Arctic-alpine tundra vegetation of the Arrigetch Creek Valley, Brooks Range, Alaska*

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with 6 photos, 5 figures and 28 tables

Abstract. The use of the Braun-Blanquet approach has been described as particularly difficult in areas lacking prior studies to offer suggestions toward classification and diagnostic species groups (WESTHOFF & VAN DER MAAREL 1978). Although there has been no previous floristic classification of the vegetation in the Brooks Range the method allowed a detailed survey of the vegetation and its controlling factors, and helped elucidate floristic and ecological relationships between stands. The ordination and numerical classification were of valuable assistance, particularly in classification above the association level.

The forty-nine lower syntaxa described here are all new. Seven alliances and three orders are provisionally described; the full description of these higher syntaxa will have to wait for more data from other portions of Alaska. All new alliances and orders and probably classes are needed for Alaska because many diagnostic taxa have Beringian and North American affinities.

Mass wasting processes are active on slopes under the present climatic regime. Highly disturbed soils, and open plant communities are maintained. Species not tolerant of this disturbance regime such as Kobresia myosuroides, Carex nardina, and Salix rotundifolia ssp. dodgeana are limited to small stable outcrops. Dryas octopetala ssp. octopetala is a dominant taxon in syntaxa which are classified into several alliances and orders based upon their diagnostic taxa groups. This is fully justified based upon the floristic tables and by the ordinations and dendrograms and is substantiated by the ecology of higher syntaxa and association groups. Dryas octopetala ssp. octopetala dominated communities appear to be the climax or zonal ecosystem type at present.

Winter snowcover in the southcentral Brooks Range was observed to be of equal depth with similar profiles on all slope aspects and in all habitats. It is not reworked by winds. The pattern of snowmelt determines the pattern of snowpatch communities. The use of the terms chionophilic and chionophobic for taxa and communities in the study area is probably not warranted.

Communities dominated by Artemisia alaskana, Calamagrostis purpurascens and other taxa which are known arctic steppe indicators occur in the warmest and most xeric habitats, the base of limestone bluffs. The subnival belt has floristic and ecological similarity with the High Arctic semi-deserts.

* Dedicated to Dr. John W. MARR