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The 1979 Resource Inventory  
for  
Pembina Trail Preserve  
Polk County, Minnesota

Section 25, 36,  
Township 149 North, Range 45 West  
Section 30, 31,  
Township 149 North, Range 44 West  
Section 1, 2,  
Township 148 North, Range 45 West  
Dugdale Quadrangle

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Division of Parks and Recreation  
Minnesota Department of Natural Resources

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## INTRODUCTION

### Scope and Organization

This report documents the information collected during a 1979 inventory of Pembina Trail Preserve. The inventory recorded information on climate, geology, soils, hydrology, plant communities, flora, butterflies, birds, mammals, amphibians, reptiles and land use history of the natural area. Data supplied by this document will be used by the Minnesota Natural Heritage Program and other evaluators to assess the site as a potential Scientific and Natural Area (SNA). The document can also be used by scientists, educators, and others interested in the area. Should the site be designated an SNA, management plans can be written using this document as a reference.

This report is divided into five sections including: introduction, abiotic, vegetational, and zoological components, and land use history of the site. Methodologies and results are presented for each section.

The inventory of Pembina Trail Preserve was part of a larger 1979 effort in which eighteen natural areas in east central, northwest and southeast Minnesota were surveyed. Inventory team members were: John Borowske, SNA Planning Coordinator; Cherry Keller, Karen Lustig, Deb Schowalter, and Jeff Weigel, Researcher/Writers; Kathy Bolin, Community Specialist; and Nancy Berlin, Tony Busche, Barbara Eikum, Peter Farrell, Joanne Herman, Laura Hill, Susan Ottoson, Deanna Schmidt, Marianne Severson, Angela Tornes, and James Ziegler, Researchers. Gerald Jensen, Coordinator, Scientific and Natural Areas Program, and Mark Heitlinger, Coordinator of Preserve Management, The Nature Conservancy, Minnesota Chapter served

as inventory advisors. Michael Rees, Project Editor, The Nature Conservancy, provided editorial assistance. Other individuals who assisted in the preparation of the inventory are mentioned in the appropriate sections. Their help is gratefully acknowledged.

#### Description of Study Area

The Pembina Trail Preserve is a 1,660 acre unit in west central Polk County, approximately 13 miles southeast of Crookston, Minnesota. The area's climate is mid-continental, relatively cool and moist, with warm summers and cold winters. Wave deposited beach ridges of the Tintah phase of glacial Lake Agassiz cross the preserve. Pembina Trail Preserve's topography is flat to gently rolling, with a slight westward downslope. Moderately well to poorly drained soils formed on the tract in a variety of parent materials under tall prairie grasses and wetland vegetation. Present vegetation is primarily native prairie with scattered willow thickets, aspen woods, sedge meadows and marshes. About 17% of the tract supports old field vegetation.

The flora and fauna of Pembina Trail Preserve are typical of native Minnesota grassland. Species observed on the tract include: 217 vascular plants, 35 butterflies, 73 birds, 11 mammals, 3 amphibians, and 1 reptile.

The Pembina Trail Preserve lies in a small grain, potato, sugar beet, sunflower, and hay production area. The Pembina Ox Cart Trail, used extensively in the late 1800's, passes near the tract along the crest of a glacial Lake Agassiz beach ridge. Sections of the tract have been plowed, grazed, or hayed before preservation. Localized invasions of weedy plant species have resulted from these disturbances.

## Preliminary Assessment of Significance

This section lists features identified by the Minnesota Natural Heritage Program (MNHP) as potential elements<sup>1</sup>, and identifies other aspects of the preserve believed by the authors to be important components of Minnesota's natural diversity, or which otherwise might qualify the site for SNA designation. Criteria for SNA evaluation are enumerated in "Minnesota Department of Natural Resources Policy Plan for Scientific and Natural Areas", dated July 6, 1979.

The Pembina Trail Preserve is notable as a large tract of native prairie within a beach ridge and interbeach area of the former Glacial Lake Agassiz. Thirteen species of national and/or state significance were identified on the site during the 1979 inventory. The White Fringed Prairie Orchid (Habenaria leucophaea; Platanthera l. - Fernald, 1950), a species with restricted habitat requirements, and the White Lady-Slipper (Cypripedium candidum), specific to wet prairie-calcareous soil habitats (Gleason & Cronquist, 1963), have been proposed for federally threatened status by the Smithsonian Institute (Ayense & De Philipps, 1978). The Dakota Skipper butterfly (Hesperia dacotae), apparently confined to undisturbed prairie (Howe, 1975), has been proposed as a federally threatened species by the U. S. Fish and Wildlife Service. The occurrence at Pembina Trail Preserve of the Sharp-tailed Sparrow (Ammodramus caudacuta), listed as having a small Minnesota range (Green & Janssen, 1975), is also noteworthy.

The Minnesota Natural Heritage Program lists the White Fringed Prairie Orchid, the White Lady-Slipper, the Macoun's Gentian (Gentiana macounii), Nuttall's Alkali Grass (Puccinellia nuttalliana), Virginia Creeper (Parthenocissus quinquefolia), the Sedges (Carex scirpiformis

<sup>1</sup> An element is a natural feature of particular interest because it is exemplary, unique, threatened, or endangered on a national or statewide basis.

and Carex sterilis, the Dakota Skipper, the Greater Prairie Chicken (Tympanuchus cupido), the Marbled Godwit (Limosa fedoa), the Sandhill Crane (Grus canadensis), the White Pelican<sup>1</sup> (Pelecanus erythrorhynchos), and the White-tailed Jack Rabbit (Lepus townsendi) as potential elements of state significance. Greater Prairie Chickens were observed booming on the preserve. Sharp-tailed Grouse (Pedioecetes phasianellus) observed on the tract are at the western edge of their range (Green & Janssen, 1975).

The natural area was affected in the past by geological processes associated with Glacial Lake Agassiz. Several inconspicuous beach ridge formations are found on the tract; a larger, better developed ridge overlaps onto Pembina Trail Preserve's eastern edge. Several types of prairie vegetation are present, represented by species such as June Grass (Koeleria cristata) and Purple Prairie Clover (Petalostemum purpureum) in driest areas, Big and Little Bluestem (Andropogon gerardi and A. scoparius) and Mat Muhly (Muhlenbergia richardsonis) on slightly moister sites, and Sedges (Carex sp!), Water Hemlock (Cicuta maculata), and Indian Hemp (Acocynum sibiricum) in relatively wet areas.

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<sup>1</sup> White Pelicans, observed flying over the site on 25 April, probably make no use of Pembina Trail Preserve.