

## THE SHORT-GRASS PRAIRIE

### **Extent**

From Nebraska panhandle and SE Wyoming through E Colorado, W Kansas, high plains of Oklahoma, Texas, New Mexico (similar in N Arizona).

Mainly on sediments washed out from the east side of the Rocky Mountains.

### **Climate and Dominant Vegetation**

N to S temperature gradient (average annual temperatures, 5 °C to 15 °C); corresponding increase in warm-season (C<sub>4</sub>) grasses, such as the sod forming grasses, *Bouteloua gracilis* (blue grama) and *Bucholoë dactyloides* (buffalo grass).

More soil organism activity in northern vs. southern short-grass prairie; results in relatively more nutrients and darker soil due to increased organic content in North.

Some southern short-grass prairie species may be found further North on South-facing aspects.

Very slight W to E increase in moisture but consistent precipitation to evaporation ratio from Montana to Texas (P/E = 0.3).

### **Ecological Processes**

In general, there is a paucity of known/published information on the ecology of the short-grass prairie prior to European-based settlement.

#### ***Drought***

1 to 2-month drought common; also more precipitation runoff than infiltration may occur.

#### ***Grazing***

Historically abundant grazers and browsers (through mid-1800s) were supported e.g. pronghorn, bison, elk; "Serengeti of North America."

#### ***Fire***

Generally has negative impact on plant productivity: decreased number of tillers and shorter growth

May have been important for decreased juniper, sagebrush, and Ponderosa pine in the North; decreased mesquite in the South.

## **Human-induced Alterations**

### ***Introduced Species***

Domestic cattle have replaced many of the native grazers. (Note: Domestic cattle graze mainly on lowlands.)

Introduction of non-native grazers and their overgrazing has led to increase in some plants:  
Native—*Opuntia*, *Yucca*, *Hordeum*, *Aristida* (threeawn—a native grass with sharp awns on seeds that are potentially injurious).

Non-native—*Bromus japonica* (Japanese brome), *Salsola* (Russian thistle/tumbleweed—a non-native annual).

Other wide-spread alien plants: crested wheatgrass, spotted knapweed, yellow sweetclover

### ***Fire Suppression***

Result is an increase of some fire-sensitive woody species (see above).

### ***Plowing***

Upon ceasing of plowing, climax plants of the short-grass prairie are slow to reestablish; many oldfields remain.

Increase in *Aristida* perhaps due to decreased soil Phosphorus in addition to avoidance by grazing livestock.

The Dust Bowl of the 1930s originated in short-grass prairie of SE Colorado, SW Kansas, and the panhandles of Texas and Oklahoma due to intensive/excessive “dryland farming.”

### ***Irrigation***

Increases plant productivity but relies upon aquifers that are generally being drained faster than their recharge rates.

## **Conservation and Short-grass Prairie Reserves**

Currently, the largest reserves (> 25,000 ha) are disjunct, scattered mainly from Canada south to NE New Mexico/panhandle of Texas. In the U.S., they may exist as National Grasslands (U.S. Dept. of Agriculture, Forest Service), National Wildlife Refuge (U.S. Dept. of the Interior, Fish and Wildlife Service), or areas managed by the Bureau of Land Management.

The large reserves are interspersed by small reserves, many of which are dominated by grasses.

Thus, the possibility exists to manage across reserves and perhaps re-establish large-scale ecological processes.