

WETLAND VEGETATION OF THE NORTHERN RANGE, YELLOWSTONE  
NATIONAL PARK: CLASSIFICATION, SUCCESSION, AND  
ENVIRONMENTAL RELATIONSHIPS

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Introduction

A 3-year study of the wetland plant communities of the northern range of Yellowstone National Park was initiated in May, 1985. This report covers activities during calendar year 1987.

Objectives

The specific objectives of the study are the following:

1. Sample, classify, and describe current wetland plant community types in the northern range of Yellowstone National Park.
2. Map pilot or demonstration areas to test the classification, ascertain whether the juxtaposition of represented types conforms to expectations, and illustrate the scale of pattern development.
3. To hypothesize the causal factors (environmental and perturbations) leading toward development of each vegetation type.
4. To illustrate the relationships among vegetation types along environmental gradients and the most probable successional pathways between related successional stages.
5. To develop a Yellowstone National Park wetland data base, parallel and cooperative to that underway as an interagency cooperative effort in Montana by the Montana Riparian Association

## Methods and Results

During 1985 and 1986, a total of 358 stands were sampled to provide a data base for vegetation analysis. Supplemental sampling in 1987 increased the total to 377 stands.

Vegetation data were analyzed in the spring of 1987 to provide a third approximation of 62 community types. These types were arranged in hypothetical positions along environmental and successional gradient in the year-end report (Hansen, Chadde and Pfister 1987).

A subset of 180 stands, representing major types, were selected for additional data collection during the summer of 1987. Water levels and soil water variables were monitored at 2 week intervals and a complete soil profile description was obtained for 108 stands. Results of this phase of the study were summarized by Brichta (1987). The major environmental control factors are water table depth and duration and quantity of organic material in the substrate. Other water and soil variables were weakly correlated with distribution of plant community types. These data on environmental factors provide a good foundation for final development of the vegetation/site classification currently in progress.

The 24 small permanent plots inside and outside of mini-exlosures (installed in 1986) were remeasured in the spring and fall of 1987. First year responses to protection from grazing were obvious and will be reported in the final contract report.

Maps of the Junction Butte and Mammoth exclosure areas were field checked and revised to reflect changes in the vegetation classification. Additional transects were established to illustrate vegetation patterns relative to precise elevations as established with a level/rod survey.

## Conclusions

The study of site factors during 1987 provided a good foundation for defining the environmental relationship of the wetland vegetation classification. Continuing analysis has led to a better understanding of successional relationships among the plant communities and responses of major individual species. These will be documented in the final contract report.

## References Cited

- Brichta, Paul H. 1987. Environmental relationships among wetland community types of the northern range, Yellowstone National Park. M.S. Thesis, Dept. Environ. Studies, Univ. of MT, Missoula. 74 p.

Hansen, P. L., S. W. Chadde and R. D. Pfister. 1987. Wetland plant communities of the northern range, Yellowstone National Park: third approximation. Second Year Study Report. School of Forestry, Univ. of MT, Missoula. 41 p.