NATURE IN THE CITY

Strategic Plan

City of Fort Collins

Adopted March 24, 2015

NATURE IN THE CITY

City of Fort Collins

City Manager's Office
City Hall
300 LaPorte Ave.
PO Box 580
Fort Collins, CO 80522

970.221.6505
970.224.6107 - fax
fcgov.com

I am pleased to present the Nature in the City Strategic Plan.

Nature in the City is a visionary approach to preserving and enhancing our quality of life now and for future generations. As Fort Collins grows in population and as infill and redevelopment continue to urbanize our community, we want to ensure that access to nature remains a defining attribute of our city. This Plan provides a defined approach to ensure there is always nature within our boundaries.

The City of Fort Collins has a long history of valuing our open spaces. We have vibrant Natural Areas and high quality parks and trails. Nature in the City will add to these programs by identifying, acquiring and protecting a network of connections within the community. Through public and private partnerships, the program will create additional natural spaces, providing quick and easy access to nature within a 10-minute walk from anywhere in Fort Collins. Creating and protecting such natural spaces within an urban setting benefits our physical and mental health, our wildlife and plant habitats, and ultimately combines to create a distinct sense of place for the whole community.

The Nature in the City Strategic Plan reflects the input of engaged residents, community and business partners, Colorado State University staff and students, the Mayor and City Councilmembers, and City staff. It reflects an interdisciplinary effort from many City departments and significant public outreach, including an active Citizen's Advisory Committee. I want to convey my appreciation to all of the citizens who participated in this process, the Mayor and Council for their leadership, and City staff for their hard work.

Nature in the City reflects our commitment to the triple bottom line, taking into account the economic, environmental and social impacts of nature, and as such, I believe this project will shape Fort Collins both in the short term and over the next century.

Sincerely,

Darin Atteberry
City Manager

Photo Credit: Natural Areas Department

Acknowledgments

City Council

Karen Weitkunat, Mayor
Gerry Horak, Mayor Pro Tem, District 6
Bob Overbeck, District 1
Lisa Poppaw, District 2
Gino Campana, District 3
Wade Troxell, District 4
Ross Cunniff, District 5

City Leadership

Darin Atteberry, City Manager
Jeff Mihelich, Deputy City Manager

Planning and Zoning Board

Jennifer Carpenter
Jeff Hanson
Gerald Hart
Emily Heinz
Michael Hobbs
Kristin Kirkpatrick
Jeffrey Schneider

Project Executive Sponsors

Bruce Hendee, Chief Sustainability Officer
Karen Cumbo, Planning, Development, and Transportation
Laurie Kadrich, Community Development and Neighborhood Services
Cameron Gloss, Planning Manager

Project Management Team

Lindsay Ex, Project Manager, Social Lead
Justin Scharton, Strategic Plan Co-Project Manager
Megan Bolin, Economic Lead
Colin Day, Colorado State University, Living Wall and Design Guidelines Project Manager
Suzanne Jarboe-Simpson, Project Facilitator
Kate Rentschlar, Environmental Lead
Amy Resseguie, Communications Lead

Interdisciplinary Project Team

Liba Pejchar, Colorado State University
Sarah Reed, Colorado State University and Wildlife Conservation Society
Brian Dunbar, Colorado State University
Colin Day, Colorado State University
Susan Beck-Ferkiss, Social Sustainability
Marcus Bodig, IT
Shane Boyle, Utilities
Scott Carman, Urban Lab
Michelle Finchum, Utilities
Clay Frickey, Planning
Kurt Friesen, Park Planning
Kristin Fritz, Fort Collins Housing Authority
Sam Houghteling, Economic Health
CJ Housley, Utilities
Melissa Hovey, Environmental Services
Pete Iengo, Utilities
Aaron Iverson, FCMoves
Robin MacDonald, Neighborhood Services
Travis Machalek, City Manager's Office
Karen Manci, Natural Areas
Aran Meyer, Natural Areas
Ginger Purvis, Utilities
Bill Whirty, Parks
Jill Wuertz, Parks
Ralph Zentz, Forestry

Document Layout and Design

Spencer Branson, Planning

Citizens Advisory Committee

Kim Barman, Coalition for Activity and Nutrition to Defeat Obesity
Michael Baute, Spring Kite Farm
Lorin Bridger, Waterwise Landscapes
Edgar Dominguez, Vida Sana
Trace Evans, Colorado State University
Nick Haws, Fort Collins Chamber of Commerce and Northern Engineering
Dave Leatherman, Local Expert
Bob Mann, Natural Resources Advisory Board
Rob Novak, Larimer County
Joe Piesman, Natural Resources Advisory Board
Rick Schroeder, former president of the local Audubon Society Chapter; retired biologist
Roger Sherman, BHA Design, Inc.
Michael Spearnak, Poudre School District
Todd Spiller, Harvest Park Homeowners Association
Joann Thomas, Senior Advisory Board
Bryan Tribby, Colorado State University

Boards and Commissions

Commission on Disability
Economic Advisory Commission
Land Conservation Stewardship Board
Natural Resources Advisory Board
Parks and Recreation Board
Planning and Zoning Board
Senior Advisory Board

Project Partners

Colorado State University, Center for Public Deliberation
Colorado State University, Department of Fish, Wildlife and Conservation Biology
Colorado State University, Institute for the Built Environment
Colorado State University, Department of Horticulture and Landscape Architecture
Urban Lab
Wildlife Conservation Society

Additional Acknowledgments

All City Boards and Commissions who have provided feedback throughout this process
More than 1,000 citizens who engaged in the Nature in the City planning process
Residents who submitted photos in association with the Nature in the City photo contest

NATURE IN THE CITY

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Photo Credit: Fresh Air Fort Collins

Executive Summary

What is Nature in the City?

Nature is a defining characteristic of Fort Collins; our community has a 40-year history of protecting nature in our City and region. Nature in the City is a planning effort that capitalizes on these long-standing efforts to further protect and integrate nature into the City's fabric through a variety of regulatory, policy, outreach and collaborative solutions. The vision of Nature in the City is to provide a connected open space network accessible to the entire community that provides a variety of experiences and functional habitat for people, plants and wildlife. This vision will be accomplished through a triple-bottom-line approach considering benefits and impacts of environmental, economic, and social variables. Efforts that enhance access for people and wildlife, the quality of natural spaces, and ongoing stewardship of those spaces are the primary focus.

Photo Credit: Rosemarie Russo

Fort Collins' Commitment to Nature

Fort Collins has a long history of protecting open space within the community; as a result, nature has become a significant part of our community's character and quality of life. This commitment to nature brings many benefits to residents including the opportunity to interact with wildlife, award-winning recreational amenities, and contributes to the city's resilient economy.

Need for this Plan

For years, the City has grown toward the edge of the Growth Management Area boundary. While City Plan has enacted policies related to infill and redevelopment since the late 1990s, development has only recently begun to focus on infill in the urban core.

These changes in development patterns have stimulated a conversation regarding how the community can balance infill and redevelopment goals while maintaining a small-town feel, and protecting important habitat for plants and wildlife. Ensuring all residents have access to nature, and opportunities to retreat from the urban environment, has been identified as a key goal by the community, City Council, and the City's Strategic Plan.

How Does Nature in the City Build Upon Existing Efforts?

Nature in the City goes beyond the borders of Natural Areas, Parks and Stormwater facilities to incorporate a connected network of nature for people and wildlife on public and private lands in the City.

The vision of Nature in the City will be accomplished by a multi-faceted approach including:

- Private/public partnerships
- Restoring existing natural spaces to increase the natural quality of sites for people and wildlife
- Working on neighborhood-scale enhancement projects
- Design guidelines to illustrate how nature can be incorporated into the urban environment
- Education, incentives and resources for landowners, business owners and landscapers
- Ongoing partnerships on new and existing City plans, policies and practices
- Targeted land acquisition to provide a connected open space network

How to Use this Plan

Nature in the City will coordinate and connect new and existing City and community resources with the needs of residents. The recommended policies within this plan are intended to be used by City staff, numerous Boards and Commissions, City Council, property owners, and other community stakeholders to identify priority actions on which to focus collaborative efforts.

Vision

A connected open space network accessible to the entire community that provides a variety of experiences and functional habitat for people, plants and wildlife.

Goals

The following goals have been prioritized to help achieve the Nature in the City vision:

- **Easy Access to Nature:** Ensure every resident is within a 10-minute walk to nature from their home or workplace.
- **High Quality Natural Spaces:** Conserve, create and enhance natural spaces to provide diverse social and ecological opportunities.
- **Land Stewardship:** Shift the landscape aesthetic to more diverse forms that support healthy environments for people and wildlife.

Photo Credit: John Bartholow

Planning Process

Nature in the City represents a 15-month planning process conducted in three phases:

Phase I – Inventory and Assessment
(January 2014 – November 2014)

This phase included extensive research and data collection of environmental, social, and economic values and impacts surrounding nature in Fort Collins. Data was collected locally and through a survey of the liteature, including:

- Survey on the benefits of nature from an economic perspective and the impacts of parcels near open space, e.g., property values
- Visioning workshop and citizen surveys to assess residents' perceptions and values about nature
- Citywide bird, butterfly, and vegetation sampling

In addition to the inventory and assessment, significant community outreach also occurred during this phase to inform residents, City staff, and community organizations about the development of the plan and to solicit feedback.

More than 1,000 residents were engaged in this phase of the project.

Phase II – Strategic Planning
(November 2014 – March 2015)

Once data were collected and an initial outreach effort had been made, City staff began a strategic planning phase by assembling several subcommittees to create draft recommendations that informed the policies included in Chapter 3. A draft plan was posted online in February 2015 for public review and comment and the plan was submitted to numerous City Boards and Commissions to solicit feedback as well. City Council adopted this plan in March 2015.

Phase III – Implementation and Evaluation
(March 2015 – ongoing)

The implementation phase of Nature in the City begins with the adoption of this Strategic Plan. Numerous short-term (2015-2016), mid-term (2017-2020), and longer-term (2021 and beyond) efforts have already been identified for implementation. Where feasible, cost estimates for each action item have been provided. Projects will continue to be identified and implemented as the policies in this plan are executed.

Community Engagement Summary

The community engagement process for Nature in the City consisted of the following:

- Hosted Visioning Workshop for residents (March 2014)
- Conducted initial project survey of more than 350 participants to assess values and priorities regarding nature and this project
- Conducted Visual Preference Survey with approximately 250 participants
- Assembled Citizen Advisory Committee, including 15 community representatives from environmental, social, and economic perspectives
- Presented to and received feedback throughout the planning process from seven City Boards and Commissions
- Created Wikimap (an online, interactive mapping tool) to identify where residents access nature and where barriers to access exist
- Held Open Houses (February 2014, April 2014, February 2015)

This word cloud reflects participants' top values related to nature in the community.

Discussing values of nature with La Familia

Policies

This plan outlines 33 policies the City will pursue to accomplish the broader goals and vision of Nature in the City. Each policy identifies a key outcome resulting from implementation. The 33 policies are categorized into five policy areas.

Connectivity

During the outreach conducted for Nature in the City, the issue of connectivity, or the ability for people and wildlife to access nature without interruption, arose again and again. Regardless of age, income level, geographic location or ethnic background, the community expressed a strong desire to enhance connectivity between natural spaces, not only for people but for wildlife as well. The policies in the Connectivity Policy Area are designed to achieve that goal.

Key outcomes include:

- A connected system of nature for people and wildlife
- Access to nature via public transportation
- Innovative wayfinding and interpretation information
- A vibrant, connected Poudre River

A common theme among all stakeholder groups was identification of connectivity as a top priority for Nature in the City to emphasize.

Connectivity Policies

C1 - Increase connectivity for plant and wildlife species

C2 - Increase connectivity for residents

C3 - Prioritize transportation infrastructure to increase access to nature

C4 - Provide public transit connections to nature

C5 - Provide innovative wayfinding and informational resources

C6 - Continue to make the Cache la Poudre River a conservation priority

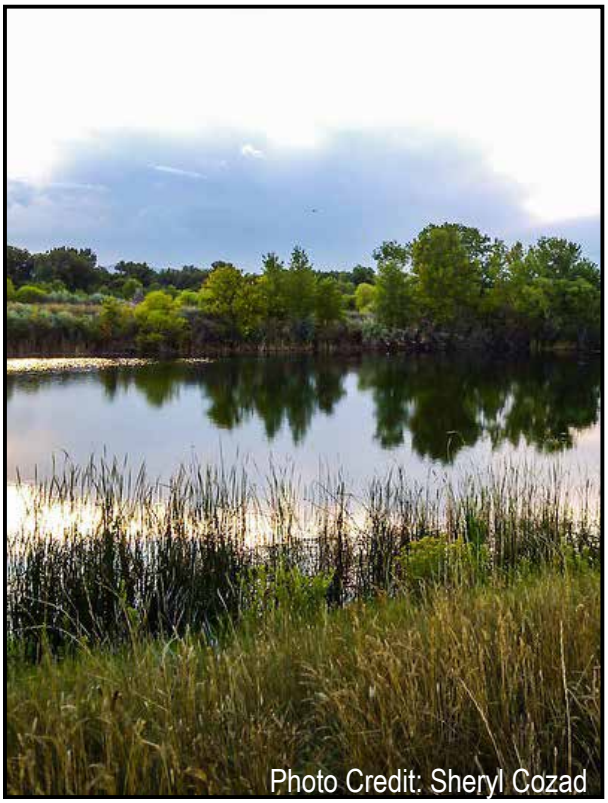


Photo Credit: Sheryl Cozad

Land Use and Development

Fort Collins' population may grow from its current 155,000 residents to between 230,000 and 255,000 not long after 2040. Throughout community discussions, a strong desire to preserve Fort Collins' small-town feel while accommodating additional growth was prevalent.

The City's Land Use Code, which governs land development, is a critical tool for addressing this balance. In addition, while many neighborhoods, businesses and districts are not currently poised to redevelop, many have expressed an interest in greater access or a greater variety of experiences with nature. These policies are designed to help meet this need through new developments, properties that redevelop, and existing neighborhoods or properties that wish to enhance their natural spaces.

Key outcomes include:

- Flexible Land Use Code requirements for open space and vegetation structure and composition
- Design guidelines and training resources to install and maintain natural spaces
- Neighborhood-scale projects to create or enhance natural spaces
- Partner with ditch companies to acknowledge multiple value of ditches
- Stormwater basin guidelines that complement Nature in the City principles
- Sustainable urban agricultural operations

Land Use and Development Policies

LU1 - Revise Land Use Code open space standards

LU2 - Develop Land Use Code changes regarding multiple tree sizes and diversity within new developments

LU3 - Create design guidelines to guide development, redevelopment and site restoration

LU4 - Develop training resources for the installation and ongoing maintenance of diverse landscapes

LU5 - Coordinate and incentivize natural space improvements at the neighborhood scale

LU6 - Support and protect the multiple values of the City's ditch system

LU7 - Provide Level of Service guidance for Nature in the City projects

LU8 - Update stormwater basin guidelines to include Nature in the City principles

LU9 - Encourage natural drainages to be re-created

LU10 - Promote and preserve urban agriculture that supports a triple-bottom-line approach

Photo Credit: Fresh Air Fort Collins

City Practices and Policy Coordination

The purpose of this policy area is to ensure the integration of Nature in the City principles into existing City programs and future planning efforts. One of the major charges of Nature in the City is to coordinate with development, infrastructure, and other plans and policies to incorporate nature where appropriate.

Key outcomes include:

- City mowing and spraying operations that adhere to best management practices, provide flexibility for site objectives to be met, ensure the protection of wildlife habitat and meet public safety and aesthetic requirements
- A darker night sky
- A complete dataset of wildlife habitat in the City's urban tree canopy
- Streetscapes with natural landscaping where appropriate
- A quieter community for people and wildlife
- Updated stormwater practices that align with Nature in the City principles
- Coordination with Nature in the City on existing and future City plans, policies and projects, ensuring nature is acknowledged as a key community value in the urban environment
- Increased recognition of the unique role nature plays in the urban environment

City Practices and Policy Coordination

CP1 - Align City mowing and weed control policies to support local species while balancing public safety and aesthetics

CP2 - Work cross-departmentally and with external partners toward a darker night sky

CP3 - Expand the City's tree inventory to include wildlife habitat

CP4 - Pollinator and bird-friendly habitat in City Streetscapes

CP5 - Provide quiet spaces in the City to escape from the urban environment

CP6 - Amend the City's Stream Rehabilitation Program to incorporate Nature in the City Principles

CP7 - Continue the City's current policies related to nature and coordinate Nature in the City initiatives with future planning and policy updates

CP8 - Coordinate with all applicable City planning processes over time to ensure opportunities to implement Nature in the City efforts and initiatives are included

CP9 - Update Nature in the City Strategic Plan

CP10 - Celebrate nature in the urban environment

Photo Credit: mrp2863198

Long-term Monitoring

The Nature in the City Strategic Plan is designed to be an ongoing guide directing how the community incorporates natural spaces into the increasingly urban environment over the next 100 years and beyond. These policies envision a longer-term application and evaluation of the Nature in the City principles.

The policies within the Long-term Monitoring policy area encourage the development of specific targets and long-term monitoring programs to aid the City in assessing whether it is on track to achieve the goals established in this plan. The policies also encourage citizen engagement in long-term monitoring.

Key outcomes include:

- Comprehensive biodiversity goal for public and private land
- Community or regional standards to assess the economic benefit ecosystem services provide
- Projects that support greenhouse gas emissions reductions as detailed in the City's Climate Action Plan
- Long-term monitoring program that tracks key indicator species

Long-term Monitoring Policies

LT1 - Set a Citywide biodiversity goal

LT2 - Establish the value of ecosystem services to the City and track the value added by existing and new projects

LT3 - Establish monitoring for carbon sequestration to support greenhouse gas emission reduction goals

LT4 - Evaluate and monitor natural spaces for air quality improvement in accordance with the Air Quality Plan

LT5 - Establish a long-term monitoring program for the City's biodiversity using citizen science projects


Photo Credit: Molly Rosey

Funding and Incentives

During the public outreach for Nature in the City, participants said they would like to incorporate nature into their homes or businesses, but many times did not have the technical knowledge to do so, and perceived increased costs as a barrier. Financial and other incentives are important to help overcome these barriers. Key to the success of Nature in the City will be establishing public/private partnerships with residents, local businesses, e.g., nurseries and others, and developers to implement the appropriate incentives at the right scale.

Identifying, coordinating and managing all the potential projects Nature in the City may have a nexus with will also require ongoing funding for the program. Policies in the Funding and Incentives Policy Area address these issues.

Key outcomes include:

- Ongoing funding for program support and project-specific capital improvements
- A variety of incentives that help landowners, business owners and others implement Nature in the City projects

Funding and Incentives Policies

F1 - Explore a diverse set of funding options to implement Nature in the City

F2 - Implement incentives that can be incorporated into new development and redevelopment projects

Photo Credit: John Bartholow

Plan Evaluation and Implementation

A common way to evaluate a plan is through the use of performance indicators. Performance indicators are tools used to track and evaluate implementation progress over time. Performance indicators are most effective when they are aligned with the key outcomes. For Nature in the City, the performance indicators are designed to measure whether the vision, goals, and policies are being achieved.

Immediate indicators include access to nature and connected habitat measurements. Longer-term indicators may include a biodiversity goal and neighborhood engagement measures.

A number of projects are detailed in this Plan, including:

Short-term Projects (2015-2016)

- Land Use Code amendments related to open space requirements
- Comprehensive Night Skies Policy and regulatory updates
- Design Guidelines for installation and maintenance of natural spaces
- Connectivity analysis for people and wildlife

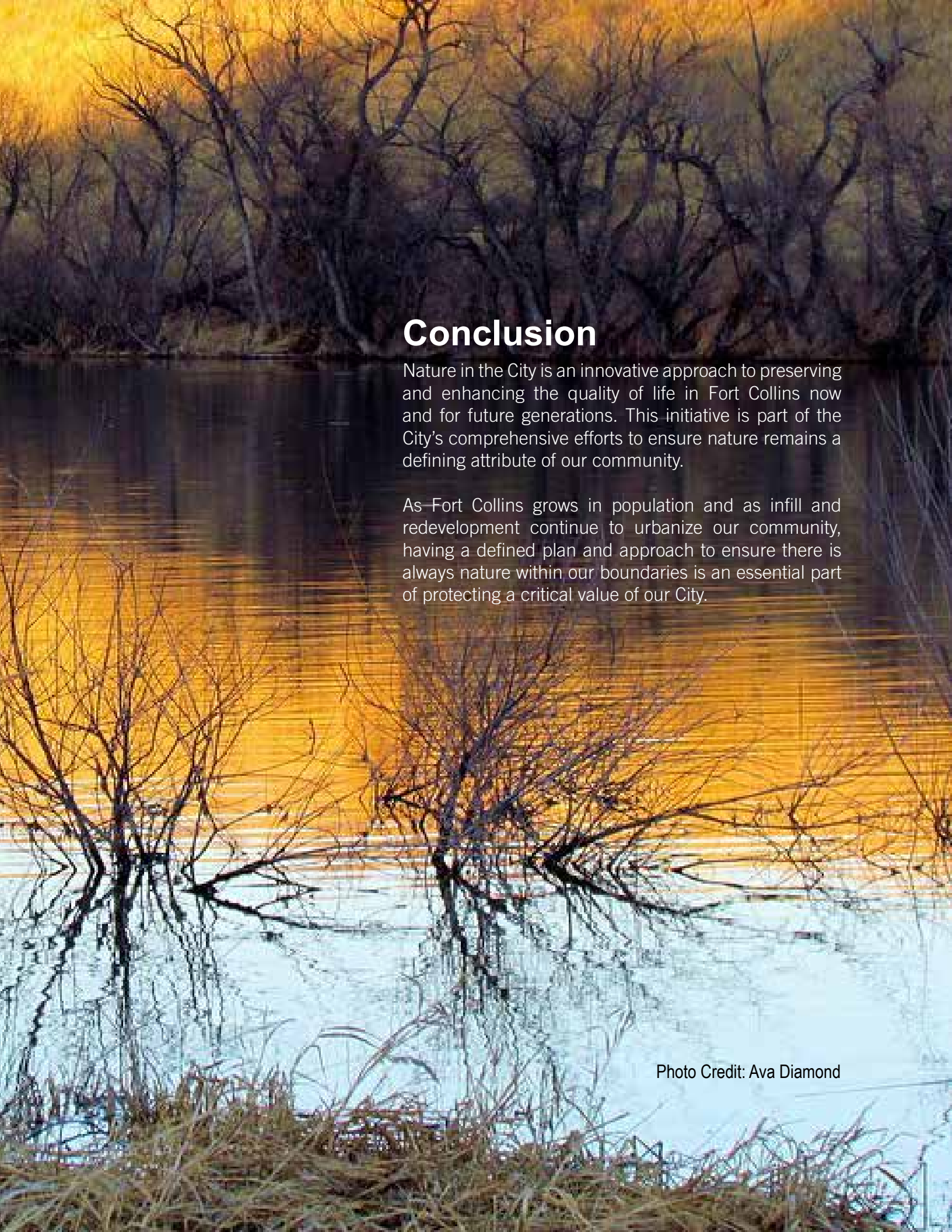
Mid-term Projects (2017-2020)

- Incorporate Nature in the City principles in the City Plan update and other planning efforts
- Acquire parcels within identified priority areas
- Neighborhood-scale programs to incorporate Nature in the City

Longer-term Projects (2020 and beyond)

- Encourage natural drainages to be re-created
- Develop level of service for Nature in the City by establishing standards for future projects
- Establish valuation for ecosystem services provided in the City


Photo Credit: Molly Rosey



Conclusion

Nature in the City is an innovative approach to preserving and enhancing the quality of life in Fort Collins now and for future generations. This initiative is part of the City's comprehensive efforts to ensure nature remains a defining attribute of our community.

As Fort Collins grows in population and as infill and redevelopment continue to urbanize our community, having a defined plan and approach to ensure there is always nature within our boundaries is an essential part of protecting a critical value of our City.

Photo Credit: Ava Diamond

Photo Credit: Norm Keally

CHAPTER 1:

INTRODUCTION

Introduction

Background

From its humble beginnings in the 1860s as an Army outpost, Fort Collins has grown to more than 155,000 residents encompassing 55 square miles. Now, Fort Collins is transitioning from a suburban town to a small urban city with a projected buildout population of 230,000 - 255,000 residents not long after 2040. As the City transitions from suburban to urban and densities increase, informal natural spaces and features within the urban core will become more important for both people and wildlife.

Purpose of this Plan

Building upon the work that City Natural Areas, Parks, Stormwater, and others have created, Nature in the City will help facilitate a connected system of public and private lands, with an ultimate goal of weaving together the natural elements and systems throughout the community. Developing this plan now is important so we can take advantage of opportunities that exist to integrate Nature in the City elements into new developments and redevelopments as well as to stimulate restoration of existing sites. Creating a high quality, interconnected open space network as Fort Collins moves toward buildout ensures the ability to preserve, enhance, and add to those natural places within our community. These spaces are integral to plant and wildlife habitat and important to creating our sense of place within Fort Collins.

According to the 2010 U.S. Census, almost 80% of people living in the United States live in an urban setting. That means now more than ever, people are experiencing nature in an urban environment.

Previous Plans and Existing City Efforts

City Plan

City Plan, the City's comprehensive plan, serves as the foundation for all operations and planning efforts in Fort Collins. As Nature in the City is interdisciplinary, numerous Principles and Policies in the Environmental Health and Community and Neighborhood Livability sections align with this project's vision.

Policy LIV 14.1 of City Plan encourages the inclusion of nature in the urban environment:

In addition to protecting existing natural features, encourage integration of unique landscape features into the design and architecture of development and capital projects. These unique features may range from informal and naturalized to highly structured and maintained features. Some examples include tree groves within a project, stormwater facilities that become naturalized over time, walls with vines, drainageway enhancements, and other small, uniquely landscaped spaces.

Citywide 2015-2016 Strategic Plan

Similarly, the City's 2015-2016 Strategic Plan delves into the Principles and Policies set forth in City Plan for a 5-year timeframe instead of a 25+ year timeframe.

Numerous Nature in the City Policies achieve Key Strategic Outcomes and Strategic Objectives in the Strategic Plan, with the most important objectives as follows:

Strategic Outcomes	Objectives
Community & Neighborhood Livability: Provide a high quality built environment and support quality, diverse neighborhoods	Objective 1.4 – Preserve and provide responsible access to nature
	Objective 1.6 – Promote health and wellness within the community
Culture & Recreation: Provide diverse cultural and recreational amenities	Objective 2.5 – Plan, design, and implement citywide park, recreation and trail improvements
Economic Health: Promote a healthy, sustainable economy reflecting community values	Objective 3.5 – Sustain high water quality to support the community and water-dependent businesses
	Objective 3.7 – Support sustainable infill and redevelopment to meet climate action strategies
Environmental Health: Promote, protect and enhance a healthy & sustainable environment	Objective 4.1 – Improve and protect wildlife habitat and the ecosystems of the Poudre River and other urban streams
	Objective 4.10 – Conserve and restore biodiversity and habitat
Safe Community: Provide a safe place to live, work, learn and play	Objective 5.4 – Protect life and property with natural, aesthetically pleasing flood mitigation facilities through building codes and development regulations
Transportation: Provide for safe and reliable multi-modal travel to, from and throughout the City	Objective 6.3 – Fill the gaps for all modes of travel and improve the current transportation infrastructure while enhancing the aesthetic environment
	Objective 6.6 – Support efforts to achieve climate action goals by reducing mobile emissions and supporting multiple modes of transportation

Existing City Programs and Policies

The City of Fort Collins has a rich history and a strong commitment to protecting the natural areas and habitats both within the City and throughout the region. From the early tax initiatives in 1972 and 1984, and through subsequent initiatives, the City's Natural Areas Department has become an award-winning conservation program that has protected more than 41,000 acres of quality natural areas in Fort Collins, both for the plant and wildlife species that inhabit them and the citizens who recreate in them. More recently, the Utilities' Stormwater Repurposing Effort has expanded the program's focus to emphasize not only runoff capture but also to mimic natural processes. Similarly, the City's Parks Department has designed and constructed new parks incorporating a combination of passive and active uses that better support a balance of natural spaces and habitat with recreation.

Since 1997, the City's Land Use Code has required developments to protect, enhance, and buffer natural resources on private lands. Each of these efforts has led to a community that values the natural environment, along with a high quality built environment.

The City's Natural Areas Department has protected more than 41,000 acres of high quality open space in Fort Collins and the surrounding region.

Existing Plans and Policies

There are a number of policies and plans that already protect and incorporate nature into City operations, providing opportunities for Nature in the City to leverage resources to make even more impact.

Plans and Policies that incorporate nature include:

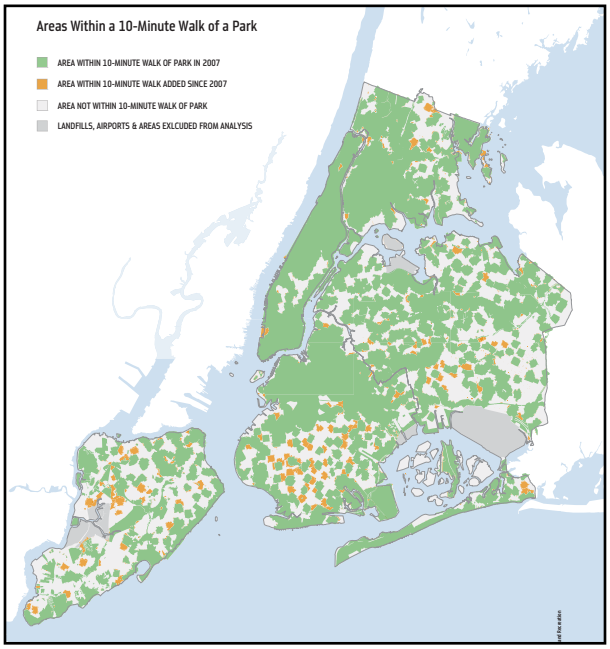
- City Plan (2011)
- City 2015-2016 Strategic Plan
- Natural Areas Master Plan (2014)
- Our Lands Our Future Study (Larimer County) (2013)
- Paved Trails Recreational Master Bicycle Plan (2013)
- Parks and Recreation Policy Plan (2008)
- Land Use Code

Other Efforts to Incorporate Nature into the Urban Environment

Numerous communities have successfully incorporated nature into the urban fabric in creative and interesting ways. New York City's Forever Wild program has protected more than 50 of the most ecologically valuable lands remaining within the five boroughs, allowing visitors to connect to nature in their urban context. Vancouver, British Columbia has defined a goal of being the Greenest City in the World and is setting out to accomplish that goal with its 2020 Action Plan. Additionally, the city-state of Singapore has invested in integrating nature into the built environment by creating the Gardens by the Bay, which allows visitors to engage with a cloud forest, gardens and lakes all within their city-state.

Nature in the City breaks new ground in weaving nature into the urban environment in the following ways:

- The extensive public, private, and academic partnerships forged through the development of the plan that will continue to be strengthened in its implementation;
- The explicit commitment to the Triple Bottom Line (social, environment and economic) aspects of nature; and
- The acknowledgment that both public and private lands contribute to the City's natural values and the identification of policies that apply to both of these types of lands.



The images above represent a greenway corridor in Vancouver, a map illustrating the 10-minute walk distance to nature in New York City, and a canopy walk in Singapore. While these examples have different climates than Fort Collins, they represent visionary examples for incorporating nature into the urban environment from which we can learn. Photo credits: City of Vancouver, New York City, and the City-State of Singapore.

Public Engagement

The Nature in the City initiative has involved 17 City departments, Colorado State University, and a 15-member Citizens Advisory Committee. Public engagement strategies included open houses, visioning workshops, farmers markets, and focus groups with the business community, schools, City Boards and Commissions, and the Hispanic community through La Familia/The Family Center. Three workshops were held to solicit feedback, and since the project was initiated, more than 1,000 residents participated in a dialogue to formulate the vision and strategic plan for achieving the initiative's goals.

For the full results of all outreach efforts see Appendix B3.

Boards and Commissions involved in Nature in the City

- Commission on Disability
- Economic Advisory Commission
- Land Conservation Stewardship Board
- Natural Resources Advisory Board
- Parks and Recreation Board
- Planning and Zoning Board
- Senior Advisory Board

Inventory and Assessment Summary

In addition to outreach, Phase One was focused on inventory and assessment. A triple-bottom-line (social, economic, and environmental) approach served as the foundation for this effort.

This phase was collected and analyzed data to assess tassets/gaps from a triple-bottom-line perspective. Staff began the project by collecting examples (precedents) from the United States and abroad (Appendix B1). For each perspective of the triple bottom line (social, economic, and environmental), staff conducted a literature review and collected local data. While the literature review is described in Appendix B2, a summary of the local data from each of these perspectives is described below.

Social Inventory and Assessment

A survey gathered feedback about the use and value of nature in our community. Surveys were given to 365 participants between March and September 2014. Demographic data were collected to ensure findings were relevant to the entire community.

92% of respondents to the project's survey indicated that access to nature was important or very important.

Participants at a Nature in the City visioning workshop facilitated by the Center for Public Deliberation (CSU)
Photo credit: Martin Carcasson.

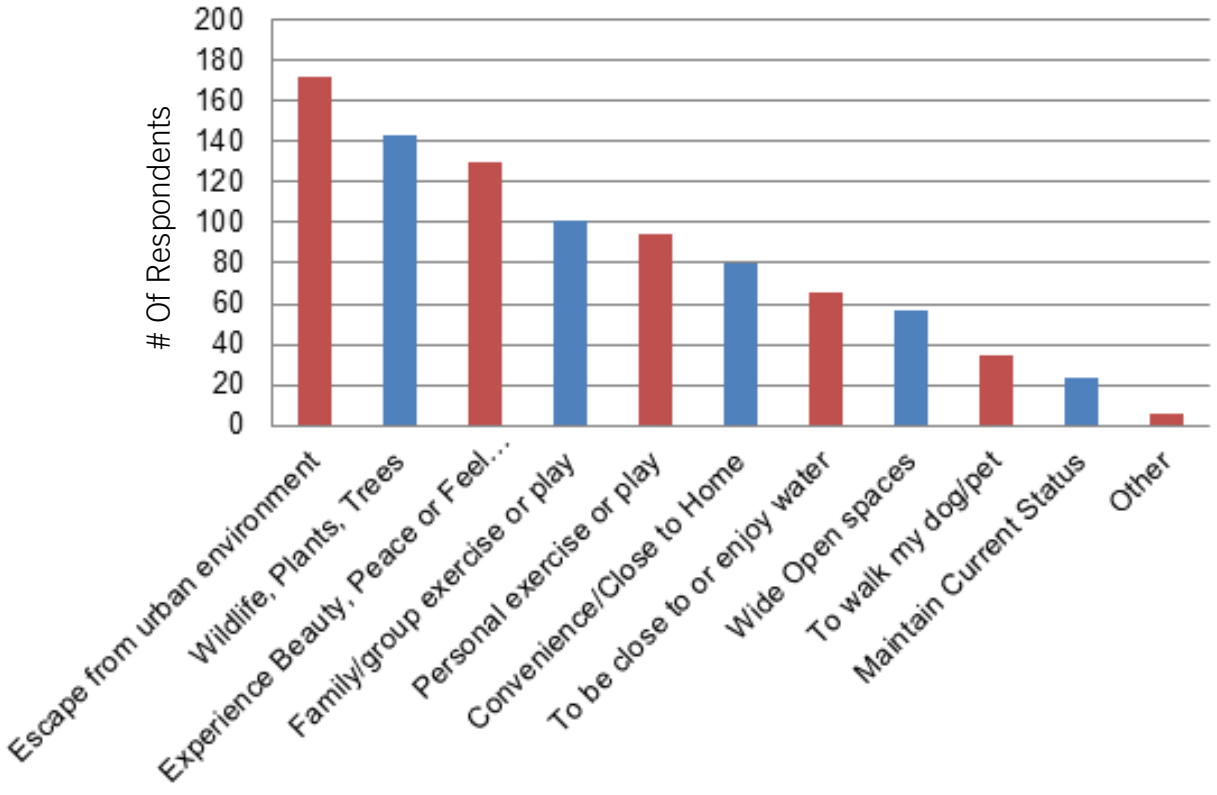
Key findings of the survey include:

- Residents in Fort Collins strongly value access to nature (92 percent of respondents indicated nature was important or very important to them).
- Most residents feel they have easy access to nature (78 percent agree or strongly agree), but note that a lack of time (94 respondents) and lack of easy access (48 respondents) are the two biggest barriers to open space access.
- When asked what this project should focus on, given our current strengths and weaknesses, four priorities emerged:

1. Provide opportunities to escape from the urban environment
2. Increase connectivity and opportunities for wildlife and plants (especially trees) to thrive in the community
3. Provide places to find beauty, peace, and relaxation
4. Provide more opportunities for personal and group exercise or play, with an emphasis on a connected network of these opportunities.

The full survey results are available in Appendix B4.

Respondent answers to the question: "Considering our current strengths and weaknesses, which of these values should this project focus on the most for the city overall?" In this question, the opportunity to escape from the urban environment was the top most preferred value to focus on, with wildlife, plants, and trees being the second most preferred item. Of note is that these priorities were consistent overall based on demographics, but that males wanted the project to focus on personal exercise or play as their second priority for the project.

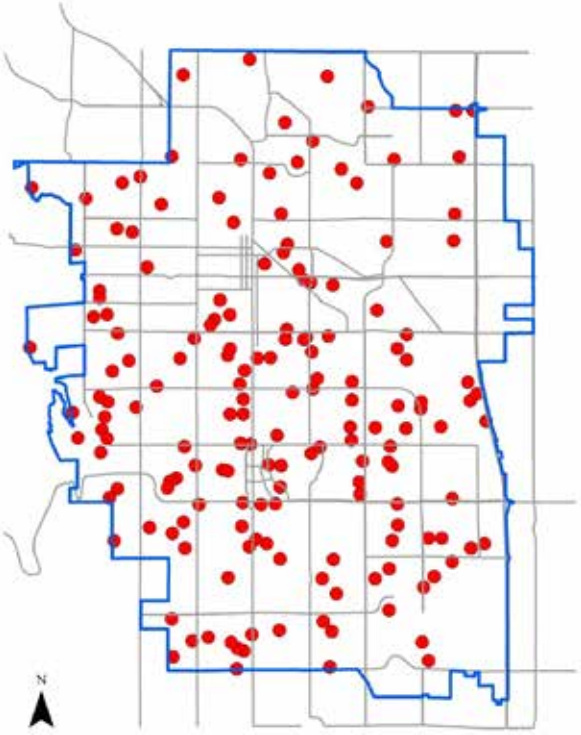


Ecological Inventory and Assessment

From the inception of the project, a key component of Nature in the City has been to conduct long-term monitoring on the condition of Fort Collins' urban habitat and the abundance and diversity of its species. In collaboration with CSU and the Wildlife Conservation Society, staff conducted the following efforts to begin collecting a baseline condition in the summer of 2014:

- Staff sampled 166 sites throughout Fort Collins from May–August 2014 for birds, butterflies and vegetation.
- Field data were collected across nine land use types – Parks, Natural Areas, schools, trails, ditches, urban agriculture, residential open space, non-residential or institutional open space, and Certified Natural Areas/Natural Habitat Buffer Zones.
- 88 species of birds and 33 species of butterflies were observed.
- Data analysis suggests land use, site area, distance to Growth Management Area boundaries and percent of disturbed habitat are the strongest drivers for the abundance and diversity of bird and butterfly species observed this past year. A full summary of results and the methods used for the surveys can be found in Appendix B5.

Bird and butterfly data collected in 2014 indicate that when private lands are managed with wildlife in mind, species diversity is comparable across public and private lands. This illustrates the potential that private lands have to contribute to the community's overall habitat value.



This map illustrates the 166 sites sampled throughout the City for birds, butterflies, and vegetation. Sampling design was developed in collaboration with CSU and the Wildlife Conservation Society.

Photo Credit: Chirpchic

Economic Inventory and Analysis
City staff met with a significant number of business organizations, primary employers, and ClimateWise partners to assess how access to nature enhances business attraction and retention in Fort Collins (see Appendix B3 for a full list). In summary, the business community reported:

- City is attractive and considered to provide high quality of life
- Nature does help with businesses recruitment and employee retention
- Residential sales price premiums for close proximity to nature in Fort Collins are approximately 10 percent
- The project should be mindful of added costs to development/business
- Encouraged staff to look for ways to "soften" commercial areas (e.g., Downtown flowers) via incentives and partnerships
- Connectivity between open spaces is important

One study in Lawrence, Kansas indicated residents were willing to pay for easier access to nature regardless of income level (see Appendix B2).


Photo credit: Mrp 2863198

Using the Plan

The Plan will serve as a policy guide for the City, private landowners and others when considering new regulations and incorporating nature into various projects. The chapters contained within this Plan are briefly described below.

Chapter 2 – Vision and Goals: This chapter presents the overall Nature in the City vision and goals.

Chapter 3 – Policies: This chapter discusses the 33 policies designed to accomplish the goals and vision of Nature in the City. Each policy contains a key outcome that will occur as a result of policy implementation. Each of the policies is categorized into five policy areas for ease of reading:

- Connectivity
- Land Use and Development
- City Practices and Policy Coordination
- Long-term Monitoring
- Funding and Incentives

Chapter 4 – Plan Evaluation and Implementation: This chapter is separated into two sections: (1) plan evaluation and (2) implementation. Plan evaluation includes a set of performance indicators, two of which can be measured as early as 2015 and others that will need to be developed after specific implementation items are complete.

Plan implementation is divided by short-term (2015-2016), mid-term (2017-2020), and long-term (2021 and beyond) actions. Costs, timelines, stakeholders and more are detailed in this section.

Photo Credit: gsaw405

CHAPTER 2:
Vision and Goals

Chapter 2: Vision and Goals

Vision:

"A connected open space network accessible to the entire community that provides a variety of experiences and functional habitat for people, plants and wildlife."

Photo Credit: Ava Diamond

Goals

Three key goals have been identified to achieve the Nature in the City vision:

- **Easy Access to Nature:** Ensure every resident is within a 10-minute walk to nature from their home or workplace.
- **High Quality Natural Spaces:** Conserve, create and enhance natural spaces to provide diverse social and ecological opportunities.
- **Land Stewardship:** Shift the landscape aesthetic to more diverse forms that support healthy environments for people and wildlife.

Easy Access to Nature

92% of respondents to the 2014 Nature in the City survey said they strongly value access to nature.


Photo Credit: Mofinchum

Easy Access. Throughout the public outreach process, residents cited easy access to nature as a key priority. In a public survey conducted during March-July 2014, 92 percent of respondents said they strongly value access to nature. One of the Nature in the City goals is to ensure easy access to nature in perpetuity.

One measure of easy access is the distance or amount of time it takes to get to nature. A 10-minute walk has been selected as the target, as it is a nationally accepted standard (see Appendix D for more information). For example, Vancouver, British Columbia and New York City have both embraced a short walk to experience nature. These cities have set 5-minute and 10-minute walking goals, respectively, and are actively acquiring property and restoring sites throughout their communities to achieve these goals.

Access to nature, especially within 10 minutes, has been shown to have many positive social and economic benefits. Studies suggest the following impacts:

- Increased cognitive health
- Increased learning
- Decrease in body mass index (BMI)
- Decrease in attention-deficit hyperactivity disorder
- Positive impact on children with special needs who have access to nature-based, therapeutic interventions
- Faster recovery after surgeries and overall healthcare cost savings
- Creating a sense of place and culture
- Making cities aesthetically pleasing
- Increased opportunities for recreation, community gatherings and refuge from the urban setting
- Increased property values for homes in close proximity to open and natural spaces


Photo Credit: Kyle McVey

Connectivity. Connectivity was identified as an overarching priority for Nature in the City throughout discussions with residents and stakeholders. Residents wanted to be able to leave their home, and quickly access a trail that would lead them to a larger open space. For species, connectivity means different things to different species, e.g., for birds, it can be a series of habitat areas in close proximity whereas some mammals need a physically connected corridor.

Key Access Outcomes:

- Connectivity analysis to identify gaps in residents' access to nature within a 10-minute walk, as well as gaps in wildlife habitat connectivity.
- Land Use Code open space requirements that provide flexible options for natural spaces during the development review process.
- Neighborhood-scale projects, especially in priority areas where connectivity for residents or wildlife is lacking, to create or enhance natural spaces.

The foraging distance for some native bees is roughly the same as the 10-minute walk, underscoring the co-benefits of a connected, easy to access open space network.

High Quality Natural Spaces

High quality natural spaces are beneficial to all species, human and wildlife alike, and help support a resilient economy. The quality of natural spaces is as important as the quantity. This goal protects existing high quality natural spaces, creates new natural spaces to provide connectivity, restores lower quality spaces to provide habitats for local species and enhances opportunities for recreation and rejuvenation.

While providing high quality natural spaces is a key goal of Nature in the City, not every space has to provide all of the benefits of nature. Some spaces are more sensitive than others and may not be conducive to human access, whereas others are highly appropriate for humans and should not be designed for highly sensitive species. Balancing these needs will be critical to the long-term success of the connected open space network within the community.

Benefits to People. According to Nature in the City outreach surveys, respondents value high quality spaces to engage in personal exercise or play, experience peace and beauty, and escape urban settings. Survey respondents indicated they most often experience such high quality natural spaces in the City's Parks, Natural Areas, streams and trails.

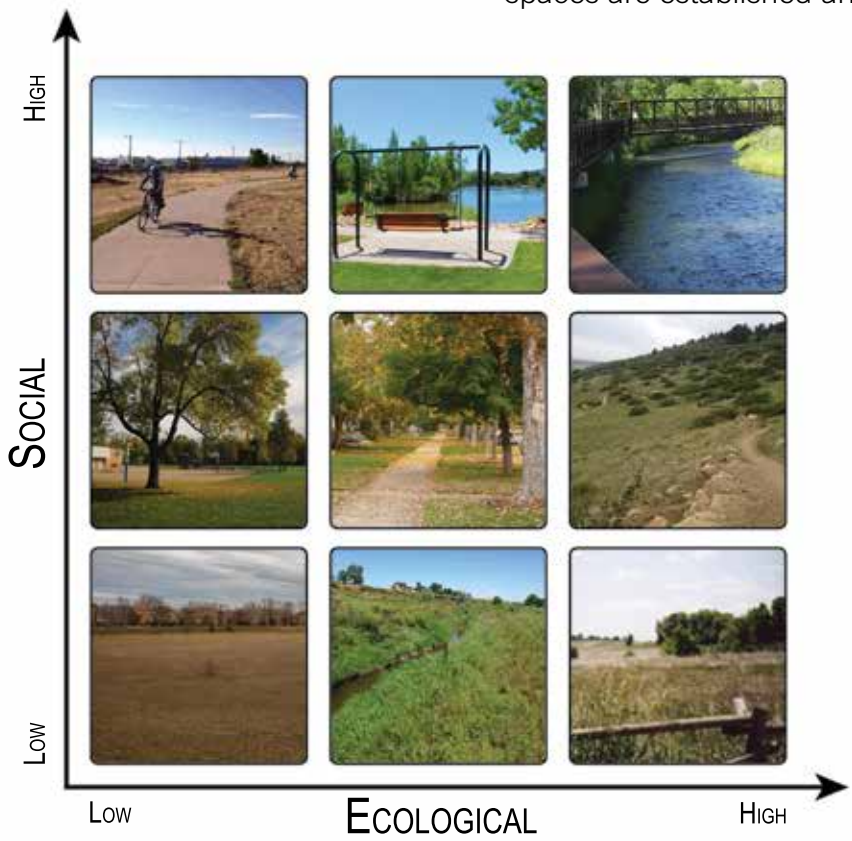

Photo Credit: Katy Bigner

Benefits for Plants and Wildlife. For plant and animal species, high quality spaces provide habitat through the appropriate combination of shelter, food sources, water availability, and natural features such as trees or rock outcrops.

Benefits for the Economy. Fort Collins' businesses and residents indicated that access to a variety of open spaces was essential to quality of life. Research also indicates that high quality open spaces, e.g., access to stream corridors, greater urban tree canopy, etc., command higher sales premiums on homes.

Key Quality Outcomes:

- Sites are enhanced and restored in partnership with existing neighborhoods and property owners.
- A greater diversity of open spaces in new developments and redevelopments is achieved through amendments to the Land Use Code.
- Existing dark sky locations are protected, baseline and trends in regional night skies are monitored, and regulatory changes to facilitate best practices for dark skies are implemented.
- Citywide goals for biodiversity and ecosystem services provided by natural spaces are established and tracked.



This graphic illustrates the variety of types of nature that can be found within Fort Collins. Residents that staff met with indicated that they desire a spectrum of experiences when they are accessing nature. Some places have greater ecological value, e.g., the Poudre River and Natural Areas, whereas other places have greater value for people, e.g., City parks, trails, and residential open spaces. Where appropriate, Nature in the City can help to enhance the value of existing spaces to help achieve the ultimate objective of a site.

Land Stewardship

Many residential and commercial landscapes in Fort Collins look similar: a landscape dominated by turf with shade trees and ornamental shrubs and flowers within. While these landscapes provide benefits, there are ample opportunities to integrate more diverse landscapes that contribute to greater social, ecological and economic health and well-being.

Landscape Preferences. In the Visual Preference Survey conducted during outreach efforts, respondents consistently rated diverse landscapes higher than less diverse forms. When shown images of different natural spaces that could occur throughout Fort Collins, respondents typically preferred images that featured natural landscapes intermixed with manicured features. With the knowledge that people prefer a more diverse landscape, the land stewardship goal provides guidance as to what diverse forms might be appropriate in certain locations, as well as how to successfully install and maintain those spaces.

Benefits of Diverse Landscapes. Diverse landscapes can be more resilient, consume less water, and provide ecological value to the surrounding area. Yet, installing and maintaining these spaces requires a different approach than a typical manicured lawn. Over a project's lifespan, the benefits of more diverse landscapes outweigh the upfront training and site establishment requirements.

Key Stewardship Outcomes:

- Create design guidelines applicable to residents, business owners, and developers for designing, installing, and maintaining more diverse landscapes.
- Align City departments' mowing and spraying procedures to balance wildlife habitat needs with management objectives and aesthetics.
- Where appropriate, adapt the streetscape to include naturalistic landscaping that incorporates pollinator-friendly plant materials, while minimizing wildlife conflicts, as well as provide diverse streetscapes for resident and visitor interactions.

As a part of the Nature in the Neighborhoods program in Portland, Oregon, this site provides opportunities for wildlife and people. This is an example of the types of places that people preferred in the Visual Preference Survey, as there is both a natural element (the wetland) and a manicured space (the seating area). (Photo credit: Megan Bolin)

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Photo Credit: Jeremy White

CHAPTER 3:

POLICIES

Chapter 3: Policies

Nature in the City builds upon many policies in City Plan and other existing planning documents within the City and Larimer County, and is designed to be additive to the work already being done.

The vision of Nature in the City is:

A connected open space network accessible to the entire community that provides a variety of experiences and functional habitat for people, plants and wildlife.

The major goals to achieve this vision are as follows:

- **Easy Access to Nature:** Ensure every resident is within a 10-minute walk to nature from their home or workplace.
- **High Quality Natural Spaces:** Conserve, create and enhance natural spaces to provide diverse social and ecological opportunities.
- **Land Stewardship:** Shift the landscape aesthetic to more diverse forms that support healthy environments for people and wildlife.

Throughout this chapter, each of the Plan goals addressed by a policy recommendation is indicated using the icons below.

Access	Easy Access to Nature
Quality	High Quality Natural Spaces
Stewardship	Land Stewardship

This chapter is organized into five policy areas, which detail specific actions the City will take to strategically accomplish those goals:

- Connectivity
- Land Use and Development
- City Practices and Policy Coordination
- Long-term Monitoring
- Funding and Incentives

Photo Credit: Natural Areas Department

Policy Area: Connectivity

During the outreach conducted for Nature in the City, the issue of connectivity, or the ability for people and wildlife to access nature without the interruption of barriers, arose again and again. While definitions of connectivity vary, regardless of age, income level, geographic location or ethnic background, the community expressed a strong desire to enhance the connectivity between the natural spaces we have, for people and wildlife. The following objectives are designed to achieve that goal.

C1: Increase connectivity for plant and wildlife species

Access | Quality | Stewardship

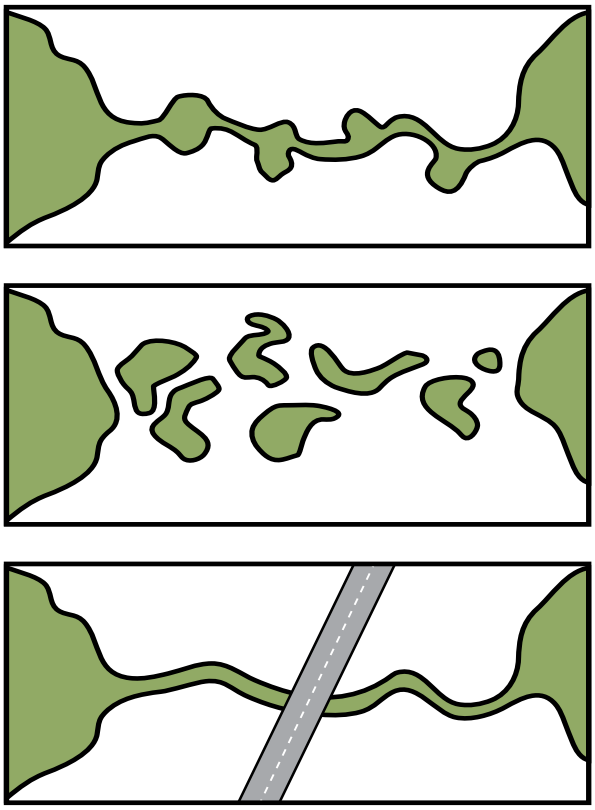
The impacts of fragmented, or disconnected, natural systems include reduced genetic diversity, invasive species establishment and overall ecosystem health decline.

The City will protect connections between existing natural spaces and capitalize on opportunities to reconnect disconnected spaces with appropriate habitat to provide travel corridors, shelter, food and adequate hunting habitat for numerous species.

Initially, connectivity analyses and metrics will focus on bird and butterfly indicator species for which data have been collected, but can later be expanded to include other species identified as indicators.

Outcome: A system of connected natural spaces that wildlife can access with minimal fragmentation.

What is Habitat Fragmentation?



This graphic illustrates a continuum from landscapes that are connected to ones that are more fragmented, or disconnected. The top image illustrates two land areas that are connected by a corridor. The middle image illustrates the two land areas with various size patches in between them, but they lack a connected corridor. The bottom image also illustrates fragmentation by showing how roadways can bisect a connected corridor. For some species, e.g., birds and butterflies, the top or middle image may still be perceived as a connected landscape, whereas for other species, e.g., mammals and reptiles, a fully connected landscape is preferred for movement.

In addition to the effects of fragmentation itself, "edge effect" also impacts the quality of smaller patches of habitat. The influence from surrounding impacts lessens as you move in from the edge of a patch. This emphasizes the importance of protecting or creating habitats that are larger, intact, and have less edge.

C2: Increase connectivity for residents

Access

Residents' ability to easily access nature is important due to the numerous health, social, economic, educational and recreational benefits nature can provide. One way to measure easy access is to set a distance or time it takes to get to nature. For Nature in the City, a 10-minute walk has been selected as the target, as it is a national standard for willingness to walk to transit and is quickly becoming a standard for easy access to nature. At the same time, the distance associated with a 10-minute walk may pose a challenge for some residents. Thus, other policies, such as C4 below, will increase accessibility to all nature spaces within the City regardless of walking ability.

The City will complete a connectivity analysis to identify barriers preventing access to nature for the typical resident within 10 minutes. Barriers may include inaccessible private land, arterial streets or a lack of sidewalks or paths. Where gaps or barriers exist, the City will seek opportunities to provide access through land acquisition, access easements, or installing new infrastructure such as pedestrian underpasses beneath arterial streets.

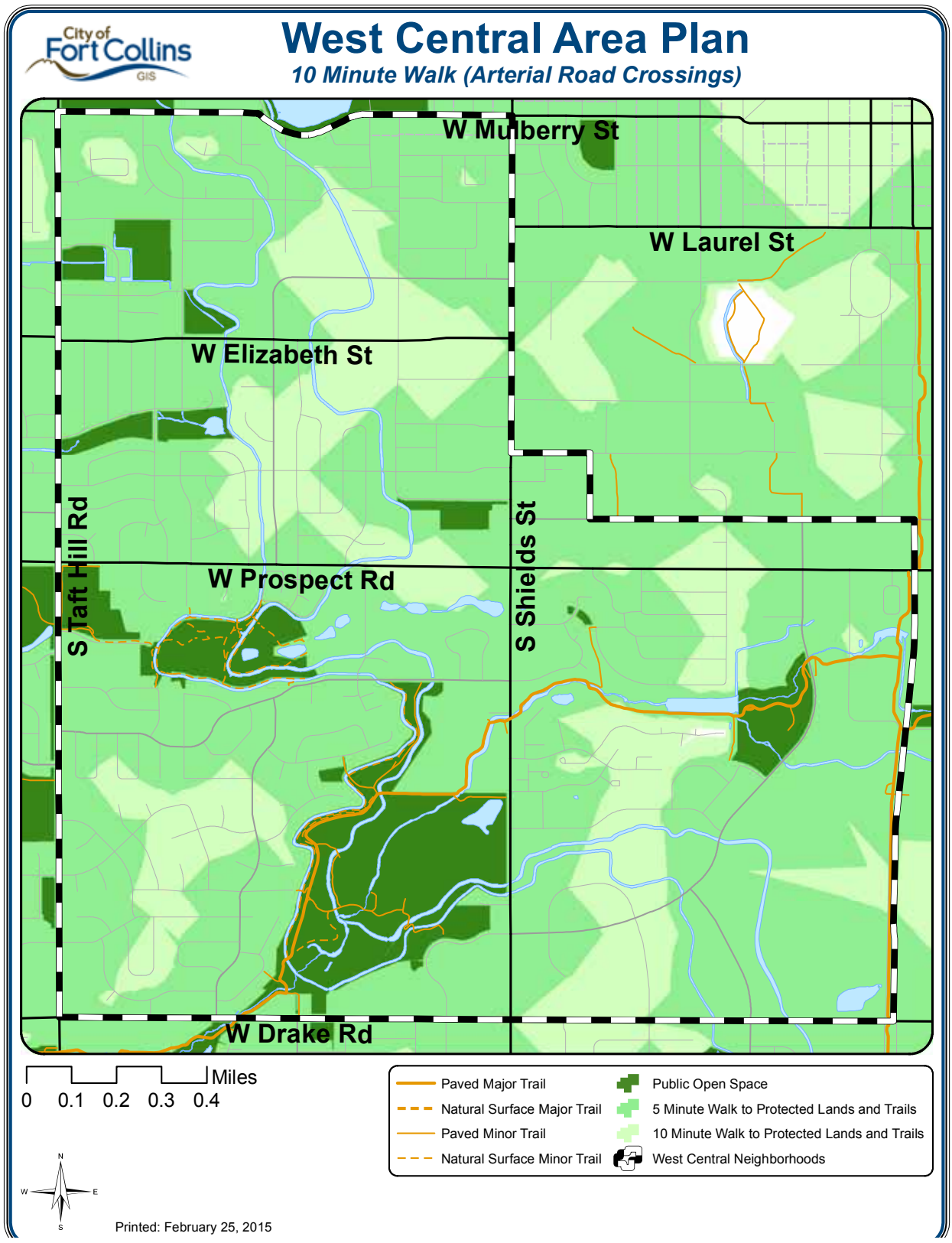
While pursuing additional connectivity for people, it will be imperative to consider and mitigate new impacts to wildlife habitat causing fragementation, that may come at the expense of additional human connectivity.

Outcome: Accessible network of connected natural spaces for all City residents within a 10-minute walk.


Photo Credit: Natural Areas Department


Photo Credit: Molly Rosey


Photo Credit: Be Xtra Ordinary U



The West Central Area Plan has been developed in tandem with Nature in the City, and has served as a pilot for the connectivity analysis proposed in this Plan. This map illustrates areas within the West Central Area Plan boundaries where residents can access natural spaces (Parks, Natural Areas, Stormwater lands, or schools) within a 10-minute walk. The map assumes residents' willingness to cross arterial streets to access nature. For additional maps, see the West Central Area Plan.

C3: Prioritize transportation infrastructure to increase access to nature

Access

While current City planning processes take into account access considerations, such as the Americans with Disabilities Act compliance, access to nature should also be considered during the planning and construction of transportation infrastructure projects.

The City will include access to nature as one consideration for transportation infrastructure projects. Including this consideration in the overall prioritization of projects can provide opportunities to minimize barriers to accessing nature, such as arterial streets. Continued collaboration among the City's Streets, Engineering, Parks, FCMoves and Natural Areas departments will be essential to ensure success of this policy.

Outcome: Access to nature is considered in transportation planning and capital projects.

C4: Provide public transit connections to nature

Access

The City of Fort Collins Transportation Master Plan envisions a community that provides safe, affordable and convenient mobility options for all ages and abilities. While one of the goals of Nature in the City is to provide nature within a 10-minute walk of residents' homes or workplaces, not all Fort Collins residents may be able to walk to these nearby natural spaces. In these situations, Fort Collins' public transportation system can fill the gap for many residents by providing transit service to the natural spaces within the community.

One way to address this gap is by considering access to nature in future Transfort bus stop upgrade priorities and future routing alignments. In addition, bus stops and their associated amenities should be upgraded to meet the Americans with Disabilities Act standards where appropriate, to ensure accessibility for all residents. In a recent Transfort assessment, 57% of the bus stops adjacent to the City's Parks and Natural Areas currently have accessibility challenges.

Outcome: Accessible natural spaces through the City's public transit system.

The bus stop adjacent to Rolland Moore Park has accessibility challenges due to the slope of the ramp leading to the bus stop. (Photo credit: Emma Belmont)

C5: Provide innovative wayfinding and informational resources

Access Stewardship

The City will build upon existing wayfinding efforts in the community by pursuing opportunities to provide innovative navigation aids, and educational and interpretive information throughout the City on both public and private natural spaces. Methods could include appropriate signage that dovetails into existing sign systems for trails, Natural Areas, and Parks while avoiding sign clutter; and other special aids such as sidewalk pavers, phone apps, podcasts, hard copy and online maps, and walking tours, to aid users' navigation and understanding.

Outcome: A comprehensive wayfinding and information system on public and private natural spaces that integrates the City's existing sign and interpretive systems while providing additional innovative navigational and educational aids.

C6: Continue to make the Cache la Poudre River a conservation priority

Access Quality Stewardship

The Cache la Poudre River is in many ways the lifeblood of the City; the river serves as the most significant form of connectivity throughout the community both for humans and for wildlife. The City has developed around the river due to its multiple values, including water delivery, ecological importance, recreation and economics.

The community and the region ask a lot of the Poudre, which poses challenges for the future ecological condition of the river, as well as its capacity to provide various services, such as flood water conveyance and water supply. Because the river is well recognized in numerous City plans as a valuable resource for residents and wildlife, river protection and restoration should remain a high priority in the future.

The City will continue efforts to support the ecological functions essential to a sustainable, healthy and resilient river as well as the recreation values residents enjoy.

This broad spectrum of efforts includes acquiring land in the floodplain; working to protect minimum and enhanced in-stream flows; reconnecting the river to its floodplain to support riparian habitats, nutrient cycling and pollutant filtration; managing the floodplain to promote native species, removing barriers to aquatic life passage; restoring tributaries; engaging in collaborative efforts to maintain a resilient upper watershed; and providing diverse and high quality recreational opportunities.

Outcome: The Poudre River remains a vibrant, connected, and thriving ecosystem that continues to support the social, ecological, and economic values it does today.


Photo Credit: John Bartholow

Policy Area: Land Use and Development

As the City grows toward its buildout population, this plan addresses how to incorporate nature into the increasingly urban environment in two ways: (1) through development or redevelopment (2) through existing neighborhoods. There are many neighborhoods, businesses and districts in the City not poised to redevelop, but that have expressed an interest in incorporating greater access or higher quality experiences with nature.

LU1: Revise Land Use Code open space standards

Access | Quality | Stewardship

The City's Land Use Code is a regulatory document that guides orderly land development consistent with community values as set forth in City Plan. Currently, there are specific requirements in the Land Use Code with regard to open space in new developments, such as full tree stocking, defining the diameter of trees planted in development projects, and a section on protecting and enhancing existing natural resources within the City. While these requirements protect existing natural resources, and provide shading and a uniform urban tree canopy, additional standards are needed to encourage the creation of habitat-friendly landscapes and more diverse natural spaces.

To achieve these goals, Land Use Code changes should be designed to provide flexibility to allow site-specific solutions based on context, scale and objectives. For example, high intensity zoning districts (e.g., the High-Intensity Mixed-Use Neighborhood and the Community Commercial zone districts) may have different requirements than lower density zone districts (e.g., Low-Density Mixed-Use Neighborhoods).

Further, the standards should be designed to include a mix of qualitative and quantitative requirements similar to existing resource protection standards outlined in Section 3.4.1 of the Land Use Code. Overall, the Land Use Code changes should facilitate functional natural spaces in new and redevelopment projects (e.g., as illustrated on page 48).

Outcome: Land Use Code open space requirements that provide flexible options for functional natural spaces during a project's development or redevelopment.

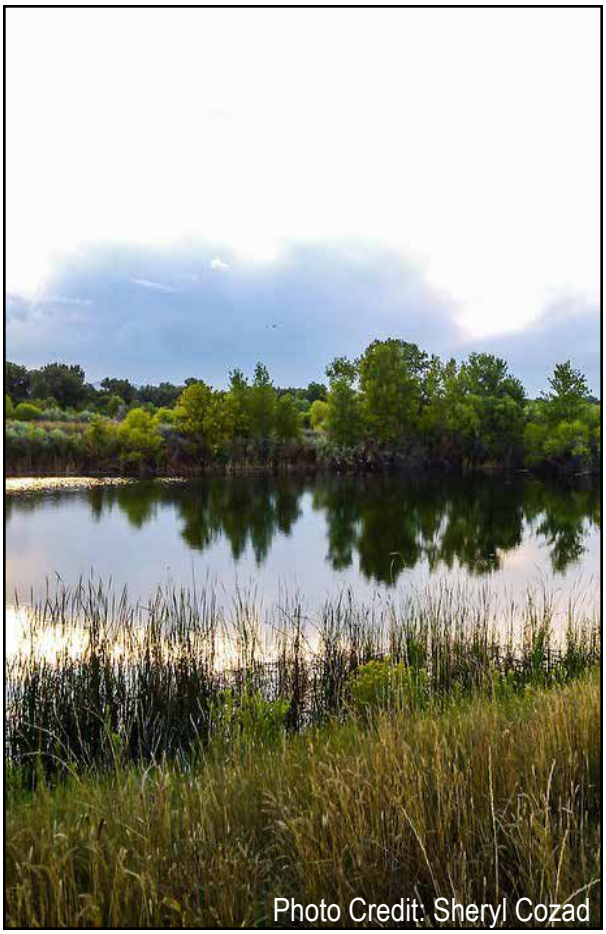


Photo Credit: Sheryl Cozad

The two images above illustrate how open space is typically provided within a multi-family development (top image), e.g., lawn area ringed by shade or ornamental trees. In the bottom image, the open space has been diversified to include pathways, native landscaping, a community garden, and other natural play spaces. The proposed Land Use Code amendments will be designed to encourage a greater diversity in the types and composition of open spaces within multi-family and other development types while still allowing for active play spaces for children and adults.

LU2: Develop Land Use Code changes regarding multiple tree sizes and diversity within new developments

Quality Stewardship

Currently, the Land Use Code has standard tree size requirements for shade, ornamental and evergreen trees, and for shrubs and perennials as well as minimum diversity requirements for trees. While these standards create the optimum uniform environment for creating an urban tree canopy, in natural landscapes a diversity of vegetation sizes and a greater variety in species may be preferred.

This policy is designed to more explicitly encourage multiple plant sizes when incorporating Nature in the City principles into a design (e.g., in a public plaza, courtyard, or larger open space as discussed in Policy LU1). Further, greater emphasis should be placed on encouraging native and appropriate non-native species that provide wildlife habitat and structure diversity. To ensure success, these changes should be developed with the Land Use Code change team as well as with Natural Areas and Forestry staff with expertise in installing natural landscapes.

Outcome: Land Use Code requirements that support diverse tree, shrub and perennial structure and composition within natural spaces.

In the top image, a uniform tree canopy has been installed. In the bottom image, the landscape has a greater diversity in vegetation types and structure, which is the intention behind Policy LU2.

LU3: Create design guidelines to guide development, redevelopment and site restoration

Quality Stewardship

One of the most frequently asked questions during Nature in the City outreach efforts was how to incorporate nature into the increasingly urban environment. In practice, establishing native or wildlife-friendly landscapes requires more expertise than establishing lawns.

One key product of Nature in the City will be a suite of design guidelines to provide technical and practical guidance on how to design native or wildlife-friendly landscapes. The design guidelines will include an

evaluation of the triple-bottom-line benefits of each potential design option, which will aid in ensuring landowner objectives can be met.

For example, a landowner seeking to create wildlife habitat will be able to quickly scan the guidelines to explore which options maximize wildlife habitat (ecological values) and be able to assess feasibility based on cost (economic values) both from an installation and maintenance perspective. Design guidelines will also provide information on ways to conserve water, enhance design options to engage all five senses, and establish and maintain the various design options.

Outcome: Design guidelines document illustrating how to incorporate nature into the urban environment; residents, developers, business owners, schools, and other property owners will be able to more easily establish diverse natural landscapes in the urban environment.

LU4: Develop training resources for the installation and ongoing maintenance of diverse landscapes

Stewardship

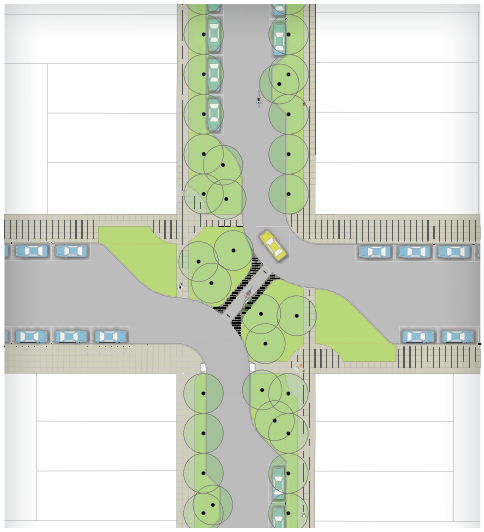
Homeowners, landscapers and business owners may need additional training and resources to properly install and maintain the more diverse landscapes encouraged in the Design Guidelines (Policy LU3). The City will leverage partnerships with internal and external programs, e.g., nurseries, which already provide these types of trainings and will develop new resources to fill any gaps.

Training resources may include in-person trainings, educational publications, and certification programs for landscapers, websites, webinars and more. Topics could be wide-ranging in order to educate residents to create positive perceptions and reasonable expectations about more diverse landscapes.

Outcome: A suite of training resources for homeowners, landscapers and business owners to successfully install and maintain diverse landscapes.

San Francisco has developed a set of design guidelines for how to improve their streetscapes for wildlife, aesthetics, and pedestrian benefits.

The Fort Collins Design Guidelines will focus on developing design options for residents, developers, and other property owners that utilize graphics (shown on the left) and actual sites (shown on the right).



LU5: Coordinate and incentivize natural space improvements at the neighborhood scale

Quality Stewardship

An entire neighborhood engaged in a coordinated effort to shift the landscape aesthetic can have much more impact than a single parcel. The City will encourage neighborhood-scale nature projects by engaging homeowner associations or other neighborhood advocates for neighborhoods without HOAs, especially in priority areas, to partner in projects to create or enhance natural spaces in their neighborhood.

Specific projects could include converting grass detention ponds or greenbelts to more diverse landscapes, converting backyards to provide landscaping beneficial to local wildlife, constructing trails through neighborhoods to connect to other natural spaces, and more. These efforts will complement existing programs, such as the Natural Areas Department's Certified Natural Areas program or Neighborhood Services' Neighborhood Grants program, and will lend themselves to new programs, such as Austin, Texas' "Neighborwoods" program that partners on a neighborhood scale to provide free shade trees in locations that could support them.

It is anticipated that once neighborhood projects are completed, the neighborhood would take on the long-term commitment of site establishment and maintenance with engagement and consultation with the City.

Outcome: Neighborhood-scale projects are implemented and/or incentivized, especially in priority areas where connectivity barriers for residents or wildlife exist.

LU6: Support and protect the multiple values of the City's ditch system

Access Quality Stewardship

While the primary role of the City's ditches is to deliver water, the community has grown up around this private irrigation network, which also provides wildlife habitat and movement corridors. Additionally, residents appreciate the visual aesthetics of the ditch corridors for wildlife viewing; residents also access recreational opportunities along ditch banks, even though legal access may not be established. The ditches themselves create small lush oases, and often support riparian vegetation. This can occur along ditch banks or in areas that experience high ground water.

This policy directs the City to seek opportunities to partner with ditch companies to:

- Keep ditches daylighted when appropriate
- Remove barriers to aquatic species passage at diversion structures in the Cache la Poudre River
- Remove barriers to wildlife movement along the ditch
- Implement water delivery agreements to increase consistent flows
- Implement wildlife habitat projects
- Provide appropriate access for people while avoiding or minimizing impacts to wildlife
- Enhance connectivity for people and wildlife where appropriate

The City is currently in the scoping process of a Citywide analysis of the ditch system to identify challenges and opportunities related to a variety of considerations such as engineering, long-term maintenance, and development adjacent to ditches. This analysis is the first strategic step in implementing this policy.

Ditch daylighting: Access to open water is a critical resource for wildlife in Colorado, and encouraging ditches to remain open, i.e., water is conveyed on the surface where appropriate, is a key tool for ensuring the ecological function of ditches is protected. As areas surrounding ditches redevelop, the City will actively engage the project developer and ditch company to develop mutually beneficial scenarios that allow the ditch to remain open where possible while weighing the benefits of leaving a ditch daylighted with concerns about evaporative loss. If a ditch is already piped underground, the City will pursue daylighting the ditches where appropriate. Re-alignment of the ditches to achieve the goals outlined in this policy and the specific site development goals should be considered when the ecological value on the site can either be protected or enhanced. Opportunities to incentivize daylighting ditches, as well as to achieve the other goals listed above, should be considered.

Outcome: Strong partnerships with ditch companies that enable their companies and residents to maximize the multiple values of ditches; a vibrant ditch system that largely remains intact and daylighted, and that maintains the diverse values inherent to the system.

LU7: Provide Level of Service guidance for Nature in the City projects

Quality

Level of Service is a commonly accepted standard in Transportation Planning to indicate the quality of a given roadway or pedestrian environment. This policy directs the development of a Level of Service standard or guideline for nature to aid developers, property owners, and City government in deciding which type of restoration or design is appropriate for a given space. For example, some spaces may require an emphasis on social values, e.g., neighborhood parks and trails, while others may benefit from greater emphasis on ecological values. This metric or standard should be evaluated at a Citywide level, to ensure spaces throughout the City provide a wide range of benefits for all residents and species.

Outcome: High quality natural spaces are provided throughout the City, with a diversity of social and ecological opportunities provided for the benefit of all residents and species.


Photo Credit: Be Xtra Ordinary U

LU8: Update stormwater basin guidelines to include Nature in the City principles

Quality

In 2009, the City adopted the "Landscape Design Standards and Guidelines for Stormwater and Detention Facilities." While these guidelines were cutting edge at the time of their development, it is timely to revisit these standards and assess how the principles outlined in the Nature in the City Strategic Plan e.g., connectivity for people and wildlife, habitat, urban agriculture, etc., can be incorporated.

These guidelines should also be translated into regulatory standards, either through the Land Use or City Codes, to ensure consistency in application.

Outcome: A set of design standards for new and retrofitted stormwater and detention facilities that promote the ecological and social values outlined in this plan.

Photo Credit: Dusty Harms

LU9: Encourage natural drainages to be re-created

Access Quality

Historically, natural drainages in urban areas in the Western United States have been reshaped to meet the needs of the community and that of land development. This policy directs future projects, redevelopments or retrofits to consider historical drainage patterns and re-create natural drainages where feasible.

Outcome: Streams, drainages and irrigation corridors throughout the City would be restored to their natural drainages. This would include daylighting previously piped streams or ditches, preserving existing drainages that still remain, and re-creating historic drainage patterns where feasible.

Photo Credit: Ava Diamond

LU10: Promote and preserve urban agriculture that support a triple-bottom-line approach

Access | Quality | Stewardship

A vibrant local food system has significant ecological, social and economic values. Urban agriculture, which includes more traditional agricultural operations that often use organic or holistic farming practices, as well as beekeeping, orchards, etc., can help maintain a sustainable economy by providing food and jobs for those in the community. Urban agriculture also keeps land open, serving as habitat for access connections for people. Results from data collection at urban agriculture sites during Phase I of Nature in the City showed that these sites are important ecologically for birds, butterflies and other wildlife.

The City will pursue partnerships with organizations (e.g., the Northern Colorado Local Food Cluster and others) to provide land, funding, education and resources to further urban agriculture in the City. These partnerships will help create a toolkit to encourage urban agriculture projects that support a triple-bottom-line approach. It will also be important to inventory existing and potential urban agriculture sites, as well as explore agricultural preservation options both via the City and through partnerships with other organizations and agencies.

Finally, City efforts to encourage urban agriculture should also seek ways to enhance the biological diversity at these sites, whether through perennial crops, reduced water use or beneficial crops for species.

Outcome: Urban agriculture operations that can sustainably operate from a triple-bottom-line perspective in partnership with the City and other entities.

Photo Credit: Spring Kite Farm

Policy Area: City Practices and Policy Coordination

The purpose of this policy area is to ensure the integration of Nature in the City principles into existing City programs and to incorporate these principles into future planning efforts. One of the major charges of Nature in the City is to seize opportunities to coordinate with development, infrastructure, and other plans and policies to incorporate nature where appropriate, while also ensuring these coordination efforts continue as plans and policies are updated. The following policies address these topics.

CP1: Align City mowing and weed control policies to support local species while balancing public safety and aesthetics

Quality Stewardship

Several City departments have responsibilities to mow or apply herbicide and other chemicals to vegetated areas on City properties. City Code dictates the management requirement for some of these actions on both public and private lands. Currently each department, with their individual mandate, manages vegetated areas in different ways. While each department utilizes a set of leading best management practices, including integrated pest management, some of these management actions can have unintended consequences for wildlife or plant species depending on the timing, location and method. As different types of properties have different needs, the purpose of this policy is to ensure departments retain the flexibility to achieve their site management objectives, while also minimizing impacts to wildlife and plants.

The City will assess current policies, plans and practices regarding mowing and applying chemicals such as herbicides on City properties to identify differences and develop a unified approach that balances unique management needs, aesthetics and public safety with needs of wildlife and plant communities. Close collaboration with the City's Code Compliance staff and adjacent and interested members of the community will also be essential to avoid conflicting or redundant direction.

Additionally, education and outreach to residents should be developed to illustrate why areas are not mowed or mowing frequency has changed, e.g., for habitat, cost purposes, etc. Finally, revisions to City Code may be necessary to allow taller vegetation in appropriate areas to provide habitat for local species, and to provide flexibility to allow longer establishment of diverse landscapes.

Outcome: City mowing and spraying policies are aligned to provide for aesthetics and public safety while allowing habitat to remain. Residents are more aware of the benefits of less frequent mowing patterns, and City Code amendments surrounding these issues allow taller vegetation for habitat where appropriate, and more time to establish more diverse landscapes.


Photo Credit: Dusty Harms

CP2: Work cross-departmentally and with external partners toward a darker night sky

Quality Stewardship

Dark night skies are an important, yet sometimes overlooked value of nature. The absence of natural darkness that all living organisms have evolved with over time can have numerous negative impacts. Wildlife are impacted by artificial light and sky glow. Behavioral and physiological changes due to artificial light include altered circadian rhythms, spatial disorientation, disrupted reproduction, and altered predator/prey relationships. These impacts can be detrimental on their own, but are often combined with other environmental stressors, which may trigger population and ecosystem level changes. Human circadian rhythms can be impacted by bright nights as well, with a lack of quality sleep having many health consequences. Beyond health concerns, losing the ability to view a starry sky impacts stargazers, community heritage, connection with the natural environment, and a small-town character.

The City will establish regional partnerships to address night sky brightness issues, including partnering with the National Park Service Night Skies Program and adjacent communities in Northern Colorado and Wyoming. Education, combined with a regional regulatory environment that fosters careful use of exterior lighting will be essential to conserve this resource at the regional scale. An ongoing citizen science program monitoring night sky brightness across the City annually provides a baseline condition and will show trends in night sky quality. Additionally, review and alignment of existing City Land Use and Building Codes related to lighting will be conducted to reflect best practices for exterior lighting. The City will incorporate night sky conservation standards regarding exterior lighting intensity, color temperature, and timing. Such best practices for exterior lighting can enhance safety, reduce energy use, and improve the environment.

Finally, in important locations where the night sky is still relatively dark, such as Soapstone Prairie Natural Area, the City will seek recognition of these areas by independent certification programs. The City also has an opportunity to elevate its status, marketing appeal, and quality of life for its citizens by pursing Dark Sky Community certification.

Outcome: A regional darker night sky

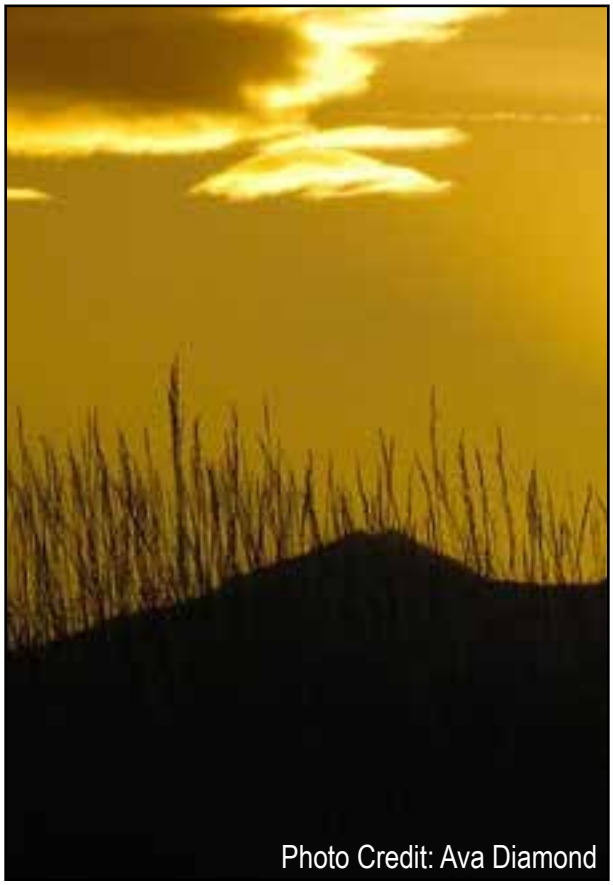


Photo Credit: Ava Diamond

CP3: Expand the City's tree inventory to include wildlife habitat

Quality Stewardship

The City's urban tree canopy contains almost 50,000 trees on developed City property and contributes significantly to our community's sense of place and quality of life. In 2013, the City embarked on an inventory effort to locate, identify and quantify every City-owned tree on developed public property.

The purpose of this policy is to provide additional funding for the City to allow the collection of data regarding wildlife habitat provided by the tree cover in the urban environment. This data will help aid the City in understanding the contribution the City's urban forest provides to the community's overall wildlife habitat in order to make better site-specific recommendations on how to best protect trees for ecological values, in addition to traditional urban tree assessment tools such as tree health.

Outcome: A complete dataset of wildlife habitat in the public urban tree canopy.

CP4: Pollinator and bird-friendly habitat in City Streetscapes

Quality Stewardship

Within the City of Fort Collins, significant attention is given to the role streetscapes play in providing an attractive network that knits the city together. Accordingly, the City has developed a set of Streetscape Standards as an accompaniment to the Larimer County Urban Area Street Standards that outlines how parkway strips (the area between the curb and the sidewalk) and medians should be treated.

This policy directs staff and interested citizens to consider the habitat value that streets can provide to the community in addition to the aesthetic and social values. Potential habitat value will vary with street size, type, and surrounding context.

As street retrofits occur to create more complete streets e.g., through the Green Streets effort, by adding bulbouts or additional tree canopy along streets, there is new opportunity to also consider habitat aspects of these spaces. For example, vegetation can be added that attracts pollinators, such as edible or flowering plants. Additionally, drainage culverts and other design components can allow wildlife passage to avoid conflicts on the street surface. Careful consideration must be paid to balance habitat value in the streetscape with ensuring that wildlife conflicts are not created.

Outcome: Where appropriate, the streetscape is adapted to include naturalistic landscaping that incorporates pollinator-friendly plant materials while minimizing wildlife conflicts, as well as providing diverse streetscapes for resident and visitor interaction.

Example of a streetscape that provides high quality habitat

CP5: Provide quiet spaces in the City to escape from the urban environment

Quality

A walk into nature can be quickly impacted by loud noise from a busy street or other activities. Similar to a brighter night sky (Policy CP2), a louder environment can have negative impacts to residents and wildlife. Sounds of the urban environment affect circadian rhythms and can prevent deep sleep, which can have negative health consequences for people. Loud noises from vehicles, equipment or other sources can cause wildlife to abandon habitat, and a louder environment negatively affects predator/prey interactions by not allowing either to hear the other as readily as in a quiet location.

While the City already has a strong noise ordinance in place, the City will work toward mitigating the sounds of an urban area by implementing a multi-faceted approach including incorporating best practices into regulatory documents, incorporating vegetation berms and other design elements into new development to reduce noise, evolving technology to help in noise reduction in capital improvement projects where appropriate, and educating residents about the impacts of urban noise and the benefits of mitigation.

Outcome: A quieter city for people and wildlife

CP6: Amend the City's Stream Rehabilitation Program to incorporate Nature in the City Principles

Access Quality Stewardship

In 2012, City Council approved an update to the City of Fort Collins' Stormwater Master Plan in accordance with Stormwater Repurposing goals to incorporate environmentally-focused projects, such as stream rehabilitation and water quality best management practice (BMP) regional projects and retrofits.

This policy directs staff to update this program in two ways:

1. A Multi-Criterion Decision Analysis (MCDA) tool was created to provide a flexible, rational and transparent means to rank and prioritize projects. This tool should be updated to incorporate the principles of Nature in the City e.g., connectivity for people and wildlife as well as access.

2. Develop a separate tool or incorporate into the MCDA a mechanism to consider how lower-cost projects can complement the higher-cost projects and achieve greater connection to more neighborhoods and areas throughout the community.

Outcome: Updated MCDA tool that incorporates Nature in the City principles and stream rehabilitation projects that are equitably distributed throughout the City to achieve both high priority goals and greater access and value of these areas for all residents.

CP7: Continue the City's current policies related to nature and coordinate Nature in the City initiatives with future planning and policy updates

Access | Quality | Stewardship

The City has numerous plans and policies that relate to Nature in the City efforts. Nature in the City is designed to complement and build upon these existing plans and policies, as well as to seek opportunities to include Nature in the City objectives where possible in new or updated plans and policies.

Current examples include incorporating the design guidelines into the Parks and Recreation Policy Plan update, and adding Nature in the City principles into the stormwater restoration program's decision-making criteria. Over time, numerous plans and policies will be updated with Nature in the City objectives in mind.

Outcome: New and existing policies involving nature will be coordinated with Nature in the City.

CP8: Coordinate with all applicable City planning processes over time to ensure opportunities to implement Nature in the City efforts and initiatives are included

Access | Quality | Stewardship

While some Nature in the City projects may be implemented in the short run, a majority of initiatives will evolve over decades as opportunities arise through regular planning updates and redevelopment. It is therefore essential that plans, policies and projects are developed in a coordinated way, so that Nature in the City initiatives are implemented where appropriate.

Nature in the City will be included in the newly-created Sustainability Analysis Tool to ensure every item presented to City Council has an opportunity to assess the potential inclusion of Nature in the City policies. Additional tools should be explored, as needed, to ensure goals continue to be met in perpetuity.

Outcome: All projects that are approved by City Council will have an assessment of the potential to include Nature in the City components.

CP9: Update Nature in the City Strategic Plan

Access | Quality | Stewardship

On a regular basis, the Nature in the City Strategic Plan will need to be updated to encompass new projects, the evolution of policies and practices within the City, and changing needs based on demographics, changing development patterns, and strategic direction for the City.

Outcome: A relevant planning strategy that reflects current conditions and efforts.

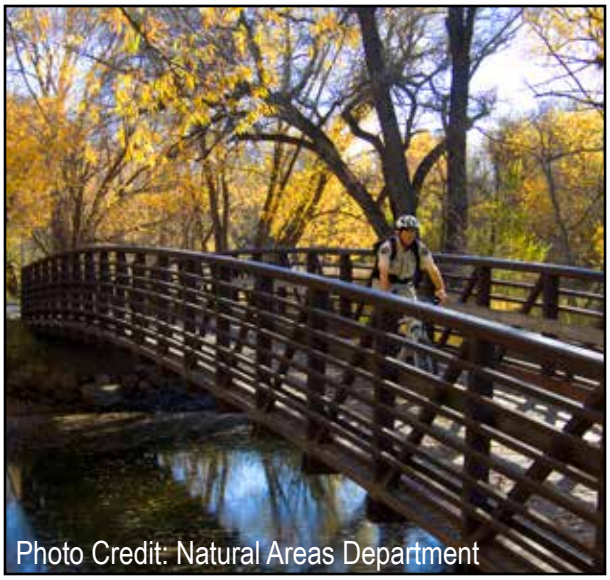


Photo Credit: Natural Areas Department

CP10: Celebrate nature in the urban environment

Stewardship

The City of Fort Collins passed its first open space sales tax in 1972, and since that time, almost 40,000 acres of land have been conserved through the Natural Areas Department, City Parks have been established throughout the City, a strong Land Use Code protects open spaces on private lands, and private landowners throughout the City are increasingly incorporating natural spaces into their projects.

This policy directs staff to acknowledge these successes and seek opportunities to celebrate the natural environment within our community. Key opportunities include the following:

- Build upon the annual Nature Fair and monthly Natural Areas events by partnering with other entities, e.g., the Sustainable Living Association, Gardens on Spring Creek, Audubon Society, Save the Poudre, etc. to celebrate nature within the urban environment.
- Consider annual events such as a chimney swift walk to highlight the unique biodiversity found within the urban environment. Chimney swifts are a bird species that nests within chimneys in Old Town Fort Collins.
- Recognize excellent examples of Nature in the City through the Urban Design Awards or other recognition programs.
- Develop walks or events to celebrate ditches and other historical resources to highlight their value to our community and to the Fort Collins open space network.
- Work with local schools (public and private) to celebrate nature in the urban environment

Outcome: Increased recognition of the unique role nature plays in the Fort Collins urban environment.


Photo Credit: Molly Rosey

Policy Area: Long-term Monitoring

The Nature in the City Strategic Plan is designed to be a living document that guides how the community incorporates natural spaces into the increasingly urban environment over the next 100 years and more. Accordingly, while the prior policy areas focus on needs that can largely be addressed in the next three to ten years, these policies envision a longer-term application and evaluation of the Nature in the City principles.

The following policies encourage the development of specific targets and long-term monitoring programs to aid the City in assessing whether it is on track to achieve the goals established in this plan and what additional policies may need to be developed in order to achieve the Nature in the City vision. The policies also encourage citizen engagement in long-term monitoring to foster a vested interest in this plan by all community members.

LT1: Set a Citywide biodiversity goal

Quality

One of the City's existing sustainability goals is focused on the percentage of native and non-native vegetation cover in Natural Areas. This policy suggests a biodiversity goal should be comprehensive to the entire City, including public and private natural spaces.

In addition, the current metric is limited to percentage of native versus non-native plant cover. The City should consider expanding this goal to include a suite of biodiversity goals that targets, for example, bird and butterfly richness and abundance. This policy would allow decision makers to better assess ecological health of plants and wildlife in Fort Collins.

Outcome: Updated biodiversity goal that includes public and private lands and that evaluates a comprehensive set of metrics.

LT2: Establish the value of ecosystem services to the City and track the value added by existing and new projects

Quality

Functioning ecosystems provide services such as soil erosion prevention, stormwater conveyance and water quality filtering, to name a few. These services have an economic value; disturbances to the ecosystem functions have negative economic and ecological impacts, just as new or restored sites provide additional economic and ecological value.

The Natural Areas Department has adopted the concept of ecosystem services and has implemented mitigation requirements for impacts to these services in the Natural Areas and Open Lands Easement Policy (2012). While research has been done on a statewide level, no research has been completed on a regional or community scale.

The City will partner with researchers to provide more local information about the ecosystem services in the City to better assess the impact development or conservation projects have on the ecological and economic conditions in the City.

Outcome: Community or regional standards for economic value provided by ecosystem services in the community.

LT3: Establish monitoring for carbon sequestration to support greenhouse gas emission reduction goals

Stewardship

Live vegetation and healthy soils can remove carbon dioxide from the atmosphere and store it as carbon, a process known as carbon sequestration. Depending on the carbon storage capacity, certain land use categories can be an important resource for offsetting carbon emissions or establishing carbon credits and can be preserved, maintained, or enhanced to increase their ability to store carbon.

The City will develop or partner with other entities to establish baseline carbon sequestration data for different land use categories; acquire parcels with high carbon sequestration potential that also have other values such as habitat, access, and connectivity; and support Forestry and other departments' efforts in vegetation monitoring and sequestration modeling. Close coordination in planning (see Policy LT3) with the City's Climate Action Plan and Green Built Environment programs and other departments within the City will be essential to the success of this policy.

Outcome: Support the greenhouse gas (GHG) emissions reduction goals of the Climate Action Plan.

Photo Credit: Dusty Harms

LT4: Evaluate and monitor open spaces for air quality improvement in accordance with the Air Quality Plan

Quality

Trees, shrubs, and other vegetation can improve air quality by absorbing or filtering air pollutants, producing oxygen, and providing a cooling effect, which can decrease the formation of ozone. In addition, vegetated areas can provide respite from heat, smog, smoke, and noise and can reduce the "heat island" effect.

The City will develop or will partner with other entities to define air quality characteristics for select areas of nature within the City. The characteristics could be used in assessing the air quality improvement value of preserving, maintaining, or acquiring key parcels. Assessment of air quality benefits will align with the Air Quality Plan.

Outcome: Support the air quality improvement goals of the Air Quality Plan.

LT5: Establish a long-term monitoring program for the City's biodiversity using citizen science projects

Quality Stewardship

Phase I of Nature in the City included establishing a network of locations across the City to collect data regarding bird, butterfly and vegetation abundance and diversity. This effort supplements other existing data collection efforts to provide a baseline condition for the City's nature at the beginning of the project. However, long-term monitoring of important key indicators will be essential to identify trends in wildlife and plant communities. Additionally, in public outreach efforts, participants often mentioned their desire to engage in data collection related to this project. Engaging residents in citizen science projects to collect this data leverages City resources and increases citizen buy-in, giving them a vested interest in the success of these projects.

The City will establish and maintain data collection on a regular basis (as well as partner with other organizations who collect similar data) to assess the health of identified key indicators to measure the overall health of nature in the community. This will include developing:

- Indicator plant and wildlife species that can provide important information about impacts of development and climate change.
- A unified City plant list, as part of the Design Guidelines and via other publications, to help developers, landscaping companies, landowners, HOAs and the City coordinate on plants that can provide numerous ecological, social and economic values.

Long-term monitoring efforts could include, but are not limited to, the following:

- Butterfly abundance
- Bird abundance
- Percentage of native plants in Natural Areas
- Regional night sky darkness
- Nuisance species and wildlife conflicts

Outcome: A long-term monitoring program that tracks key indicator species and assists the City in evaluating its progress in achieving the principles outlined in the Nature in the City Strategic Plan.

Policy Area: Funding and Incentives

During the public outreach for Nature in the City, participants said they would like to incorporate nature into their homes or businesses, but didn't have the technical knowledge to do so, and perceived increased costs as a barrier. Financial and other types of incentives are important to help overcome these barriers.

In addition, identifying, coordinating and managing all the potential projects Nature in the City may have a nexus which will require ongoing funding for the program. The following policies address these issues.

F1: Explore a diverse set of funding options to implement Nature in the City

Access | Quality | Stewardship

A reliable and diverse set of funding sources is vital to fully implement the goals of Nature in the City. Possible sources include federal and state grants, private and non-profit grants, Building on Basics 2.0 capital improvement funds, Budgeting for Outcomes funding, and others. In order to develop this set of funding sources, the City will identify likely internal and external funding sources and pursue appropriate sources on a project-by-project basis.

Additionally, since native landscapes are more challenging to establish, ongoing operations and maintenance costs need to be considered in addition to capital costs.

Outcome: Ongoing funding for program support and project-specific capital improvements is secured and maintained.

F2: Implement incentives that can be incorporated into new development and redevelopment projects

Access | Quality | Stewardship

Offering different incentives to new developments, existing neighborhoods, businesses or other properties not poised to redevelop can increase the likelihood that Nature in the City features are implemented.

Incentives can be financial, such as rebates, material discounts or competitive grant programs. Another option to consider is the development of a Design Assistance Program, similar to the Landmark Preservation Design Assistance Program, whereby developers can apply for technical assistance for how to include Nature in the City principles into the developments. This program also could be used to help landscaping companies become familiar with best practices for establishing and maintaining native or naturalized landscapes. Opportunities to partner with outside agencies (e.g., the Colorado State Forest Service or the Master Gardener program), should be explored.

Finally, incentives could be recognition based, e.g., LEED certification or Climate Wise. It will be important to partner with existing incentive programs that are offered by other entities within the community, such as the Audubon Society's backyard habitat program, CSU Master Gardeners, and others.

Outcome: A variety of incentives that provide more opportunities to implement Nature in the City projects.

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Photo Credit: Ava Diamond

CHAPTER 4:

Plan Evaluation and Implementation

Chapter 4: Plan Evaluation and Implementation

This chapter contains two key elements: how the plan will be evaluated and a proposed implementation strategy. Implementing Nature in the City will require dedicated resources, policy and code updates, and coordination among internal and external stakeholders in the years to come. This chapter outlines a strategy to achieve the coordination required to accomplish the vision and goals set forth in this plan.

Plan Evaluation

A common way to evaluate a plan is through the use of performance indicators, which track and evaluate implementation progress over time. Performance indicators are most effective when they are aligned with the key outcomes a project is seeking to achieve. For Nature in the City, the performance indicators are designed to measure whether the vision, goals, and policies are being achieved.

As the vision for Nature in the City is meant to be implemented over time, two phases of indicators are proposed:

1. **Indicators to Implement Immediately:** These indicators can be implemented upon completion of the connectivity analysis (planned for 2015) and are designed to evaluate the plan in its entirety:

    - *Access to Nature*. This measure will evaluate the percentage of parcels that have access to nature within a 10-minute walk (1/4 – 1/3 mile).
    - *Connected Habitat Network.* This measure will build upon the connectivity analysis for wildlife and evaluate the proportion of the habitat network that is connected.

2. **Longer-term Indicators:** These indicators can be implemented upon completion of specific actions contained within the implementation strategy and may change over time based on community needs. As implementation evolves, specific indicators tied to the plan's goals may be developed. Examples include the following:

    - *Neighborhood Engagement.* This measure is an example of how an indicator could tie to a specific Nature in the City goal; in this case, neighborhood engagement is tied to the Stewardship goal. This measure will assess the number or percentage of neighborhoods engaged with Nature in the City projects. This indicator will include evaluating how equitably engagement is distributed across the City, the demographics of the neighborhoods engaged, and a target for how often neighborhoods should be engaged over time, e.g., once every five or ten years.

- *Biodiversity Goal*. This measure is an example of how an indicator could tie to a specific action item. This measure builds upon the ecological data collected through this project and in future efforts to establish a target for biodiversity. Regularly monitoring the City's wildlife will be critical to long-term measurement of the City's biodiversity.

Additional measures will be identified by an interdisciplinary team and be displayed in a transparent and accessible manner to the public to ensure all residents can track implementation progress.

Plan Implementation

The actions identified on the following pages have been divided in two ways:

1. **Timeframe** – The timeframes below indicate when an item will be initiated, but note that many of the items will continue beyond the specific timeframe, e.g., seeking funding will occur in all three time frames.
   - *Short-term* (2015-2016): These items were identified as concurrent actions that should be completed with or shortly after the adoption of the Nature in the City Strategic Plan.
   - *Mid-term* (2017-2020): These are high priority items that should be developed and implemented in alignment with the next budget (BFO) cycles.
   - *Longer-term* (2021 and Beyond): These items generally require ongoing coordination and implementation beyond a specific timeframe to achieve the Nature in the City objectives.

2. **Type of Action required**
   - *City Council Action Items:* These items will require action by City Council, whether by Resolution or Ordinance or through the approval of funding.
   - *Administrative Items:* These items will not require action by City Council.

In each of the actions, the key City departments or external stakeholders or partners have been identified to implement the action item. Top priority items have been identified based on citizen feedback and general estimates about staff resources and City Council time availability.

Note that mid-term and long-term implementation items estimated costs are in current dollars and may require additional funding and/or staff resources to implement.

Nature in the City Vision:

A connected open space network accessible to the entire community that provides a variety of experiences and functional habitat for people, plants and wildlife.

Goals:

1. ***Access*** - Ensure every resident is within a 10-minute walk to nature from their home or workplace
2. ***Quality*** - Conserve, create and enhance natural spaces to provide diverse social and ecological opportunities
3. ***Stewardship*** - Continue to shift the landscape aesthetic to more diverse forms that support healthy environments for people and wildlife

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Land Use Code Amendments *(PRIORITY)*	*Open Spaces* • Develop clarification on open space requirements; ensure standards allow for site-specific solutions based on context, scale, and objectives. *Alternative Vegetation Sizes and Composition* • Develop standards to allow for a diversity of tree, shrub, and grass sizes and species to be installed with the goal of creating more diverse, natural landscapes. *Ditches* • Craft standards that encourage ditch corridors, which contribute to important ecological functions, to continue to remain daylighted, i.e., retain surface conveyance.	• LU1 • LU2 • LU6	Planning, City Attorney's Office, Forestry, Park Planning, Natural Areas, Utilities, e.g., Stormwater	Existing staff resources Estimated costs to the development community will be calculated during the code amendment process.
Climate Action Plan *(PRIORITY)*	Incorporate Nature in the City principles into the Climate Action Plan update, including carbon sequestration goals. (Scheduled for adoption in February 2015)	• CP7 • LT3	Environmental Services, Planning	Existing staff resources (Currently underway)

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Comprehensive Night Skies Policy and Regulatory Updates *(PRIORITY)*	• Conduct an assessment of existing City policies surrounding night skies and where gaps in policies may exist based on current best practices; from this analysis, develop a comprehensive night skies policy. • Incorporate this policy into regulatory updates, e.g., the 2015 International Building Code update and the Annual Land Use Code amendments.	• CP2	All City Service Areas, e.g., Utilities, Traffic, Building, Planning, Natural Areas; National Park Service	Existing staff resources (Currently underway)
Acquire parcels, as needed, to achieve the goals contained within this Strategic Plan *(PRIORITY)*	Acquisitions should target a) sites that ensure all residents have access to nature within a 10-minute walk from their homes, or b) sites that fill gaps from a species connectivity perspective. Estimates include 4-6 parcels for acquisition.	• C1 • C2	Planning, Natural Areas, Park Planning, Stormwater, Private Property Owners, e.g., Homeowners Associations	Estimated $1-1.5 million based on initial analysis
Nature in the City Program Management *(PRIORITY)*	Support the ongoing coordination and implementation of Nature in the City through City-based funding, e.g., capital projects, future budgeting cycles, etc.	• F1	Planning, Natural Areas, Sustainability Service Area, City Manager's Office (Grant Specialist)	Will vary based on need; estimate full-time staff member needed to coordinate efforts
West Central Area Plan	Incorporate Nature in the City principles into the West Central Area Plan; strong staff coordination on the Open Space Network portion of the WCAP has been occurring (Scheduled for adoption in March 2015).	• CP7	Planning, FCMoves	Existing staff resources (Currently underway)

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Update the Stormwater Basin Guidelines	Update the standards for new and retrofitted stormwater and detention facilities to promote the ecological and social values outlined in Nature in the City. These guidelines should also be translated into regulatory standards, either through the Land Use or City Codes, to ensure consistency in application.	• LU8 • C1 • C2 • CP7	Stormwater, Natural Areas, Planning, City Attorney's Office	Existing staff resources
Administrative Action Items (no City Council action required):				
Connectivity Analysis – Wildlife *(PRIORITY)*	Conduct connectivity analysis to identify fragmented natural systems in the City; identify priority areas and fill in gaps for species connectivity.	• C1	Planning, Natural Areas, GIS, Colorado State University	Funded via Nature in the City ($8,000) (Currently underway)
Connectivity Analysis – People *(PRIORITY)*	Conduct connectivity analysis to identify locations with a walk to nature longer than 10 minutes, identify priority areas and fill gaps for access to nature for all residents.	• C2	Planning, GIS, Park Planning, FCMoves	Existing staff resources (Currently underway)
Design guidelines *(PRIORITY)*	Develop a set of design guidelines for how to incorporate Nature in the City principles into a range of settings, from private backyards and existing businesses to new residential, commercial, and mixed-use developments.	• LU3	Planning, Natural Areas, Park Planning, Stormwater, Light and Power, Environmental Services, Communications and Public Involvement Office, Neighborhood Services, Parks, Colorado State University	Funded via Nature in the City ($25,000) (Currently underway)

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Design and install the living wall *(PRIORITY)*	Through funding from the City's Innovation Fund, the Downtown Development Authority (DDA), and the Urban Lab, install the community's first living, or green, wall.	• LU5	Planning, Urban Lab, Parks, Operation Services, Gardens on Spring Creek, Utilities, Colorado State University	Funded via Nature in the City, the Innovation Fund, and the DDA ($30,000) (Currently underway)
Establish citizen-science or City-based programs to monitor biodiversity *(PRIORITY)*	Develop a long-term monitoring program that establishes a baseline over three years and then collects biodiversity data, e.g., birds and butterflies, every 2-3 years thereafter. Key indicators should be developed to track long-term progress of Nature in the City implementation.	• LT5	Colorado State University, Wildlife Conservation Society, Natural Areas, Planning	$50,000-75,000 to develop; estimate $10,000-25,000 for ongoing management (Funding proposals in review)
Support the City's efforts to evaluate the multiple values of irrigation ditches	In accordance with the 2015-2016 BFO Offer 130.1, support the City's efforts to conduct a scoping effort for a Ditch Master Plan.	• LU6	All City Service Areas, Ditch Companies, Private Landowners	Existing staff resources (Currently underway)
Support the Northern Colorado Food Cluster's efforts to develop a strategic plan	As the Northern Colorado Food Cluster develops the region's first strategic plan around a resilient, local food system, continue to support these efforts where they align with the principles of Nature in the City.	• LU10 • CP7	Planning, Economic Health, Gardens on Spring Creek, Natural Areas, Northern Colorado Food Cluster	Existing staff resources (Currently underway)

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Adapt the Sustainability Assessment Tool (SAT) to incorporate Nature in the City	The Sustainability Assessment Tool is a method for evaluating how projects incorporate the Triple Bottom Line (environment, economy, and social); the tool should be adapted to include a line-item for Nature in the City to ensure all City planning processes will be coordinated with the principles outlined in this Strategic Plan.	• CP8	Environmental Services, Planning	Existing staff resources (Currently underway)
Collect baseline data on the carbon sequestration values of the City's tree canopy	Forestry and other departments will conduct data collection in the summer of 2015 on approximately 200 plots throughout the City to assess carbon sequestration values of the tree canopy, among other metrics, e.g., health.	• LT3	Forestry, Environmental Services, Natural Areas, Planning	Estimated $70,000 (approved through 2015-2016 BFO Offer 99.3) (Currently underway)
Update the Stormwater Program's Multi-Decision Criteria Analysis Tool to incorporate Nature in the City principles	In 2012, the City's Stormwater Program developed a multi-decision criteria analysis tool to prioritize stream restoration efforts across the City; this tool should be updated to include Nature in the City principles, including connectivity for people and for wildlife.	• C1 • C2 • CP6 • CP7	Stormwater, Planning, Natural Areas, Park Planning	Existing staff resources
Collaborate with other ongoing air quality assessments	Environmental Services staff are conducting air quality sampling in accordance with the Air Quality Plan; collaborate with these efforts to also include sampling in open spaces throughout the City.	• LT4	Environmental Services, Natural Areas, Planning	Existing staff resources

Short-Term Actions: 2015-2016				
Short-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Incorporate Nature in the City into the City's Strategic Plan	In the update to the 2015-2016 City Strategic Plan, specific language should be added to reflect the implementation of the Nature in the City Strategic Plan.	• CP8	City Manager's Office, Sustainability Service Area, Planning	Existing staff resources
Consider pollinator and bird-friendly habitats in the City's Streetscape Standards	Interdisciplinary Streetscape Standards staff team should consider where and when habitat value can be added to City streets while minimizing wildlife conflicts.	• CP6	Planning, Parks, Park Planning, Streets, Engineering, FCMoves	Existing staff resources

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Continue to acquire parcels, as needed, to achieve the goals contained within this Strategic Plan *(PRIORITY)*	Acquisitions should target a) sites that ensure all residents have access to nature within a 10-minute walk from their homes, or b) sites that fill gaps from a species connectivity perspective. Continued from short-term priority (4-6 parcels anticipated to be acquired).	• C1 • C2	Planning, Natural Areas, Parks Planning, Stormwater, Private Property Owners, e.g., Homeowners Associations	Will vary based on need; Funding will be identified and secured on a per-project basis
Align City mowing and weed control policies while balancing public safety and aesthetics *(PRIORITY)*	Assess City regulations, policies, plans, and practices to identify differences and align around unified best management practices that balance management needs, aesthetics, and public safety with the needs of wildlife and plant communities.	• CP1	Natural Areas, Parks, Neighborhood Services, Planning, Streets, Utilities, e.g., Stormwater, Light and Power, etc.	Existing staff resources
Nature in the City Program Management *(PRIORITY)*	Support the ongoing coordination and implementation of Nature in the City through City-based funding, e.g., capital projects, future budgeting cycles, etc.	• F1	Planning, Natural Areas, Sustainability Service Area, City Manager's Office (Grant Specialist)	Will vary based on need; estimate full-time staff member needed to coordinate efforts
Neighborhood-scale program to incorporate Nature in the City *(PRIORITY)*	Develop a coordinated neighborhood-level program, e.g., Sustainable Neighborhoods (Lakewood, CO) or Neighborwood (Austin, TX), that implements projects in neighborhoods where gaps (in access or species connectivity) have been identified to create or enhance natural spaces.	• LU5	Neighborhood Services, Planning, Natural Areas	$100,000 to pilot the program over two years; estimate $10,000-25,000 for ongoing management

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Incentivize incorporating Nature in the City principles into community projects *(PRIORITY)*	Create a variety of incentives to provide more opportunities for landowners, businesses, and others to implement Nature in the City projects. Estimates include 20-30 parcels that can be restored and improved.	• F2	Planning, Natural Areas, Sustainability Service Area, Gardens on Spring Creek, ClimateWise, Property Owners	Will vary based on need, estimate $1.5-2 million
Develop a Design Assistance Program to train contractors and assist designers with incorporating nature into the urban environment	Similar to the Historic Preservation Design Assistance Program, this action could create a technical assistance program for developers who wish to incorporate naturalized landscaping into their developments; alternatively, it could assist landscaping companies with training for establishing and maintaining native or naturalized landscapes.	• F2	Planning, Natural Areas, Parks, Stormwater	Estimate $30,000-50,000 to develop; estimate $5,000-10,000 for annual implementation
City Plan Update	Incorporate Nature in the City principles into the next City Plan update.	• CP7	Planning, Natural Areas	Adapt into the plan scope
Transportation Master Plan	Incorporate Nature in the City principles into the next Transportation Master Plan update, including transit access and wayfinding to nature and include access to nature within transportation improvement plans.	• C3 • C4 • CP7	FCMoves, Transfort, Engineering, and Planning	Adapt into the plan scope
Parks and Recreation Policy Plan	Incorporate Nature in the City principles into the next Parks and Recreation Policy Plan update, including design guidelines and access to nature standards, and updates to Best Management Practices.	• CP7	Park Planning, Planning	Adapt into the plan scope

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Subarea Plan Updates	Incorporate Nature in the City principles into future subarea plan updates, including Downtown Plan, Old Town Neighborhoods Plan, etc.	• CP7	Planning	Adapt into the plan scope
Assess policies related to sound	Conduct an assessment of existing policies surrounding sounds, e.g., the noise ordinance, landscaping requirements, etc., to assess how noise impacts near nature can be mitigated.	• CP5	Planning, Natural Areas, Neighborhood Services, Police	Existing staff resources
Continue to support the City's efforts to evaluate the multiple values of ditches	Implementation of this action item could include the development of a Master Plan for the ditches within the City of Fort Collins, pilot projects to demonstrate how ditches can continue to convey irrigation water while also enhancing the other values they provide, etc.	• LU6	All City Service Areas, Ditch Companies, Private Landowners	Will vary based on need; plan cost estimated at $150,000-250,000
Training Resources for the Installation and Maintenance of Natural Spaces	Coordinate an interdisciplinary project team to develop a suite of training resources for landowners, business owners, and landscapers to allow the successful installation and maintenance of diverse landscapes.	• LU4 • LU5	Planning, Natural Areas, Park Planning, Stormwater, Private Sector Businesses, e.g., landscaping companies, Colorado State University, Homeowners Associations	Estimate $30,000-50,000 to develop; estimate $5,000-10,000 for annual implementation

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Update the Stormwater Stream Rehabilitation Program to Optimize Project and Funding Distribution *(PRIORITY)*	Evaluate the outputs of the Multi-Criteria Decision Analysis (MCDA) tool of the stream rehabilitation program to compare the relative value of all possible projects and to make decisions based on results and equity throughout the City, specifically where small projects can significantly improve neighborhood access or quality of experiences.	• C1 • C2 • CP6 • CP7	Stormwater, Planning, Natural Areas, Park Planning	Existing staff resources
Maintain and monitor the living wall *(PRIORITY)*	Maintain the plants, irrigation system, etc. of the living wall. Monitor the living wall to assess energy efficiency, benefits to habitat, water use, etc. to guide future demonstration projects.	• LU5 • LT3 • LT4 • LT5	Parks, Planning, Environmental Services	Plant maintenance: $250-500/year (funded); Monitoring estimated at $2,000-5,000 per year
Transit Connections to Nature	Identify appropriate access points to natural spaces on existing and future transit routes and develop a plan to provide accessible access to open spaces throughout the City. Upgrade bus stops where appropriate.	• C4	Transfort, Planning, Natural Areas, Park Planning, Stormwater	Existing staff resources for the planning analysis; average cost of $10,000 per bus stop to ensure accessibility, though cost will vary based on site-specific conditions.

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Wayfinding to Nature	Develop a comprehensive and consistent wayfinding system throughout the City using innovative wayfinding that helps to minimize sign pollution.	• C5	Planning, FCMoves, Natural Areas, Park Planning, Stormwater	Will vary based on need; Directional signs - $75-200/ sign Interpretive signs - $500-1,200/sign
Identify pilot or demonstration sites to illustrate Nature in the City principles	In addition to the living wall, identify and install additional demonstration projects to illustrate how nature can be incorporated into the increasingly urban environment.	• LU5	Planning, Homeowners Associations, Business Associations	Will vary based on need, estimate of $5,000-30,000 per project
Continue monitoring baseline and trends in night sky brightness in the region	Continue to monitor existing sites within Fort Collins and the region and extend this monitoring to include new sites based on night skies policy.	• CP2	Natural Areas, National Park Service	Existing staff resources, but additional resources may be necessary depending on scale, objectives, etc.
Update the City's tree inventory to include wildlife habitat	As the City's tree inventory is updated, collect a complete data set of wildlife habitat in the urban tree canopy to inform future decisions.	• CP3	Forestry, Planning, Natural Areas, Parks, Colorado State University	To be determined, as collecting these types of data are not within a standard protocol.
Establish a Citywide biodiversity goal	The City's Sustainability Goals currently focus on biodiversity on public lands. This goal should be updated to reflect goals for the City as a whole, i.e., both public and private lands.	• LT1	Environmental Services, Planning, Natural Areas, Colorado State University	Estimate of $10,000-15,000 for professional expertise to develop an appropriate goal

Mid-Term Actions: 2017-2020				
Mid-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Establish monitoring for carbon sequestration	Collect data to estimate the overall carbon sequestration in the City and develop targets to evaluate future progress in accordance with the Climate Action Plan.	• P1 • LT3	Environmental Services, Forestry, Planning, Natural Areas	To be determined after completion of the initial carbon sequestration analysis, currently underway and led by the Forestry Department
Partner with other entities to celebrate nature within the urban environment	Collaborate with key partners to develop annual events surrounding urban nature, e.g., a walk through Downtown to observe the chimney swift populations or a walk along the ditches and other historical resources to highlight their value to the community.	• CP10	Planning, Natural Areas, Gardens on Spring Creek, Environmental Organizations, Property Owners	Existing staff and partnership resources; minimal marketing costs

Longer-Term Actions: 2021 and Beyond				
Longer-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
City Council Action Items:				
Update the Nature in the City Strategic Plan *(PRIORITY)*	To ensure the plan continues to function and serve the community well over time, the plan must be reviewed, revised and updated periodically. Plan evaluation should occur on an annual basis with comprehensive updates taking place every 5-10 years.	• CP9	Planning, Natural Areas, Park Planning, Utilities, Sustainability Service Area, Colorado State University	Annual monitoring – existing staff resources; 5-year update - $25,000-50,000
Continue to acquire parcels, as needed, to achieve the Strategic Plan goals *(PRIORITY)*	Acquisitions should target a) sites that ensure all residents have access to nature within a 10-minute walk from their homes, or b) sites that fill gaps from a species connectivity perspective. Continued from short-term and mid-term priorities.	• C1 • C2	Planning, Natural Areas, Park Planning, Stormwater, Private Property Owners	Will vary based on need and accomplishments to date.
Establish the value of ecosystem services to the City and track the value of existing and new projects	Current ecosystem services valuations are based on statewide assessments; this item develops a localized assessment of ecosystem services to track the value of the City's ecosystem services over time.	• LT2	Natural Areas, Planning, Colorado State University	Estimate of $100,000
Develop Level of Service standards for Nature in the City	As the data collected on pilot projects begins to emerge, a Level of Service for nature within the community (for public and private sector projects) should be developed to ensure higher quality nature spaces are installed within the community.	• LU7	Planning, Park Planning, Natural Areas, Stormwater, Engineering, Sustainability Service Area	Estimate of $75,000-$100,000 to develop the Level of Service standards

Longer-Term Actions: 2021 and Beyond				
Longer-Term Action Item	Description	Related Policies	Responsibility	Estimated Cost
Administrative Action Items (no City Council action required):				
Encourage natural drainages to be re-created	Streams, drainages, and irrigation corridors would be restored to their natural drainages; this would include daylighting previously piped streams or ditches, preserving existing drainages that still remain, and re-creating historic drainage patterns where feasible.	• LU10 • C1 • C2	Planning, Natural Areas, Stormwater, Parks	Will vary based on need; should be incorporated into the development review process to the extent feasible.
Long-term stewardship of parcels acquired through Nature in the City	Parcels acquired over the short-, mid-, and long-term will require ongoing stewardship, e.g., site maintenance, restoration, etc. Landownership and maintenance of individual parcels will be determined on a case-by-case basis.	• C1 • C2	Planning, Natural Areas, Park Planning, Parks, Stormwater, Private Property Owners	Estimate of $100,000 on an annual basis


Photo Credit: mrp2863198

Appendices

Appendix A - Glossary

Arterial streets – Roads within the community that serve major traffic movements within urbanized areas connecting central business districts, outlying residential areas, major intercity communities, and major suburban centers. (Examples in Fort Collins include: College Avenue, Drake Road, etc.)

Biodiversity – For the purposes of Nature in the City, the generalized term for variety of life in a particular habitat or ecosystem

Carbon sequestration - A natural or artificial process by which carbon dioxide is removed from the atmosphere and held in solid or liquid form

Citizen science – A method of scientific data collection by engaging interested citizens in the community to gather the data

City of Fort Collins 2015-2016 Strategic Plan – The planning document that clearly articulates City priorities and directs the 2015-2016 City of Fort Collins Budget

City Plan – The comprehensive plan for the City of Fort Collins that illustrates the vision of the City of Fort Collins for the next 25 years and beyond

ClimateWise – A free, voluntary program managed by the City of Fort Collins Utilities dedicated to helping local businesses and the environment

Community Dashboard – A web-based assessment tool that conveys a quarterly snapshot of the City of Fort Collins' progress in attaining key outcomes, organized by Key Outcomes in the City Strategic Plan

Connectivity – The state or extent of being connected or interconnected; in the context of Nature in the City, how connected natural spaces are for people and wildlife

Design Guidelines – One of the key short-term products of Nature in the City; a suite of guidelines to help design and install more diverse landscapes within the City

Diverse landscape – Landscapes that include a variety of species, including natives, which provide habitat and aesthetic interest in comparison to typical landscaping

Easement – The legal right to cross or otherwise use another's property for a specified purpose

Ecosystem services – The inherent services provided by an ecosystem that many times have economic value, such as soil erosion prevention or water quality improvements

Fragmentation – For the purposes of Nature in the City, the breach of connections between larger patches of wildlife habitat, preventing species from traveling between patches.

Growth Management Area – The area of land outside of the City limits that the City has identified a plan to grow into as a means of regional planning

In-stream flows – In Colorado, a water right that remains within the stream or river to provide enough flow to support wildlife species within

Institutional Open Space – For the purposes of Nature in the City, a category of land use identified during the Ecological Assessment and Inventory that refers to locations of open space within commercial, medical, and City stormwater parcels

Integrated pest management – An ecosystem-based strategy that focuses on the long-term prevention of pests using biological, mechanical, cultural and chemical methods

Invasive species – Typically a non-native species that invades an ecosystem; lack of natural competition from other species allows invasives to thrive once established

Land stewardship – For the purposes of Nature in the City, the concept of caring for and managing land with the overall land's health in mind

Land Use Code – The suite of regulations that facilitate orderly and safe development within the City

Landscape aesthetic – Refers to preferences by individuals for what landscapes, e.g., yards, open space areas, parks, etc. should look like. Traditionally, preferences have included lawn areas with trees to frame various spaces. This Plan suggests a more ecologically-driven landscape aesthetic, e.g., plantings that support wildlife species, reduce water consumption, etc.

Living wall – A landscape architectural feature that uses plants on a vertical wall as a component of the overall landscape of an area.

Multi-criterion decision analysis (MCDA) – An analysis tool used by the City's Stormwater Department and an interdisciplinary team to evaluate stream rehabilitation projects. For example, projects were ranked from 1-5 for economic issues (e.g., cost to rehabilitate, maintenance requirements), social issues (e.g., aesthetics), and environmental issues (e.g., aquatic habitat).

Native species – Plant or animal species that have evolved with a particular ecosystem over a long period of time

Natural Areas – Land acquired by the City of Fort Collins Natural Areas Department that provides residents access to open space and protects important wildlife habitat

Natural Habitats and Features – Features within natural spaces that naturally occur, such as natural springs, open spaces, rock outcroppings, etc.

Natural spaces – For the purposes of Nature in the City, a general term referring to places that are undeveloped and provide nature that are typically not owned by the City.

Nature – For the purposes of Nature in the City, the definition of nature is explained in Appendix C

Night sky brightness – A concept to describe the amount of human-created light that brightens the night sky

Non-native species – Plant or animal species that have been introduced to an ecosystem that it did not evolve within

Open space – A generalized term that refers to land that has not been developed or has been restored to remain undeveloped. Larimer County's Department of Natural Resources calls their conserved properties Open Spaces.

Predator/prey relationships – A term that generally relates to the relationship wildlife species have with each other; specifically those species that prey on other species and those that are preyed upon

Pollinator – An insect or other animal that assists plants in pollination

Residential Open Space – For the purposes of Nature in the City, a category of land use identified during the Ecological Assessment and Inventory that refers to locations of open space within residential parcels such as greenbelts and other open space areas within residential subdivisions

Riparian – Land that is adjacent to or otherwise connected to a stream, river, or other water body

Sites – Specific locations where Nature in the City efforts or other projects are taking place

Species Richness – The number of different species represented in an ecological community, landscape or region

Species Abundance – The number of individuals per species represented in an ecological community, landscape, or region

Suburban – A portion of a city or town that features more residential land use and lower densities than within the more densely developed city or town core

Structural variability – For the purposes of Nature in the City, the characteristic of tree and shrub canopies including species of varying height.

Sustainability Analysis Tool (SAT) – A tool crafted in February 2015 for the City to assess and report to City Council the economic, social, and environmental sustainability of a project or policy requiring Council approval

Transfort – The public transit department of the City of Fort Collins

Tree stocking – Full tree stocking is defined in the Land Use Code as areas within 50 feet of a building that include the following, "Landscape areas shall be provided in adequate numbers, locations and dimensions to allow full tree stocking to occur along all high use or high visibility sides of any building or structure. Such landscape areas shall extend at least seven (7) feet from any building or structure wall and contain at least fifty-five (55) square feet of nonpaved ground area, except that any planting cutouts in walkways shall contain at least sixteen (16) square feet. Planting cutouts, planters or other landscape areas for tree planting shall be provided within any walkway that is twelve (12) feet or greater in width adjoining a vehicle use area that is not covered with an overhead fixture or canopy that would prevent growth and maturity." (See Section 3.2.1(D)(1)(c) of the Land Use Code)

Urban – The portion of a city that is typically more densely developed and features a number of land uses

Urban agriculture – The general categorization of agricultural activities that are typically done on a small scale within the City, many times using organic or holistic techniques

Wayfinding – For the purposes of Nature in the City, signage and other methods to assist users of natural spaces to navigate from point to point

West Central Area Plan – The adopted subarea plan for the West Central Area of Fort Collins


Photo Credit: John Bartholow

Appendix B1 - Precedents

How Other Communities Are Approaching Nature in the City

Purpose

This document summarizes other communities' efforts to integrate nature into the urban fabric. Twelve cities and ten projects were evaluated in the United States and abroad.

How to Read the Document

Cities

The city is listed with its population. The following bullet points list the eight criteria each plan was evaluated for.

- Scale: What is the scope? It ranges from neighborhoods to counties.
- Purpose: Why is it being done?
- Target: What are they focusing on to improve? It could be buildings, parks, streets, etc.
- Wildlife: Will they be monitoring any wildlife? If so, do they have a specific focus?
- Nature Definition: Did they define the term nature or use another term to represent it?
- Guidelines: This link will send you to the completed plan or guidelines published by the city. Additional bullet points highlight specifics that are particularly relevant or interesting.
- Public Engagement: What did they do to get public input?
- Success: How are they measuring success? Specifically in quantitative measures.

Projects

The company or organization is listed. As with the cities, the first link is the name of the project and the bullet points are described above.

Summary

Many cities and organizations are looking for ways to incorporate more "green" into the urban environment both in the public and private sectors. The methods used to accomplish this range from policies to guidelines to specific projects. The most common method cities seem to be employing is the idea of green streets and the dual benefit of beautification and stormwater filtering. Many of these cities did not make the list unless they did an outstanding job, e.g., San Francisco.

Overall, Singapore seems to have the most comprehensive and extensive strategy to truly integrate nature into the city. Their Development Control Parameters (Land Use Code) encourage greenery on terraces on high-rise buildings and for developers to contribute to green buffers on their property. The Sustainable Blueprint highlights a few key goals for the city: adding 75 acres of skyrise greenery and tripling the length of park connectors by 2020, and adopting a landscape replacement policy that will require new developments to provide landscape areas equivalent to the overall development site area. They also have an independently managed Garden City Fund to raise money and fund projects that promote City in a Garden ideals and public engagement.

Chicago's Nature and Wildlife Plan is the closest aligned with Nature in the City ecological goals. Many of their recommendations mirror this project's goals, such as: "Create new programs to work with large land owners to enhance the quality and biodiversity value of their lands; increase native habitat within community managed-open spaces, schools and residential yards; Engage people in appreciating the aesthetics of native ecosystems." Whether or not these recommendations have been completed yet is currently unknown.

Several cities have conducted biodiversity studies: District of Columbia, Oslo, New York, Chicago, Singapore and San Francisco. The intensity of surveys varied. DC and Singapore are completing a full inventory; New York City, Chicago and Oslo are performing full inventories in natural areas/green space; and San Francisco has a targeted species for each green connection route.

Vancouver, the District of Columbia and New York City all have goals for 100% of their population to be within a five- to 10-minute walk to a green space/park. Oslo uses a similar metric – proportion of population within 990 ft of green space. These cities' primary focus for achieving their goals is through the acquisition of more land for parks, natural areas, etc.

San Francisco and Larimer County had the most extensive and diverse outreach plans. Both employed a variety of techniques such as interactive mapping, mailed surveys, open houses and engaging specific groups of stakeholders. San Francisco's interactive mapping at Sunday Streets was hugely successful and would be easy to replicate for our project. During Sunday Streets, a stretch of road is blocked off to car traffic to allow for various activities. The Green Connections team laid down large posters of maps that citizens were encouraged to draw and write on to gather input on their project. Larimer County held their open houses at convenient locations like the library and provided free child services.

Of the projects reviewed, the Green City Guidelines (funded by the Dutch Government) provides the most relevant and helpful information for our efforts. It presents a multitude of techniques for greening the built environment while also discussing benefits. Benefits were evaluated in six categories: economy, health, social interactions, ecology, water, climate and pollution.

After reviewing what other cities and projects are doing, it is apparent that Fort Collins' approach is unique. Many are trying to achieve similar goals but their efforts are spread across multiple plans and departments. Our approach is based on the idea of a triple bottom line. We will be gathering data on economic, social and environmental issues and questions. Our final strategic plan will then use this data to formulate actions regarding regarding each aspect of the triple bottom line. Another point that makes Nature in the City different is that the project is specifically concerned with access to nature, not just parks or green space. While our project may not be at the same scale as others cities (adding thousands of acres of green space), it better addresses issues a city our size faces.

Photo Credit: Molly Rosey

SECTION 1

CITIES

FORT COLLINS, CO POP. 155,400

Nature in the City

http://www.fcgov.com/natureinthecity

- Scale: City-wide
- Purpose: Provide more access to nature within the urban environment
- Target: The main focus is on informal natural areas, but also how the built environment can be adapted to support nature
- Wildlife: A bird and vegetation inventory will be completed throughout the City
- Nature Definition: See Appendix C
- Guidelines: In progress
- Public Engagement: Interactive mapping, open houses See Appendix B3
- Success: Population within a 10-minute walk to nature

Certified Natural Areas

http://www.fcgov.com/naturalareas/certified.php

- Scale: City-wide
- Purpose: Encourage site management practices that focus on protecting, restoring and enhancing native animal and plant communities.
- Target: Private lands
- Wildlife: Management plan needs to address local native species
- Nature Definition: Native animal and plant communities
- Guidelines: Natural Areas Certification Program Guidelines
  - Must write and implement a management plan
  - Applicants can get financial assistance for implementing their fund through the Natural Areas Enhancement Fund.
- Public Engagement: Program educates the public about the values of natural areas, certified areas have to display at least one sign
- Success: Certification lasts five years. Re-certification is allowed if the management plan was successfully implemented.

These two specific programs are just the tip of the iceberg of the City's commitment to protecting and promoting the environment in the City. The details of this commitment are further described in Chapter 1 of this Plan.

San Francisco, CA pop. 825,863

Green Connections project
http://www.sf-planning.org/index.aspx?page=3002

- Scale: City-wide project
- Purpose: To create, protect and enhance a network of routes to encourage bike, pedestrian and wildlife movement to parks, open space and the waterfront
- Target: Public streets
- Wildlife: Ecology Guide: Each route has a species or ecosystem that it is targeting to improve habitat
- Nature Definition: Landscaping and associated wildlife
- Guidelines: Design Toolkit
    - Each tool is rated on: active transportation to parks, urban ecology, neighborhood stewardship and placemaking, ability to implement and traffic and parking considerations.
- Public Engagement: Open house, on-line survey, walking tours, interactive mapping, "Sunday Streets"
- Success: Tentative ideas: miles completed, bike commuting numbers, stormwater standards and potentially some sort of monitoring program

Larimer County, CO pop. 310,487

Plug in to Nature
http://www.larimer.org/plugintonature/

- Scale: County-wide
- Purpose: To determine effective ways to connect families and children to nature and the outdoors
- Target: Outdoor Programs, Improving accessibility and awareness
- Wildlife: N/A
- Nature Definition: "… [A] spectrum of outdoor places ranging from a child's backyard to wilderness experiences."
    - Guidelines: Plug in to Nature Project Report
    - Improve safe access to parks and open space in urban places
    - Explore "redeveloping" nature in urban areas surrounded by populations with limited access to nature
    - Transform existing properties to include nature play areas
- Public Engagement: County-wide surveys, Community meetings, interviews, inventories and meetings with Youth and Family Program Providers and Nature Program Providers
- Success: Time children spend outside, obesity rates, number of outdoor/nature programs, number of barriers preventing access, proximity to publicly accessible play space

Chicago, IL pop. 2,715,000

Adding Green to Urban Design

http://www.cityofchicago.org/city/en/depts/dcd/supp_info/green_urban_design.html

- Scale: City-wide project
- Purpose: "Maintain and improve Chicago's urban design to optimize its environmental benefits for current and future generations."
- Target: All exterior elements of the built environment
- Wildlife: Not focused on wildlife. Instead looked at: water, air, land, quality of life.
- Nature Definition: Green Space
- Guidelines: Green Urban Design Booklet
  - 21 Policies with specific implementation road maps.
- Public Engagement: N/A
- Success: No quantitative measures

A roof top garden in Chicago. http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/Green_Urban_Design/GUD_booklet.pdf

Nature and Wildlife Plan

http://www.cityofchicago.org/city/en/depts/dcd/supp_info/chicago_nature_andwildlifeplan.html

- Scale: City-wide
- Purpose: To protect natural habitat, manage existing open space, monitor sites and educate the public.
- Target: Natural areas, open space, private land
- Wildlife: Emphasis on birds and native vegetation but want a full inventory
- Nature Definition: Natural area: "managed open space dominated by native vegetation that supports wildlife and provides ecosystem services."
- Guidelines: Nature and Wildlife Plan and Update
  - Create programs to work with large land owners to enhance the quality and biodiversity value of their lands.
  - Evaluate biodiversity value of unprotected, unmanaged space
  - A habitat guide for Chicago land owners: enhancing your property for birds
- Public Engagement: The 2006 plan had 40+ outside group contributors
- Success: N/A

NASHVILLE, TN POP. 609,644

Nashville Naturally

https://www.conservationfund.org/projects/open-space-plan-for-nashville/

- Scale: City-wide
- Purpose: Inventory, evaluate and develop an implementable vision for conserving and enhancing Nashville's lands and natural resources.
- Target: Open Space
- Wildlife: N/A
- Nature Definition: Nature is defined as open space - areas that support recreation, socialization, scenic beauty, habitat for plants and animals, water filtration, farming, and forests.
- Guidelines: Nashville Naturally Open Space Plan
    - Improve connectivity and create green corridors around and through downtown
    - Explore sustainable open space funding and incentive programs, such as a development project fee that could be offset by the creation of green space, including green roofs in dense urban areas.
- Public Engagement: 31-member advisory committee, blog site, public forums
- Success: Add 6,000 acres of both parkland and private green infrastructure by 2035, transition 20% of impervious surfaces to pervious in downtown, double the amount of local food produced in the county, protect 10,000 acres of sensitive natural areas via regulations.

Nashville's open space vision. https://www.conservationfund.org/projects/open-space-plan-for-nashville/

CHRISTCHURCH, NEW ZEALAND POP. 367,700

Christchurch Central Recovery Plan

http://ccdu.govt.nz/the-plan

Scale: City-wide

Purpose: To re-build the city with the "green" mindset the citizens envision.

Target: Parks and urban landscape

Wildlife: N/A

Nature Definition: N/A

Guidelines: Anchor Project Overview

Public Engagement: The plan was developed around key areas that citizens deemed the most important

Success: N/A

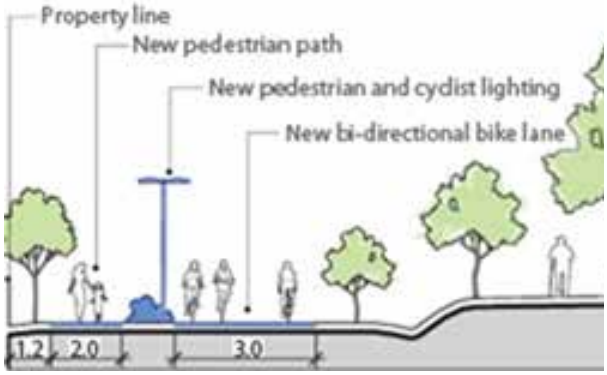
Christchurch's concept for incorporating green space into their city after the earthquake. https://ccdu.govt.nz/sites/ccdu.govt.nz/files/documents/the-blueprint-plan-A3.pdf

VANCOUVER, BC POP. 603,502

Greenest City 2020 Action Plan (access to nature section)

http://vancouver.ca/files/cov/greenest-city-2020-action-plan-2012-2013-implementation-update.pdf

- Scale: City-wide
- Purpose: "Ensure every person lives within a five minute walk of a park, greenway or other green space by 2020"
- Target: Green Space
- Wildlife: N/A
- Nature Definition: Green Space - parks and fields, greenways, the seawall, street mini-parks, natural green spaces, as well as park-like spaces such as the grounds around institutional buildings like City Hall, hospitals, and schools
- Guidelines: Access to nature Website or PDF
    - Create 4-6 new mini-parks by converting street right-of-ways
    - Work with the community to decide where new green space will go
    - Current targets don't address the quality of green space. City staff are working with local environmental groups to develop a proposed biodiversity target.
- Public Engagement: Treekeepers program; neighborhood greenways are initiated by residents
- Success: Population is within a five minute walk to green space, plant 150,000 new trees by 2020



A street cross section in Vancouver. http://vancouver.ca/streets-transportation/point-grey-cornwall.aspx

DISTRICT OF COLUMBIA POP. 632,323

Sustainable DC

http://www.sustainabledc.org/

- Scale: City-wide
- Purpose: To restore impaired ecosystems for the benefit of biodiversity, environmental quality, climate resilience and recreation.
- Target: Green recreational space, the trail system and river ways
- Wildlife: Their Division of Wildlife and Fisheries is doing an inventory of all mammal, invertebrate, amphibian and avian species

- Nature Definition: Parks and natural resources
- Guidelines: Sustainable DC (nature section p72)
    - Prepare an open space plan to increase residential connections to green space and the rivers
    - Require trees and green space on all new development sites
    - Create a connectivity map to guide development of habitats throughout the District
- Public Engagement: Three community action plans: DC summer youth employment program; Public Design competition for parklets; wetland restoration tours
- Success: By 2032 provide parkland or natural space within a 10-minute walk of all residents, increase wetland acreage by 50% and tree canopy cover to 40%.

Green Area Ratio (GAR)

http://ddoe.dc.gov/GAR

- Scale: All new buildings requiring a Certificate of Occupancy and major building renovations
- Purpose: Set standards for landscape and site design to reduce stormwater runoff, improve air quality and reduce the urban heat island effect
- Target: External elements of private buildings
- Wildlife: N/A
- Nature Definition: Landscaping
- Guidelines: The GAR Guidebook and Landscape Checklist are under development
- Public Engagement: Training seminars
- Success: New development achieving the required GAR score

New York City, NY pop. 8,336,697

PlaNYC: Parks and Public Spaces

http://www.nyc.gov/html/planyc2030/html/theplan/public-spaces.shtml

- Scale: City-wide
- Purpose: "Ensure all New Yorkers live within a ten-minute walk of a park"
- Target: Parks and Public Space
- Wildlife: Performing a biodiversity study in natural areas
    - Natural Areas Conservancy
- Nature Definition: Parks and Public Space
- Guidelines: Parks and Public Space
    - Re-imagine the public realm-activate streetscapes and create a network of green corridors
    - Support ecological connectivity
- Public Engagement: Million TreesNYC, Love Your Block, CoolRoofs
    - Public Engagement for entire PlaNYC
- Success: Population is within a 10-minute walk of a park

A map of New York showing areas within a 10-min walk of a park. http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_parks.pdf

SEATTLE, WA POP. 634,535

Green Factor

http://www.seattle.gov/dpd/cityplanning/completeprojectslist/greenfactor/whatwhy/

- Scale: Specific zone districts
- Purpose: Increase the amount and improve the quality of landscaping in new development
- Target: External elements of private buildings
- Wildlife: N/A
- Nature Definition: Landscaping
- Guidelines: Six case studies and other documents
- Public Engagement: Series of workshops
- Success: New development achieving the required green factor score

SINGAPORE POP. 5,312,000

Urban Redevelopment Authority

http://www.ura.gov.sg/uol/

- Scale: City-wide
- Purpose: This how they regulate development
- Target: Development
- Wildlife: N/A
- Nature Definition: N/A
- Guidelines: Development Control Parameters
  - Promote “lush greening” on sky terraces and roof top greenery
  - Private developers are encouraged to contribute to the greening of buffers on their property
- Public Engagement: N/A
- Success: N/A

Sustainable Singapore

http://app.mewr.gov.sg/web/Contents/ContentsSSS.aspx?ContId=1034

- Scale: City-wide
- Purpose: Protecting and enhancing our biodiversity to conserve our natural heritage for all to enjoy (Ch.6)
- Target: Parks, Private buildings, waterways
- Wildlife: Protect and enhance biodiversity
- Nature Definition: N/A
- Guidelines: Sustainable Blueprint
  - Co-funding for green roofs in the

Central Business District and Orchard Road area

- Develop a City Biodiversity Index and implement a National Biodiversity Strategy and Action Plan
- Transform drains, canals and reservoirs to support recreational use

- Public Engagement: N/A
- Success: Add 75 acres of skyrise greenery, 2,225 acres of green park space and 162 mi of park connectors by 2020. Provide 2 acres of park land per 1,000 persons by 2030

A canopy walk in Singapore. http://www.nparks.gov.sg/cms/index.php?option=com_visitorsguide&task=attractions&id=64&Itemid=73

Green Mark

http://www.bca.gov.sg/greenmark/green_mark_buildings.html

- Scale: City-wide
- Purpose: A scoring system that helps, "…to establish environmentally friendly practices for the planning, design and construction of buildings, which would help to mitigate the environmental impact of built structures."
- Target: New Buildings
- Wildlife: N/A
- Nature Definition: N/A
- Guidelines: Certification Standards
  - Part 3 - Environmental Protection
- Public Engagement: N/A
- Success: All new buildings getting Green Mark certified

Oslo, Norway pop. 593,045

Urban Ecology Programme 2011 – 2026

http://www.oslo.kommune.no/english/environment/environmental_policies/urban_ecology_programme/

- Scale: City-wide
- Purpose: (Section 5) Maintain and strengthen the blue-green infrastructure (waterways and greenery).
- Target: Forest zone, outdoor rec. areas, green spaces, areas of natural environment
- Wildlife: Between 2002-2007 all green areas were surveyed for biological diversity by biologist. They identified 1,558 valuable natural habitats and 344 locations with threatened species. Two areas have been protected; zoning plans for 12 more
- Nature Definition: Green Space - "public parks, gardens, churchyards and similar, exclusively for the purposes of walking and cycling, plus outdoor sports facilities and private green spaces available free of charge to the public."
- Guidelines:
  - Target 5.2: 5.2.1 – 5.2.7 -Valuable unregulated areas of natural environment will be safeguarded by zoning

- Target 5.6: 5.6.1-5.6.2 - Safeguarded through active management by the city, the private sector and voluntary organizations

- Public Engagement: N/A

- Success: Proportion of population who live within 330yd of green space; Area of designated outdoor recreation areas and green spaces with public access; Area of school gardens and allotments in m2; Number of children and adults who use school gardens and allotments

Photo Credit: Mofinchum

Section 2

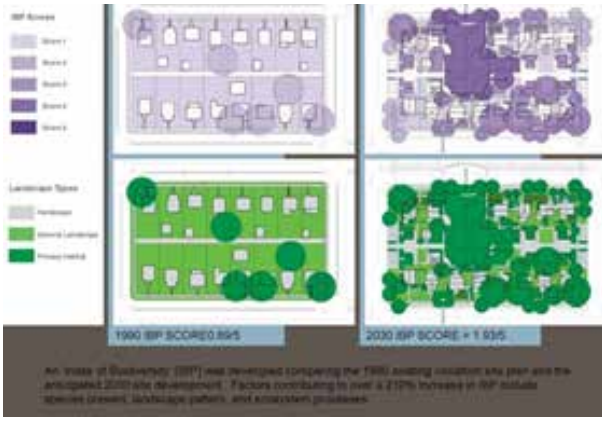
PROJECTS

AECOM

Landscape Biodiversity Planning and Design System

http://www.aecom.com/deployedfiles/Internet/Capabilities/Design%20and%20Planning/_documents/130403_LandscapeBiodiversitySystem_TM.pdf

- Scale: Site specific
- Purpose: Use a quantitative measurement of biodiversity at a site to compare different planning alternatives
- Target: Landscaping and layout
- Wildlife: Local Target Species
- Nature Definition: N/A
- Guidelines: Landscape Biodiversity Planning and Design System
    - Scoring system tracks performance of multiple indicators of landscape biodiversity such as priority species, habitat quality, connectivity, and total habitat area.
- Public Engagement: N/A
- Success: Increasing the Landscape Biodiversity Index score



Before and after images of a project site using the Landscape Biodiversity Planning and Design System.
http://www.nparks.gov.sg/cms/index.php?option=com_visitorsguide&task=attractions&id=64&Itemid=73

International Council for Local Environmental Initiatives (ICLEI)

Local Biodiversity Strategy and Action Plan

http://www.cbd.int/en/subnational/guidelines

- Scale: City or smaller
- Purpose: assist local governments in making a start with, or improvements to, their biodiversity planning processes
- Target: Policy
- Wildlife: Varies on biodiversity index used.
- Nature Definition: N/A
- Guidelines: Local Biodiversity Strategy and Action Plan Guidelines
    - Lays out information, resources and actions needed for a city to create its own biodiversity strategy and action plan.
- Public Engagement: Varies, but participation is a large theme
- Success: N/A

LAB

Local Action for Biodiversity

AN ·I·C·L·E·I – IUCN PROGRAMME

Local Action for Biodiversity Logo
http://www.iclei.org/details/article/local-biodiversity-strategies-and-action-plan-lbsap-guidelines.html

The Green City Campaign

The Green City Guidelines

http://www.thegreencity.com/Highlights/The_Green_City_Guidelines

- Scale: City, neighborhood, streets and building
- Purpose: To provide facts, figures, examples and references on how Green Infrastructure contributes to the livability of urban places.
- Target: Green infrastructure
- Wildlife: N/A
- Nature Definition: N/A
- Guidelines: Green City Guidelines click the "learn more" link at the bottom to download the PDF
    - Covers thirty different topics related to "greening"; providing explanations, benefits, facts and examples, e.g. how trees reduce air pollution.
- Public Engagement: N/A
- Success: N/A

An image of the Green City Guidelines. http://www.thegreencity.com/Highlights/The_Green_City_Guidelines

Biophilic Cities

Biophilic Cities Project

http://biophiliccities.org/the-biophilic-cities-project/

- Scale: City
- Purpose: To advance the theory and practice of planning for biophilic cities, through a combination of collaborative research, teaching, dialogue and exchange.
- Target: All aspects of a city
- Wildlife: Depends on city
- Nature Definition: "Biophilia…is the innately emotional affiliation of human beings to other living organisms."
- Guidelines: No definition or criteria for what a biophilic city is. A few key qualities are laid out here.
    - Nine partner cities are identified, along with the associated qualities that make them biophilic
- Public Engagement: The project will periodically convene researchers, publish working papers, reports and other publications that spread the findings of the project work and the message about biophilic cities.
- Success: N/A

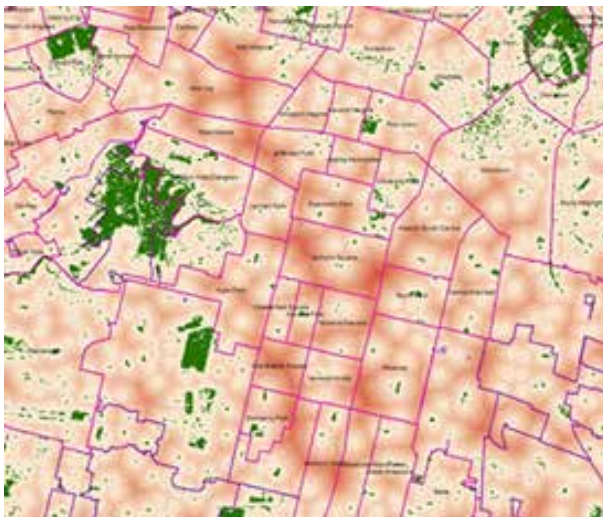
Stanford

City Nature
http://citynature.stanford.edu/

- Scale: Neighborhood, City, Metropolitan area
- Purpose: Explore why nature is unevenly distributed in and across cities
- Target: N/A
- Wildlife: N/A
- Nature Definition: They acknowledge that there are many definitions and forms of nature while never actually defining nature
- Guidelines: No guidelines but a significant amount of data
- Public Engagement: N/A
- Success: N/A

From LANDSAT data (greenness band) they found an average pixel value for parks in a specific city. Then they identified all pixels in the city area that were >= to the average pixel value.

For arid regions where everything isn't green, they looked at "pavedness". From the 2006 NLCD "Percent Developed Impervious" data they determined an average pixel value of 0.25 for designated park and open space areas and then identified all pixels with <= 0.25 impervious surface. A single pixel appears to be about the size of two lots with a house on them.



LA with distance shown to"park-like-greenness". http://citynature.stanford.edu/naturehoods/index.html#

Portland Sustainability Institute

EcoDistricts
http://ecodistricts.org/

- Scale: Neighborhoods
- Purpose: To create sustainable cities from the neighborhood up through community and individual action
- Target: Determined by group
- Wildlife: N/A
- Nature Definition: N/A
- Guidelines: The EcoDistricts Framework
  - Provides a road map of how to organize, develop, implement and monitor an EcoDistrict project
  - Has eight performance areas: Equitable development, health & well-being, community identity, access & mobility, energy, water, habitat & ecosystem function and materials management.

- Public Engagement: EcoDistrict teams are composed of neighbors, community institutions, businesses, city staff and utility providers.
- Success: Monitoring is performed and data collected from the EcoDistrict performance standards

USDA Forest Service

i-Tree
http://www.itreetools.org/

- Scale: Individual trees, parcels, neighborhoods, cities, states
- Purpose: Quantifying the environmental services that trees provide and the structure of the urban forest
- Target: Trees
- Wildlife: N/A
- Nature Definition: N/A
- Guidelines: There are nine different i-Tree tools that have an associated manual or guiding document. Each tool provides a wealth of information, including monetary estimates.
- Public Engagement: The software is peer-reviewed. Collaborators include: Forest Service, Davey Tree Expert Company, National Arbor Day Foundation, Society of Municipal Arborists, International Society of Arboriculture and Casey Trees
- Success: N/A

An image from i-Tree Design.
http://www.itreetools.org/applications.php

National Center for Ecological Analysis and Synthesis

Comparative Ecology of Cities
http://www.nceas.ucsb.edu/featured/aronson

- Scale: City-wide
- Purpose: Answer "What makes an urban biota 'urban'?" and "Are the patterns of urban biota and the processes that shape them the same across the world?"
- Target: N/A
- Wildlife: Existing bird and vegetation databases
- Nature Definition: N/A
- Guidelines: Using several factors to determine species distribution including regional context, urban scale and density, and local culture
- Public Engagement: Had three working groups sessions with participants from many universities around the world
- Success: Four goals:

- Compile and synthesize larger datasets of flora and avifauna of cities around the world
- Compare patterns and ecological responses of birds and plants in urban habitats
- Understand the social constraints on biodiversity in cities
- Develop recommendations for monitoring biodiversity in urban areas

International Living Future Institute

Living Building Challenge

http://living-future.org/lbc/about

- Scale: Building
- Purpose: To encourage the creation of Living Buildings, Landscapes and Neighborhoods in countries around the world while inspiring, educating and motivating a global audience about the need for fundamental and transformative change.
- Target: All aspects of building and site design
- Wildlife: N/A
- Nature Definition: Discussed in broad terms from energy to ecosystems
- Guidelines: Considered the most stringent green building certification; Seven performance areas: Site, Water, Energy, Health, Materials, Equity and Beauty
- Public Engagement: N/A
- Success: All criteria must be met for certification.

Living Building Challenge logo.
http://living-future.org/lbc

Royal Horticultural Society

It's Your Neighborhood

http://www.rhs.org.uk/Gardening/Community-gardening/Its-Your-Neighbourhood

- Scale: Country
- Purpose: To support communities to improve their quality of life through gardening.
- Target: Gardening space – both pots and land
- Wildlife: Wildlife and the gardener
- Nature Definition: Gardens
- Guidelines: Information Pack
  - Each groups' goals need to revolve around the three core pillars: Community Participation, Environmental Responsibility and Gardening Achievement
  - Britain in Bloom Impact Report - discusses benefits of the Britain in Bloom and It's Your Neighborhood initiatives from a triple-bottom-line perspective
- Public Engagement: Each group is started by and made up of locals. "In Bloom" experts visit each group to provide feedback and advice
- Success: N/A


Photo Credit: Mofinchum

Appendix B2 - Literature Review

Background

As a portion of the Inventory and Assessment phase of Nature in the City, a literature review was conducted for the economic, environmental and social values nature inparts.

Process

Staff from the Economic Health Office, Planning Department, and Utilities reviewed 43 peer-reviewed articles and 5 white papers to assess the latest research in their respective fields that might inform this project. These results are summarized on the following pages and individual studies are discussed beginning on page 112 of the document.

What's included in this document?

- A review of the scientific literature from a triple-bottom-line perspective - economic, environmental, and social.
- A detailed description of each of the articles are reviewed and included beginning on page 112 of this document.

Summary of Findings

There is a significant amount of literature related to how access to nature influences economic, social, and environmental outcomes.

From an *economic perspective*, the majority of the literature has focused on the economic benefits of residential property in close proximity to nature. Studies throughout the U.S. suggest that close proximity to nature commands between a 20-32% premium in home sales price.

From an *environmental perspective*, assessing urban wildlife habitat and biodiversity (the variety of species in an area) is a newer field of research. Many studies have found that overall species diversity tends to reach what is called an "intermediate disturbance" peak; in other words, as housing or development density increases, urban sensitive species tend to decline as urban adapted species increase. Then, at a certain point of development density, even the urban adapted species tend to decrease. More recently, scientists are examining how the effects of urbanization (which tend to be negative) can be lessened or even become positive for species diversity. This new area of research is exciting for communities like Fort Collins that are interested in enhancing urban biodiversity.

Perhaps best documented are the *social benefits* of access to nature in an urban environment. Spearheaded by leaders in the field such as Richard Louv, the mental, emotional, and physical benefits of nature are well-documented to the point where it is clear that nature in cities is critical to overall human well-being.

Economic Literature

The majority of previous studies focused on measuring economic impact based on property value and assessed whether being located near an open space or having specific features, e.g., trees, added value.

Open spaces like parks or recreation areas can have a positive impact on nearby residential property values, but the impact dissipates the further a home is located from that space. The size of the space

and characteristics of the neighborhood are also influential factors. One study found an approximately 20% statistically significant sales price premium for homes in a conservation development versus a traditional neighborhood development. Another effort found that homebuyers find open space in neighborhoods important and attractive with 66% of respondents indicating a willingness to pay for more embedded open spaces. The positive impact on home values is important for both developers and local governments to consider; higher property values translate into higher taxes and greater revenue for government, and developers benefit from higher sales prices, enhanced marketability, and faster sales/leases than conventional development.

Other features like trees, greenbelts, and bike paths were found to positively impact property values. A study in Boulder, Colorado found a $4.20 decrease in the price of a residential property for every foot one moves away from a greenbelt. Another effort looked at different income levels and willingness to pay to live near a bike path. Low-income persons would pay $1,091, medium-income persons would pay $1,369, and high-income persons would pay an additional $6,901 for a home purchase. Trees are also important to consider and a Portland, Oregon study found that an additional tree on a house's lot increased monthly rent by $5.62, and a tree in the right-of-way increased rent by $21.00.

These and other findings consistently show that there is monetary value to open spaces and natural features.

Open spaces like parks or recreation areas can have a positive impact on nearby residential property values, but the impact dissipates the further a home is located from that space.

Environmental Literature

A majority of the studies in this review looked at a specific taxonomic group and how it was affected by development along an urban gradient, e.g., from rural or protected areas to a suburban neighborhood to a more urban context. In general, all groups of wildlife (bumblebees, raptors, coyotes, butterflies, birds, spiders, rodents, deer, and bees) declined in either abundance or diversity with increasing intensity of development. Native diversity always declined while non-native species diversity often increased, to a certain level of urbanization. However, overall native and non-native species diversity declined with significant urbanization.

Several studies focused strictly on the urban environment and many have found that size of a site will influence overall diversity. For example, one study in Mexico found that species richness was positively correlated with area of the open space. Other studies, especially those focused on pollinators (butterflies and bees) have found that site quality can significantly influence overall abundance and diversity.

More recently, studies have begun to link social and ecological issues in one effort. A study in Phoenix compared income levels and residents' satisfaction with overall bird diversity. This study found that higher income areas tend to correlate with increased diversity and that resident satisfaction increased with overall diversity. Another Phoenix study found that species diversity was positively correlated with income, which

suggests a disparity in access to a quality natural experience depending on income levels in an area.

Some studies showed that loss of diversity could be partially mitigated by using native plantings and landscaping in development projects and residential yards. When acquiring or creating new green space, these studies suggest that efforts should be made to conserve existing native habitat, make the space as large as possible, have it connect to existing green areas and restore the habitat to as native as possible using a diversity of species. Additional research is needed within cities, especially to identify how site-scale restorations (or interventions) are influencing overall species diversity and abundance.

"For many urbanites, their primary interactions with nature occur in their front and back yards…Providing opportunities for positive experiences with the natural world leads to an increased sensitivity to ecological issues, an ability to incorporate sound ecological initiatives into public policy, and ultimately the ability and desire to conserve urban biodiversity..."
- Lerman and Warner 2011

Social Literature

Reviewed articles support nature incorporated into the growth of a city for social sustainability benefits such as mental health, children and nature, and overall human health.

Mental Health

Research indicates a strong relationship between positive mental health and exposure to natural places. Case studies show that stress and associated negative health issues are reduced when people have access to nature. Rates of lower depression and anxiety diminish as well. Longitudinal studies (studies conducted over a long period of time) indicate that communities with more natural areas have a population with better mental health, longevity and 'happiness'.

The relationship between mental health and nature is complex. Strong evidence shows that when people have access to parks, they exercise more and the studies are clearer about the mental health benefits from increased activity levels.

Children

By far, the most research in the last decade has been on the relationship between children and nature. Entire professional journals and organizations have bloomed since the 2005 book "Last Child in the Woods" by Richard Louv, where he examined the social impacts due to a decline in exposure to nature by children. There has been significant research in the realm of the importance of children's connection with nature and the healthy benefits of this as well as the importance for connections to the larger value of understanding and protecting natural resources. Studies suggest positive impacts from urban design of green spaces for many health outcomes, including cognitive health, learning, decreased attention-deficit hyperactivity disorder as well as positive impact on children with special needs that have access to "nature-based interventions".

Providing opportunities for urban and suburban children is especially important because they need places where they can be outdoors and physically active on a regular basis in their own neighborhoods. Children that have closer (e.g., within a 10-15 minute walk) access to parks and recreational resources are less likely to experience

significant increases in body mass index (BMI). Obese children that go to urban parks to walk and play more demonstrate weight loss.

Overall Human Health

Studies showed a variety of small benefits with a cumulative impact – such as recovering from surgeries faster, creating a sense of place and culture, making cities attractive and providing places for relaxation and increasing quality of life. Open spaces provide places for recreation, community gatherings and refuge from the urban environment. There are also studies that show that crime is reduced in cities with more natural settings.

The use of local parks, trails and other urban settings is more frequent than visits to national parks and other sites well known for exposure to nature. Given the health contributions and other societal benefits from exposure to daily natural environments, there are implications associated with health care cost savings. Proximity to nearby natural areas is important to get this benefit.

Acknowledgments

Researchers from Colorado State University, Wildlife Conservation Society, the US Forest Service and the City of Fort Collins recently completed a literature review of more than 550 peer-reviewed articles that studied the ecological, social, and economic impacts of residential development (Pejchar et al. 2014). That paper served as the basis for the articles reviewed in this study.

Staff also recognizes the Children in Nature Network in Larimer County for the extensive database on research they've compiled for the role of children in nature.


Photo Credit: Dusty Harms

Economic Literature

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Bowman and Thompson	Barriers to implementation of low-impact and conservation subdivision design: Developer perceptions and resident demand	2009	Landscape and Urban Planning	Iowa	Alternative development techniques, e.g., conservation and low-impact subdivision design, has not been used in Midwest because of barriers to implementation.	* Developers perceive consumer indifference and lack of willingness to pay for open spaces in residential design * Developers concerned about greater cost for creating alternative subdivisions * Consumers indicated open space in neighborhoods were important and attractive, and reported willingness to pay for more open spaces * Developers' perceptions of barriers should be mitigated by local planners through flexible standards and faster approval for alternative designs
Donovan and Butry	The effect of urban trees on the rental prices of single-family homes in Portland, Oregon	2011	Urban Forestry & Urban Greening	Portland, OR	Rental price of houses are affected by environmental amenities.	* An additional tree on a house's lot increased monthly rent by $5.62 * A tree in the ROW increased rent by $21.00 * Results are consistent with previous analysis of the effects of trees on sales prices of homes in Portland - suggests homeowners and renters place similar values on urban trees
Reichert and Liang	An economic analysis of real estate conservation subdivision developments	2007	The Appraisal Journal	Northeast Ohio	There is a relationship between appreciation rates between single-family conservation developments and more traditional developments.	* There is no statistically significant difference * Homebuyers in this area may prefer "private openness" - own a two-acre parcel that allows for some degree of openness or separation between houses, rather than have access to a large common open space * May be due to relatively inexpensive land prices and lack of homebuyer exposure to conservation development * These results contrast with results from Massachusetts, California, and Colorado where dramatic differences in land prices, incomes, and lifestyles prevail

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Bowman, Thompson and Colletti	Valuation of open space and conservation features in residential subdivisions	2007	Landscape and Urban Planning	Journal of Environmental Management	Homebuyers value embedded conservation features in residential areas.	* Higher 5-year appreciation rate for conservation vs. standard subdivision design * Well-integrated conservation features (e.g., protected stream corridors) within subdivisions have positive effect on home prices * 66% of all respondents indicate willingness to pay for more embedded open space * Maximum willingness to pay related to: income, gender, desired level of open space, and concern about urban development * Consumer demand and willingness to pay for conservation subdivision design are positive and shouldn't be considered a barrier to implementation
Earnhart	Using contingent-pricing analysis to value open space and its duration at residential locations	2006	Land Economics	Lawrence, Kansas	There is a relationship between the duration of open space (chance of development or permanently protected) and what individuals would be willing to pay.	* Prairie-type open space with uncertain development adds no value to a housing location (may be due to negative externalities associated with uncertain future development pattern) * Permanently protected prairie carries a value of $5,066 (5% of total housing value) * Value rises as the risk of development falls * Value is not dependent on socioeconomic characteristics of the household - relative to low-income households, however, high-income households are willing to pay more in absolute terms

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Active Living Research	The economic benefits of open space, recreation facilities and walkable community design	2010	Activeliving research.org	Research Synthesis	N/A	* Open space such as parks and recreation areas can have a positive effect on nearby residential property values, and can lead to proportionately higher property tax revenues for local governments (provided municipalities are not subject to caps on tax levies) * The economic impact parks and recreational areas have on home prices depends on how far the home is from the open space, the size of the open space and the characteristics of the surrounding neighborhood * Open space in urban areas will increase the level of economic benefits to surrounding property owners more than open space in rural areas * Open space, recreation areas and compact developments may provide fiscal benefits to municipal governments * Compact, walkable developments can provide economic benefits to real estate developers through higher home sale prices, enhanced marketability and faster sales or leases than conventional development

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Wolf	Economics and public value of urban forests	2004	Urban Agriculture Magazine	Research Synthesis	N/A	* An urban forest is a resource system that can be cultivated and stewarded on all lands within a municipality (public and private, and all socio-economic zones). * Urban forestry involves an ecosystem approach of urban tree management encompassing long-term planning, interdisciplinary professional coordination and local participation. Ultimately, the aim is to secure the health and vitality of forest resources, thereby sustaining delivery of benefits for current and future generations of urbanites.
Correll, Lillydahl, Singell	The effects of greenbelts on residential property values: some findings on the political economy of open space	1978	Land Economics	Boulder, CO	Under certain circumstances price differentials may be used to evaluate the quasi-public good provided by greenbelts.	* There is a $4.20 decrease in the price of a residential property for every foot one moves away from the greenbelt. However, all properties in the area are affected by the area-wide public good. * Average value of properties adjacent to the greenbelt would be 32% higher than those 3,200 walking feet away. * Neighborhood value of open space as reflected by an increase in nearby property values depends critically on the ability of private developers and urban planners to integrate neighborhood development and access to open space. * As the public good of preserved open space becomes more common in the region, it's expected that intra-area property value effects will diminish; however, the collective value of greenbelts as an important component of maintaining quality urban life will continue.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Shiftan	Peoples' evaluation of urban and suburban characteristics: a residential stated preference model	2003	International Journal of Transport Economics	Portland, OR	There is significance to different urban and residential characteristics, including accessibility by different modes, to residents' willingness to pay for such characteristics.	* Low-income persons are willing to pay $1,091.70 to be near a bike path, medium-income is $1,369.00, high-income is $6,901.30 for a home purchase. * Low/medium-income renters willing to pay extra $5.60/month, high-income $15.70/month. * However, located near a bike path was surpassed by significant majority of other characteristics, with the exception of price of shopping locally relative to the area average, walking time to local shops in minutes, and travel time to work by public transportation in minutes.
Fausold and Lilieholm	The economic value of open space	1996	Land Lines	Research Synthesis	N/A	* Open space possesses intangible values that are above and beyond any calculation of monetary value. * On a strictly financial basis, the cost of providing public services is more than twice as high for residential development as for commercial development or open space. * Proximity to preserved open space enhances property values, especially if the space is not intensively developed for recreation, and if it's carefully integrated with a neighborhood. This enhanced value is important to the local property tax base because it offsets the effects of open space, which is usually tax-exempt or taxed at a lower rate. * Lands valued for open space are part of a working landscape vital to the production of goods and services that are valued and exchanged in markets, e.g., animal products from pasture and grazing lands.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Hannum et. Al.	Comparative Analysis of Housing in Conservation Developments: Colorado Case Studies	2012	The Journal of Sustainable Real Estate	Colorado	The location of a property within a Conservation Development (CD) constitutes an environmental amenity with a positive impact on the value of that property.	* There are significant differences in prices for homes in CD projects vs. 35-acre, large lot, and unregulated CD projects. * There are significant differences in prices for homes in CD projects across the five CO counties. * There are significant differences in the total number of sales and transactions between CD projects and non-CD projects. * The impact of additional privately-held land is only 9 cents/sq. ft. * There is a significant sales price premium (approximately 20%) for homes located in CDs relative to comparable non-CD projects, while controlling for housing, time, and location factors.

Environmental Literature

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Ahrne et al.	Bumble Bees (Bombus spp) along a Gradient of Increasing Urbanization	2009	PLoS ONE	Stockholm, Sweden	Bumble bee abundance and diversity was studied at allotment gardens across an urban gradient	• Bumble bee diversity decreases with an increase in urbanization (measured by impervious surface). • Bumble bee abundance is more affected by characteristics of a specific site, such as, flower abundance or plant species richness. • Gardens provide forage for a large number of species, but the surround landscape context influences how many species will be present at a given site. • To support the high number of bumble bee species, urban planners must preserve and create a variety of natural spaces, and plan the larger landscape to maintain pollination services	Inner city of Stockholm to periurban areas.
Berry et al.	Abundance of diurnal raptors on open space grassland in an urbanized landscape	1998	The Condor	Boulder, CO	Point counts of diurnal raptors were conducted in Open Space sites to compare abundance and species to nearest development.	• Effects of urbanization on raptors are species dependent. • Four species (Bald Eagle, Ferruginous Hawk, Rough-legged Hawk, Prairie Falcon) were negatively correlated with the amount of urban development. The first three species were positively correlated with proximity to prairie dog colony. • American Kestrels and Red-tailed Hawks were uncorrelated with urbanization. • Large open spaces with little urbanization (<5-7%) and prairie dog towns need to be protected if we want to keep our diversity of raptors.	Counts conducted all in Boulder Open Space. Surrounding land use contained varying amounts of development.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Blair and Launer	Butterfly diversity and human land use: species assemblages along an urban gradient	1995	Biological Conservation	Palo Alto, CA	The distribution and abundance of butterfly species was monitored at six sites along an urban gradient.	• Species richness and Shannon diversity of butterfly species was highest at moderately disturbed sites. • Relative abundance decreased from most natural to most urban sites. • Presence of species thought to best represent the pre-development butterfly community, decreases as sites become more urban. • Any amount of urbanization reduces the native assemblage of butterfly species. • Concentrated development should be utilized whenever possible to leave as much land undisturbed as possible.	Six sites: nature preserve, recreational area, golf course, residential neighborhood (single family detached), office park and business district.
Bock et al.	Patterns of Rodent Abundance on Open-Space Grasslands in Relation to Suburban Edges	2002	Conservation Biology	Boulder, CO	Rodents were live-trapped in 65 grassland plots along Boulder Open Space lands. Capture rates were compared to habitat type, percent of surrounding use urbanized and proximity to suburban edge.	• Native rodents were captured more often on interior plots than edge plots. • For all native species, landscapes with less than 10% urbanization had the highest capture rates. • Minimizing urban or suburban edge in relation to the amount of interior space in natural areas is important for conserving native grassland rodents.	Rodents all captured in Boulder Open Space. Capture sites moved from open grassland to suburban edge.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Bock et al. Carbo-Ramirez and Zuria	The value of small urban greenspaces for birds in a Mexican city	2011	Landscape and Urban Planning	Pachuca, Hildago, Mexico	Bird communities were measured in 19 small greenspaces (<5 ac) in an urban environment. Bird abundance was compared to area, vegetation, impervious surface, and human disturbance	• Species richness was positively correlated with greenspace area and herbaceous plant height. • Species richness had a negative relationship with percentage of surrounding area covered by buildings. • Greenspace size in cities must be maximized to support rich and abundant communities. • Greenspace should contain more areas that are not mowed and have complex vegetation cover. • The landscape matrix surrounding greenspaces needs to be considered for amount of vegetation cover and connectivity	All sites located in the city. Three different land uses: public parks, gardens and road strips.
Collinge et al.	Effects of Local Habitat Characteristics and Landscape Context on Grassland Butterfly diversity	2003	Conservation Biology	Boulder, CO	Butterfly species abundance and composition was recorded in 66 grassland plots. Observations were analyzed against grassland type, quality of grassland and surrounding land use.	• Grassland type was the primary determinant of species richness and composition. • Habitat quality secondarily affected butterfly community diversity. • Landscape context did not significantly predict butterfly species composition. • Important to preserve and enhance a variety of high quality grassland types	All plots were located in Boulder Open Space. 66 plots were adjacent to some form of human activity, such as residential or commercial use. 36 plots were surrounded by native habitat.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Germaine et al.	Relationships among breeding birds, habitat, and residential development in greater Tucson, Arizona	1998	Ecological Applications	Tucson, AZ	Breeding bird surveys were complete on 334 plots along an urban gradient in Tucson, AZ. Bird species and guilds were compared to habitat, vegetation and surrounding land use.	• Housing density explained a majority of variation in species richness for both non-native (positive correlation) and indicator species (negative correlation) guilds. • For the native species group, upland Sonoran vegetation cover had a positive correlation and distance from undisturbed washes had a negative correlation. • To retain the native species: native vegetation should be used, riparian and other vegetation corridors must be protected and patches >2.5ac of native vegetation need to be retained and interspersed throughout the urban matrix. • Native bird species have strongly differing habitat requirements than non-native species.	The 334 plots were located in Tucson metropolitan area and ranged from undisturbed natural to highly developed. Housing density ranged from 0-7.9 houses/ac.
Grubbs and Krausman	Use of Urban Landscape by Coyotes	2009	The South-western Natu-ralist	Tucson, AZ	Movements of radio-collared coyotes were monitored to determine home range size and use of habitat based on land-use categories.	• The average home range size for a coyote was 26.8 ± 5.1 km2 (approx.10mi2 ± 2mi2). • Washes, medium-density residential and low-density residential land uses were utilized most frequently by coyotes. • However, high-density and commercial areas were the land uses that had the most use at night. • Diverse land uses and available resources allow coyotes to persist in an urban environment. • Coyotes in this area shifted their behavior from crepuscular to nocturnal.	An urban pack of coyotes were tracked in Tucson. Low density: < or = 0.4 residences/ac; Medium density: 0.8-2.8; High density >2.8

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Hope et al.	Socioeconom-ics drive urban plant diversity	2003	PNAS	Phoenix, AZ	Plant diversity was measured at 204 sites across the Phoenix metropolitan area. Species richness was compared to land-use, distance from city center and various demographic variables	• Plant diversity was best explained by land-use, elevation (positive), median family income (positive), and whether the site had ever been farmed (negative). • Humans remove resource limitations which allow for a higher diversity of species to coexist. • Humans who have more monetary resources can create more diverse habitats.	Plots were located in Phoenix metropolitan area and moved from the city to agriculture to undeveloped native desert land.
Kaye et al.	Carbon fluxes, nitrogen cycling, and soil microbial communities in adjacent urban, native and agricultural ecosystems	2005	Global Change Biology	Fort Collins, CO	Carbon fluxes, nitrogen cycling and soil microbial community structure was measured across four habitats: urban lawns, corn, wheat-fallow and shortgrass steppe.	• Aboveground net primary production was four to five times greater for lawns than wheat or shortgrass, but significantly lower than corn. • Soil respiration and total below ground C allocation were both 2.5 to 5 times greater for lawns than any other land-use type. • Land-use type had a large impact on microbial biomass, but only a small impact on relative abundance of taxonomic groups of microorganisms. • Urbanization enhances C cycling rates that are large enough to alter regional C budgets	Four habitats were assessed: urban lawns, corn fields, wheat-fallow and shortgrass steppe.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Kinzig et al.	The effects of Human Socioeconomic Status and Cultural Characteristics on Urban Patterns of Biodiversity	2005	Ecology and Society	Phoenix, AZ	Bird and plant species were recorded at 16 different parks located throughout Phoenix. This data was compared to the socioeconomic status of the surrounding neighborhood.	• Median family income is the most effective variable in explaining neighborhood plant diversity. • The addition of using socioeconomic status in models increased the models' ability to predict both plant and bird diversity. • Lower income neighborhoods have less diversity. • This has environmental justice implications and could affect how low-income citizens interact with and build a relationship with nature. • Cities are not irrelevant for conservation and the better we understand how humans affect biodiversity the better we can plan to keep it in our cities.	All sites were located on parks in Phoenix.
Lerman and Warren	The conservation value of residential yards: linking birds and people	2011	Ecological Applications	Phoenix, AZ	Native bird population was analyzed against socioeconomic factors, landscaping in residential yards, and urban gradient measures in Phoenix.	• Native species increased in neighborhoods with desert landscaping designs, neighborhoods closer to large desert tracts and higher-income neighborhoods. • Residents' satisfaction with bird diversity was positively correlated with actual bird diversity. • Residential yards have the potential to support and increase urban biodiversity when landscaped with native plant species.	Forty neighborhoods in Phoenix that ranged from the 'fringe' to 'urban core' were surveyed. Urban gradient measured by distance to desert, housing age and % soil.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Loss et al.	Relationships between avian diversity, neighborhood age, income, and environmental characteristics of an urban landscape	2009	Biological Conservation	Chicago, IL	Bird communities were compared to environmental characteristics, as well as, neighborhood age and income.	• Housing age was strongly related to avian species richness, with newer neighborhoods supporting more species. • Income was positively related to exotic species and negatively related to native species. • Total richness was highest in sites with undeveloped patches and mixed land cover types; richness decrease with distance from natural areas larger than 0.4 mi2. • Bird diversity is enhanced by both small patches of nature as well as close proximity to larger patches. • It is important to understand how social factors also affect biodiversity, since it cannot be entirely accounted for by natural features.	All sites were located in the Chicago metropolitan area. Sites were classified as urban open space, outer suburban, inner suburban or high density urban. Urban gradient was measured by % undeveloped and housing density - which was measured by using 2000 Census data.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Maestas et al.	Biodiversity across a Rural Land-Use Gradient	2003	Biodiversity and Land Use	Larimer County, CO	Bird, meso-predator and plant communities were evaluated across an urban gradient from nature reserves, cattle ranches to exurban developments.	• Seven, human commensal or tree nesters, bird species had their highest density on exurban developments. • Six, ground and shrub nesters, had their highest densities on ranches or reserves. Coyotes were most frequently detected on ranchlands. Ranches had plant communities with higher native species richness and lower non-native species richness and cover than the other two land uses. • Ranches are important for protecting biodiversity. • To make significant conservation impacts, future efforts may require less emphasis on reserves and more on private lands.	Sites were located in nature reserves, cattle ranches or exurban development.
McIntyre and Hostetler	Effects of urban land use on pollinator (Hymenoptera: Apoidea) communities in a desert metropolis	2001	Basic Applied Ecology	Phoenix, AZ	Species richness and abundance of pollinator communities was compared to four types of urban land use in Phoenix.	• Richness and abundance of bees was lower in residential areas compared to desert areas. • Desert areas on the fringes of town had the highest overall diversity. • Residential yards with xeriscape had more diversity of bees than yards with turf lawns. • Types of habitat features seemed to influence the number and type of bees present. • The use of native landscaping can help preserve bee populations if a diverse set of plant types are used.	Sites were in three land use types: residential yards, urban desert-remnant parks, and natural desert parks on the fringe of the metropolitan area.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Mills et al.	Effects of Urbanization on Breeding Bird Community Structure in southwestern Desert Habitats	1989	The Condor	Phoenix, AZ	Bird density and diversity were compared across 34 neighborhoods in Phoenix. Researchers looked for correlations between the bird community, vegetation characteristics and urban land use characteristics.	• Native bird species richness and diversity were strongly correlated with native plant volume. • Density of exotic birds was correlated with correlated exotic plant volume. • Vegetation factors explained more variation than housing density. • Breeding bird densities are affected by critical resources. • Native bird populations can be retained in urban developments if native plants are used.	Sites were located in native desert or low, medium or high density housing. Housing density ranged from 0 - 1.44 houses/ac.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Nelson and Nelson	Bird and Butterfly communities associated with two types of urban riparian areas	2001	Urban Ecosystems	Denver, CO	The distribution of birds and butterflies were evaluated in two types (native or lawn) of urban riparian areas in Denver, Colorado.	• Bird abundance was similar at both sites but consisted of different assemblages. • Butterfly abundance was less at lawn sites. • Bird and butterfly species richness was 44% less at highly modified riparian sites. • Bird and butterflies respond to habitat changes in different ways. • Open lawn urban habitats should be discouraged. • Wooded riparian areas should be buffered with undeveloped land around them rather than just greenbelts and sport fields.	Two types of sites, all located within Denver: relatively natural areas containing native woody vegetation, or highly modified with trees and shrubs removed and planted with lawn grass.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Shochat et al.	Urbanization and spider diversity: influences of human modification of habitat structure and productivity	2004	Ecological Applications	Phoenix, AZ	Six habitat types were sampled for spider abundance and diversity across an urban gradient in Phoenix, Arizona. Spider composition was compared to habitat type and productivity.	• Agriculture fields and mesic-yards were the most productive. • Spider abundance was highest at these sites, but had low species diversity. • Sider diversity decreases as sites become more urban, but abundance increases. • Changes in habitat structure and productivity change community structure, as urban or agriculture habitats favor one or a few taxa over others. • Native plantings and conserving remnant natural habitats is needed to keep a diverse community of spiders.	Six habitat types within the Phoenix metropolitan area: desert parks, urban desert remnants, industrial, agricultural, and residential yards.
Smith and Wacob	Trends associated with residential development in riparian breeding bird habitat along the Snake River in Jackson Hole, WY, USA: Implications for conservation planning.	2006	Biological Conservation	Jackson Hole, WY	Bird counts were performed across an urban gradient along the Snake River in Jackson Hole, Wyoming. Bird communities were compared to habitat variables at three spatial scales	• Overall species richness and diversity declined with increasing residential development. • Food generalists, ground gleaners and avian nest predators all increased with increasing development. • Residential development within riparian habitats negatively influences bird communities. • Preserving forest structure may benefit a few bird species, but will not conserve a diverse population. • Minimizing fragmentation associated with residential development should be the focus.	Point counts were done in four different areas: Grand Teton NP, low, medium or high density development. (1–15, 16–50, and 50–115 houses within 545yds of the patch, respectively).

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings	Urban Gradient
Strohbach et al.	Are small greening areas enhancing bird diversity? Insights from community-driven greening projects in Boston	2013	Landscape and Urban Planning	Boston, MA	Bird communities were compared at small greensites, urban sites and large parks in Boston, Massachusetts to help understand how small green areas affect bird biodiversity.	• Large parks have a distinct and rich bird population. • Other sites were similar to each other, but small greensites had higher species richness than urban sites. • Patch size had explained the most variation and tree cavities to a lesser extent. • Small green areas should focus on preserving, increasing and connecting existing green space.	Three different types of sites, all within Boston: small 'greening' projects, urban sites or large parks.
Vogel	Response of deer to density and distribution of housing in Montana	1989	Wildlife Society Bulletin	Bozeman, MT	Deer populations were monitored along an urban gradient in Bozeman, Montana. Deer use was compared to housing density.	• The number of deer decreases with housing density. • Farmhouses were avoided less than other houses. Nocturnal activity increased with more dense housing. • White-tailed deer became more dominant (over Mule deer) with increasing development density. • It is better to increase the housing in areas where development already exists than to develop new areas.	The 21 sites were located at either: low, medium, high or very high development levels. Housing density was measured by houses/km^2.

Social Literature

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Aspinall P, Mavros P, Coyne R, Roe J.	The urban brain: analyzing outdoor physical activity with mobile EEG.	2013	Journal of Sports Medicine	Unavailable	The study analyzed how a 25-minute walk in different areas (urban, green space, or a busy street) affects emotional experiences.	This study has implications for promoting urban green space as a mood enhancing environment for walking or for other forms of physical or reflective activity.
McDonnell, Mark and Hahs, Amy	Four Ways to Reduce the Loss of Native Plants and Animals from Our Cities and Towns	2014	The Nature of Cities	N/A	N/A	Key issues related to the creation of management actions to reduce future local extinctions of plants and animals in our cities and towns include (1) link management actions with ecological knowledge, (2) protect existing natural habitats, (3) restore degraded habitats, and (4) integrate remnant patches into the urban landscape.
Diana E Bowler, Lisette M Buyung-Ali, Teri M Knight, Andrew S Pullin	A systematic review of evidence for the added benefits to health of exposure to natural environments.	2010	BMC Public Health	Numerous	Research synthesis assesses how exposure to natural environments affects human health.	This study is suggestive that natural environments may have direct and positive impacts on well-being, but support the need for investment in further research on this question to understand the general significance for public health.
Roberta Kwok	Do parks boost long-term mental health?	2014	Conservation Magazine	United Kingdom	Are there mental health benefits from moving to an area with more green space? Can those benefits be sustained?	An article about a team that examined survey data from 1,064 people in the UK who had moved between 1991 and 2008. About half had moved to a neighborhood with more green space, and the other half had moved to a less green area. The data included participants' evaluations of their moods for two years before and three years after the move. The people who moved to a greener area had better mental health in the three years following the move.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Richard A. Fuller, Katherine N. Irvine, Patrick Devine-Wright, Philip H. Warren and Kevin J. Gaston	Psychological benefits of green space increase with biodiversity	2007	Biology Letters, The Royal Society	United Kingdom	Can open space users accurately assess areas with higher and lower species diversity? How do psychological benefits correlate with increased species diversity?	This study demonstrates positive psychological benefits increase with the species richness of urban greenspaces. Greenspace users can more or less accurately perceive species richness depending on the taxonomic group in question. These results indicate that successful management of urban greenspaces should emphasize biological complexity to enhance human wellbeing in addition to biodiversity conservation.
Kristen Malecki	Exposure to neighborhood green space and mental health: evidence from the Survey of the Health of Wisconsin	2014	International Journal of Environmental Research and Public Health	Wisconsin	The researchers assessed how levels of vegetation in a neighborhood affect mental health.	The study combines mental-health data from the Survey of the Health of Wisconsin (SHOW) and Landsat 5 satellite data from July 2009 that analyzed how much vegetation was present in each of the SHOW census blocks. They found that across all strata of society, people who lived in a neighborhood with less than 10 percent tree canopy were much more likely to report symptoms of depression, stress and anxiety.
Peter P Groenewegen, Agnes E van den Berg, Sjerp de Vries and Robert A Verheij	Vitamin G: effects of green space on health, well-being, and social safety	2006	BMC Public Health	Netherlands	To document and understand the relationship between the amount and type of green space and human health and to suggest policy solutions	Looking out on and being in the green elements of the landscape around us seem to affect health, well-being and feelings of social safety. This article discusses the design of a research program on the effects of green space in the living environment on health, well-being and social safety.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Ann P. Kinzig, Paige Warren, Chris Martin, Diane Hope, and Madhusudan Katti	The Effects of Human Socioeconomic Status and Cultural Characteristics on Urban Patterns of Biodiversity	2005	Ecology and Society	Phoenix, Arizona	To assess how socioeconomic factors and cultural characteristics influence biodiversity.	Species diversity (specifically plants and birds) increased with increasing affluence in an area, e.g., they found 28 avian species in high-income parks whereas only 18 species were observed in low-income parks.
Frances E. (Ming) Kuo	Parks and Other Green Environments: Essential Components of a Healthy Human Habitat	2010	National Recreation and Park Association	N/A	This white paper summarizes the research from the impacts of open space on human health.	Parks and other green environments are an essential component of a healthy human habitat.
Ian Alcock, Mathew P. White, Benedict W. Wheeler, Lora E. Fleming, and Michael H. Depledge	Longitudinal Effects on Mental Health of Moving to Greener and Less Green Urban Areas	2013	Environmental Science & Technology	Great Britain	This study used panel data to explore three different hypotheses about how moving to greener or less green areas may affect mental health over time.	Individuals who move to areas with more green space had significantly better mental health (measured for two years before a move and three years after the move). Moving to less green areas worsens mental health initially, but then it returns to the baseline.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
Jenny Veitch, Ph.D. & Anna Timperio, Ph.D. & David Crawford, Ph.D. & Gavin Abbott, G. Dip. Pysch. & Billie Giles-Corti, Ph.D. & Jo Salmon, Ph.D.	Is the Neighbourhood Environment Associated with Sedentary Behaviour Outside of School Hours Among Children?	2011	The Society of Behavioral Medicine	Melbourne, Australia	This study aims to examine the associations between public open spaces (POS), parent perceptions of the neighborhood and children's sedentary behaviors.	Neighborhood features appear to positively and negatively influence children's sedentary behaviors, highlighting the complexity of urban planning on behavior.
Jennifer Wolch, Michael Jerrett, Kim Reynolds, Rob McConnell, Roger Chang, Nicholas Dahmann, Kirby Brady, Frank Gilliland, Jason G. Su, Kiros Berhane	Childhood obesity and proximity to urban parks and recreational resources: A longitudinal cohort study	2011	Health & Place Journal 17	California	The objective of the research was to assess how proximity to parks and recreational resources affects the development of childhood obesity through a longitudinal study.	When a park is within 500 m of a child's home, there is a significant decrease in BMI (body mass index), and the decrease was more significant for boys. Better access to open space has demonstrable effects on BMI.

Authors	Title	Date	Publication	Location	Hypothesis	Key Findings
NPR news article	To Make Children Healthier, a Doctor Prescribes a Trip to the Park	2014	NPR news	N/A	This is a news report about encouraging obese children to go to urban parks to walk and play more.	A doctor in Washington D.C. received funding by the National Recreation and Park Association, the National Environmental Education Foundation and the American Academy of Pediatrics to come up with an app to better find nearby parks and open spaces which can also be linked to patient records.
Jessica M. Clement, Antony S. Cheng	Using analyses of public value orientations, attitudes and preferences to inform national forest planning in Colorado and Wyoming	2011	Applied Geography Journal	Colorado, Wyoming	This paper presents results and discusses implications from social surveys conducted on three national forests in Colorado and Wyoming.	The results indicate that although respondents identified aesthetic, biodiversity, future and recreation value orientations as most important, there are also surprising linkages between value orientations, attitudes and preferences towards forest uses and policy options associated with specific geographic and socio-economic contexts and conditions.
Bibliography	Children & Nature Worldwide: An Exploration of Children's Experiences of the Outdoors and Nature with Associated Risks and Benefits	2012	IUCN Commission on Education and Communication and Children and Nature Network	Numerous	Summarizes the literature on children's connections with nature.	Evidence base for the importance of children's connections with nature. Bibliography of studies, joint publication
The Trust for Public Lands	The Benefits of Parks: Why America Needs More City Parks and Open Space	2006	The Trust for Public Lands	Numerous	Summarizes the benefits of parks and open space.	The Trust for Public Lands publication on City parks and open space improve our physical and psychological health, strengthen our communities, and make our cities and neighborhoods more attractive places to live and work.

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Appendix B3 - Outreach Summary

Background

In 2014, the City launched Nature in the City to ensure that, as our community grows to its buildout population, all residents have access to high-quality, natural spaces close to where they live and work. Whether it's a formal natural area, neighborhood park, or just the open space behind your house, our primary objective is to create and maintain access to nature within Fort Collins.

Executive Summary

More than 1,000 residents have engaged in the dialogue around how to provide access to nature close to home as our community urbanizes.

Key themes heard during Phase I outreach were:

- Find opportunities to (1) escape from the urban environment, (2) find beauty, peace or opportunities for relaxation, (3) support wildlife, plants, and trees, and (4) engage in personal or group/family exercise or play.
- Maintain our current policies, e.g., Parks and Trails Master Plan and Natural Areas Master Plan.
- Continue to increase connectivity across the City, both for people and for wildlife.
- Identify ways to acknowledge the multiple values ditches provide.
- Be cognizant of additional costs efforts like these may add.
- Coordinate this effort with others, e.g., Climate Action Plan, Housing Affordability, etc.
- Provide better wayfinding to nature.
- Address disparities in access across the City.

Nature in the City Public Engagement

Boards and Commissions:

- Commission on Disability
- Economic Advisory Comission
- Land Conservation & Stewardship Board
- Natural Resources Advisory Board
- Parks and Recreation Board
- Planning and Zoning Board
- Senior Advisory Board

Public Engagement:

- Launched Project Website
- 15-member Citizens Advisory Committee
- Idea Lab Question
- Trans. and Planning Joint Open House
- Visioning Workshop
- CityWorks 101 Participants
- Air Quality Open House
- Phase I Project Survey
- Wikimap
- CSU Natural Resources Class
- Partnership with CSU Graduate Level Landscape Architecture Class
- Chamber Local Legislative Affairs
- Fort Collins Board of Realtors
- Fort Collins Museum of Discovery
- NoCo Economic Development Commission
- Drake Road Farmers Market
- Convention and Visitors Bureau
- Built Environment Work Group
- Video – Project Overview on Full Circle show
- Fort Collins Housing Authority Property
- Common Ground Food School
- IBMC
- Teaching Tree Early Childhood Center
- South Fort Collins Business Assoc.
- North Fort Collins Business Assoc.
- Riversong School
- La Familia
- Rocky Mountain High School
- Partnership with CSU Senior-Level Wildlife Management Class
- Video “Nature in the City: What does this project mean to you?”
- Larimer County Farmers Market
- Sustainable Living Fair
- Project newsletter
- Instagram Photo Contest
- Visual Preference Survey
- All Boards & Commissions Meeting
- City Council Work Session
- Social media and online content
- Phase II Project Open House
- Interdisciplinary Graduate Level Seminar at Colorado State University

Public Engagement Feedback

Boards and Commissions

Since 2013, numerous City Boards and Commissions have been engaged in the dialogue around Nature in the City. Staff met with City Boards and Commissions either during the All Board and Commission Meeting or during their individual board meetings. Specific feedback from these entities is as follows:

All Boards and Commission Meeting

On October 27, 2014, staff met with 13 Boards and Commissions via the "All Boards and Commission Meeting" organized by the City Clerk's Office. During this meeting, Board and Commission members provided feedback on the Visual Preference Survey utilized to inform the project's design guidelines and initial feedback on the proposed policies for the Strategic Plan.

The policies most supported during the meeting were as follows:

- Coordinate Nature in the City with future City Planning updates
- Ensure high-quality access to nature for all of the city's residents
- Prioritize sidewalk or transportation infrastructure
- Continue current policies
- Land Use Code changes for all developments
- Encouraging open space improvements at the neighborhood scale
- Address connectivity

The policies with the least amount of support were as follows:

- Consider developing carbon sequestration goals
- Land Use Code changes for multi-family developments
- Citywide metric for ecosystem services

Commission on Disability

The Commission discussed how open spaces are often inaccessible. Commissioners noted the provisions outlined in the Poudre River Downtown Plan for accessibility for all users and encouraged staff to explore other opportunities for providing access to nature that was accessible. The Commission also discussed the need for an off-leash dog area that was less formal than existing dog parks.

Economic Advisory Commission

The Commission generally supported the draft plan and encouraged staff to develop a financing plan that outlines how individual programs and projects will be implemented.


Photo Credit: Chirpchick

Land Conservation and Stewardship Board

The Board expressed general support for the project and requested staff return if there is a specific project the Board could support. The Board also discussed funding for this effort and how funding could be identified that would be in addition to the existing open space sales taxes.

Natural Resources Advisory Board

The Board has identified Nature in the City as one of the key projects in their 2014 Work Plan. Feedback from the Board has focused on how to mainstream Nature in the City into other City programs, e.g., parks and stormwater. Additional feedback has included how to consider the services provided by nature, the need to consider West Nile Virus with the implementation of this planning effort, and how we increase biodiversity across the City.

Parks and Recreation Board

The Board expressed an interest in this project and noted specific parks where nature is abundant, e.g., Indian Hills. The Board expressed an interest in participating in the living wall demonstration project. The Board also asked staff to be clear on the costs of implementing this project and including other spaces in the mapping effort, e.g., HOA open spaces.

Planning and Zoning Board

Staff met quarterly with the Planning and Zoning Board. In concurrence with the Parks and Recreation Board, P&Z recommended including many types of open space within the project maps, e.g., schools and urban farms. The Board also helped prioritize the

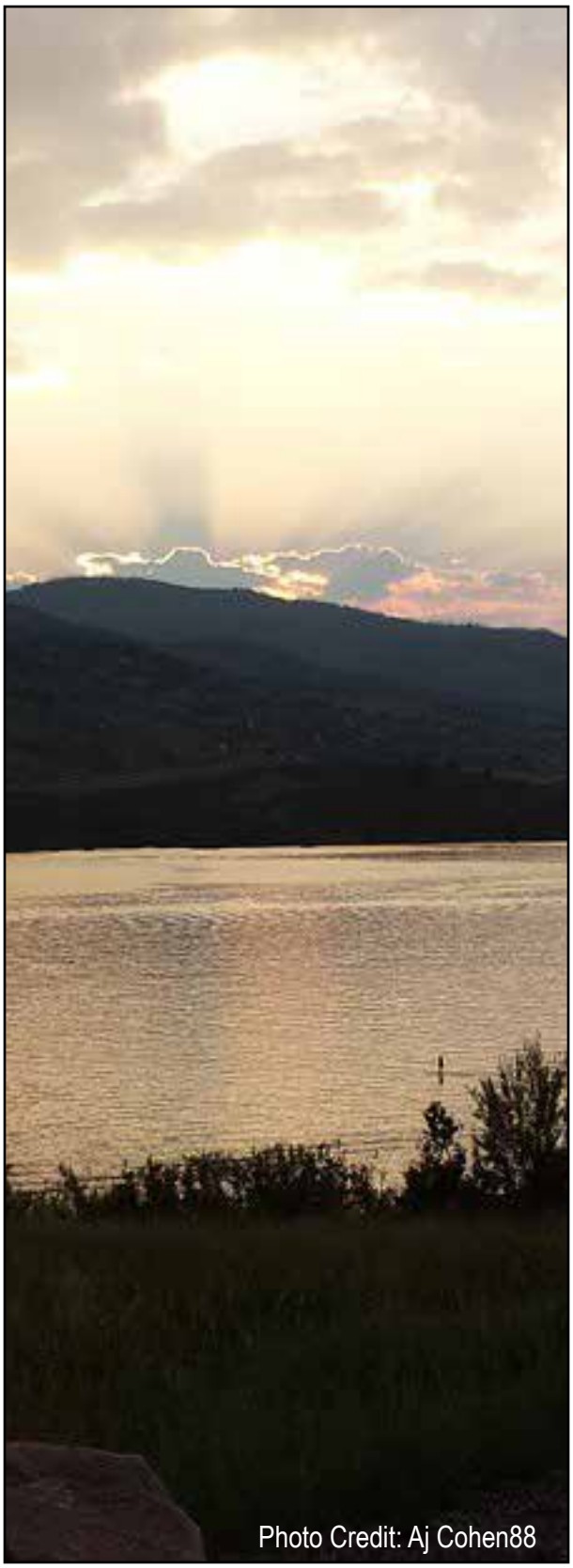


Photo Credit: Aj Cohen88

Visioning Workshop

On March 26, 2014 at the Lincoln Center, more than 60 Fort Collins residents participated in a community issues forum sponsored by the City of Fort Collins and the Colorado State University Center for Public Deliberation. The forum focused on two topics: (1) Nature in the City, and (2) an update on the water restrictions plan.

The participants at the forum were placed in individual round tables with 4-7 other participants and a facilitator from the Center for Public Deliberation (CPD). Martín Carcasson, the Director of the CPD, facilitated the process, with assistance from City staff, and connected to the two topics. The forum was organized in several different sessions that had the participants respond to gathered information and various prompts.

Participants prioritized the following values for this project to emphasize:

1. Opportunities to escape from the urban environment
2. Places that are convenient/close to home
3. Wildlife opportunities (for both intrinsic value and for viewing)

An interesting tension was identified by CSU in the discussions and written comments among participants that preferred "nature" to be as natural, wild, and "minimally landscaped" as possible, while others preferred their experience with nature to be more managed and manicured.

For example, for some, concrete trails were a negative, but for others, such man-made features were important to provide access and a quality experience. For some, having natural spaces maintained was important; others preferred more of the wild look. For some, "critters" and bugs were a positive, for others, not so much.

Another difficult tension that may arise is between the focus on tranquility and open spaces, with the reality that the spaces will likely get busier and busier as the city grows. The more popular a spot becomes the less desirable it may become for some as well.

Lastly, Fort Collins is known for being a wonderful town for both bicycling and dog enthusiasts, and the City's Parks and Natural Areas are critical to both bicyclists and dog-owners. On the other hand, problems with bicyclists and dogs were the most common concerns with Natural Areas when participants were queried.

Regardless of which group staff spoke with, the number one issue brought up was connectivity – both for people and for wildlife.

Visioning Workshop Participants (Photo by Martin Carcasson)

Business Community Outreach

Staff met with numerous individuals and groups from the business community to understand how access to nature attracts businesses and employees to the community and whether proximity to nature increases property or rental values. Staff also sought general feedback about the project from the business community.

Feedback generally focused on how Fort Collins' commitment to nature has paid off – the City is attractive and provides a high quality of life. Access to nature does help businesses recruit and retain employees. Anecdotal information suggests a premium of approximately 10 percent for lots adjacent to open space.

The business community asked staff to be mindful of adding costs to the development review process. They asked staff to look for ways that partnerships could be increased to "soften" commercial areas, e.g., the Downtown flowers. They also asked if there were any programs that could help encourage additional natural spaces in commercial areas.

In alignment with others, the business community also discussed the need for connectivity through the City and that access to natural or recreational spaces is very important.

Additional Open Houses or Events

Staff participated in or hosted numerous additional events (see page 1 for a full list). At each of these events, an overview of the project was presented and surveys were administered (either via keypad polling or paper surveys).

Key themes discussed at various events include those summarized on page 136. One of the key discussions with various parties included the notion of disparity in access depending on where you lived in the City. For example, individuals in North Fort Collins and those in older neighborhoods felt disconnected from the City's open space network, even if it was nearby. Potential solutions discussed were retrofitting connectivity to these various spaces, increasing wayfinding and looking at opportunities to restore stormwater features or other, informal open spaces in their neighborhoods.

Residents at various outreach events noted the need to connect the City's open space network. In fact, connectivity was the number one issue brought up at almost every focus group staff held.

A focus group held with residents of Fort Collins Housing Authority apartment complexes (Photo by Rebecca Smith)

Other discussions focused on night skies – or the opportunity to see the stars at night, which benefits people and wildlife. Other ideas included designing the transit system to include stops at various open spaces throughout the City. There were also several discussions around the importance of education and the need to instill an appreciation for nature into our children.

Finally, there was a generally agreed upon need to provide additional clarity around open space requirements in multi-family developments. Many residents expressed concerns about the lack of open space in recently approved developments.

WikiMap

Wikimaps are online, editable maps where participants can provide feedback on specific questions. In this exercise, respondents identified where they access nature within the City and where barriers to accessing nature were. These results are on the project's webpage at www.fcgov.com/natureinthecity.

Project Survey

A project survey was developed to solicit feedback from the community on whether nature is important to them, where residents access nature, why nature is important to them, and what residents believe this project should focus on, given current strengths and weaknesses.

In this survey, respondents prioritized the following values for this project to focus on:

1. Find opportunities to escape from the urban environment,
2. Create places or restore existing spaces to find beauty, peace or opportunities for relaxation,
3. Support wildlife, plants, and trees, and
4. Create additional opportunities to engage in personal or group/family exercise or play.

Full survey results are available in Appendix B4 and on the the project's website at www.fcgov.com/natureinthecity

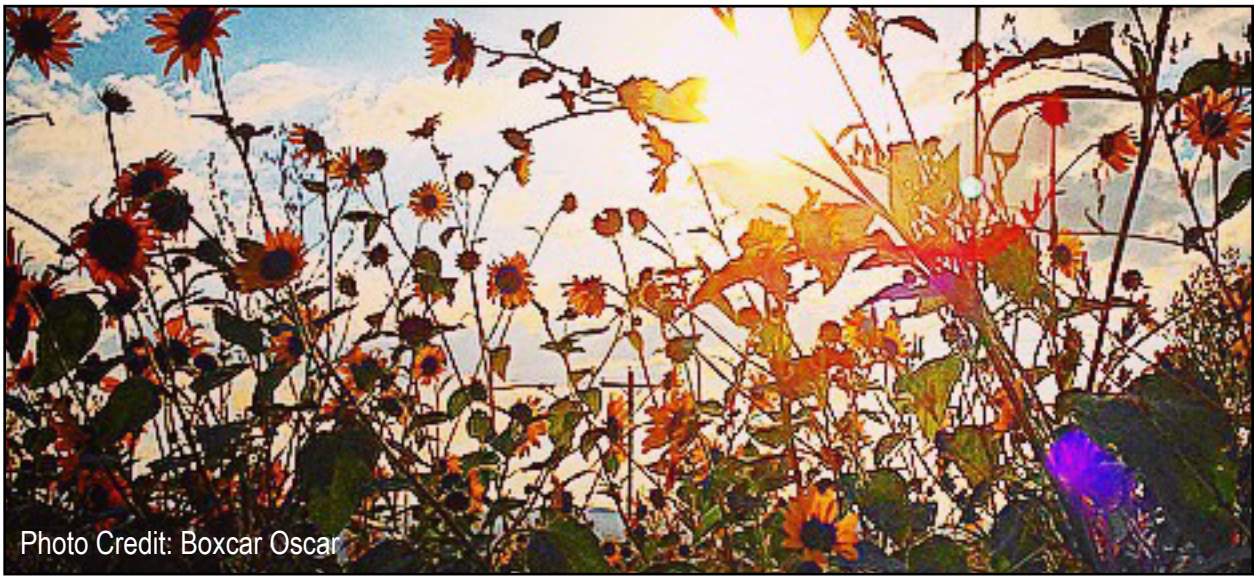
Visual Preference Survey

One of the key products of Nature in the City will be a set of design guidelines that will allow anyone, e.g., developers, business owners, residents, etc. to incorporate nature into their projects. During the Phase One project survey, residents expressed that the City should focus on providing more opportunities to escape from the urban environment, connectivity for people and wildlife, and more opportunities for recreation and play.

To translate these values into design guidelines, a Visual Preference Survey was developed. This survey asked respondents to rank various photographs to determine which photos best aligned with the specific objective, e.g., where they would prefer to escape from the urban environment. Almost 250 residents provided feedback on the survey, and results are available on the project's website.

Photo Contest

Staff also engaged the community through a Nature in the City photo contest that garnered over 150 photo submissions. These submissions are viewable throughout the Strategic Plan and on the project's website.



Visioning Workshop Participants were asked what three words came to mind when asked to define nature. Note that wordles show which words appear more in the survey, via larger font sizes. In other words, the larger the word, the more respondents used that word to describe nature.

Appendix B4 - Survey Summary

Background

In 2014, the City launched Nature in the City to ensure that, as our community grows to its buildout population, all residents have access to high-quality, natural spaces close to where they live and work. Whether it's a formal natural area, neighborhood park, or just the open space behind your home, our primary objective is to create and maintain access to nature within Fort Collins.

Process

Staff received 356 completed surveys from the public between March and September 2014. The survey was initially piloted at the March 2014 visioning workshop as well as in other focus groups, e.g., the Chamber's Local Legislative Affairs Committee, and then refined based on feedback.

Surveys were presented via keypad polling ("clickers") or residents could complete them via paper surveys. A copy of this survey is provided at the end of this summary (p. 157). Demographic data were collected to ensure that the findings were relevant across a broad range of factors, including gender, age, income levels, race, and where individuals live and work throughout the City.

Summary of Findings

A project survey was developed to solicit feedback from the community on whether nature is important to them and why, where they access nature, and on what they believe this project should focus.

Key findings from the survey are as follows:

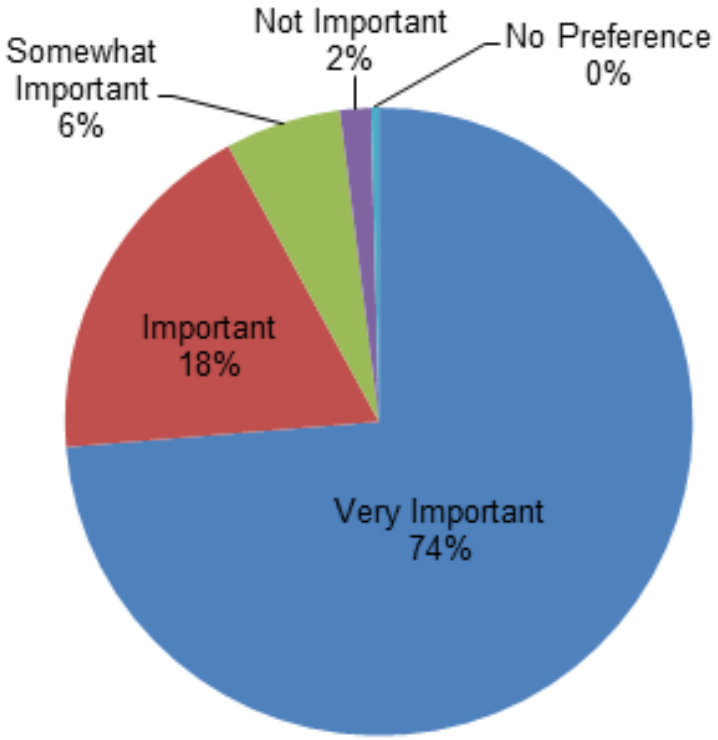
- Residents in Fort Collins strongly value access to nature (92% of respondents indicated nature was important or very important to them).
- Most residents feel they have easy access to nature (78% agree or strongly agree), but note that a lack of time (94 respondents) and lack of easy access (48 respondents) are the two biggest barriers.
- The places residents most frequently access nature are City's Parks (305 respondents) and the Natural Areas (283 respondents). Younger respondents accessed nature more often in schools and community gardens/local farms.
- Residents access nature within the community primarily for personal recreation or exercise; to escape from the urban environment; and to observe wildlife, plants and trees.

When asked what this project should focus on, given our current strengths and weaknesses, four priorities emerged:

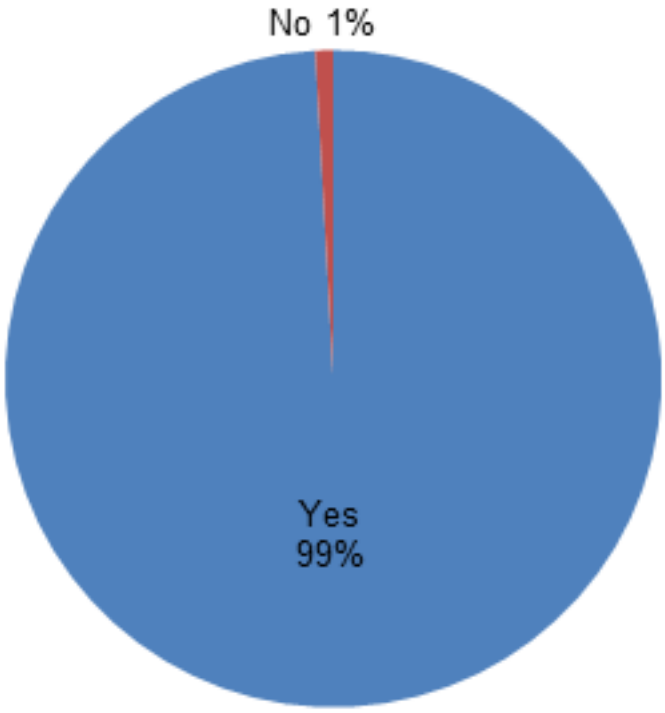
1. Provide opportunities to escape from the urban environment
2. Increase connectivity and opportunities for wildlife and plants (especially trees) to thrive in the community
3. Provide places to find beauty, peace, and relaxation
4. Provide more opportunities for personal and group exercise or play, with an emphasis on a connected network of these opportunities.

Project Survey Results by Question

Question 1: Is nature in Fort Collins important to you?
Most residents (92%) responded that nature was either very important or important to them.



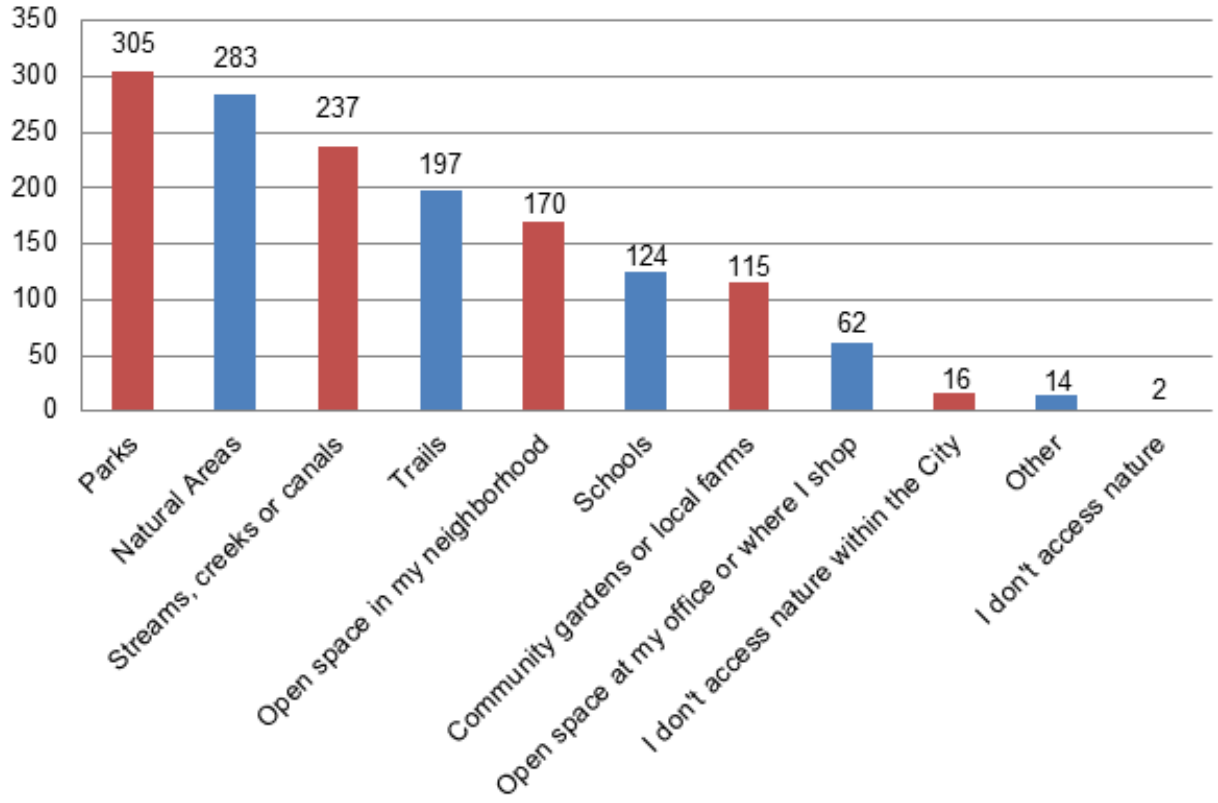
Question 2: Do you access nature in the city?
Almost all (99%) residents are able to access nature in the city.



Project Survey Results (cont.)

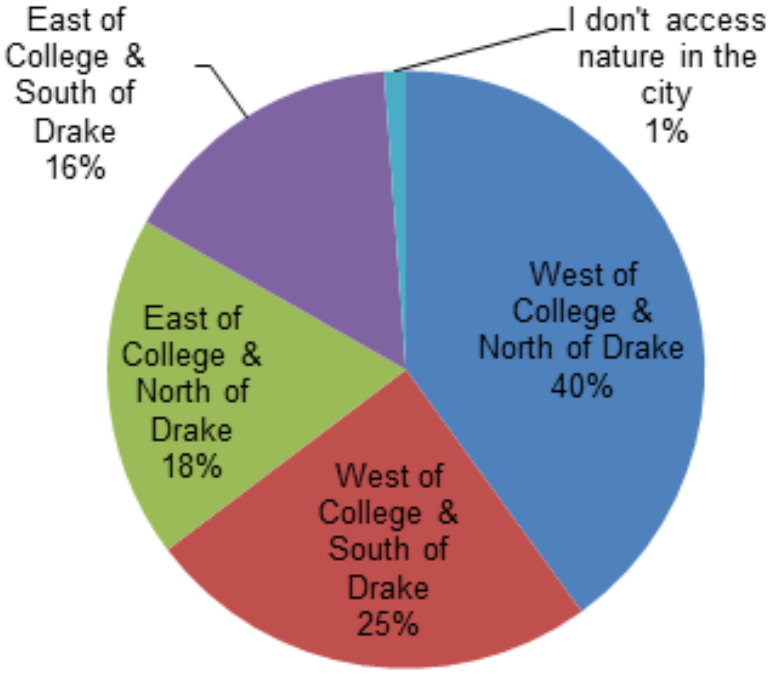
Question 3: Where do you access nature in the city?

The most cited place where residents access nature is in parks, followed closely by Natural Areas, and then by streams, creeks, and canals.



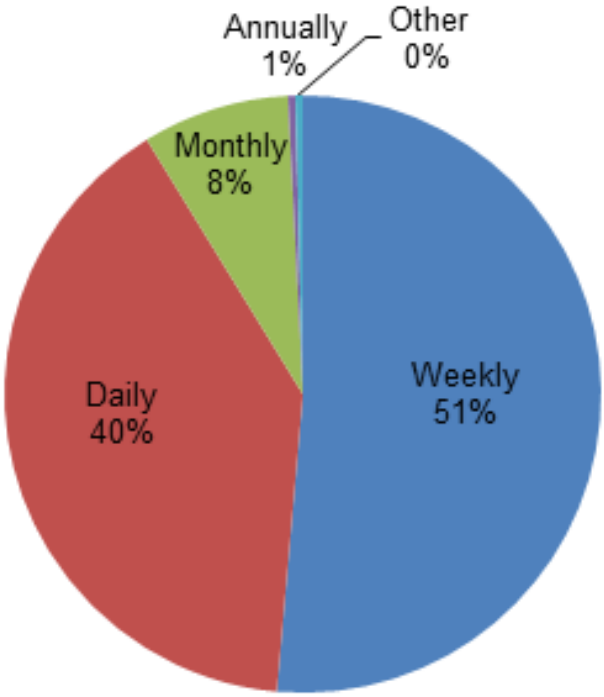
Question 4: In what part of the City do you access nature most often?

Access to nature was spread across the City, with areas in the northwest part of town being visited most often (40%).

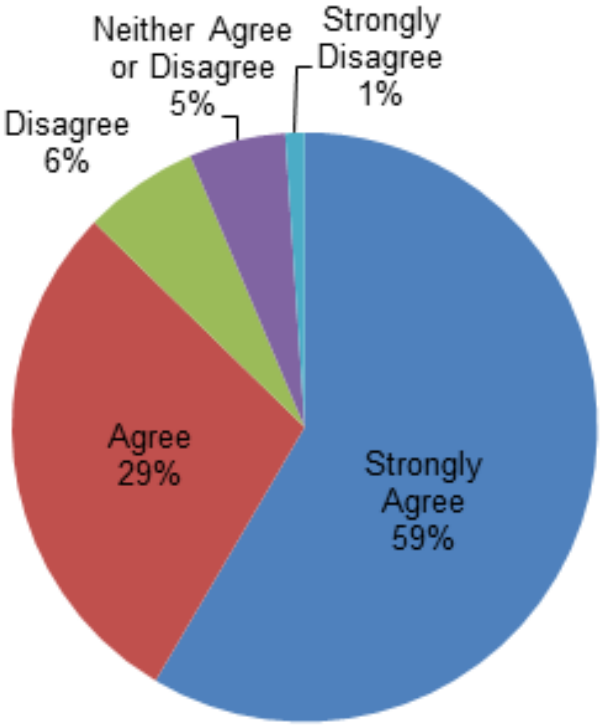


Project Survey Results (cont.)

Question 5: How often do you choose to access nature?
Most residents choose to access nature either weekly (51%) or daily (40%).



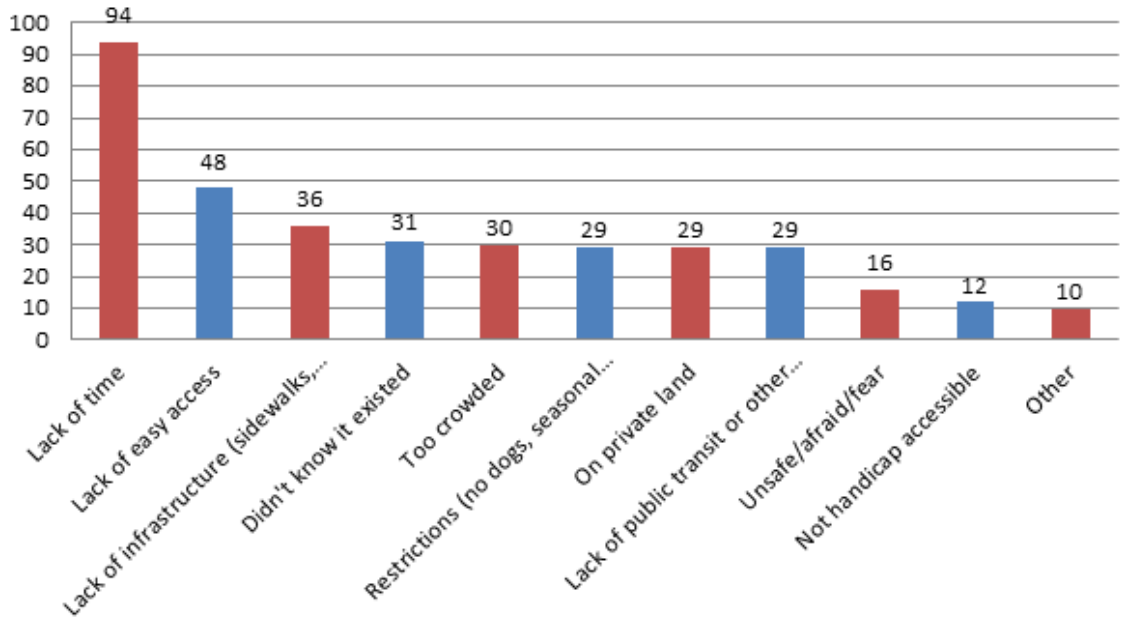
Question 6: I feel I have easy access to nature (within a 10-minute walk).
Most residents agree that they have easy access to nature (78%).



Project Survey Results (cont.)

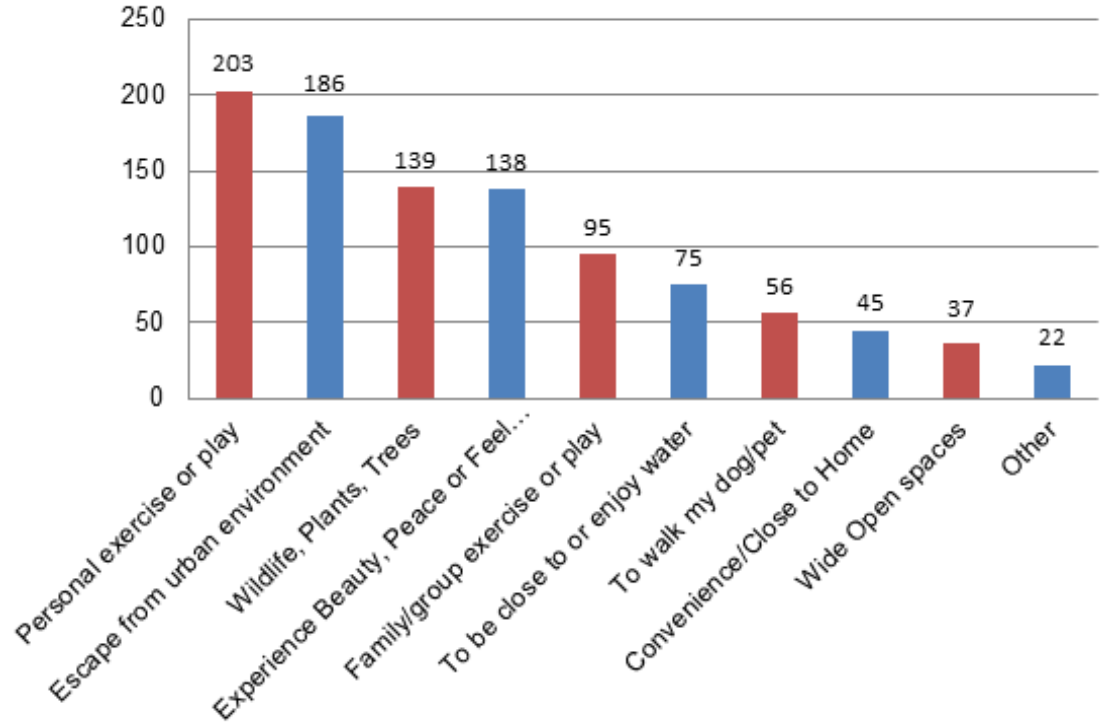
Question 7: What barriers prevent you from accessing nature?

The biggest barrier to accessing nature is lack of time (n=94), with lack of easy access being the second most common barrier (n=48).



Question 8: Why do you choose to spend time in nature?

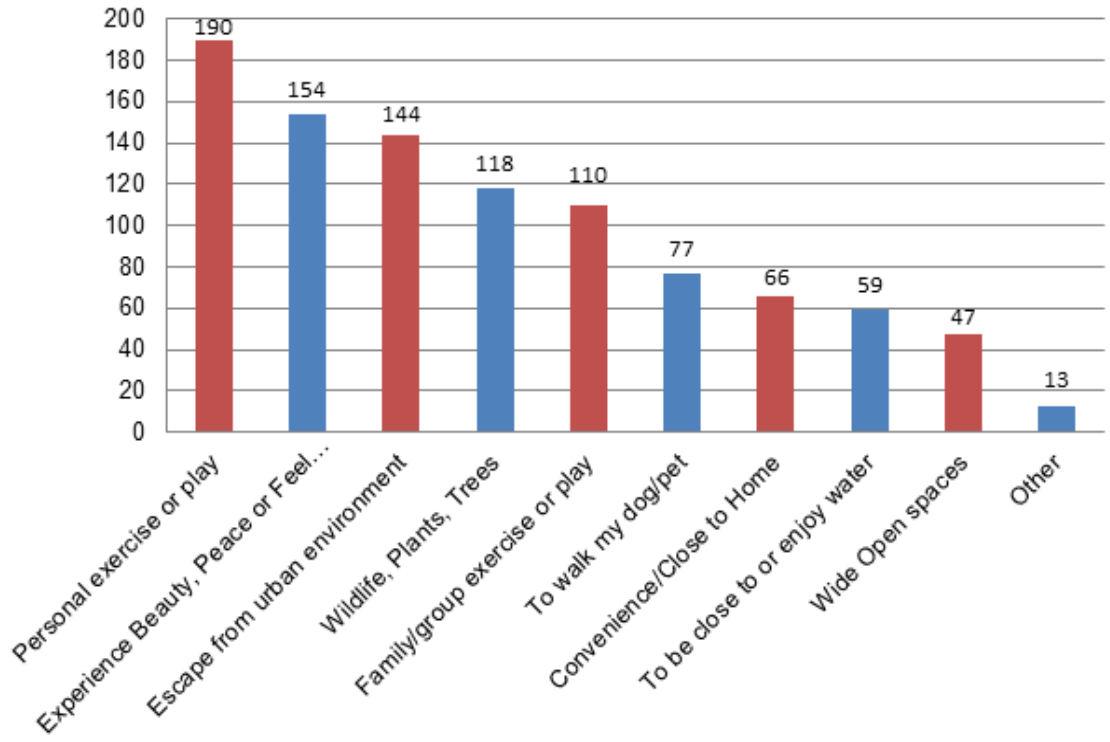
The most common reason people choose to spend time in nature is for personal exercise or play (n=203).



Project Survey Results (cont.)

Question 9: Which of these values are most important for you in your neighborhood?

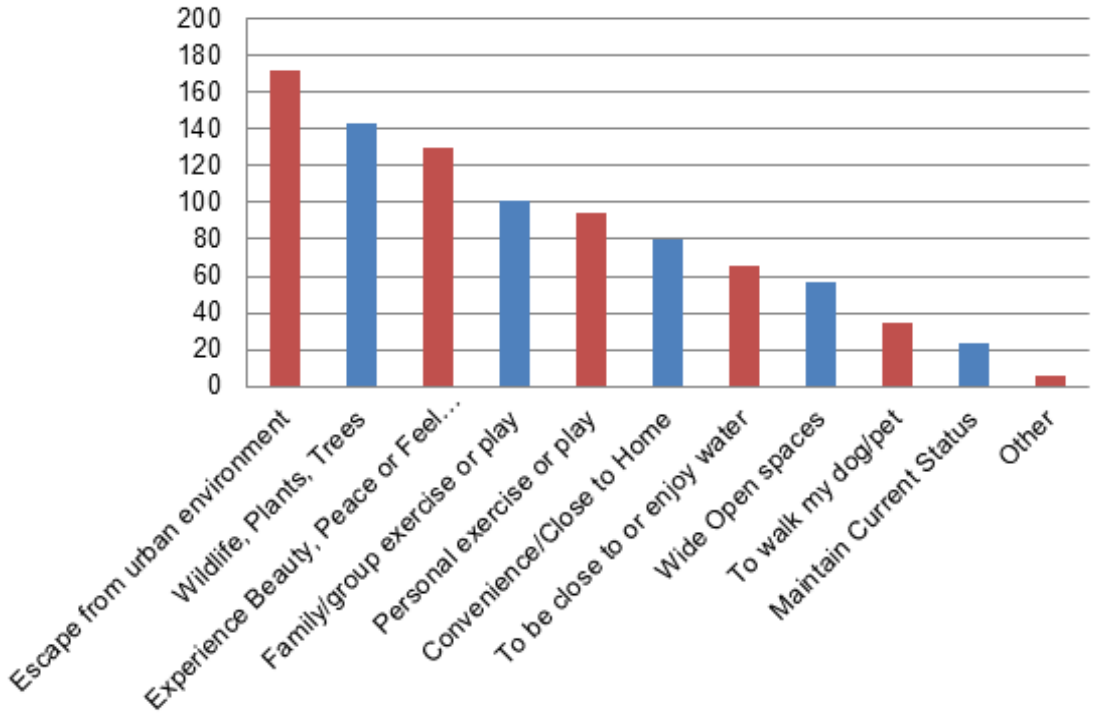
As with question 8, the most important reason people access nature in the neighborhood is for personal exercise or play. However, the opportunity to experience beauty, peace or feel relaxed moved from #4 to #2 in terms of preference.



Project Survey Results (cont.)

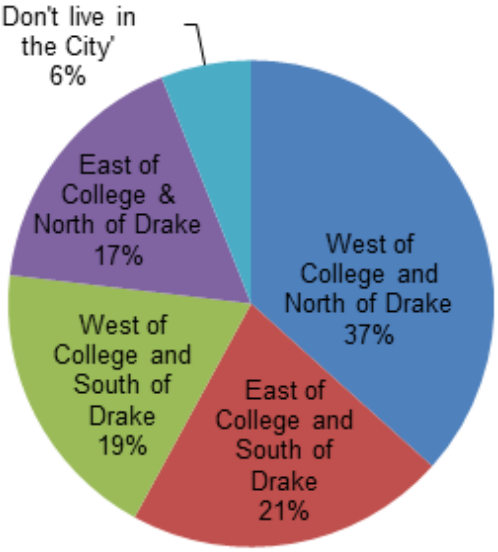
Question 10: Considering our current strengths and weaknesses, which of these values should this project focus on the most for the city overall?

In this question, the opportunity to escape from the urban environment moves to the top most preferred value to focus on, with wildlife, plants, and trees being the second most preferred item. Of note is that these priorities were consistent overall based on demographics, but that males wanted the project to focus on personal exericse or play as their second priority for the project.



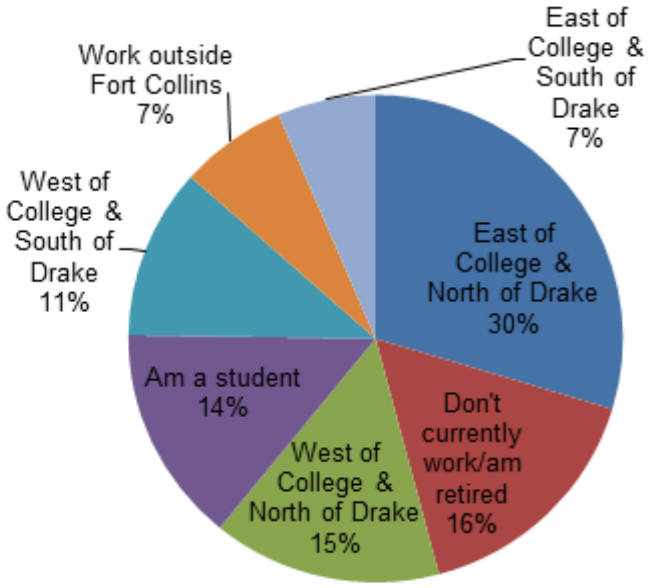
Question 11: What part of the City do you live in (by quadrant)?

Respondents were distributed across the City, but the northwest quadrant had the greatest representation.

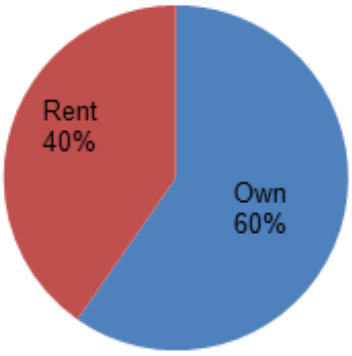


Project Survey Results (cont.)

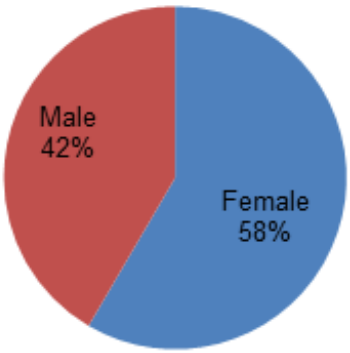
Question 12: Which part of the City do you work in (by quadrant)?
Respondents work in a variety of places across the City.



Question 13: Do you own or rent your residence?
Respondents were nearly split on home ownership versus being renters.

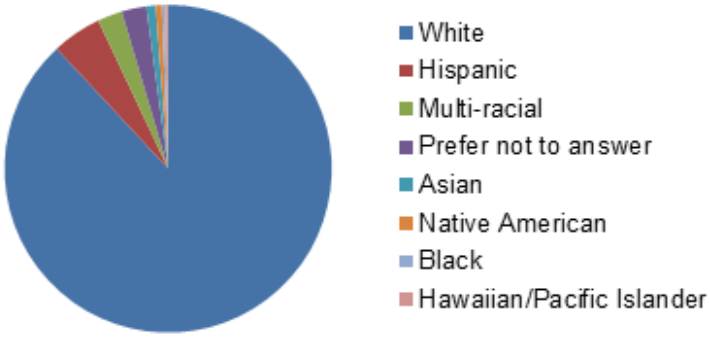


Question 14: What is your gender?
Overall, more females responded to the survey than males.

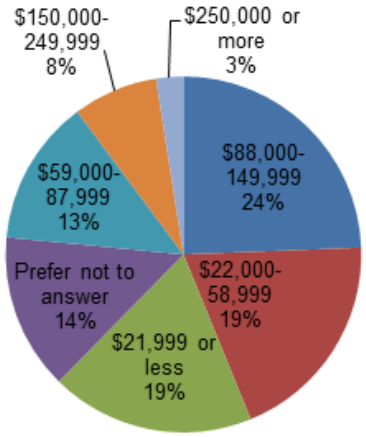


Project Survey Results (cont.)

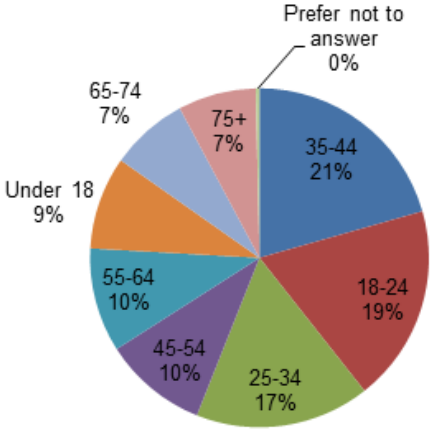
Question 15: What is your race?
Approximately 85% of respondents are white, with approximately 5% of the respondents being Hispanic. The remaining 10% of repsondents are multi-racial (2.4%), prefer not to answer (2.4%), and less than 1% each of Asian, Native American, Black, and Hawaiian/Pacific Islander respondents. Fort Collins Demographics from 2012 indicated the population is approximately 82.5% white, 10.3% Hispanic, 2.0% Black, 1.7% Native American, 4.1% Asian, 0.3% Hawaiian/Pacific Islander, and 2.4% is another race.



Question 16: What is your household income?
Respondents had varying income levels. Preferences for different values did not vary greatly among the different income levels, and across every income level – the opportunity to escape from the urban environment was prioritized.



Question 17: What is your age?
A variety of folks of different age groups responded to the survey.



Project Survey Results (cont.)

Analysis: How do project priorities compare across income levels?

In general, the top three priorities found overall (escape from the urban environment; widlife, plants and trees; and to experience beauty, peace or feel rejuvanated) were consistently in the top three priorities for all income levels. As income levels increased, family exercise or play was also identified as a top priority. Note that only 8 respondents to the survey indicated an income over $250,000, and the priorities in this income level varied greatly, likely as a result of the low number of respondents sampled.

		Income Levels						
		$21,999 or less	$22,000-58,999	$59,000-87,999	$88,000-149,999	$150,000-$249,999	$250,000 or more*	Prefer not to Answer
Priorities	Top Priority	Escape from the Urban Environment	Wildlife, Plants, Trees	Escape from the Urban Environment	Escape from the Urban Environment & Family Exercise or Play	Escape from the Urban Environment	Escape from the Urban Environment; Family exercise or play; To Experience Beauty, Peace or Feel Rejuvenated; and Wide Open Spaces	Escape from the Urban Environment
	Second Priority	Wildlife, Plants, Trees	Escape from the Urban Environment	To Experience Beauty, Peace or feel Rejuvenated	Wildlife, Plants, Trees	Wildlife, Plants, Trees & Family Exercise or Play	Wildlife, Plants and Trees and To Walk my Dog/Pet	Wildlife, Plants, and Trees & To Experience Beauty, Peace or feel Rejuvenated
	Third Priority	To Experience Beauty, Peace or feel Rejuvenated	To Experience Beauty, Peace or feel Rejuvenated	Wildlife, Plants, Trees	To Experience Beauty, Peace or feel Rejuvenated	To Experience Beauty, Peace or feel Rejuvenated		Personal exercise or play; Family exercise or play; and Convenience/ It's Close to Home

Analysis: How do project priorities compare across genders?
In general, the top priorities for men and women were comparable, with men prioritizing family/group exericse or play slightly higher than women.

		Gender	
		Male	Female
Priorities	Top Priority	Wildlife, Plants, and Trees	Wildlife, Plants, Trees
	Second Priority	Family/group exercise or play	Escape from the Urban Environment & To Experience Beauty, Peace or feel Rejuvenated
	Third Priority	Escape from the Urban Environment	Family/group exercise or play

Analysis: How do project priorities compare across home ownership versus renters?
Both home owners and renters prioritized the opportunity to escape from the urban environment and wildlife, plants, and trees, but their third priorities differed. For renters, family/group exercise or play ranked #7 overall, while it ranked #3 for home owners. The opportunity to experience beauty, peace or feel rejuvanted was ranked #3 for renters and #4 for home owners.

		Home Owners	**Renters**
Priorities	Top Priority	Escape from the Urban Environment	Escape from the Urban Environment
	Second Priority	Wildlife, Plants, and Trees	Wildlife, Plants, and Trees
	Third Priority	Family/group exercise or play	To Experience Beauty, Peace or feel Rejuvenated

Analysis: How do project priorities compare across where people live?
In general, the top priorities were consistent regardless of where respondents lived in the City, with those West of College prioritizing personal or family exercise or play in their top three priorities.

		East of College & North of Drake	East of College & South of Drake	West of College & North of Drake	West of College & South of Drake	Don't live in the City
Priorities	Top Priority	Wildlife, Plants, and Trees	Escape from the Urban Environment	Escape from the Urban Environment	Escape from the Urban Environment	Wildlife, Plants, and Trees
	Second Priority	Escape from the Urban Environment & To Experience Beauty, Peace or feel Rejuvenated	To Experience Beauty, Peace or feel Rejuvenated	Wildlife, Plants, and Trees	Wildlife, Plants, and Trees	Family exercise or play
	Third Priority	Convenience/It's Close to Home and To be Close to or Enjoy Water	Wildlife, Plants, and Trees	Personal exercise or play	Family/group exercise or play	Escape from the Urban Environment; Convenience/It's Close to Home and To Experience Beauty, Peace or feel Rejuvenated

Analysis: How do project priorities compare across age groups?

In general, at least two of the top three priorities found overall (escape from the urban environment; widlife, plants, and trees; and to experience beauty, peace or feel rejuvanated) were consistently in the top three priorities for all age groups. Note there were few respondents who were above the age of 75 or who preferred not to answer this question on the survey.

		Age Groups								
		Under 18	18-24	25-34	35-44	45-54	55-64	65-74	75+	Prefer not to Answer
Priorities	Top Priority	Wildlife, Plants, Trees	Escape from the Urban Environment	Escape from the Urban Environment & Wildlife, Plants, and Trees	Wildlife, Plants, Trees	Family/ group exercise or play	Wildlife, Plants, Trees	Personal exercise or play	Wildlife, Plants, and Trees & To Walk my Dog/ Pet	Escape from the Urban Environment & To Experience Beauty, Peace or Feel Rejuvenated & Wide Open Spaces (only priorities identified in this group, and all were the same)
	Second Priority	Escape from the Urban Environment	Wildlife, Plants, Trees	Family/ group exercise or play	To Experience Beauty, Peace or feel Rejuvenated	Escape from the Urban Environment & To Experience Beauty, Peace or Feel Rejuvenated	Escape from the Urban Environment & To Experience Beauty, Peace or Feel Rejuvenated	To Experience Beauty, Peace or feel Rejuvenated	Wide Open Spaces	
	Third Priority	To Experience Beauty, Peace or feel Rejuvenated & Wide Open Spaces	To Experience Beauty, Peace or feel Rejuvenated	Personal exercise or play & To Experience Beauty, Peace or feel Rejuvenated	Family/ group exercise or play	Wide Open Spaces	Personal exercise or play	Escape from the Urban Environment		

Nature in the City Survey

1) Is nature in Fort Collins important to you?
   a. Not important
   b. Somewhat important
   c. Important
   d. Very important
   e. No preference

2) Do you access nature in the city?
   a. Yes, see questions 3 and 4
   b. No. If not, why do you not access nature in the city? _____

3) Where do you access nature in the city? (choose all that apply)
   a. Natural Areas
   b. Parks
   c. Open space in my neighborhood (HOA or other)
   d. Open space at my office or where I shop
   e. Schools
   f. Community gardens or local farms
   g. Streams, creeks or canals
   h. Trails
   i. I don't access nature
   j. I don't access nature within the city
   k. Other _____

4) In what part of the city do you most often access nature?
   a. East of College & North of Drake
   b. East of College & South of Drake
   c. West of College & North of Drake
   d. West of College & South of Drake
   e. I don't access nature in the city

5) How often do you choose to access nature?
   a. Daily
   b. Weekly
   c. Monthly
   d. Annually
   e. Other _____

6) I feel I have easy access to nature (within a 10-minute walk)
   a. Strongly Agree
   b. Agree
   c. Neither agree or disagree
   d. Disagree
   e. Strongly Disagree

7) What barriers prevent you from accessing nature? (choose all that apply)
   a. Lack of easy access, e.g., major street/ railroads/traffic
   b. Unsafe/Afraid/Fear
   c. Lack of infrastructure, e.g., no sidewalks, trail, or parking
   d. Too crowded
   e. Didn't know it existed
   f. Not handicap accessible
   g. Restrictions (no dogs, seasonal closures, cost)
   h. On private land
   i. Lack of public transit or other transportation
   j. Lack of time
   k. Other _____

8) Why do you choose to spend time in nature? (rank top 3 reasons in order)
   ___ Escape from urban environment/ Fresh Air
   ___ Wildlife (intrinsic value or viewing), Plants, Trees
   ___ Personal exercise or play
   ___ Family/group exercise or play
   ___ Convenience/It's Close to Home
   ___ To Experience Beauty, Peace, or feel Rejuvenated
   ___ To be Close to or Enjoy Water
   ___ To Walk My Dog/Pet
   ___ Wide Open Spaces
   ___ Other _____

9) Which of these values are most important in your neighborhood to you? (rank top 3 values in order)
   ___ Escape from urban environment/ Fresh Air
   ___ Wildlife (intrinsic value or viewing), Plants, Trees
   ___ Personal exercise or play
   ___ Family exercise or play
   ___ Convenience/It's Close to Home
   ___ To Experience Beauty, Peace, or feel Rejuvenated
   ___ To be Close to or Enjoy Water
   ___ To Walk My Dog/Pet
   ___ Wide Open Spaces
   ___ Other _____

10) Considering our current strengths and weaknesses, which should this project focus on the most for the city overall? (rank top 3 values in order)

___ Escape from urban environment/ Fresh Air
___ Wildlife (intrinsic value or viewing), Plants, Trees
___ Personal exercise or play
___ Family exercise or play
___ Convenience/It's Close to Home
___ To Experience Beauty, Peace, or feel Rejuvenated
___ To be Close to or Enjoy Water
___ To Walk My Dog/Pet
___ Wide Open Spaces
___ Maintain current status
___ Other _____

11) What part of the city do you live in (by quadrant)?

a. East of College & North of Drake
b. East of College & South of Drake
c. West of College & North of Drake
d. West of College & South of Drake
e. Don't live in the city

12) What part of the city do you work in?

a. East of College & North of Drake
b. East of College & South of Drake
c. West of College & North of Drake
d. West of College & South of Drake
e. Work outside Fort Collins
f. Don't currently work/am retired
g. Am a student

13) Do you own or rent your residence?

a. Own
b. Rent

14) What is your gender?

a. Male
b. Female

15) What is your race?

a. Asian
b. Black
c. Hispanic
d. White
e. Native American
f. Hawaiian/Pacific Islander
g. Multi-racial
h. Prefer not to answer

16) What is your household income?

a. $21,999 or less
b. $22,000-58,999
c. $59,000-87,999
d. $88,000-149,999
e. $150,000-$249,999
f. $250,000 or more
g. Prefer not to answer

17) What is your age?

a. Under 18
b. 18-24
c. 25-34
d. 35-44
e. 45-54
f. 55-64
g. 65-74
h. 75+
i. Prefer not to answer

18) Is there anything else you would like to add?

_____

_____

_____

_____

_____

_____

19) Would you like to join our email list?

Email: _____

Photo Credit: John Bartholow

Appendix B5- Ecological Inventory and Assessment Summary

The ecological section of the inventory and assessment had several goals including:

- Understanding what biodiversity is currently present in the City and how various sites contribute to that biodiversity
- Determine how different variables (land use, site area, habitat type, etc.) affect wildlife
- Use the findings from the first two goals to inform site design and restoration across the City

Survey Design

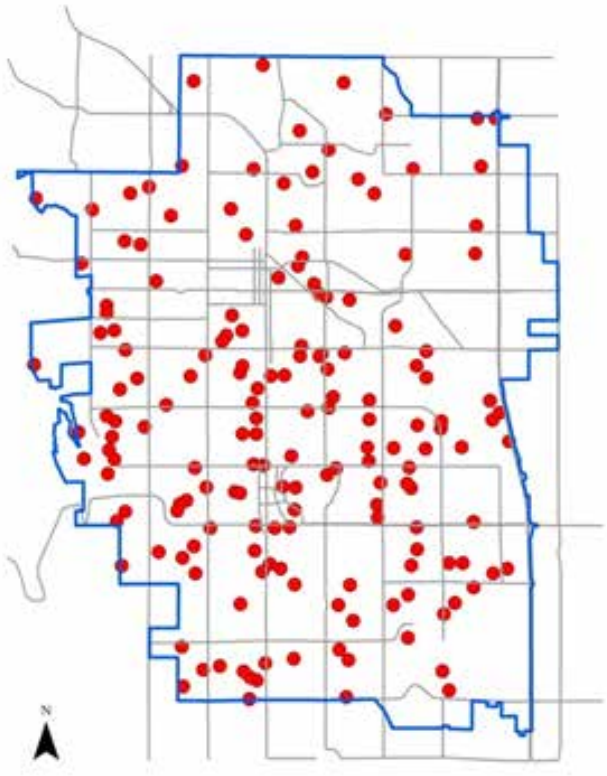
To achieve the goals of the assessment, a survey was designed collaboratively by City staff, Colorado State University and the Wildlife Conservation Society. The survey was designed to be statistically defensible, inclusive of all areas within the City's Growth Management Area (GMA) and repeatable.

Site Selection

Staff surveyed 166 sites throughout the summer (Map A). All sites were randomly selected by an algorithm designed by CSU. Site selection was constructed around four main variables: land use, site size, habitat type and spread between points.

Nine representative land use types were chosen to survey:

- Parks
- Natural Areas
- Trails
- Ditches
- Schools
- Certified Natural Areas and Natural Habitat Buffer Zones (hereafter referred to as CNAs)
- Urban Agriculture
- Residential Open Space
- Institutional Open Space



Map A - 166 survey sites throughout the community were sampled for birds, butterflies and vegetation.

Land Use

Each land use was designed to have an equal number of survey sites (20); however various constraints, such as limited availability or challenges gaining access, did not make this possible for every land use.

Site Area

Many open areas within the City are small parcels (<0.5 acres). To ensure that small parcels were represented in the survey sites, the algorithm was designed so small parcels had an equal likelihood of being selected as larger parcels. Also, when like land use types were adjacent to each other, they were combined together to form one large parcel.

Habitat Type

While Fort Collins contains many habitat types, the dominant habitat types are lawns and non-native grasslands. To make sure all types of habitats were surveyed, the algorithm made areas next to Natural Habitats and Features (wetlands, riparian forests, etc.; see glossary for full list) more likely to be selected.

Spread

The survey was designed to have sites spread across the 77.7 square miles of the Growth Management Area (GMA). The algorithm selected points for each land use to be spread as evenly throughout the GMA as possible.

Survey Protocols

The project consisted of four different surveys: birds, butterflies, vegetation cover and human activity. For each survey a detailed protocol was created by City staff, Colorado State University and the Wildlife Conservation Society. All surveys were performed between May 12 and August 15, 2014 by two technicians.

Birds and butterflies were selected as the two taxonomic groups to survey because they respond to variables at different landscape levels. For example, birds tend to respond to variables at a broad landscape level, whereas butterflies are more affected by site level variables. Both species were also chosen for their ease in identification and the extensive amount of literature and other studies that are available for comparison of results.

Bird Surveys

Bird surveys were conducted from May 12 to June 26, 2014, from approximately 5:30 to 10:30 a.m. in all weather conditions except heavy rain or strong wind. All 166 sites were surveyed on three separate days. The survey location in a site was determined by the algorithm, which placed a specific point in each site. The survey method was a five-minute point count. This consists of standing in a single location recording and identifying all birds seen and heard, as well as the minute and distance at which the observation was made and method of detection.

Butterfly Surveys

Butterfly surveys took place from June 30 to August 15, 2014. Due to time constrains, half of the overall sties were surveyed for butterflies; consistent with the bird surveys, butterflies were surveyed on three separate days. Surveys occurred from 10:00 a.m. to 3:00 p.m. and only on sunny days with cloud cover of less than 50 percent. Two 50-meter (54.7 yards) transects were placed near the location of the bird point count spot. The transects were placed so that they would go through the best habitat for butterflies. The Pollard Walk method was used, consisting of walking the two transects at a slow pace (1 mph) with the field technicians counting and identifying butterflies within 20 feet of the transect line to the front, left, right and above, as well as recording what habitat the butterfly was seen in. Vegetation data was also recorded along the transects which included habitat types, percent cover of flowers, and whether the ground cover had been mowed.

Vegetation Surveys

Vegetation surveys occurred from June 30 to August 15, 2014. All sites were surveyed for vegetation once. All vegetation within a 50-meter (54.7 yards) radius of the point count location was recorded. Vegetation was categorized into ground cover, midstory or overstory. Average height and the three dominant species were recorded for each canopy cover category. Within the 50-meter radius, all habitat types and their percent cover were also recorded. A densitometer (a device used to estimate canopy cover) reading was taken at the point count location, and all noxious weeds were listed as well.

Human Activity

A survey for human activity was performed every time prior to conducting any of the other surveys. For a five-minute period human-related activities within 100 meters (109.4 yards) were recorded. These activities included:

- Moving cars
- Parked cars
- Pedestrians
- Cyclists
- Cats
- Dogs
- Horses
- Other livestock
- Other disturbances (e.g. train)

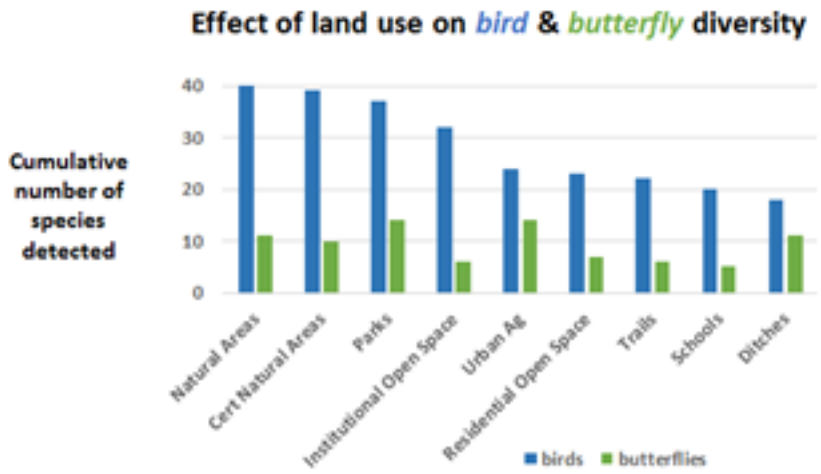
Photo Credit: Gsaw405

Results

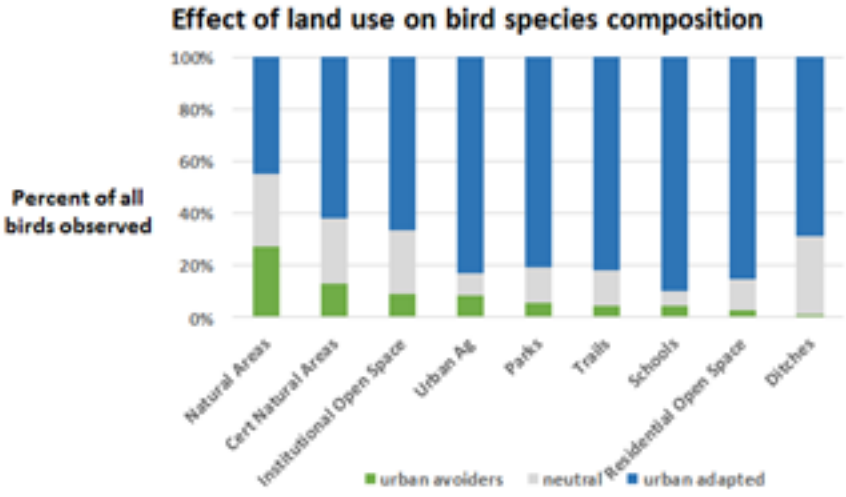
Data analysis was completed by the Wildlife Conservation Society and Colorado State University. Overall, 33 species of butterflies were observed and 88 species of birds. Many various relationships were tested. The following results are a handful of the most relevant to this strategic plan.

Birds

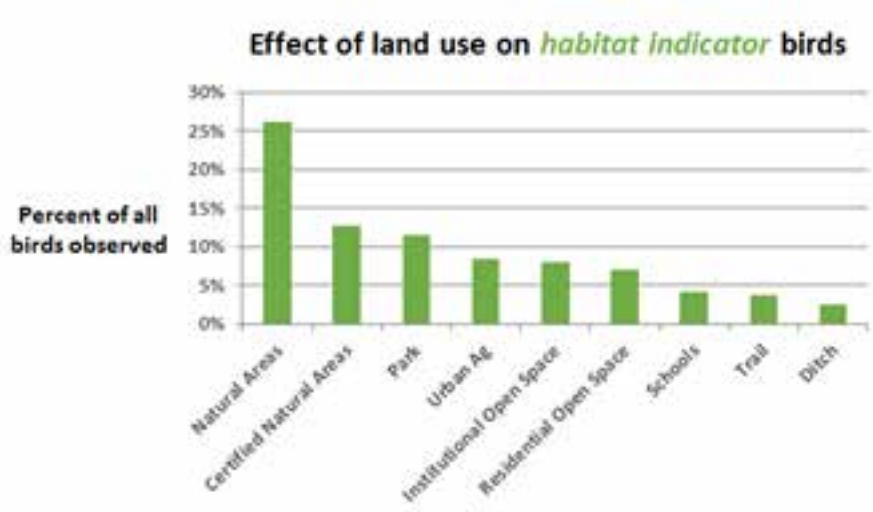
Land Use. The study was designed to compare different land uses. For birds, there were multiple relationships. The first relationship examined how diversity, or number of different species, and land use are related. Natural Areas, CNAs and Parks, respectively, had the most diversity with 37-40 species observed. Ditches, schools and trails had the least diversity with approximately 20 species observed at each site.



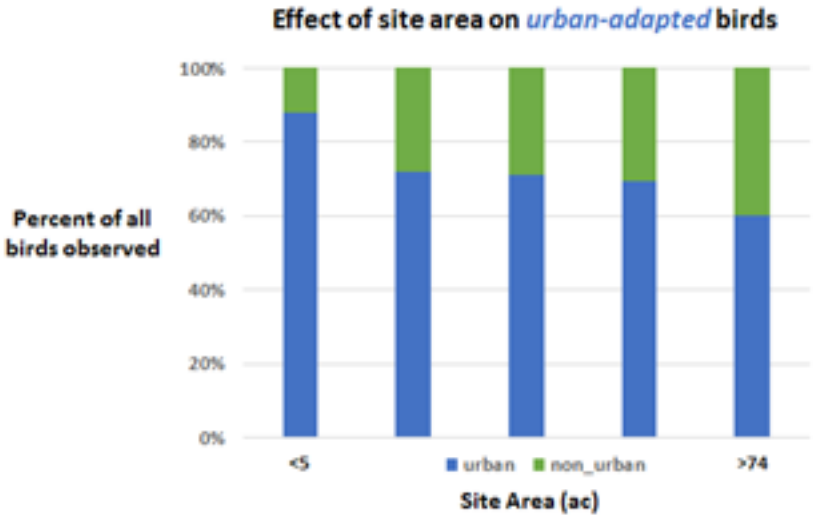
Next, the effect of land use on bird species composition was explored, specifically the proportion of all observations that are classified as urban avoider and urban adapted species for each land use. These two categories represent how a bird species reacts to urbanization – either by adapting or avoiding. Natural Areas had the greatest proportion of urban avoiding species with close to 27 percent, with CNAs following at 13 percent. Trails, Schools, Residential Open Space and Ditches all had less than 5 percent.



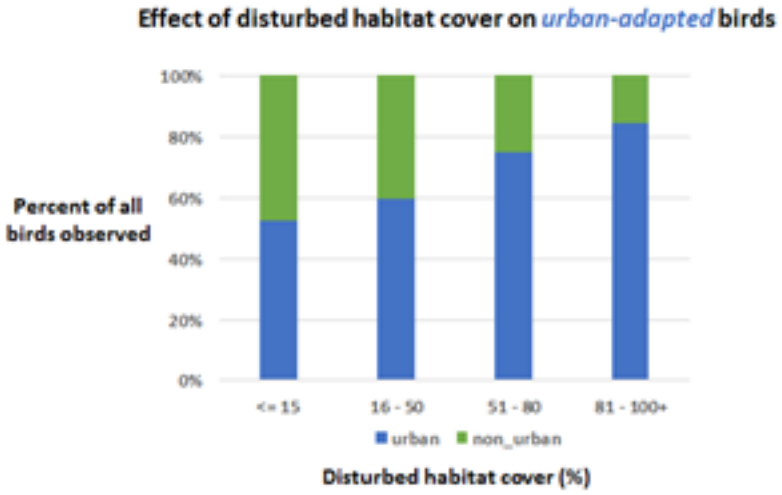
Finally, land use was compared to the proportion of habitat indicator species observed. Habitat indicators are species that are generally tied to a specific habitat and often are used as a measure of quality. Natural Areas had the largest percentage of habitat indicator birds observed with 26 percent. CNAs and Parks came next with both approximately 12 percent. For Schools, Trails and Ditches, less than 5 percent of observations were habitat indicator species.



Site Area. Another variable that the survey was designed to analyze is site area. Site area was compared to the proportion of urban avoiders and urban adaptors observed on each site. On sites that were less than 5 acres, 12 percent of species observed were urban avoider birds. However, sites that ranged from 5 acres to 74 acres saw urban avoiders make up around 30 percent of the birds seen. On sites larger than 74 acres, there was another increase to 40 percent of the total observations.

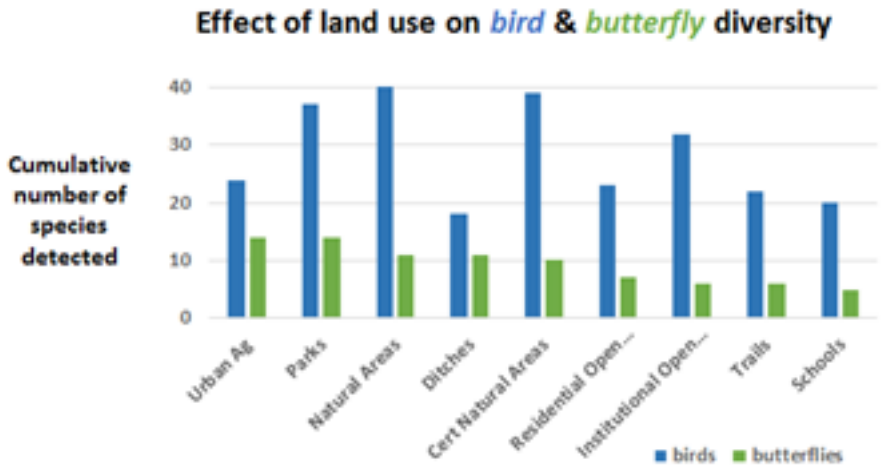


Disturbed Habitat Cover. While on site, field technicians recorded how much of each site was covered by certain habitats. Land covers such as impervious surfaces and lawns were grouped into a disturbed habitat cover category. This category was then compared to the proportion of urban avoiders and urban adaptors observed on each site. At sites with less than 15 percent of their area comprised of disturbed habitat, 48 percent of observations were urban avoiders. On the other end, sites made up of 81-100% disturbed habitat saw 15.5 percent of the observations containing urban avoiders.

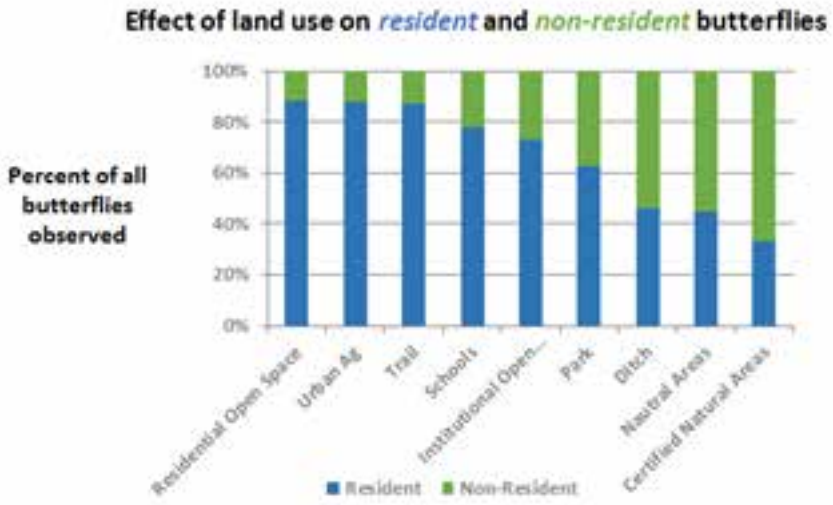


Butterflies

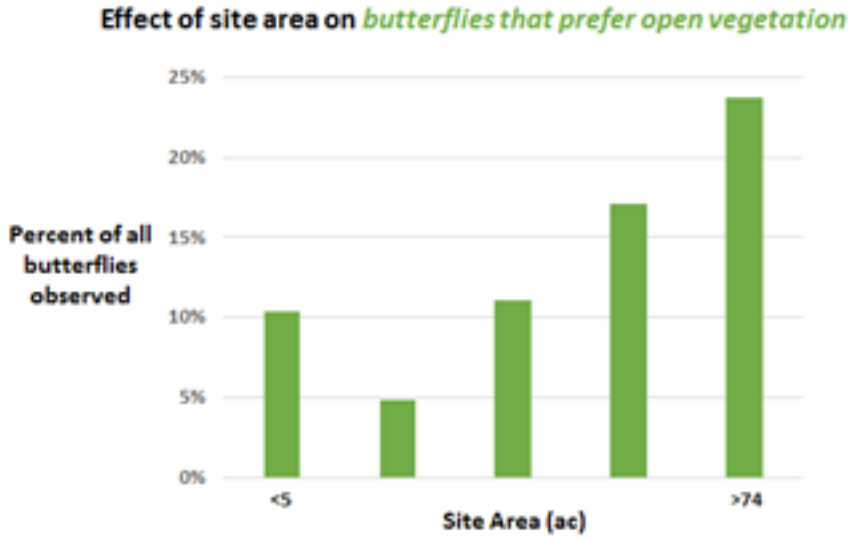
Land Use. An even number of butterfly surveys were performed on each land use (10) so a comparison could be made between the various land uses. One relationship examined for land use is how it affects butterfly diversity. Parks and Urban Agriculture had the most diversity with 14 species seen on each. Natural Areas and Ditches were next, both with 11 species. Institutional Open Space, Trails and Schools had the least diversity with 5-6 species observed.



Land use also had an effect on the composition of species seen, specifically resident vs. non-resident butterflies. These two categories reflect whether the species migrates to the region after undergoing metamorphosis (i.e. from caterpillar to butterfly) – it is not associated with a species' status as native or non-native. Residential Open Space, Urban Agriculture and Trails had the largest proportion of resident butterflies with 88-89 percent. Ditches, Natural Areas and Certified Natural Areas had the smallest proportions with 33-46 percent. Note that the land uses with a more even split between the two categories also tended to have higher biodiversity.



Site Area. Again, site area was an important component of the survey design. Site area had an effect on butterflies that prefer open vegetation. On sites less than 5 acres, about 10 percent of all observations were of these butterflies. On sites larger than 74 acres, around 24 percent of observations were butterflies that prefer open vegetation.



Conclusion

Understanding how different variables affect biodiversity and the health of our local environment is necessary for creating effective management practices and policies. The results derived from this study will guide the ecologically focused policies laid out by this strategic plan.

All of the results increase the collective understanding of how nature reacts in the urban environment. However, two of the findings show great promise for integrating more high quality nature in an urban setting. First is the performance of the Certified Natural Areas and Natural Habitat Buffer Zones (referred to collectively as CNAs) land use. This land use consistently ranks in the top two land uses for both birds and butterflies on variables that signify high quality and diversity. This shows that privately owned lands that are enhanced for native vegetation and wildlife can have a significant impact.

Second is a lack of relationship; neither structure density nor the number of people is important for explaining variation between sites. This is encouraging from an urban development point of view in that density does not necessarily correlate with lower quality and diversity.

Further data analysis is ongoing including creating species-specific models – these will show how particular species are affected by variables. The analysis team is also working on creating connectivity models that show how species move throughout the City.

While the information collected and learned from the monitoring is important for increasing our knowledge about the baseline condition in the City, it is crucial that more than one year of data is collected. Scientific studies are more accurate and useful if performed over a span of time. This allows them to track changes over time and also helps reduce variability from outlier years that may have had unusual weather.


Photo Credit: Dusty Harms

Appendix C - Definition of Nature

For the purposes of this project, we define Nature in the City as the following:

"Places that support plants, animals, and natural processes and contribute to a variety of experiences for human enjoyment and well-being."

Through this definition, we are acknowledging nature is all around us. Whether we see a Sharp-shinned Hawk in Old Town or a butterfly seemingly floating through the Bacon Elementary schoolyard, or we feel the shade from a cottonwood tree or the respite experienced from silence and fresh air in the middle of an urban environment, nature is the air we breathe, the land that surrounds us, and the species that inhabit the land.

When we shift to the definition of nature with respect to this project, we are seeking to provide a wide range of places and experiences so all residents have meaningful and enriching interactions with nature. For example, places may include parks, Natural Areas, or informal spaces such as the open space in your neighborhood or where you work, or the community garden where you grow vegetables. By experiences, we've heard people value the intrinsic value of having nature nearby as well as the opportunities for personal or family recreation, the need to escape from the urban environment, or as a place to find beauty and relaxation. While not every site will provide every experience, we are seeking to ensure that all residents have access to a variety of natural experiences close to where they live and work.

The photos above depict a range of natural experiences within the City of Fort Collins, ranging from public lands such as Spring Canyon Park (Top Photo: Hines, Inc.) to informal spaces including the Larimer Canal No. 2 (Middle Photo: Lindsay Ex), or natural play spaces such as a fallen tree or in your own backyard (Bottom Photos: Plug in to Nature). Depending on your perspective, all of these places contribute to Nature in the City.

Appendix D - 10-Minute Walk Rationale

Fort Collins residents cited easy access to nature as a key priority for them throughout the project's public outreach process. In a public survey conducted during the initial outreach phase, 92 percent of respondents said they strongly value access to nature. Long-term residents indicated they used to be able to go to the end of their street and be in open space. While this continues to be true for some residents, one of the key project goals is to maintain or restore easy access to nature in perpetuity for everyone in the City.

One measure of easy access is the distance or amount of time it takes to get to nature. For Nature in the City, a 10-minute walk has been selected as the target, as it is a nationally accepted standard for willingness to walk to transit and is becoming a standard for easy access to nature throughout the U.S. and internationally. For example, Vancouver, British Columbia and New York City have both embraced a short walk access standard; these cities have set 5 minutes and 10 minutes, respectively, as their walking distance to nature goals and are actively acquiring property and restoring various sites to achieve these goals.

While the distance a 10-minute walk encompasses varies for different people, on average most people are willing to walk approximately 1,200-2,000 feet before choosing other transportation modes. Walking was chosen as the basis for the goal as it is typically the longest travel time for a person as compared to other modes (e.g., bicycles or transit), and thus is the most inclusive.

In addition to providing easy access, there are many other reasons the 10-minute walking distance is important. A person's ability to easily access nature will largely dictate how much time is spent there, and in Nature in the City outreach efforts lack of time was cited as one of the biggest barriers to accessing nature. If access to nature is further than a 10-minute walk, people are likely to choose other activities. Crossing major intersections, detours around inaccessible private property, and lack of desirable spaces to enjoy nature are also deterrents.

In addition, the literature (see Appendix B2) also has documented significant benefits for the following populations:

Children:

- Entire professional journals and organizations have bloomed since the 2005 book "Last Child in the Woods" by Richard Louv, where he examined the social impacts of a decline in children's exposure to nature.
- There has been significant research around the importance and benefits of children's connection with nature, as well as the importance of connecting to the larger value of understanding and protecting natural resources.
- Studies suggest positive impacts from urban design of green spaces for many health outcomes, including cognitive health, learning, and decreased attention-deficit hyperactivity disorder, as well as positive impact on children with special needs who have access to nature-based therapeutic interventions.

- Children who have closer (e.g., within a 10- to 15-minute walk) access to parks and recreational resources are less likely to experience significant increases in body mass index (BMI). Obese children who are encouraged to go to urban parks to walk and play demonstrate weight loss because access and availability of parks and green areas decrease children's sedentary behaviors.

Adults:

- Studies show a variety of benefits with a cumulative impact, such as recovering from surgeries faster, creating a sense of place and culture, making cities attractive, providing places for relaxation and increasing quality of life.
- Natural spaces provide places for recreation, community gatherings and refuge from the urban environment.
- There are also studies that show crime is reduced in cities with more natural settings.
- The use of local parks, trails and other urban settings is more frequent than visits to national parks and other sites well known for exposure to nature. Given the health contributions and other societal benefits of exposure to daily natural environments, there are implications associated with health care cost savings.

Wildlife:

- One study suggests that the foraging distance of native bees in Texas is roughly the same as a 10-minute walk, underscoring the co-benefits of connectivity and access to nature for people and wildlife.


Photo Credit: John Bartholow

Appendix E - Potential Funding Sources

The Nature in the City Plan funding appendix presents a range of options for obtaining funds for implementation of the Plan's goals. While additional funding sources are available to implement Nature in the City, depending on the specific project need, several sources at the local, state, federal, and private level are highlighted below.

Local Funding Sources

Budgeting for Outcomes (BFO) – The City of Fort Collins utilizes a biennial budget process to allocate its resources. Budgeting for Outcomes (or BFO) is a transparent budget processing which allocates revenues to the highest priorities citizens need and want. Budget offers prepared on behalf of Nature in the City would go through a thorough review process to ensure alignment with the City's priorities.

Innovation Fund – The Innovation Fund helps identify, fund and implement innovative improvements to the City's physical plant and operational procedures not otherwise funded. Projects must be implemented within one year and may not exceed $30,000 in requests.

State Funding Sources

Great Outdoors Colorado (GOCO) Open Space Grants – Grants to help fund the acquisition and protection of unique open space and natural areas of statewide significance. Project areas include:

- Buffers/inholdings
- Greenways/stream corridors
- Community separators
- Agricultural land
- Natural areas and non-game wildlife habitat
- Scenic viewsheds
- Urban open-space parcels

Great Outdoors Colorado (GOCO) Local Government Parks and Recreation Mini Grants – Grants for projects costing $60,000 or less. Project areas include:

- New park development: Creating a park where one does not exist.
- Enhancing existing park facilities: Improving current park facilities, including installing or creating new facilities at existing parks.
- Park land acquisition: Acquiring land for a future park.
- Environmental education facilities: Building new facilities or enhancing existing ones. (Please note: GOCO does not fund programming or non-fixed assets for these facilities).

Great Outdoors Colorado (GOCO) Conservation Excellence Grants – Grants for projects that advance land conservation on a regional or statewide scale. These projects should benefit and be transferrable/ replicable to more than a single organization or locale. Projects will fall into one or more of the following categories:

- Policy
- Standards and Education
- Community Engagement
- Stewardship and Long-term Sustainability

Great Outdoors Colorado (GOCO) Planning Grants – Grants that help to fund projects that are strategic and forward thinking in nature and directly relate to an effort to develop:

- Master Plans for entities to include parks, outdoor recreation, open space, identifying and acquiring local park lands and/or trails.
- Trail Plans with connections and access to trails, parks, open space and recreation and community facilities.
- Site Specific Plans for park development or redevelopment of a particular site.
- Updates to existing plans that are five years and older.
- Open Space Plans.

Federal Funding Sources

Five Star Restoration Grant Program – The Five Star Restoration Program brings together students, conservation corps, other youth groups, citizen groups, corporations, landowners and government agencies to provide environmental education and training through projects that restore wetlands and streams. The program provides challenge grants, technical support and opportunities for information exchange to enable community-based restoration projects. Funding levels range from $5,000 to $20,000, with $10,000 as the average amount awarded per project.

Land and Water Conservation Fund (LWCF) – Federal grants from this fund can be used to purchase land and water areas for conservation and recreation purposes. Additionally, money from the LWCF is used in state matching grants programs to fund the planning, developing, and acquiring of land and water areas for state and local parks and recreation facilities. The State of Colorado divides this money up evenly between local government projects and State Parks projects.

Wetland Program Development Grants (WPDG) – Federal grants from this fund can be used to develop policies to advance wetland protection, research best practices for wetland mapping and/or protection, develop trainings or other demonstrations, and conduct studies to reduce water pollution into wetlands. Applications are available on a biennial basis, with the next available opportunity anticipated in 2016.

Other Funding Sources

Gates Family Foundation – The Gates Family Foundation supports capital projects that:

- Invest in land and water protection that safeguards important natural resources, habitat, and health of natural systems
- Help preserve the state's ranching and agricultural legacy and encourage smart land use patterns
- Construct and improve urban and mountain parks and open space for public recreation and access
- Maintain the state's urban and mountain trail systems
- Provide recreation, environmental education and leadership opportunities for young people
- Encourage the spirit of scientific inquiry and the preservation of natural habitat

The Trust for Public Land (TPL) – The TPL offers transaction services; completing land transactions to create parks, playgrounds, and protected natural areas. Land is bought from willing landowners, and then transferred to public agencies. The TPL has a local office in Denver.

Wells Fargo Environmental Solutions for Communities – Offered in partnership with the National Fish and Wildlife Foundation, the program is designed to support projects that link economic development and community well-being to the stewardship and health of the environment. In partnership with the Wildlife Conservation Society and Colorado State University, staff submitted a proposal to this program in 2014 to support citizen science for ongoing biodiversity monitoring. The outcome of this proposal is pending.

Photo Credit: Ava Diamond

NATURE IN THE CITY

Learn more at:
www.fcgov.com/natureinthecity

City of Fort Collins