

Scope of Work

Title of Project:

Nature in the City

WCS Staff:

Dr. Sarah Reed, Associate Conservation Scientist
Ms. Jessica Sushinsky, Research Associate
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North America Program
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Bozeman, MT 59715

Scope of Work:

The City of Fort Collins, Colorado, is implementing the Nature in the City Strategic Plan, which will include design guidelines, policies, and actions designed to achieve three main objectives: (1) Ensure that every citizen of Fort Collins has access to nature; (2) The City has natural spaces that provide diverse social and ecological opportunities; and (3) Shift the landscape aesthetic to more diverse environments that support all species. Using their skills, experience, and best practices expertise, Dr. Sarah Reed (WCS) and Ms. Jessica Sushinsky (WCS) will work together with colleagues from Colorado State University (CSU) to advise the City of Fort Collins on research design, data collection and analysis, and interpretation of results.

During Phase 1 of the project, WCS contributed to the following tasks:

- Developed research questions, study design, and sampling methods for ecological data collection collaboratively with City staff;
- Reviewed job description, reviewed highly-ranked applications, and participated in interviews of prospective ecological field technician(s) to be hired by the City;
- Provided advice on survey site selection, participate in field technician training, and answer technical questions as needed;
- Supervised data analysis, assist with interpretation, and answer technical questions as needed;
- Developed a relational database in Microsoft Access that summarizes all predictor and response variables by site and survey visit;
- Generated comprehensive species lists for birds and butterflies in the City, and comprehensive species lists by site;
- Assigned bird and butterfly species to guilds (e.g., native species) and functional groups (e.g., ground-nesting species);
- Calculated of community response variables for birds and butterflies for all sites: (1) mean species richness, (2) mean total detections, and (3) proportional detections by species guild/functional group;
- Calculated of predictor variables for all sites: (1) land use, (2) site area, (3) human activity, (4) dog activity, (5) distance to water, (6) distance to Poudre River, (7) distance to GMA line, (8)

development density (@ 500m, 1500m), (9) canopy cover, (10) shrub cover, (11) habitat type, (12) grass and forb cover, (13) mowing, and (14) distance to nearest structure;

- Calculated correlations among predictor variables;
- Completed univariate regressions of all predictor and response variables; and
- Attended project team and subcommittee meetings and provided additional technical assistance as needed.

During Phase 2 of the project, WCS contributed to the following tasks:

- Explored 42 additional predictor variables (e.g., land cover) and assessed the scale-dependence of area-based metrics (e.g., structure density) to improve the explanatory power of statistical models.
- Developed an impervious surface layer and a corresponding green space layer for the study area;
- Selected 10 indicator species, completed individual species models in an occupancy framework, and calculated the relative importance of predictor variables in influencing the habitat use of indicator species;
- Applied the LinkageMapper spatial modeling tool to calculate connectivity of green space and identify gaps in the current habitat network for a subset of indicator species;
- Prepared the final Microsoft Access database, summarizing all predictor and response variables by site and survey visit, for delivery; and
- Attended project team and subcommittee meetings and provided additional technical assistance as needed.

During the next phase of the project, WCS will complete the following tasks:

- Revise connectivity models for five indicator species based on agreed-upon methods for selecting core habitat patches and movement distances;
- Update the Microsoft Access database to include data from 2015 citizen-science surveys;
- Update occupancy models for 10 indicator species to include data from 2015 citizen-science surveys and re-calculate the relative importance of predictor variables in influencing the habitat use of indicator species; and
- Revise connectivity models for up to seven indicator species to include data from 2015 citizen-science surveys.