

VEGETATION DISTRIBUTION IN BADLANDS NATIONAL PARK

JACK L. BUTLER ♦ JAMES E. BATT

DEPARTMENT OF BIOLOGY

UNIVERSITY OF SOUTH DAKOTA ♦ VERMILLION

The objectives of this study are to 1) determine the steppe habitat types and indicate the successional status of the current vegetation, 2) provide a mylar map of climax/relict communities, if any, for the entire park, 3) establish a network of permanent plots to evaluate changes in seral and climax communities for the North Unit and Sheep Mountain Table, and 4) provide a mylar map of candidate and/or listed rare, threatened, or endangered plant species per state and federal lists as they are encountered during the course of the study.

All of the field work for the project was completed during the 1991 field season. Specific study sites used during the 1990-91 field seasons were selected with the use of soil survey photo-orthoquad maps obtained from the Soil Conservation Service office located in Huron, SD. Once located, the vegetation which best represented the plant community residing on that soil type was selected for detailed study. The representative vegetation was taken to be that which was homogeneous in composition and free from animal trails, badlands formations, and other major breaks in topography. In some cases, a particular habitat type required several sampling sites to adequately describe the vegetation mosaic. In small areas where the vegetation pattern was extremely complex, the community was described qualitatively.

A total of 139 sites were sampled during the 1990 field season primarily within the Sage Creek Wilderness Area (Batt, in preparation). The collected

data have been entered into the USD mainframe computer in preparation for summarization and analysis. Exploratory analysis indicates that much of the within-site variation can be reduced using an agglomerative clustering technique (Ratliiff and Westfall 1989). The method appears to be quite useful in classifying a particular site into a community type and in determining the successional status of the site.

The vegetation of the Sage Creek Wilderness Area consists of an intricate mosaic of a predominately grassland vegetation type interspersed with a variety of shrub and woodland communities (Batt, in preparation). Western wheatgrass (*Agropyron smithii*) was the dominant native species in approximately 70% of the sampled stands. However, *Bromus* spp., which includes *B. tectorum* and *B. japonicus*, were the dominant or subdominant species within a substantial number of the stands, even those stands previously considered to be undisturbed or relict. Blue grama (*Bouteloua gracilis*) and threadleaf sedge (*Carex filifolia*) were the two most common secondary species.

Batt (in preparation) has identified 10 community types within the Sage Creek Wilderness Area (Table 1). The community types were found occupying different positions on the landscape in different areas of the park. Further, a considerable number of the sampled stands have been disturbed by bison and/or prairie dogs, and much of the area has

Table 1. Major grassland community types of the Sage Creek Wilderness Area, Badlands National Park, South Dakota which were sampled during the 1990 field season.

Community type

1. *Agropyron smithii/Bouteloua gracilis*
2. *Agropyron smithii/Buchloe dactyloides*
3. *Agropyron smithii/Carex eleocharis*
4. *Agropyron smithii/Carex filifolia*
5. *Agropyron smithii/Festuca octoflora*
6. *Agropyron smithii/Stipa viridula*
7. *Artemesia cana/Agropyron smithii*
8. *Festuca octoflora/Bouteloua gracilis*
9. *Sporobolus cryptandrus/Agropyron smithii*
10. *Stipa comata/Agropyron smithii*

been impacted by livestock grazing in the past. The current successional status of the major community types within the North Unit appears to be part of a continuum ranging from early seral to near climax condition. Consequently, community types were also separated according to soil series even though they were sometimes classified as belonging to the same range site by the Soil Conservation Service. Such separation will increase the complexity of the vegetation map, but should increase the utility of the map as a management tool. The vegetation map for the Sage Creek Wilderness Area is complete and will be submitted to Badlands National Park along with a copy of Mr. Jim Batt's completed thesis, which should be finished in 1991.

The primary goal of the 1991 field season was to identify and evaluate potential climax/relict communities (objective 2 above) which may serve as reference points in evaluating the successional status of the major habitat types in the park (objective 1 and 3). Several sites north of the wall, which were initially described by Olson (1988), were also evaluated during the 1991 field season. A dedicated effort was also made to identify any candidate and/or listed rare, threatened or endangered plant species during this survey (objective 4).

Several sites which were established during the 1990 field season were revisited in 1991. Although fairly detailed directions were recorded as to the location of the permanent sampling points, the complex nature of the badlands type topography will make finding the sites in the future difficult. Probably nothing short of using a Global Positioning System will help in locating these sites.

Information collected during the 1991 field season is currently being entered into the USD mainframe computer in preparation for analysis. The vegetation map as delineated by Batt (in preparation) is currently being expanded to include the successional communities for the North Unit and the climax/relict communities for the entire Park.

◆ LITERATURE CITED

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