ABUNDANCE AND DISTRIBUTION OF VASCULAR PLANTS IN THE BIGHORN CANYON NATIONAL RECREATION AREA

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Objectives

This study began in 1983 and, as originally proposed, has three phases:

1. Floristic survey and herbarium development (1983-84);
2. Vegetation analysis and classification (1984-85); and
3. Conclusion of vegetation analysis and preparation of a vegetation map (1985-86).

This work is on schedule. Justification for the study was to provide the Bighorn Canyon National Recreation Area (BCNRA) with basic vegetation information that could be helpful in resource management. Very little ecological research has been conducted in the BCNRA.

Progress Report

Phase 1 has been completed, with approximately 500 plant specimens having been identified, mounted, and deposited in the Herbarium at the Lovell Visitor Center. A 51-page report entitled, "Checklist of vascular plants for the Bighorn Canyon National Recreation Area," has been sent to the Superintendent and is available to other interested persons. A total of 73 families of vascular plants have been found thus far in the BCNRA, with 320 genera and 656 taxa of specific or subspecific rank. In the Checklist, each species is coded to indicate abundance and habitat. Regional endemics are identified and the status of rare species is discussed.

Phase 2 is on schedule. During the summer of 1984, data on species composition and soils were collected from 70 stands, each about 1-2 hectares in size. The stands were selected to represent the full range of vegetation types within the BCNRA. Vegetation sampling consisted of listing the species present in the stand, estimating frequency and cover of herbaceous species and shrub seedlings in 100, 20 by 50 cm quadrats, and estimating shrub cover from 10, 40 m lines. We collected specimens of all unidentified species and will add these to the collection at the Lovell Visitor Center when they are identified and mounted.

Two soil pits were dug to a depth of approximately 1 m in each stand, and samples were collected from two depths. Slope, aspect, position on slope, proximity to water, geologic substrate, and depth to rooting zone were noted.

The influence of geologic substrate is especially apparent in the southern part of the recreation area, from Horseshoe Bend to the southern boundary. We identified a desert shrub type on river terraces and areas of Cretaceous marine shales. Sandstone formations support juniper and mountain mahogany vegetation types. Grassland vegetation, often with considerable sagebrush, occurs on a variety of substrates. Forests are found on the steep scarp face of East Pryor Mountain and are dominated by Douglas fir and some limber pine. There are several stands of relatively young trees on the Mountain, apparently the result of recent fires. We measured the diameters of over 200 trees on 6 transects through these stands and took increment cores from 100 trees. These cores will be used to date the fires which created the younger stands of forest.

Phase 3 was for data summarization and analysis, developing and completing the vegetation map, and preparation of the final report. All of our vegetation data have been stored on the UW computer and have been subjected to preliminary runs using ORDIFLEX — software developed by the ecology program at Cornell University for the purpose of subjecting large phytosociological data sets to gradient analysis. More work with this software will be done in January and February before writing our report. During the winter of 1984-85, aerial photos were used to develop a preliminary vegetation map for the BCNRA, and during the following summer we checked the boundaries in the field during a 2 month period. The map has now been redrawn in ink on mylar, and various black and white, acetate-film symbols are being added so that the distribution of each vegetation type is readily visible. The following vegetation types are shown on the map when they occur over a sufficient area to be visible from the low-level aerial photographs:

Juniper woodland
Juniper-mountain mahogany woodland
Limber pine-juniper woodland
Limber pine woodland
Limber pine-Douglas fir woodland
Douglas fir woodland
Ponderosa pine-Douglas fir woodland
Ponderosa pine woodland
Riparian woodland
Riparian shrubland
Riparian meadows
Agricultural land
Grassland
Greasewood desert shrubland
Saltbush desert shrubland
Sagebrush desert shrubland
Chugwater desert shrubland
Big sagebrush grassland
Black sagebrush grassland
Mixed sagebrush grassland
Foothill shrubland
Creek woodland
Mountain mahogany shrubland
Bare rock and miscellaneous

The vegetation map should be available by late Spring, 1986, as should our report summarizing what we have learned about the vegetation ecology of the BCNRA.