Southern Plains Network

RESOURCE BRIEF

National Park Service
U.S. Department of the Interior

Intermountain Region
Inventory & Monitoring Program

Capulin Volcano National Monument

Grasslands

The central grassland region of North America is one of the largest contiguous grassland environments on earth. Capulin Volcano National Monument is located within the region generally classified as shortgrass steppe, which is located in the warmest and driest area and is the least productive of all grassland types—uniquely adapted to survive drought conditions. Grassland as a whole is the second largest habitat type found within the boundaries of the monument and comprises approximately 26% of the total area within the monument. The monument's grassland is situated within the Raton-Clayton Volcanic Field and located along a transition zone, "where the Rocky Mountains meet the High Plains," creating an ecotone whose plant assemblages are a combination of Rocky Mountain and shortgrass prairie. As a result, there is considerable variation in the types of grasslands throughout the monument.

Status and Trends

Scientists with the National Park Service (NPS)Southern Plains Inventory and Monitoring Network (SOPN)along with the Southern Plains Fire Group have been annually monitoring the grasslands at the monument since 2010. Using the data from this monitoring effort, the biotic integrity of the grasslands were assessed, including plant mortality, the presence of exotic plants, and the species composition of the grasslands. The plant mortality was within the expected range of variability, in spite of the fact that sampling occurred during a drought period at the monument.

The species that were most commonly found included little bluestem and blue grama grasses. The total number of perennials (n=56) accounted for 76.7% of the total of species recorded (n=73) during the grassland/fire effects monitoring. With the exception of the widespread invasive bromes, the species present throughout the monument's grasslands are consistent with what might be expected given the ecological conditions at Capulin Volcano NM. These bromes, however, have been known to alter other grassland ecosystems to an irreversible state.

Another aspect of grassland condition is its soil stability, which was assessed by Dr. Pete Biggam, a soil scientist with the NPS Geologic Natural Resources Program Center Geoscience and Restoration Branch in 2010. The overall condition of the grassland's site stability was considered to be good.

Capulin Volcano National Monument grasslands.

System Drivers

As with most ecological communities, shortgrass prairie system driver patterns have changed. Land use ranged from early Native Americans hunting the open plains for bison to European exploration and subsequent settlement. European occupation in the region began in the mid 1800s with the introduction of sheepherding, which eventually gave way to cattle ranching in the mid to late 1800s, which continues to remain one of the primary land uses throughout the region, including the land surrounding the monument.

As settlement continued, changes in fire patterns and fire frequency followed; although, according to grassland

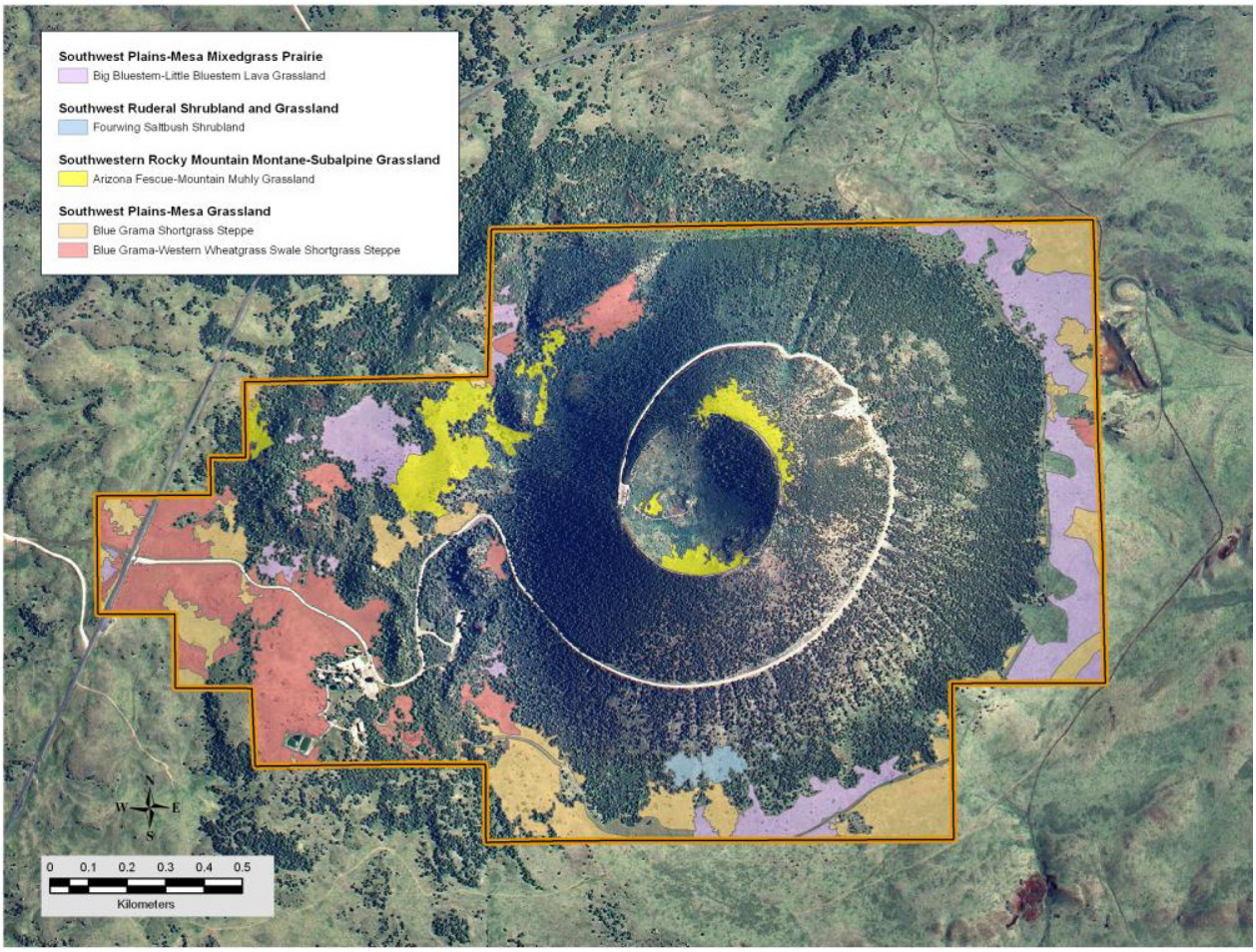
Bennetts, R. E., K. Struthers, P. Valentine-Darby, T. Folts, H. Sosinski, and E. Yost . 2011. Capulin Volcano National Monument: Natural Resource Condition Assessment. Natural Resource Report NPS/SOPN/NRR—2012/492. National Park Service, Fort Collins, Colorado.

experts, fire probably played a lesser role in maintaining a healthy prairie in the shortgrass steppe than other drivers such as herbivory and climate variation. A study of fire history at Capulin Volcano NM suggested that around the time cattle grazing became common throughout the area, the fire frequency began to decrease, creating a "modern fire regime controlled by land use and ignition suppression." These conclusions, however, were largely based on fire scar samples from ponderosa pine and included scars that may have been from very local ignitions rather than widespread fires.

In addition to herbivory and fire, climate change is and will continue to increasingly impact the shortgrass prairie region, creating changes in temperature and precipitation patterns and amounts, which in turn will affect the plants and animals native to the shortgrass ecosystem.

Discussion

Grasslands are a dynamic system with high annual variability. The amount of rainfall, temperatures, and diseases, can have a dramatic effect on some plants, which in turn, affects interpretation of grassland condition. The relatively unique ecological conditions of Capulin Volcano NM with its volcanic influence make comparisons with other grassland sites difficult. The absence of any multi-year datasets from a site with similar conditions additionally limits our ability to assess the "normal range of variability" for plant species composition. The most significant threat to the continued health of the monument's grassland, however, is the spread of exotic plants. Monitoring over a longer period of time is necessary to better understand the complexity and natural variation that occurs within a grassland community such as that found at Capulin Volcano National Monument.



While Capulin Volcano NM is situated within the broad category of shortgrass steppe, there is also considerable variation in grasslands within the monument. The USGS-NPS Vegetation Characterization Program is a cooperative effort by the U.S. Geological Survey (USGS) and the National Park Service (NPS) to classify, describe, and map vegetation communities in more than 280 national park units across the United States. Based on this system Capulin Volcano NM includes five different associations within four different alliances: Southwest Ruderal Shrubland and Grassland, Southern Rocky Mountain Montane-Subalpine Grassland, Southwest Plains-Mesa Mixedgrass Prairie, and Southwest Plains-Mesa Grassland.