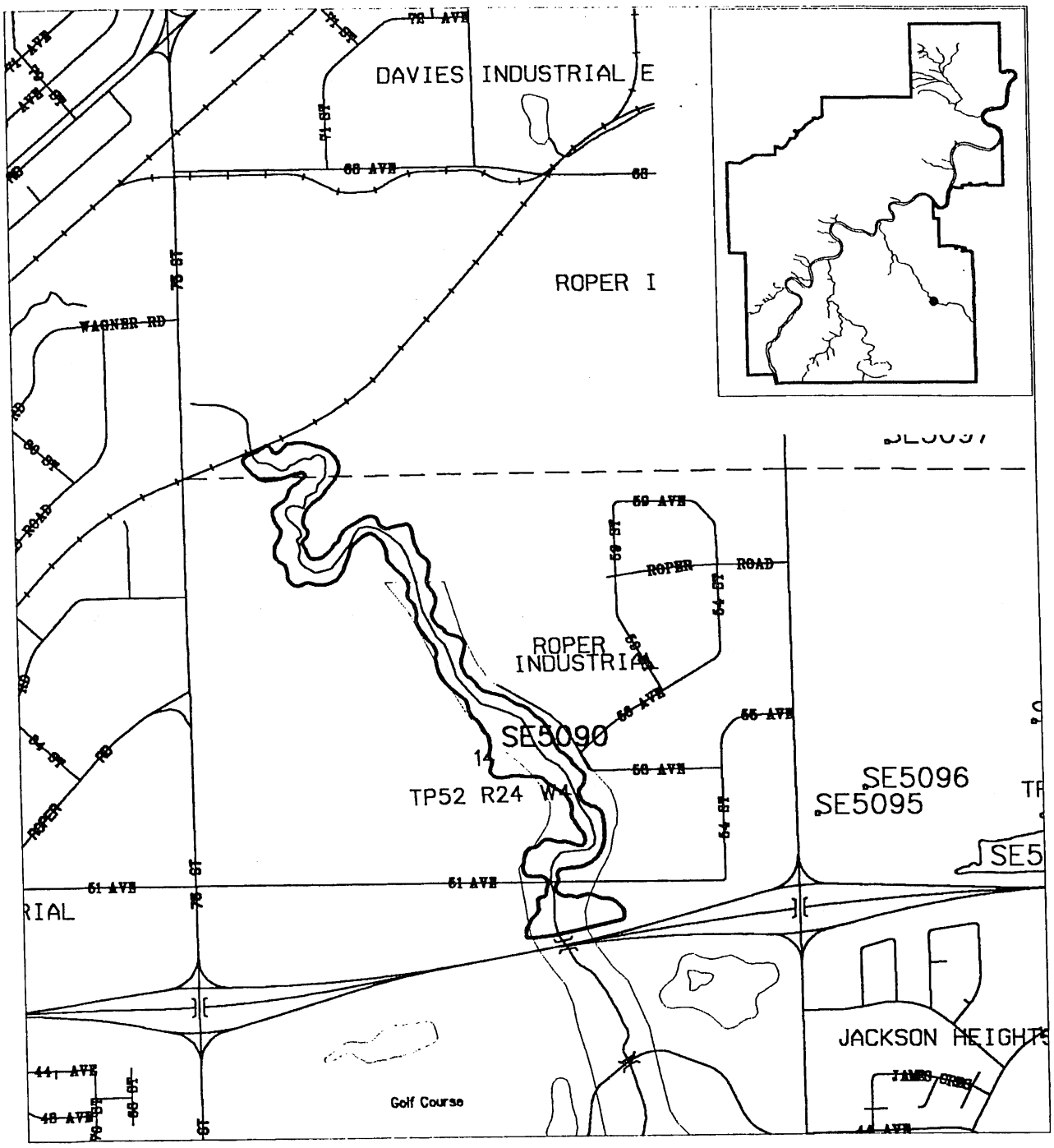
- provides critical linking function to ESA/SNA's identified within and outside of city, including the North Saskatchewan River Valley and Ravine System
- provides critical hydrological function in maintaining local hydrology

Sensitivity High

The stream is highly sensitive to any disturbances that would negatively impact the quality of the water. Considering the closeness of this stream to adjacent industrial developments, measures must be taken to ensure that the stream does not become polluted in any form. Also, it is recommended that clean-up measures be undertaken to improve overall ecological integrity of the steam. The relative "good" condition of the stream channel affords the opportunity to develop a nature trail within an industrial complex.

Management Considerations

Attempts must be made to preserve this rather unique stretch of Mill Creek as it provides an important linking and corridor function for wildlife and provides habitat for local wildlife species, including beaver.


DAVIES INDUSTRIAL E
ROPER I
WAGNER RD
ROPER ROAD
ROPER INDUSTRIAL
SE5090
TP52 R24 W4
SE5096
SE5095
JACKSON HEIGHTS
Golf Course
61 AVE
66 AVE
58 AVE
55 AVE
76 ST
54 ST

Site Name **SE 5093**

Significance **Local Environmentally Sensitive Area**

Size 4.09 ha

Site Location 1.5 km north of Whitemud Drive on west side of 34th Street
[NE 13 TP52 R 24 W4M]
Pylypow Industrial Park

Description

Isolated wetland with open water and well-developed ring of cattails and sedges; permanent water body, however, water levels appear to be down somewhat due to local hydrological regime.

Unique combination of permanent, open water, cattail and sedge fringe provides critical waterfowl habitat, especially for nesting and brood rearing habitat.

Surrounded by pasture land that is used by cattle; site does not appear to be too negatively affected by grazing pressures.

Criteria

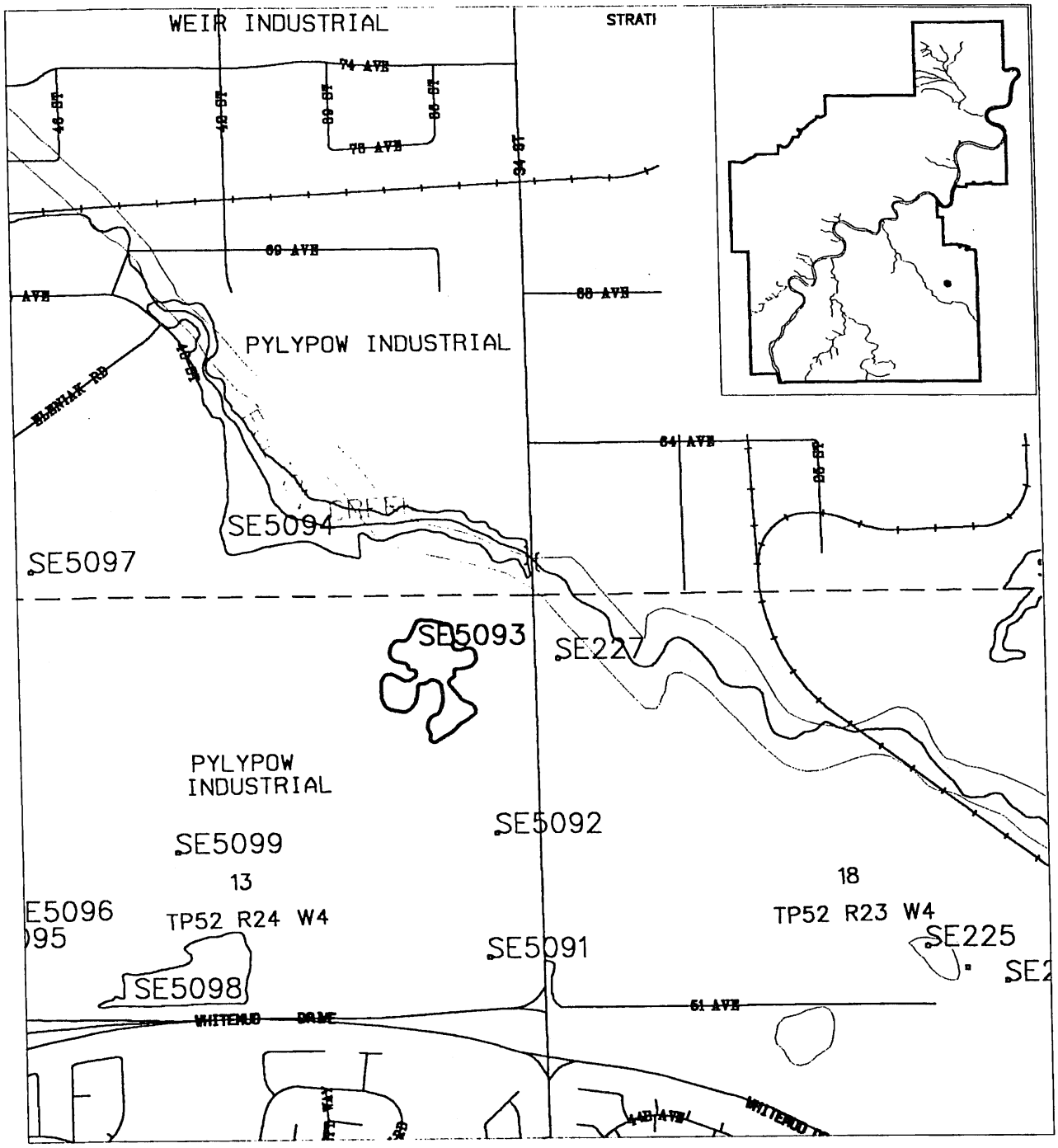
- critical waterfowl habitat
- provides critical hydrological function in maintaining local hydrology

Sensitivity High

The nature and composition of the existing vegetation is threatened by possible developments that would alter the natural hydrological conditions of the area. In addition, increased grazing pressures may significantly reduce nesting habitat for waterfowl.

Management Considerations

Attempts must be made to maintain this critical wetland and to possibly incorporate it into any future development plans for the area. Discussions should be held with the present landowner to ensure that increased grazing pressures do not adversely affect the existing nesting habitat.


WEIR INDUSTRIAL
STRATI
74 AVE
46 ST
48 ST
66 ST
68 ST
78 AVE
34 ST
68 AVE
68 AVE
PYLYPOW INDUSTRIAL
64 AVE
86 ST
SE5094
SE5097
SE5093
SE227
PYLYPOW
INDUSTRIAL
SE5092
SE5099
13
18
TP52 R24 W4
TP52 R23 W4
E5096
)95
SE5091
SE225
SE2
SE5098
51 AVE
WHITEMUD DRIVE

Site Name **SE 5094**

Significance **Local Environmentally Sensitive Area**

Size 12.55 ha

Site Location East of 34 Street, approximately 1.5 km north of Whitemud Drive
[Sec 24 TP 52 R24 W4M]
Pylypow Industrial Park

Description

Fulton Creek has previously been designated as a local environmentally sensitive area (O'Leary *et al.* 1993) and has been mapped independently as it passes through a major industrial complex.

Fulton Creek flows to the southeast and has a well-defined stream course and valley system for most of the reach; water flows are highly variable with minimum flows observed in the late fall; well-developed stream bank and flood plain vegetation composed mainly of balsam poplar with understorey of red-osier dogwood; remnant woodland parcel occurs on south side of stream course and consists of balsam poplar-aspen with variable shrubs of red-osier dogwood, rose, snowberry, raspberry, choke cherry, honeysuckle, and saskatoon; canopy height to 20 m; richness of site indicated by 10 m mountain ash; numerous snags throughout site.

Snags provide excellent nest and perching sites for red-tailed hawks; numerous large stick nests observed during inventory; black-billed magpie, blue jays and black-capped chickadees seen at site; presence of white-tailed deer indicated by feces, light to moderate browsing on red-osier dogwood and other palatable species and the presence of a bow hunting stand.

Surrounding land uses include cultivated hayland and industrial development to the north. Numerous pipeline crossings and culverts.

Criteria

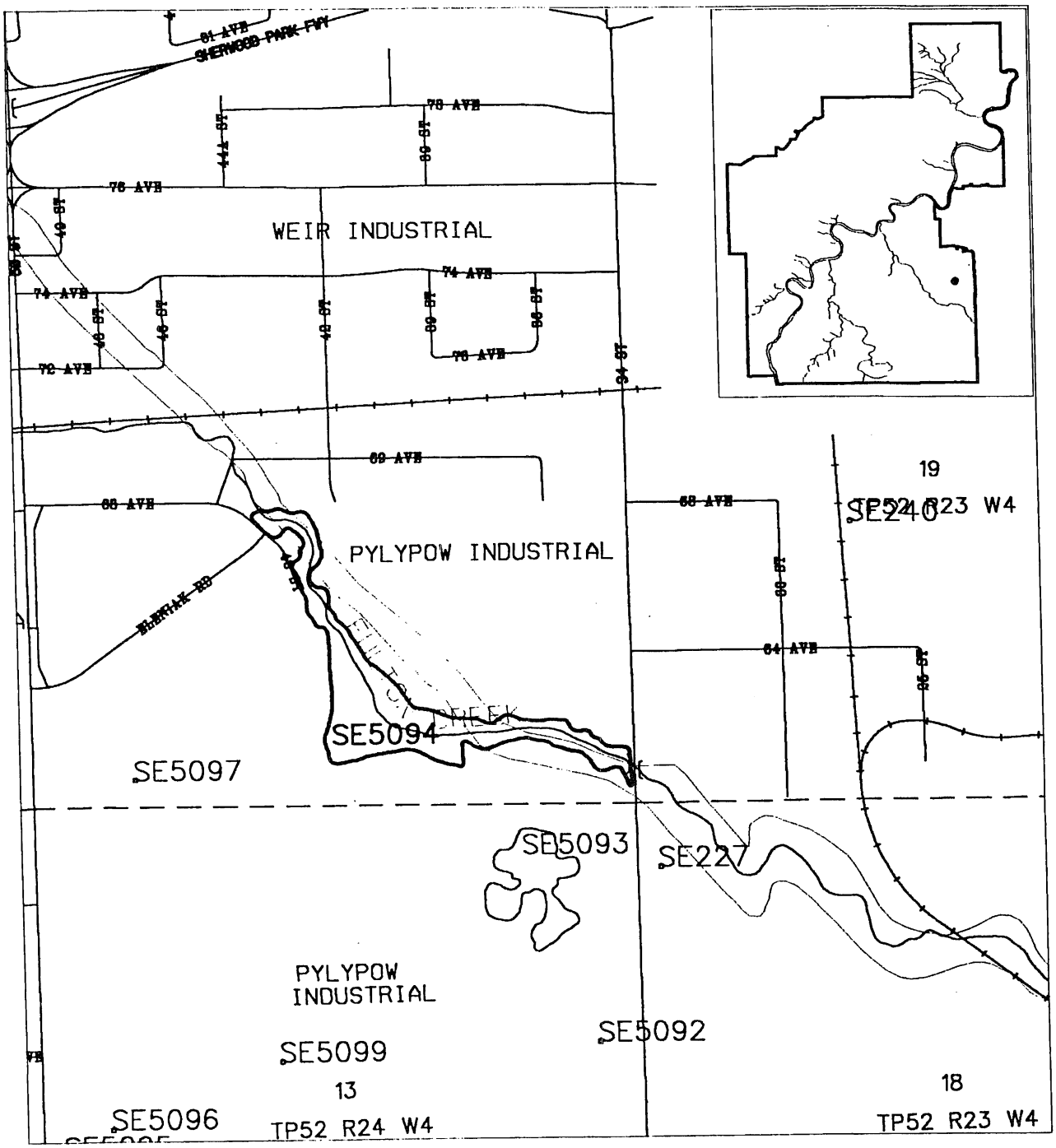
- possible "old growth" forest
- good example of riparian balsam poplar community
- provides habitat for white-tailed deer and birds
- provides critical linking function to ESA/ SNA's identified within and outside the city
- provides critical function in maintaining or balancing local hydrological conditions

Sensitivity High

Fulton Creek, like any other water course, its highly subject to any form of pollution that may adversely affect water quality.

Management Considerations

It is strongly suggested that attempts be made to maintain this rather unique landscape, especially the remnant forest stand that occurs on the south side of Fulton Creek. This remnant upland forest provides critical wildlife habitat and provides a buffer for Fulton Creek and acts like a filter for any disturbances. The present trail system that cuts diagonally through the site should be maintained or even enhanced to improve current usage. It is also suggested that a clean-up of existing garbage occur to improve the sites' ecological integrity.


81 AVE
SHERWOOD PARK FWY
78 AVE
76 AVE
WEIR INDUSTRIAL
74 AVE
72 AVE
70 AVE
69 AVE
68 AVE
PYLYPOW INDUSTRIAL
BERTRAM RD
64 AVE
SE5094
SE5097
SE5093
SE227
PYLYPOW
INDUSTRIAL
SE5092
SE5099
13
TP52 R24 W4
SE5096
19
TP52 R23 W4
SE240
18
TP52 R23 W4

Site Name **SE 5098**

Significance **Significant Natural Area**

Size 4.48 ha

Location 0.5 km east of 75 Street on north side of Whitemud Drive
[SW 13 TP52 R24 W4M]

Description

Young seral aspen community with aspen varying in height from 4 - 8 m; stand is approximately 8 - 10 years old and has established itself following construction of Whitemud Drive; canopy densities vary from doghair to very open; some wet meadow areas where cattails have established; open grass meadows with occasional willows.

Area appears to be heavily utilized by white-tailed deer as evidenced by heavily browsed aspen saplings, red osier dogwood and willow and a number of well-developed trails and deer beds; coyote den found at site; black-capped chickadee and red-tailed hawk observed during survey.

Surrounding land uses include Whitemud Drive to the south, cultivated haylands to the north and light industrial development to the west.

Criteria

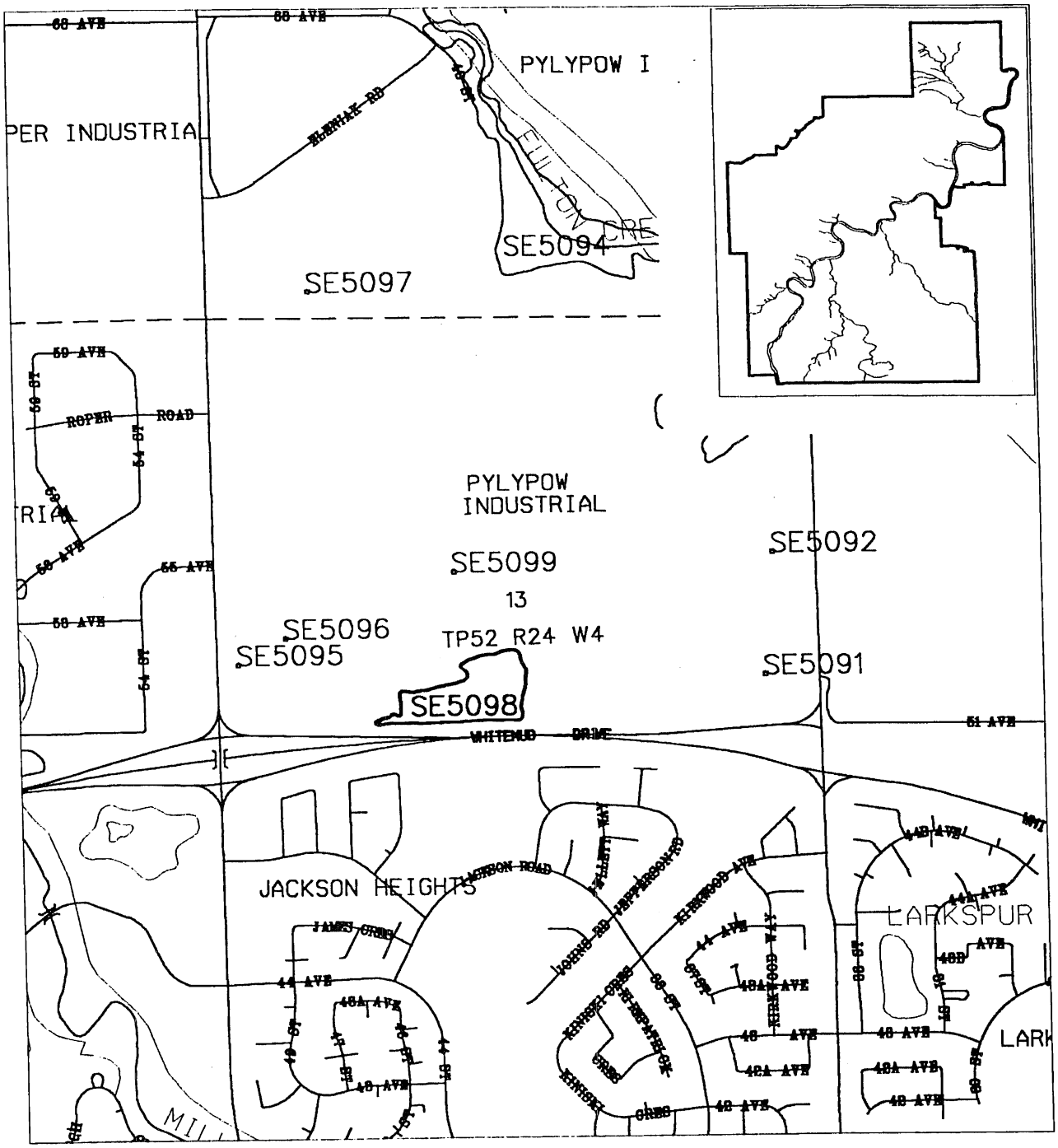
- good example of young aspen stand
- provides habitat for local wildlife, especially white-tailed deer
- provides a corridor for wildlife movement

Sensitivity Moderate

Because of the relatively young nature of the stand, any disturbances will ultimately have a greater negative impact to the structural and functional diversity of the stand than to an older, more mature and established stand.

Management Considerations

Attempts must be made to conserve this rather young aspen stand as it provides habitat for local white-tailed deer populations. Deer are commonly observed utilizing this site.


PYLYPOW I
PER INDUSTRIA
SE5094
SE5097
PYLYPOW
INDUSTRIAL
SE5099
13
TP52 R24 W4
SE5092
SE5096
SE5095
SE5091
SE5098
ROPER ROAD
WHITEMUD DRIVE
JACKSON HEIGHTS
LARKSPUR

4.0 REFERENCES

Ducks Unlimited. 1992. *City of Edmonton Wetland Reconnaissance*. (unpubl).

Ealey, D.M. 1986. *Urban Natural History Interpretive Sites in and Adjacent Edmonton*. Prepared for John Janzen Nature Centre. 220 pp.

Infotech Services and Associates. 1989a,b. *Environmentally sensitive areas: County of Strathcona and M.D. of Sturgeon*. Phase Two and Phase Three reports. Prepared for Edmonton Metropolitan Regional Planning Commission. 216 pp. + xxiii + Maps.

O'Leary, D., J. Bentz, D. Ealey and A. Schwabenbauer. 1993. *Inventory of Environmentally Sensitive and Significant Natural Areas, City of Edmonton, Technical Report*. Prepared for City of Edmonton, Department of Planning and Development. **GEOWEST** Environmental Consultants Ltd. 303 p.

Planning and Development. 1992. *Environmentally Sensitive and Natural Area Protection Within Edmonton's Table Lands: Policy and Implementation Background Study*. City of Edmonton.

Strong, W.L., J.L. Kansas, K.J. Van Tighem and B. MacCallum. 1985. *A Biophysical Inventory and Analysis of the Fort Saskatchewan and Devon Restricted Development Areas*. Prepared for Environmental Planning Section, Restricted Land Use Branch, Alberta Environment. Edmonton. 172 p.

Sweetgrass Consultants Ltd. 1989. *Environmentally Significant Areas of the County of Paintearth*. Prepared for Red Deer Regional Planning Commission and Alberta Forestry, Lands and Wildlife.

Wallis, C. 1991. *Environmentally Significant Areas of the County of Fourty Mile*. Prepared for Alberta Forestry, Lands and Wildlife and the Southeast Regional Planning Commission.

Westworth, D.A. and Associates Ltd. 1991. *Environmentally sensitive areas study: County of Leduc*. Report prepared for Edmonton Metropolitan Regional Planning Commission. Volume II-Technical Report. 154 pp.