



A floristic survey of the Pryor Mountains, Montana
by Judith Colleen McCarthy

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in
Biological Sciences
Montana State University
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Abstract:

The Pryor Mountains are located in southcentral Montana in Carbon and Big Horn counties. They occur at the interface of three floristic provinces: the Great Plains, the Rocky Mountains, and the Great Basin. It has been hypothesized that plant diversity is high in this area both because of this junction and the presence of xeric habitats which have accommodated invasion of species from more southern deserts. This floristic study was undertaken to describe the plant diversity and its relationship to the flora of the three adjoining regions. During the summer field seasons of 1994 and 1995, plants were systematically collected and a checklist of 981 taxa was developed for the 1,278 square kilometers study area. This flora was compared with 11 other floristic surveys from the western United States, which represented the three cited regions. The Pryor Mountain flora was found to be more diverse than comparative floras. While it has 948 species, the adjusted mean of the other floras is 716 species. The closest affinity of the Pryor Mountain flora was to the northwestern Black Hills, a Great Plains flora, with a 37% similarity, followed by floras from the Rocky Mountains and the Great Basin. Although the Great Basin region has the least numerical influence on this flora, a full 5% of the Pryor Mountain flora is composed of northern range extensions of southern desert species.

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APPROVAL

of a thesis submitted by

Judith Colleen McCarthy

This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Signature Judith C. McCarthy

Date April 18, 1996

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ABSTRACT

The Pryor Mountains are located in southcentral Montana in Carbon and Big Horn counties. They occur at the interface of three floristic provinces: the Great Plains, the Rocky Mountains, and the Great Basin. It has been hypothesized that plant diversity is high in this area both because of this junction and the presence of xeric habitats which have accommodated invasion of species from more southern deserts. This floristic study was undertaken to describe the plant diversity and its relationship to the flora of the three adjoining regions. During the summer field seasons of 1994 and 1995, plants were systematically collected and a checklist of 981 taxa was developed for the 1,278 square kilometers study area. This flora was compared with 11 other floristic surveys from the western United States, which represented the three cited regions. The Pryor Mountain flora was found to be more diverse than comparative floras. While it has 948 species, the adjusted mean of the other floras is 716 species. The closest affinity of the Pryor Mountain flora was to the northwestern Black Hills, a Great Plains flora, with a 37% similarity, followed by floras from the Rocky Mountains and the Great Basin. Although the Great Basin region has the least numerical influence on this flora, a full 5% of the Pryor Mountain flora is composed of northern range extensions of southern desert species.

INTRODUCTION

The flora of the Pryor Mountains is distinctive in Montana because it occurs at the juncture of the Great Plains, Rocky Mountain, and Great Basin Provinces. Here documented are 981 vascular plant taxa from the Pryor Mountains with a composite of my collections from the summers 1994-1995 and other botanical collections from 1978-1994. This survey of the Pryor Mountain flora provides a taxonomic checklist of the flora as well as an analysis of the relationship to surrounding floristic regions of western North America (Cronquist, 1982).

Statement of the Problem

The Pryor Mountain Region has elements of three floras, the Great Plains, Rocky Mountain, and Great Basin. However, botanists have described it as Great Basin in character (Dorn, 1978; Lichvar et al., 1985; Kratz, 1988; Lesica and Shelly, 1991; Achuff and Lesica, 1992). What actually dominates in the Pryor Mountains? The area has also been described as rich in diversity (Achuff and Lesica, 1992). How diverse is the Pryor Mountain flora compared with other regions of the western United States? How does its richness

compare with another reputedly diverse area in Montana, the Centennial Valley?

Description of the Pryor Mountain Study Area

Physical

The Pryor Mountain study area is located in Carbon County in southcentral Montana. This region lies between 45 degrees north latitude at the south boundary (the Montana-Wyoming line) and 45.27 degrees latitude at the north (Crow Indian Reservation) and is primarily in Custer National Forest and the Bureau of Land Management districts. The eastern boundary is at -108.88 degrees longitude, the Big Horn River, and the western boundary is -108.16 degrees, Hunter Creek, west of Montana Highway 310 (Figure 1). The study region covers approximately 1286 square kilometers.

Geology

The Pryor Mountains consist of four major crustal blocks--West Pryor Mountain, Northeast Pryor block, Red Pryor Mountain, and East Pryor Mountain--each of which is elevated at the northeast corner and downwarped on the southwest side. These can be visualized as trap-door blocks with uplifted corners which form steep eastern scarps and gentle southwestern dip slopes (Orrell, 1988; Blackstone, 1978) (Figure 2).

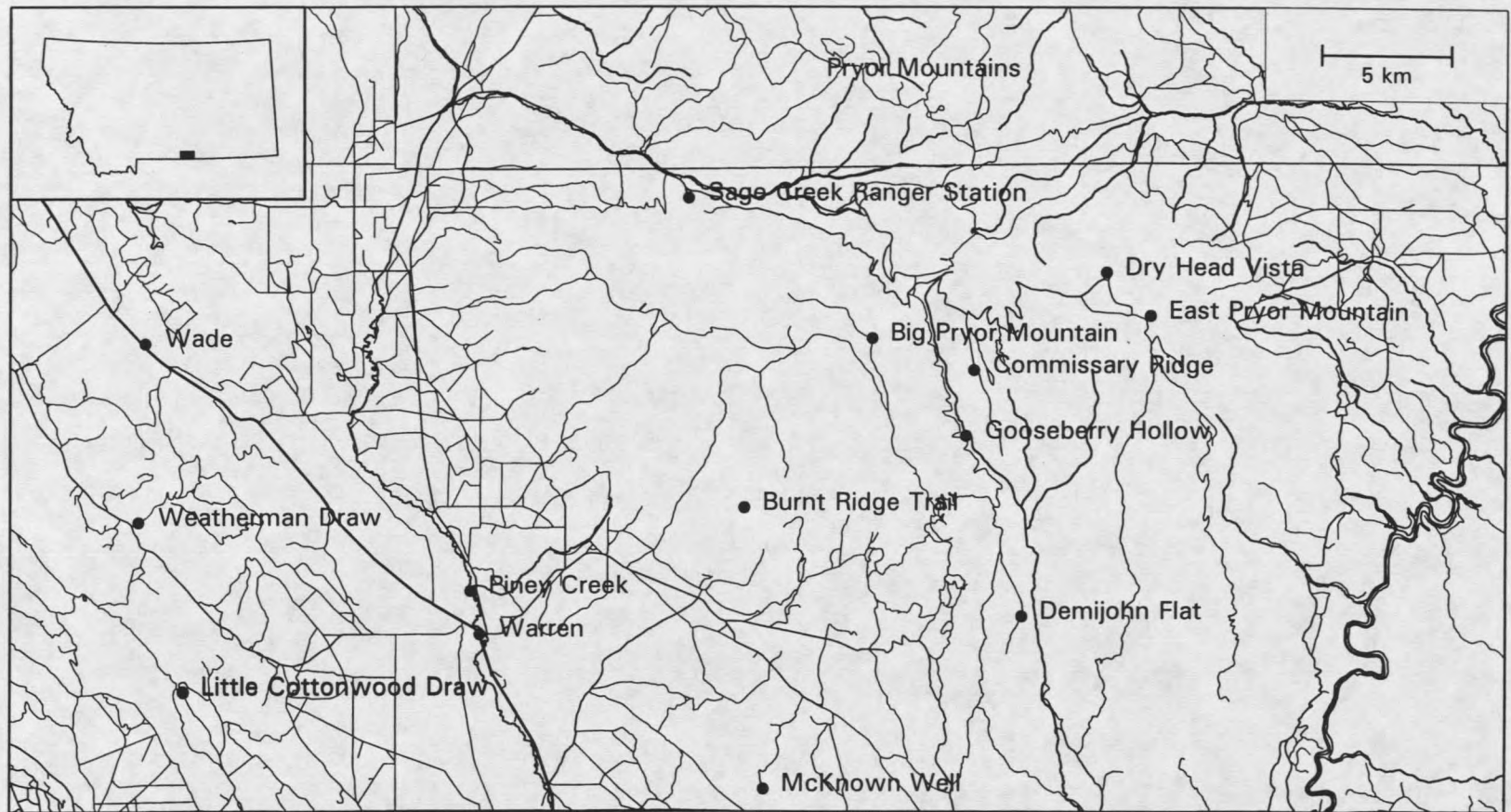


Figure 1. Map of the location of the Pryor Mountain Study Area with major drainages and roads.

