Fescue Grassland in North Dakota

HUGH E. COSBY

Range Conservationist, Soil Conservations Service, USDA, Minot, North Dakota

Highlight

Local areas of North Dakota grassland are dominated by rough fescue. The composition of the vegetation on these areas is very similar to that of the Fescue Grassland described in Canada. Small amounts of the species are widely distributed across the northern portion of the state.

The *Festuca scabrella* association has been characterized by Moss and Campbell (1947) and by Coupland and Brayshaw (1953). The Fescue Grasslands have not generally been regarded as occurring in North Dakota, though some collections of the species in the state have been recorded in taxonomic literature.

(Coupland 1961) described the Fescue Prairie Association as follows: "It occupies the black soil between clumps of *Populus tremuloides* in the aspen grove region along the north of the Mixed Prairie from central Saskatchewan westward to the foothills of the Rocky Mountains and then extends southward along the foothills contacting the western edge of the Mixed Prairie at least as far southward as the United States boundary". Rough fescue was reported as having been found in all 12 counties west of the Continental Divide and in 9 counties along the east side of the divide in Montana (Stickney 1961).

Local areas exist in North Dakota having rough fescue-dominated plant communities (Fig. 1). Some of these are of sufficient extent to be mapped as a distinctive grassland type. The principal area is in northwest North Dakota in Burke and Mountrail counties (Fig. 2). It is commonly encountered on hillsides, in high range condition, on the Max Moraine surrounding the area of most common occurrence.

A line-interception transect was established in a rough fescue plant community without grazing by domestic livestock for more than 25 years. Relative coverage and basal coverage in a typical rough fescue plant community are inidcated in Table 1. Clippings for total herbage yield were made in this type from 1958 through 1964, except in 1959, to compare total herbage yield with other plant communities by soil type. Plant species were recorded for each plot clipped and the percentage of total herbage contributed by species was estimated. New plots were used each year.

It was estimated that rough fescue contributed 94% of the total herbage yield from all plots clipped during the 6-year period and that sun sedge *(Carex heliophila)* and penn sedge

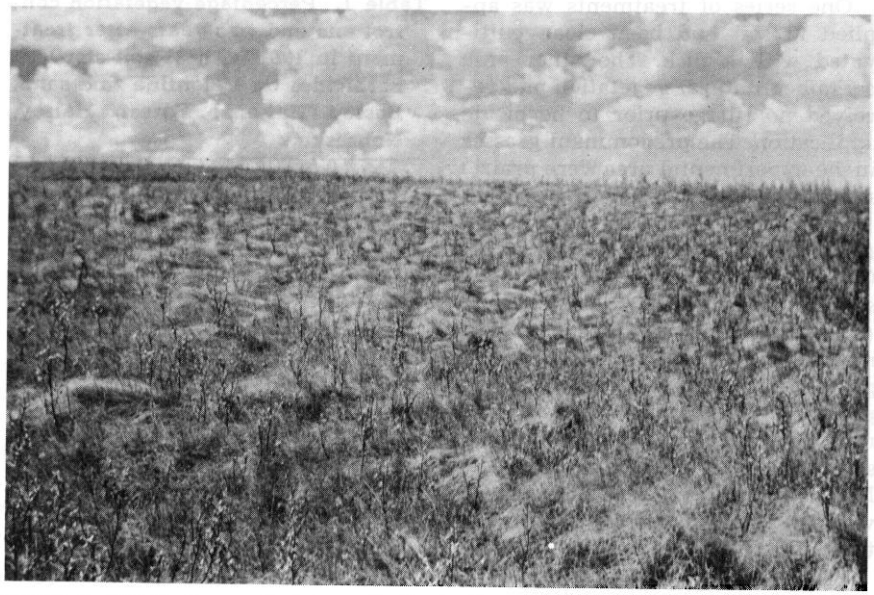

FIGURE 1. Rough fescue *Festuca scabrella* is the dominant species on this north exposure on the Lostwood National Wildlife Refuge. SW¼ sec. 35, T. 159 N., R. 91 W.

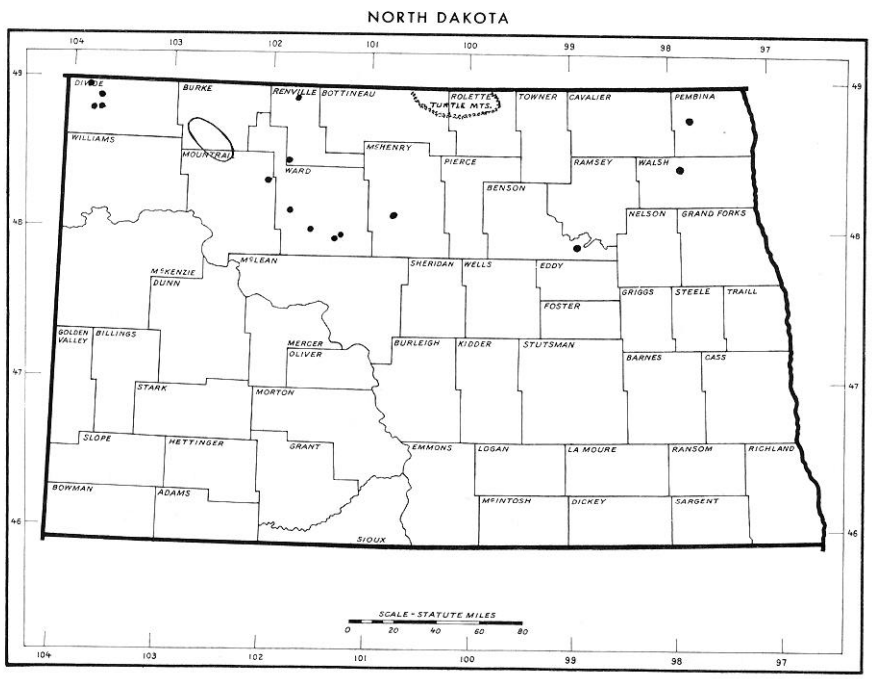

FIGURE 2. Locations of rough fescue in North Dakota. The shaded portion represents the best developed area of fescue grassland. Other observed locations are along the escarpment of the Turtle Mountains and at locations shown by dots.

Table 1. Basal coverage and relative coverage in percent, by species, as determined by line-interception transect.

Species	Coverage Relative	Basal
Festuca scabrella	77.20	12.52
Carex heliophila	8.33	.44
Agropyron subsecundum	3.03	.16
Helianthus rigidus	2.27	.12
Aster oblongifolia	1.51	.08
Unidentified forb	1.51	.08
Stipa comata	1.51	.08
Anemone patens	.76	.04
Cerastium arvense	.76	.04
Agropyron smithii	.76	.04
Solidago missouriensis	.76	.04
Linum lewisii	.76	.04
Solidago rigida	.76	.04
Woody species canopy		
Rosa arkansana		1.68
Elaeagnus argentea		.16

(Carex pennsylvanica) contributed 3%. The following species were recorded in trace amounts, all estimated to contribute the remaining 3%: western yarrow *(Achillea lanulosa)*, western wheatgrass *(Agropyron smithii)*, pasque flower *(Anemone patens)*, fringed sagewort *(Artemisia frigida)*, cudweed sagewort *(A. ludoviciana)*, heathaster *(Aster ericoides)*, *(Astragulus* spp.), threadleaf sedge *(Carex filifolia)*, silverberry *(Elaeagnus argentea)*, spike oatgrass *(Helictotrichon hookeri)*, Arkansas rose *(Rosa arkansana)*, soft goldenrod *(Solidago mollis)*, needleandthread *(Stipa comata)*, porcupinegrass *(S. spartea)* and American vetch *(Vicia americana)*.

There is much similarity in these plant communities with the Fescue Prairie Association in Canada (Coupland 1961) and the ungrazed Fescue Grassland of southwestern Alberta (Johnston 1961).

The best developed area of fescue grassland is indicated by the shaded area in Figure 2. Widely scattered locations are indicated by dots. These scattered communities range from a few feet across to a few acres in size. The following are observed locations by county, section, township and range. Divide County: NW¼-NW¼ sec. 9, T. 163 N., R. 101 W.; NE¼ sec. 11, T. 162 N., R. 100 W.; sec. 2, T. 161 N., R. 100 W.; SE¼-SW¼ sec 4, T. 161 N., R. 100 W. Renville County: SE¼ sec. 30, T. 163 N., R. 85 W.; SW¼NE¼ sec. 30, T. 158 N., R. 86 W. Mountrail County: NE¼NE¼ sec. 9, T. 156 N., R. 88 W. Ward County: SW¼SW¼ sec. 17, T. 154 N., R. 86 W.; NE¼-NE¼ sec. 26, T. 153 N., R. 85 W.; NW¼ sec. 21, T. 152 N., R. 83 W.; NW¼ sec. 30, T. 152 N., R. 83 W. McHenry County: NE¼NW¼ sec. 35, T. 154 N., R. 79 W. Pembina County: NE¼ sec. 16, T. 161 N., R. 55 W. Walsh County: SE¼ sec. 27, T. 158 N., R. 56 W. Benson County: NE¼NE¼ sec. 5, T. 151 N., R. 64 W. Also, it has been observed in several places along the slopes of the Turtle Mountains in Bottineau and Rolette Counties, including St. Paul Butte (also reported by Dr. O. A. Stevens 1950).

Thus fescue grassland occurs, to some extent, across northern North Dakota from the northwest corner to the northeast corner, below the Pembina escarpment and southward to southern Ward County, and south of Devils Lake. By far the best stands are on north facing slopes and on soils of medium texture. Ayyad and Dix (1964), reported *Festuca scabrella* increases in importance value towards a maximum on north aspects, on complex prairie slopes in Saskatchewan. The greatest observed variation in this area was that in Pembina County where the soil was a loamy fine sand with moderate slope on an east exposure.

The question may well be raised as to what place this species had in the original vegetation of North Dakota. It currently is of significance in range management locally, as well as being of interest to botanists and ecologists over a much broader range. Total annual herbage yield exceeded that of the typical Mixed Prairie plant community on the same soil type (Cosby 1964). Within the area of common occurrence, its abundance is directly associated with range condition, decreasing in relative amounts as range condition declines from climax.

LITERATURE CITED

AYYAD, M.A.G. AND R.L. DIX. 1964. An analysis of a vegetation-microenvironmental complex on prairie slopes Saskatchewan. Ecol. Monog. 34:421-442.

COSBY, H. E. 1964. Some yield characteristics of range as influenced by soil type and weather. J. Range Manage. 17:266-269.

COUPLAND, R. T. 1961. A reconsideration of grassland classification in the northern Great Plains of North America. J. Ecol. 49:135-167.

COUPLAND, R.T., AND T.C. BRAYSHAW. 1953. The fescue grassland in Saskatchewan. J. Ecol. 34:386-405.

JOHNSTON, ALEXANDER. 1961. Comparison of lightly grazed and ungrazed range in the fescue grassland of southwestern Alberta. Canadian J. Plant Science. 41:615-622.

MOSS, E. H., AND J. A. CAMPBELL. 1947. The fescue grassland of Alberta. Canadian J. Res. 25:209-227.

STEVENS, O. A. 1950. Handbook of North Dakota Plants. Knight Printing Co., Fargo, N. Dak. 224 p.

STICKNEY, P. F. 1961. Range of rough fescue *(Festuca scabrella* Torr.) in Montana. Proc. Mont. Acad. Sci. 20:12-17.

Big Sagebrush in Fresno County, California

HAROLD W. WOLFRAM AND MORRIS A. MARTIN, JR.

Range Specialist, California Division of Forestry and Work Unit Conservationist, Soil Conservation Service, U.S.D.A., Fresno.

The known range of big sagebrush *(Artemisia tridentata* Nutt. subsp. *tridentata)* in California is usually considered to be in northeastern, eastern, and southern California, with scattered stands in southcentral California (Beetle, 1960; Jepson, 1923-1925; McMinn, 1939; Munz, 1959). Isolated patches have been found north of New Idria, San Benito County, by C. B. Wolf at 2,400 feet, and by A. C. Hawbecker and C. H. Quibell at 3,700 feet. Two species of the genus *Artemisia* occur eastward to eastern North Dakota (Cosby, 1964).

In May, 1964, specimens of big sagebrush (properly known as basin