

City of Boulder Open Space and Mountain Parks

2024 Priority Research Topics

Last updated 10/04/2023

Preference will be given to original proposals that address topics identified below. Proposals that directly address one or more facets of climate change will be given additional preference. However, all proposals will be considered based on their merits.

Each question or topic is followed by the corresponding strategy from the OSMP Master Plan; learn more [here](#).

Climate and Fire

- What are management opportunities for reducing fuels in the Wildland Urban Interface (e.g., mowing, grazing, prescribed fire) and their ecological consequences (such as species invasion or habitat loss/fragmentation)? (EHR.3)

Wildlife Ecology

- Habitat use and ecology of Preble's meadow jumping mouse on OSMP, especially as related to influences of land management (grazing, restoration, trail development, etc.). (EHR.1, EHR.2)
- Hibernation biology of Preble's meadow jumping mouse. (EHR.2)
- Investigate nesting success, productivity, and breeding chronology of grassland birds nesting in irrigated hayfields, including impacts of agricultural management on nesting success. (EHR.1, ATT.7)
- Examine impact of grassland bird closures on reproductive success of grassland birds and/or relationships between grazing and nesting success. (EHR.1)
- Investigate new non-insecticidal control mechanisms for sylvatic plague in prairie dogs, potentially evaluating application methods and nontarget impacts. (ATT.3)
- Investigate success and feasibility of novel approaches to prairie dog exclusion. (ATT.3)
- What are the comparative effects of different prairie dog relocation methods on native prairie communities? Are there practical and effective alternatives to prairie dog nesting boxes (e.g., directional boring)? (ATT.3)
- What are the effects of New Zealand mud snails on lotic ecology? Are there impacts on algae or fish populations? (EHR.6)
- Evaluate environmental constraints (e.g., flow regime, temperature gradient, etc.) that potentially limit the upstream spread of New Zealand mud snails?
- Ecology and habitat use of Abert's squirrels in ponderosa pine forest stands. (EHR.2, EHR.7)

Vegetation Management

- What is the influence of trail building and trail use on invasive species spread? (EHR.6)
- How do we best reclaim degraded lands and track success over time? (EHR.1)

Agricultural Land Restoration

- Evaluate the abundance and species diversity of invertebrate pollinators and characterize other beneficial insect habitat on OSMP's agricultural lands. (ATT.2, ATT.7)

- How do invertebrate populations / communities differ between prairie dog-occupied irrigated fields and unoccupied irrigated fields? (ATT.3, ATT.7)
- Which agricultural fields are most at risk for losing irrigation water in a future with severely reduced snowpack? (ATT.4)
- How does the soil microbial community change as soil health increases from poor to good on OSMP agricultural lands? (ATT.2, ATT.5)
- What impact will removing invasive trees and shrubs from irrigation ditch corridors have on wildfire behavior and risk on OSMP property? What are the impacts to wildlife habitat? (EHR.6, ATT.1, ATT.7)
- How can GPS livestock collars be used most efficiently to monitor livestock movement, particularly to reduce visitor conflict between livestock and trail users on OSMP? (ATT.6, ATT.9)
- Study the hydrogeology of the western portion of OSMP's grazed system to determine the source water and causal factors for dry up of surface ponds and springs. (ATT.4, ATT.6)

Wetland Ecology

- Develop hydrologic models for both montane and front range wetlands on OSMP to quantify the effects of climate change to help inform future restoration and management actions. (EHR.3)
- Evaluate the role of irrigation in maintaining wetland communities across the OSMP system (EHR.1, ATT.4) with a particular interest in OSMP's Van Vleet property.
- Research related to new and emerging techniques to control invasive wetland plant species, including either cattail (*Typha latifolia*) and/or reed canarygrass (*Phalaris arundinacea*). (EHR.1, EHR.6)
- Evaluate how presence/absence of topsoil or different soil amendments influence weed and seed germination in wetland restorations using mesocosm studies. (EHR.1, EHR.6)
- Examine the distribution of *Didymosphenia geminata* (rock snot) and its impact on the benthic ecosystems of OSMP's streams? (EHR.1, EHR.6)

Recreation/Visitor Experience

- To what extent does education or messaging impact behavioral outcomes? What are the OSMP visitor behavioral drivers? (CCEI.2, RRSE.9)
- Survey of regional land managers re: what sorts of messaging and infrastructure increase regulatory compliance?
- How does OSMP (and OSMP visitors) relate/contribute to the local economy? Potential topics could include visitor spending patterns, economic impact effects, or equity outcomes. (FS.3)
- Conservation Framing: How do our visitors and staff define "conservation" (nature for itself, nature despite people, nature for people, nature and people, etc.), and how might these different understandings influence the development of policy and management strategies? (RRSE.8, RRSE.9)
- What are the primary barriers to using available multimodal trailhead access options? (RRSE.1, RRSE.4)
- How does measured bicycle speed vary across different trail design elements (e.g., surface type, incline, width, level of difficulty, line-of-sight) on OSMP trails? (RRSE.6)
- Using existing survey data, identify underrepresented groups and develop inclusive data collection strategies to reach these groups. (CCEI.1, RRSE.9)

Recreational Ecology

- How does trailside habitat vary with type of OSMP dog regulations? For example, to what extent does weed density/diversity vary among trails where dogs are allowed off-leash compared to on-leash or no-dog trails? (RRSE.1, RRSE.5)
- Does wildlife use increase or visitor use decrease in the vicinity of closed/restored undesignated trails? (RRSE.1, EHR.7, RRSE.9)
- Is fencing along trail corridors correlated with grassland bird abundance, diversity, or nesting success/fecundity? (RRSE.1, EHR.7, RRSE.9)
- Conduct new research on the correlation of visitation and ecological health (plants, wildlife, soils, water quality, insects). This could include the correlation of visitation with the spatial or temporal habitat use by native wildlife; the correlation of night-time human use and wildlife use; the correlation of dogs with wildlife community composition. (RRSE.1, EHR.7, RRSE.9)
- Evaluate use of passive acoustic recording devices to document airplane noise impact to wildlife or visitor experience on OSMP. (EHR.2, EHR.8, RRSE.6)

Soil Ecology

- How does forest management impact soil moisture and fertility? (ATT.2, EHR.2)
- What are the best and most practical methods to enhance soil quality in tilled fields, especially wheat-fallow? (ATT.2)
- To what degree can better soil health, associated with greater soil water infiltration, mitigate flooding on OSMP lands during more intense or prolonged rain events? (EHR.2, ATT.4)

Plant Ecology/Restoration Ecology

- How can we use LIDAR data to understand fire behavior or forest composition? (EHR.1, EHR.3)
- Are there genetic changes in native grass cultivars after decades, and if there are, how might those changes affect plant traits that relate to long-term restoration success? (EHR.1, EHR.7)
- How can we use our City of Boulder [digitized herbarium](#) to study some aspect of plant geography, ecology or morphology? (EHR.7)
- Test monitoring methods (remote and/or ground-based) to assess soil erosion vulnerability under scenarios of climate change, catastrophic weather events, human use and land management, particularly in ecologically significant habitats such as our shale barrens, White Rocks, and foothills riparian areas. Evaluate techniques to mitigate soil erosion and associated impacts to native plant communities in these habitats. (EHR.1)

Cultural and Scenic Resources

- Does publicizing cultural resource presence through signage and interpretation to visitors adversely affect their integrity? Is information availability correlated to integrity in other public lands contexts? Is constraining information availability an effective strategy to protect cultural resources? (CCEI.9)
- Who were the people referenced by inscriptions at White Rocks? What are their connections to the Boulder area? (CCEI.9)