Longmont Ecosystem Management Funded Research

Topics of Interest | 2027

Key:
[Regional] = particularly suitable for shared funding, methods, or interagency comparisons
[Management Priority] = likely to inform near-term restoration methods, identify conservation-sensitive species or habitats, or address a consequential management knowledge gap. These are proposed designations for team review, not final rankings.

Wildfire and Forest Health

- Evaluation of fuels treatment effectiveness at Button Rock Preserve *[Regional] [Management Priority]*
- Mitigation of negative ecological impacts associated with fuels treatments
- Mapping bark beetles and other tree pests in Longmont's watershed
- Vegetation recovery on slash-pile burn scars at Button Rock Preserve

Climate Change and Ecosystem Resilience

- Carbon storage across vegetation communities, including riparian forests, prairie, hayfields, and wetlands *[Regional]*
- Vegetation community responses to drought, extreme precipitation, and climatic variability *[Regional]*

Water, Streams, and Aquatic Ecosystems

- Public understanding and effectiveness of fishing signage and monofilament collection stations
- Innovative techniques for water conservation
- Approaches to maintaining creek flows without affecting water rights or deliveries
- Causes, ecological effects, and mitigation of harmful algal blooms along the Front Range *[Regional] [Management Priority]*
- Ecological effects of the Resilient St. Vrain Project *[Regional] [Management Priority]*
- Water quality impacts associated with visitor use at Button Rock Preserve
- Fishery health, productivity, and sustainability at Ralph Price Reservoir and North St. Vrain Creek
- Native fish inventories and habitat characteristics in Front Range streams *[Regional]*
- Effects of beaver dams on native fish communities

Wildlife, Pollinators, and Habitat

- Sustainable dryland agricultural practices for wildlife habitat, including windrows, cover crops, and field margins
- Effectiveness of Habitat Conservation Areas and seasonal wildlife closures at Button Rock Preserve *[Regional] [Management Priority]*
- Northern leopard frog and bullfrog habitat inventories on City properties *[Management Priority]*
- Use and performance of installed bee logs and other cavity-nesting bee habitat features
- White-tailed deer abundance, habitat use, and ecological impacts along St. Vrain Creek
- Wildlife use of dead wood in the pre-2013 St. Vrain Creek flood channel
- Success of prairie dog relocation efforts
- Effects of noise pollution on wildlife use of riparian corridors *[Regional]*

- Pollinator and invertebrate communities in grasslands with and without prairie dogs *[Regional]*
- Pollinator diversity in recently thinned forest parks
- Bat habitat modeling on City properties *[Regional]*
- Sensitive plant and wildlife populations at Button Rock Preserve *[Management Priority]*

Prairie Dog Colonies and Grassland Recovery

- Soil seed-bank composition, viability, spatial variation, and rates of change in active and former prairie dog colonies *[Regional] [Management Priority]*
- Native vegetation nucleation sites within active prairie dog colonies, including protective structures and planting treatments *[Regional] [Management Priority]*
- Drivers and rates of vegetation recovery following prairie dog removal or colony abandonment, including reseeding outcomes *[Regional] [Management Priority]*
- Effects of prairie dog occupancy and colony history on plant diversity, functional composition, and vegetation heterogeneity *[Regional]*

Vegetation Restoration, Seeding, and Invasive Species

- Mapping invasive plant populations at Button Rock Preserve and evaluating treatment strategies *[Management Priority]*
- Herbicide treatment effectiveness against Russian thistle within native grasses and forbs *[Management Priority]*
- Native seeded-species establishment associated with the Resilient St. Vrain Project *[Management Priority]*
- Germination requirements of native species across stratification regimes and elevation gradients *[Regional]*
- Seed-bank composition and dynamics in areas disturbed by cheatgrass or feral rye *[Regional] [Management Priority]*
- Improving drone-based identification and mapping of invasive plant distributions
- Fall versus spring drill-seeding effectiveness for native grasses on dryland sites *[Regional]*
- Succession following hydromulch versus straw-crimp seeding
- Local versus commercial ecotypes of priority native restoration forbs *[Regional]*
- Seed rain from adjacent native and invaded vegetation
- Native early-seral species as initial seedings followed by more diverse later-seral seedings *[Management Priority]*
- Seed limitation versus establishment limitation in degraded grasslands *[Regional [Management Priority]*
- Effects of seed mix diversity, seeding density, and species interactions on restoration outcomes *[Regional]*
- Effects of nurse crops on native establishment and invasive species competition *[Regional] [Management Priority]*
- Integrated site preparation, invasive species suppression, and seeding strategies on disturbed soils *[Management Priority]*
- Effects of prolonged invasive species dominance on soils and subsequent native vegetation recovery *[Regional]*

Soils, Planting, and Riparian Restoration

- Soil amendments, including compost, biochar, and mycorrhizal inoculants, on compacted or saline soils *[Management Priority]*
- Native shrub transplants versus artificial nurse structures for herbaceous diversity and microhabitat

- Rapid field indicators of soil condition and their predictive value for restoration potential *[Regional] [Management Priority]*
- Hydrologic and geomorphic conditions governing riparian plant recruitment and establishment *[Regional] [Management Priority]*
- Effectiveness of planted riparian shrubs and wetland plugs across site conditions *[Management Priority]*
- Cattail occurrence in relation to stream depth, velocity, width, and related site conditions
- Wetland plant establishment and competition with cattails across hydrologic conditions *[Management Priority]*
- Native versus non-native tree recruitment and distribution in relation to stream-channel morphology

Ecological Assessment, Monitoring, and Land Stewardship

- Indicators of ecological condition, habitat quality, and restoration potential across open space properties *[Regional] [Management Priority]*
- Ethnobotanical surveys and Indigenous traditional ecological knowledge to inform land stewardship, with appropriate partnerships

Visitor Use and Recreation Impacts

- Amount and type of use of the City trail system
- Ecological impacts of visitor use *[Regional]*
- Ecological effects of informal trails and effectiveness of trail closure and restoration *treatments [Management Priority]*