



Vegetation Composition, Structure, and Soils Monitoring

Grasslands, shrublands, and forests are integral components of the natural and cultural landscapes of parks within the Rocky Mountain Network (ROMN). Because they can be impacted by rapid climate change, human land use, and impacts from exotic species, we monitor them closely to detect change. We communicate what we learn to inform management decisions. For example, the encroachment of annual invasive species into an intact perennial grassland can alter historic fire regimes, increase erosion potential, and affect wildlife habitat. If detected in time, park management can reduce or eliminate threats by treating the invasive plants and avoid the costly consequences of their impacts.

Scientifically credible information on the current status and long-term trends of the composition, structure, and function of the forests and grasslands in Florissant Fossil Beds National Monument (NM) is a key component for sound management. In 2008, the Rocky Mountain Inventory and Monitoring Network (ROMN) began an effort to determine status and trends in upland vegetation structure, species composition, and soil condition in Florissant Fossil Beds NM. A complete report of findings was published earlier this year, presenting summary data and information from the ROMN and the Rocky Mountain Fire Effects Program (FireEP) monitoring between 2008-2013 and 2000-2014, respectively. This report, as well as the full protocol on which monitoring is based, is available on our website science.nature.nps.gov/IM/units/romn/.



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Select Results

Select results include the following:

- Surface fuel loading at FireEP sites was highest in the mixed conifer stands, followed by closed ponderosa pine stands and open ponderosa savannas (Figure 1).
- Upland sites in the park had a moderately diverse mixture of mostly native plants. Of the exotic species found at sites, smooth brome (*Bromus inermis*) and roundfruit rush (*Juncus compressus*), were the most abundant (Figure 2).
- Forested sites contained mostly ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*) with a mix of mature trees, saplings, and seedlings (Figure 3).
- ROMN sites had generally high soil aggregate stability, high cover of litter, and moderate soil compaction, suggesting erosion potential was not of concern at those locations. Moreover, a soil quality index suggested quality of the soils at ROMN sites was

Florissant Fossil Beds NM.

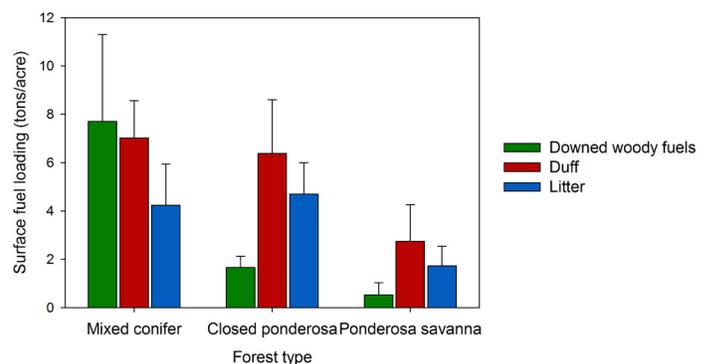


Figure 1. Fuel loads in each forest type in plots sampled 2000-2014 show downed woody fuels (green), duff (red), and litter (blue). Note that standard practice in fire management is to report fuels data in English units of tons/acre.

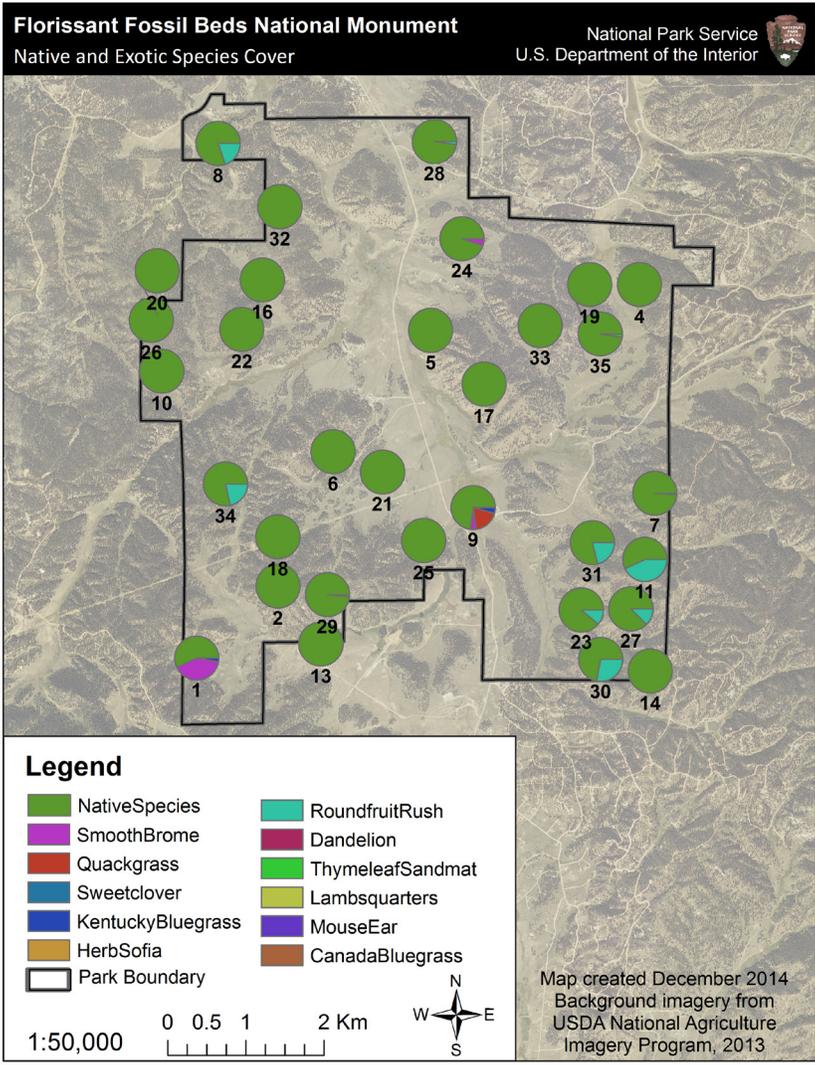
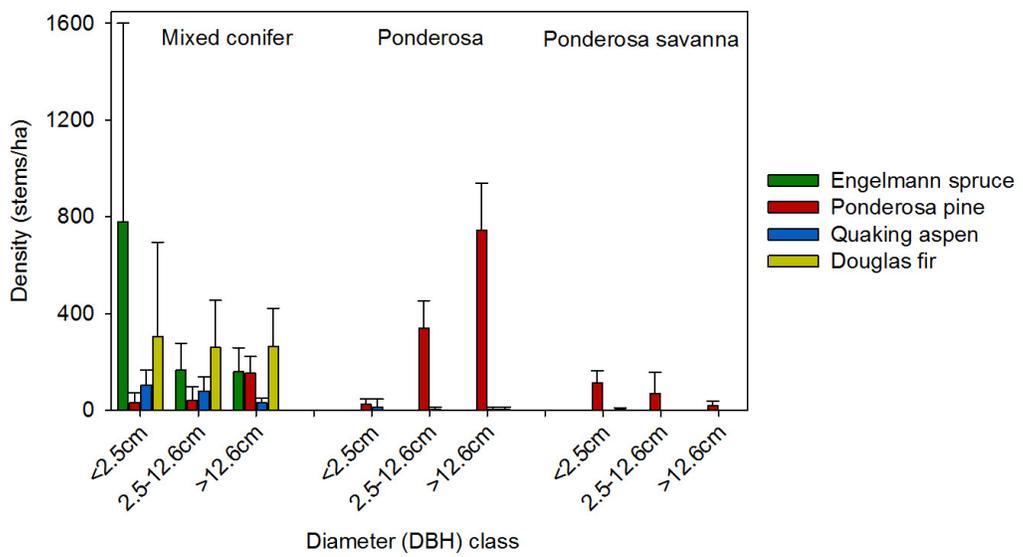


Figure 2. Native (green) and exotic (all other colors) species percent relative cover for each ROMN site in sample years 2009-2013. Where multiple years of data exist for the same plot, the most recent year's data were used to provide the most current information.

above average.

Figure 3. Stem density for FireEP plots (2000-2014) show Engelmann spruce (green), ponderosa pine (red), quaking aspen (blue), and Douglas fir (yellow) for each size diameter at breast height (DBH) class and each forest type: mixed conifer (left); ponderosa pine (center); and ponderosa savanna (right).



ROMN upland vegetation and soils monitoring will help park staff understand issues such as the impact of a changing climate on the park ecosystems, the response of soils to disturbance, and changes in native and non-native species. As we collect more data and conduct a thorough analysis, we will look for patterns and trends that might indicate a change in the ecological integrity of the vegetation and soils at Florissant Fossil Beds NM.

References

The full report, as well as the protocol and procedures on which monitoring is based, is available on our website science.nature.nps.gov/IM/units/romn/.

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