Missoula Urban Area Open Space Plan 2019

As part of the Parks, Recreation, Open Space and Trails (PROST) Plan

Foreword – Why a New Plan?

Open space defines Missoula. It frames our views and daily life. We use trails to commute and recreate, enjoy the views of natural areas, play in parks and conservation areas, and appreciate wildlife and agricultural abundance fortunately still common in our area. These conserved lands exist because of the foresight of those who came before us.

For almost half a century, Missoulians have reaffirmed their support for open space by engaging in the planning process, by connecting with land, water and wildlife, and by voting in support of open space bond funding. Protecting open space has benefits ranging from ecological and human health to economic vitality. The vision from the original 1995 *Missoula Urban Area Open Space Plan* still reflects our values: "The vision of Missoula's open space system reflects a future community whose most intensive activities and land uses so successfully coexist with its internal and external open space that both residents and visitors readily enjoy a sense of place."

Funds from the original 1980, 1995 and 2006 bonds, in combination with private, non-profit, and governmental partnerships, fueled a successful expansion of our popular open space system. Since 1980, open space bond funding has protected over 7,000 acres of land in the Missoula urban area and leveraged millions of additional dollars for conservation projects to match the public investment through bonds. Since 2006, and the first county-wide open space bond, open space bond funds have protected over 14,000 acres throughout Missoula County and have helped to leverage an additional 15,000 acres for protection in the county. These projects have protected wildlife habitat, agricultural land, scenic open space, forests, riparian corridors, and open space lands for public access for recreation and enjoyment.

Missoula has continued to change since the *Missoula Urban Area Open Space Plan 2006 Update*. Population growth and changing patterns of residential development intersect with 21st century recreational and transit patterns, ecological concerns including a changing climate, and a need for social equity in the distribution of and access to all of the benefits of open space. There is ever-increasing pressure on many public open space areas and a growing awareness that agricultural and open space resources are limited.

The *2019 Plan* addresses the Missoula community's current desire for a connected open space system that balances public access for all, natural habitats and resources, and population growth. It recognizes the important role our landscape has in providing natural climate solutions. As in previous plans, the *2019 Plan* calls for an expansion of the open space system in a way that addresses conservation of public resources and private agricultural areas, increases connectivity between areas and provides high quality habitat for wildlife. The plan also recognizes that maintenance and restoration of existing open space areas is critical to protecting the values of the open space system into the future.

Through our work on this new version of the open space plan, we expand upon the community's open space accomplishments by continuing to prioritize conservation of diverse open space lands. These include conservation and recreational areas, wildlife habitat, accessible river corridors, developed parks, agricultural lands, and an integrated trail system.

With our community's reaffirmed commitment to open space comes expanded responsibility.

We must ensure that all people in our community have access to the benefits of our open spaces. We must create safe access to open space, and parks and recreation opportunities for all community members. This includes investments in park projects for underserved neighborhoods and programs and policies that protect vulnerable neighborhoods from environmental and health hazards. Our success relies on stewardship of our existing and future public lands to maximize their many benefits.

Signed,

Open Space Working Group

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I. Introduction

Citizens of Missoula deeply value open spaces. These natural amenities are at the foundation of a unique sense of place that defines Missoula and contributes to the high quality of life we love and enjoy. An engaged citizenry, numerous organizations, elected officials, landowners and other passionate community members have prioritized open space. The result is thousands of acres of conserved land that protect air and water quality, wildlife habitat, agriculture, trails, scenic vistas, and public access to our lands and waterways for recreation.

Open space planning in Missoula dates back to the 1960s to Missoula's first comprehensive plan, adopted in 1968 by the City of Missoula ("the City") and Missoula County ("the County"). Specifically, that plan called to: "Expand and equitably distribute areas for open spaces, parks, recreational and cultural facilities within the urban area…[and] [p]reserve mountainous areas and water courses in the Planning Area for future generations."[1] The 1975 update of this comprehensive plan treated open space resources in greater detail and identified the need to provide "adequate space to serve recreational, environmental, health and safety needs of the community" and support for Missoula to "develop a uniquely large and beautiful open space area which links developed park facilities and all living and commerce areas…."[2]

In 1969, the Montana Legislature passed the Open Space Land and Voluntary Conservation Easement Act, §76-6, Parts 1 & 2, M.C.A. ("Open Space Act")[3]. In passing the Open Space Act, the legislature found that preserving open space land was essential and the expenditure of public funds for those purposes constituted a public benefit. Further articulating the importance of conserving open space, in 1981 the City passed the City of Missoula Open Space Conservation Ordinance "to preserve significant open space land, including conservation land, parkland, trails, views and vistas, agricultural land, and urban forest, which, because of its aesthetic, scenic, recreational, historic or ecological value, it is in the public interest to preserve."

In 1976, Missoula County adopted its first open space plan. The *Missoula County Parks, Recreation and Open Space Plan* chronicled Missoula's urban area open space resources and recommended the City and County "establish and preserve open space through zoning, acquisition, easements, grants, donations, and other available means to prevent undesirable land uses in critical areas."[4] In 1995, the City completed its first formal Open Space Plan, which described then-current efforts and recommended additional actions to achieve an open space

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[1] Missoula Urban Area Open Space Plan at 55; August 1995.

[2] Missoula's 1975 Comprehensive Plan update, *A Policy Guide for Urban Growth* (Missoula Planning Board, 1975), went into much greater detail on open space than the original Comprehensive Plan, recognizing the importance of preserving ecologically important habitat types, natural drainage patterns, cultural, scenic and historic values. The Plan states, "The opportunity for Missoula to develop a uniquely large and beautiful open space area which links developed park facilities and all living and commerce areas is an idea in which Missoulians have expressed great interest and support…. An open space pattern should be created which gives the community an aesthetically pleasing form and provides corridors which may be used as travel ways from one section of the community to another." As cited in: Little, Jed D., "From ridge to river: Conserving open space in Missoula, Montana" (2003). Graduate Student Theses, Dissertations, & Professional Papers. 2413. https://scholarworks.umt.edu/etd/2413

[3] Section 76-6. Parts 1 & 2, M.C.A.

[4] Little, Jed D., "From ridge to river| Conserving open space in Missoula, Montana" (2003). Graduate Student Theses, Dissertations, & Professional Papers. 2413. https://scholarworks.umt.edu/etd/2413

system by 2010. In 2006, the City and County's Open Space Plan Update recognized the growing and ongoing need to protect open space as Missoula continued to grow. It reviewed, affirmed and expanded upon the 1995 open space vision, with the intent that subsequent reviews of the plan goals would take place about every 10 years, or sooner if needed.

Today, the vision and need for open space conservation in Missoula endures. The landscapes of the Missoula Valley and Missoula County reflect a portfolio of accomplishments from decades of work (Figure 1). Nevertheless, Missoula continues to grow and change. There are further needs in the form of incomplete connections between protected areas[5] or gaps in cornerstones, key habitats still in need of protection, and a growing demand for places for the public to recreate. Accordingly, this plan charts the course forward for the next decade of open space conservation in Missoula.

[5] In this plan the term "protected area" generally means the following: "A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values." International Union for Conservation of Nature (IUCN) definition 2008. https://www.iucn.org/theme/protected-areas/about. It can also mean areas protected for a particular public benefit, such as recreation, agriculture, historic or scenic value.

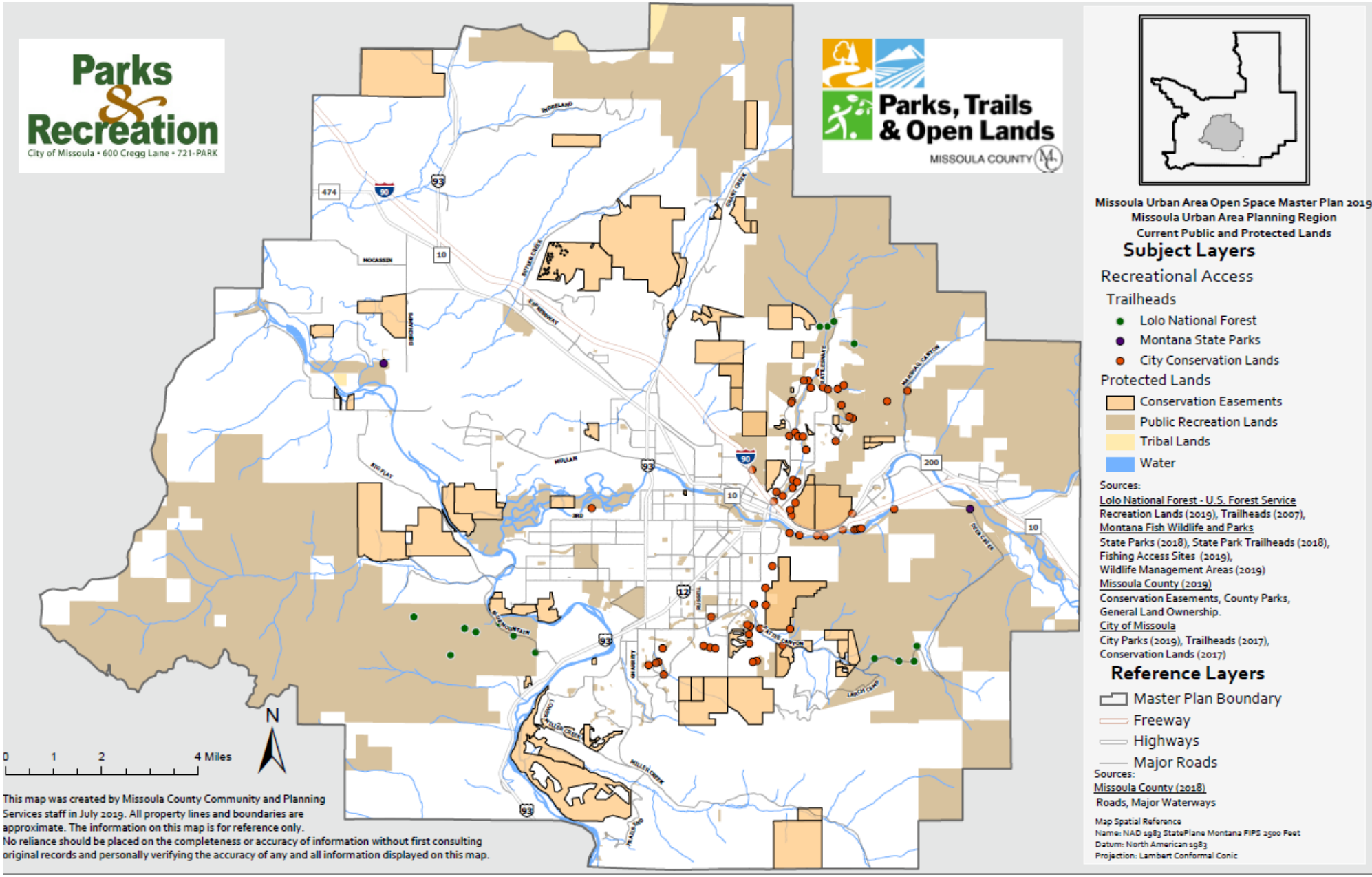

Figure 1. Map of Missoula Urban Area: Current Public and Protected Lands

II. Purpose of an Open Space Plan

The open space plan is a policy document that helps prioritize limited resources available for open space conservation in the Missoula urban area. The plan emphasizes open space as a key element in Missoula's overall urban development patterns, and informs open space conservation and land use decision-making by local government, conservation organizations, and citizens. This open space plan, combined with other relevant adopted plans, serves as a continued statement of our community's priorities for parks, trails and open space. As with previous versions of the open space plan, this document is implemented through a variety of tools outlined below, and helps guide expenditure of public and private funds for open space conservation.

The City and County have a number of adopted land use planning documents that provide the policy framework for this document. Appendix A contains the list of these documents. State and local laws provide the legal framework for this open space plan. The text of the Open Space Land and Voluntary Conservation Easement Act and the City's Open Space Ordinance is included in full in Appendix B, along with the constitutional provision providing Montanans a constitutional right to a clean and healthful environment.

The open space plan is intended to be a chapter of the Parks, Recreation, Open Space and Trails (PROST) plan, yet will stand alone until the remainder of the PROST Plan is drafted and adopted. The open space plan is intended to support, and be consistent with, the City and County's respective adopted plans and to guide open space acquisitions. The open space plan may also be used to help inform land use planning decisions about natural resource functions and values, but is not intended to be used as a regulatory instrument. The open space plan may also be useful for promoting education, partnerships, and intergovernmental cooperation aimed at conservation and environmental quality.

The term "Missoula urban area" is used throughout this plan and refers to the area identified in Figure 1 as the open space planning area or "PROST" planning area. This area includes the City of Missoula and County lands within the urbanizing fringe around the city limits and the adjacent lands, which consist mainly of foothills and mountains or valley agricultural lands. The area is similar to the open space planning region boundary in the 2006 Update, with slight adjustments to be more consistent with the boundaries of the County's Missoula Planning Region.

III. Vision for Missoula Urban Area's Open Space System

The **open space vision** is to *conserve, protect, and connect* Missoula's system of open space lands to achieve *a coherent and connected open space system, with access to a park, trail, open space land, natural area, or recreation area available in every neighborhood.* This integrated system includes lands protected for wildlife habitat and natural resources, park lands, lands protected for historic and scenic values, agricultural lands, and trails. This vision contributes to shaping our community's character, reinforcing and enhancing our community's environmental and social values, and helps guide growth.

A. Open Space Goals

To achieve this vision, the plan aims to achieve the following goals:

Conserve natural systems through purchase and stewardship of land, conservation easements and other available tools, for the benefit of future generations. These systems include:

- Natural areas and open spaces of local and regional significance;
- Places of refuge and travel corridors for wildlife;
- River corridors, aquifer recharge areas, and other water resources; and
- Significant agricultural lands.

Protect community open space values including important natural, cultural, and recreational resources.

- Protect, maintain and enhance areas that sustain our human, plant and animal communities, and contribute to our resilience in the face of climate change;
- Spatially define the shape of our growing community in a way that honors its significant landforms, natural features, and ecosystems; and
- Protect scenic viewpoints and viewsheds, including visual reminders of our geologic history.

Connect urban green spaces and anchor areas through corridors and connect areas of development with open spaces through corridors. These corridors will:

- Provide appropriate public access to natural areas, rivers, and open spaces for recreation and enjoyment;
- Improve opportunities for pedestrian and bicycle access and connect human travel corridors throughout our community; and
- Provide space and habitat for urban trees and other appropriate native and non-native vegetation to facilitate wildlife movement.

B. Conceptual Framework of Missoula Urban Area's Open Space System

The 2019 plan incorporates concepts from, and builds upon, previous open space plans, while also incorporating new terminology, data, and updated priorities, to better preserve, protect and connect the system. The categories depicted (See Figure 2) and defined below (Anchor Areas, Corridors, Urban Green Spaces) represent a new effort to create a set of terms to describe the components of the Missoula Urban Area's open space system. This model is not specific to any one geographic area in Missoula, but rather can be applied to any area of the open space planning region and represents the structure of the open space system. ***To accomplish the goals of this plan, the City and County consider the framework of this model while aiming to protect a variety of different types of open space.***

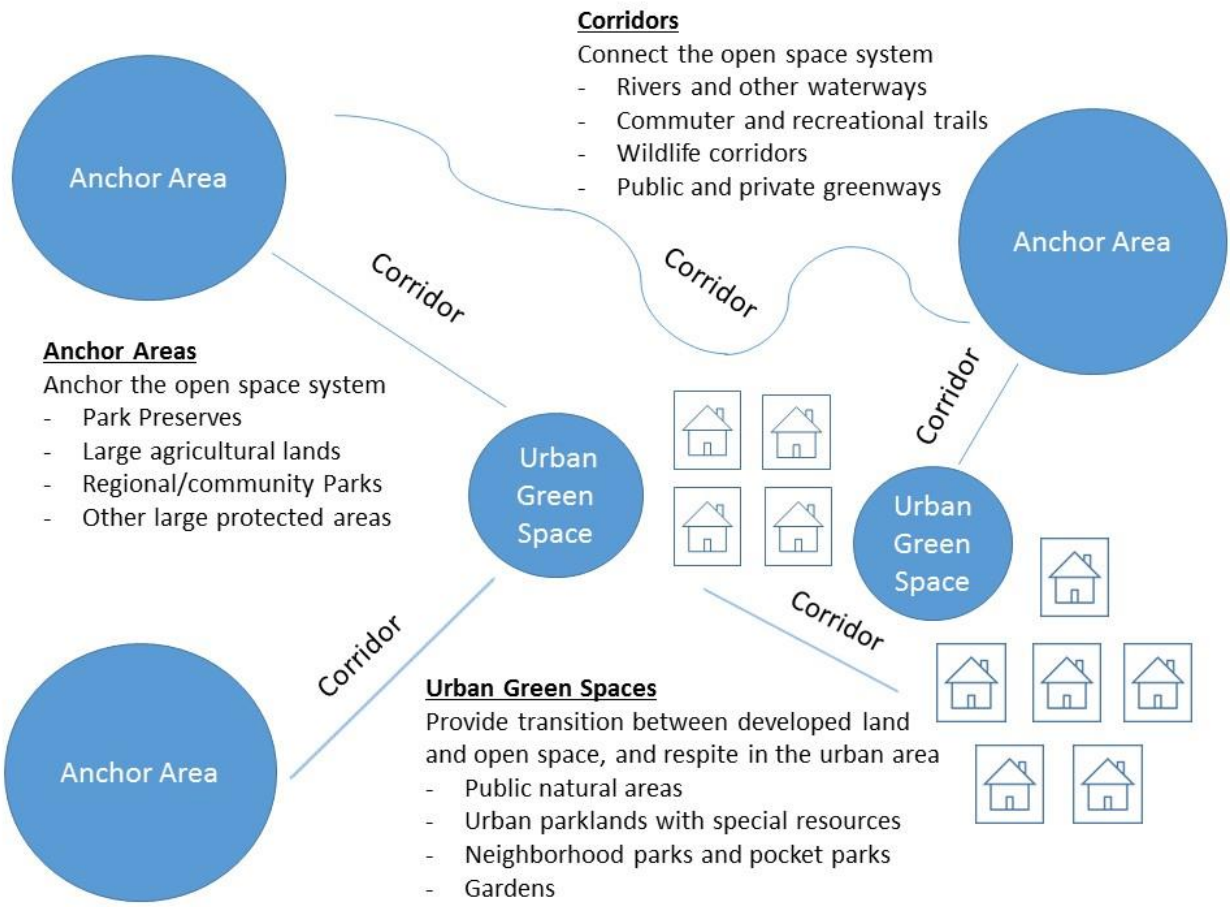

Figure 2. Model of Open Space in Missoula Urban Area

1. Anchor Areas

Anchor areas are large (generally larger than 100 acres) protected areas that provide core open space land in the system. Anchor areas include larger parcels owned by the City or County and other public and private protected lands. Anchor areas may contain unique habitat types, cultural resources, and/or recreational amenities. Due in part to their size, anchor areas can achieve multiple goals related to habitat, recreation, agriculture, ecosystem services, and human health.

Anchor areas act to:

- Preserve natural ecosystem functions;
- Conserve working lands, such as farms, ranches, and forests;
- Preserve important views and scenic vistas;
- Protect air and water quality;
- Provide buffers to ecosystem functions in larger wildland areas, such as wildland fires, wildlife movement, and flooding;
- Protect areas of cultural importance; and
- Meet the community's needs for recreation while also incorporating natural resources.

Some examples of existing anchor areas around the Missoula valley include Fort Missoula Regional Park, Mount Jumbo, the North Hills, Kelly Island, and the Pattee Canyon and Blue Mountain recreation areas.

Implementation Strategies for Anchor Areas

- Protect key lands to improve wildlife habitat and protect natural resources.
- Preserve larger and/or high-quality tracts of agricultural land.
- Protect key lands to enlarge and connect anchor areas.
- Establish anchor areas in regions of the planning area that do not contain such areas.
- Provide public access to conservation lands.
- Provide more dirt trails for hiking, biking, and running.
- Balance demand for recreational access with need to protect habitat.

2. Urban Green Spaces

Urban green spaces provide transitions between developed land and open space and provide respite in the urban environment. Urban green spaces serve as buffer areas within areas of moderate to high development. They are often threaded along the corridors that connect anchor areas. While these areas may contain important habitat or natural resources worthy of protection, due to their proximity to development, they tend to have high human use. Key benefits of urban green spaces include storm water management, visual green spaces for beautification, climate resilience, and human health and recreation, including enhancement of or opportunity for social justice, health equity, and inclusion.

Urban Green Spaces act to:

- Provide areas for recreation, education, and respite from the urban environment;
- Preserve urban agriculture, gardens and community trees; and,
- Provide a buffer between developed areas and anchor areas and provide a buffer to the wildland-urban interface.
- Provide habitat for urban wildlife.

Examples of urban green spaces include public natural areas such as Greenough Park, Tom Green Natural Area and Bancroft Ponds, neighborhood parks like Bonner or Franklin, and pocket parks such as Little McCormick.

Implementation Strategies for Urban Green Spaces

- Protect additional urban green spaces within neighborhoods that have insufficient acres of parks, trails and open space per capita.
- Work toward ensuring that the majority of citizens in the Missoula urban area have access to a park, trail or open space trailhead within a 10-12-minute walk from home.
- Protect lands to balance demand for recreational access with adequate buffer zones to protect wildlife habitat.
- Invest in agricultural lands and urban farming by creating more community gardens.

3. Corridors

Corridors connect urban green spaces and anchor areas and, depending on the type of corridor, can be managed primarily for wildlife habitat or human use, or in many cases for an appropriate balance of each. They are often linear in nature, following rivers or streams, providing access between and among protected areas, or they can provide access between commercial and residential development and open space lands.

Corridors act to:

- Provide travel corridors for humans and wildlife;
- Support important riparian vegetation and wildlife species (river corridors);
- Enhance air and water quality;
- Play an essential role in maintaining biodiversity and connections among plant and animal populations that could otherwise be isolated (river and wildlife corridors); and
- Provide important recreation and transportation corridors for humans (rivers, commuter trails, *etc.*).

Corridors provide locations for travel by humans and wildlife, such as the Bitterroot Trail and Ron's Riverfront Trail, or the Clark Fork and Bitterroot Rivers. Urban trees and other vegetation in corridors provide habitat for songbirds and other wildlife, while also providing respite for humans and supporting climate and conservation goals.

Implementation Strategies for Corridors

- Improve access and connectivity between parks, trails and open spaces by filling gaps in commuter trail networks.
- Improve vegetation and wildlife habitat and open space values through connected vegetation corridors, including the urban forest, when and where appropriate.
- Expand existing commuter trail networks to connect with surrounding national forest recreation areas and under-connected areas of town.
- Provide safe and sustainable access points to rivers, to minimize impacts to riparian areas and protect water quality.
- Provide more paved and dirt trails for commuting and recreating.

IV. Implementation of Missoula Urban Area's Open Space System

The City and County use a variety of voluntary and regulatory tools to implement this plan. Not every tool will fit every situation, and each property and set of circumstances is unique. The City and County work with willing landowners who wish to see a conservation outcome for their land. The City and County also work in the regulatory capacity to engage in land use planning and regulation. The combination of these efforts is the opportunity to guide growth and protect open space in a manner consistent with our community's priorities.

The opportunity to acquire open space through the private development process can occur when a landowner proposes a development project for review by the local governing body. The landowner can propose an open space set-aside; the local regulations may require an open space or parkland dedication; or to mitigate impacts, the local government can place conditions on the development to create such areas, consistent with state and local regulations. Other opportunities to implement this plan arise when landowners voluntarily seek open space bond funding or other

partnerships to protect land as open space. Appendix C describes the most common voluntary and regulatory tools the City and County staff and citizen advisory committees may use to implement this plan.

There are many considerations that staff, elected officials, conservation professionals, and landowners undergo when deciding whether to undertake an open space project. When considering an open space project, City and County staff examine how the project would fit into the following (in no particular order):

- **Specific Open Space Bond Language and Criteria (if using bond funds):** *Whether a project qualifies for open space bond funding, based on the bond language citizens voted to support and criteria contained in land use plans, ordinances, and other policy documents.*

- **Types of Open Space in the Missoula Urban Area's Open Space System:** *Whether a project will provide one or more of the desired types, and associated uses, of open space.*

- **Geography of High Open Space Value in Missoula Urban Area – Cornerstones and/or Riparian Areas:** *Whether, how, and where a project fits into geographic areas of high open space value, as characterized by cornerstones and/or riparian areas. The meaning and use of cornerstones to focus open space work is explained in greater detail in following pages.*

- **Stewardship:** *Whether the land manager responsible has the ability to provide appropriate stewardship for the expected and intended uses or reasons for acquisition.*

Other considerations include public input and community desires as obtained by various public meetings, public hearings and comment opportunities and consideration of the unique benefits of each open space project.

The above considerations are discussed in more detail below.

A. Open Space Bonds

Since the 1980s, open space bonds have provided public funding for voluntary conservation projects in the city and county. The bonds have allowed the City and the County to work with a variety of partners and private landowners to complete numerous projects. City of Missoula voters passed the state's first open space bond in 1980, in the amount of $500,000, with a second city-wide open space bond in 1995, in the amount of $5 million. Missoula County voters passed Missoula's first county-wide open space bond in 2006 in the amount of $10 million. In 2018, 63% of Missoula County voters passed a new $15 million open space bond, and 63% of City voters passed a 4 mill (approximately $500,000 annually in 2018 dollars) conservation stewardship levy.

If bond funds are expended for a project, the project must at a minimum fit the purpose and allowable activities of the bond (Table 1).

	1995 Open Space City	2006 Open Space County	2018 Open Space County
Primary Purpose	Acquiring open space land in or near the City	Preserving open space	Conserving, enjoying, and enhancing open space land
Additional Purpose	Acquiring funds for the open space acquisition trust fund, moneys from which fund may be expended for the purpose of acquiring, in fee, by easement, or otherwise, open space land in or near the City Acquiring Mount Jumbo lands, lands at the South end of Mount Sentinel, Fort Missoula area lands, upper South Hills lands, North Hills, Clark Fork River Corridors, areas for recreational playing fields Acquiring and establishing community trails consistent with the Open Space plan	Protecting the water quality of rivers, lakes, and streams Protecting wildlife habitat Conserving working ranches, farms, and forests Providing access along rivers, lakes, and streams Managing for growth Providing open space and scenic landscapes Providing recreational and commuter trails	Providing public access to water and land Conserving agricultural lands, fish and wildlife habitat, and rivers, lakes, and streams Protecting scenic views Making improvements to lands acquired or designated as open space that are accessible to the public
Allowed Activities and Costs	Acquiring, in fee, by easement, or otherwise, open space land in or near the City Defraying costs related to such acquisition	Purchasing land, easements, and other interests in land from willing landowners Paying non-personnel related transaction costs, costs of initial clean-up and weed control associated with an approved project	Purchasing land, easements, or other interests in land from willing landowners Paying for improvements and costs related to or serving lands acquired or designated as open space Transaction and project costs and fees
Requirements	Acquisitions are guided by the open space plan recently adopted by Missoula local governments	Willing landowners	Citizen input For improvements, must be on land acquired or designated as open space and accessible by the public

Table 1. Purposes, allowable activities and costs, and requirements of 1995, 2006, and 2018 open space bonds

The ballot language from the 1995, 2006, and 2018 bonds can be found in Appendix D.

1. Process for Determining Open Space Bond Fund Expenditures

Open space conservation in Missoula would not be possible without the ongoing coordination and collaboration among the City, County, and numerous partners including land trusts and other non-governmental organizations, businesses, developers, private landowners and other governmental agencies, who work together to implement the goals of this plan. The City and County formally work together through a number of mechanisms, one of which is interlocal agreements.[6]

City elected officials, with recommendations from staff and citizen advisory committees, make decisions related to the expenditure of open space bond funds. Interlocal agreements help outline the details of how local governments work together, to streamline this process to most efficiently expend public resources. The process for how the City and County generally work together to determine county-wide bond fund expenditures is described in a flowchart in Appendix E.

An essential component of the process of City open space and County open lands projects is the involvement and recommendations of citizen advisory committees. The County Open Lands Citizens Advisory Committee (OLC) makes recommendations to the County Commissioners on expenditure of open space bond funds, and the City Citizen's Advisory Committee on Open Space (OSAC) makes recommendations to City Council on expenditures of bond funds. Each committee bases recommendations on evaluation criteria, which are derived from a variety of sources including specific requirements of the funding source (i.e. in the case of bonds, the specific bond language), state law, ordinance, and the open space plan goals and objectives. The 2006 open space update criteria show the types of criteria used previously, and can be found here: https://www.ci.missoula.mt.us/DocumentCenter/View/652/2006-Updated-Open-Space-Plan?bidId=. Each citizen advisory committee employs its own procedures for vetting a project against the criteria, and making recommendations to its respective elected body.

Additionally, City lands acquired with intention or potential for public access, include an assessment for determining level of development, acceptable uses, how best to achieve balance of conservation and recreation, and long term stewardship.

[6] Montana Interlocal Cooperation Act. Title 7, Chapter 11, Part 1, Mont. Code Ann. (2017). This act allows local governments to make the most efficient use of their powers by enabling them to cooperate in areas of mutual advantage to provide services and facilities that will accord best with geographic, economic, population, and other factors influencing the needs and development of local communities. Section 7-11-102 Mont. Code Ann. (2017).

B. Types of Open Space in Missoula Urban Area's Open Space System

The Missoula urban area open space system includes several types of land, and this plan focuses primarily on the protection of these types. Each property will generally possess multiple open space values, and its protection can accomplish multiple conservation goals, even when one value may be the primary impetus for protection. ***The City and County focus on protecting these types of open space, within the structure of the conceptual framework.***

- **Conservation Lands:** Conservation lands are natural areas that are protected and managed primarily to protect their high natural resource, habitat and scenic values, where recreational use is secondary to the protection of habitat. They can be found within anchor areas, corridors, and urban green spaces. Tower Street Conservation Area, Clark Fork River riparian corridor, Bancroft Ponds, Mount Jumbo, the North Hills, and Greenough Park are examples of conservation lands.
- **Parkland/Developed Parks:** Developed parks are protected and managed primarily for active and passive recreation. They are primarily found within urban green spaces; however, large regional parks can also function as anchor areas. Parks also contain many of our community's trees and other important natural resources. Lafray, Bonner, Northside, and McCormick Parks are typical examples of developed parks.
- **Historic or Scenic Lands:** Historic or scenic lands are protected and managed primarily for historic or scenic purposes. Lands with scenic or historic open space values can exist within anchor areas, urban green spaces, or corridors. The Moon-Randolph Homestead is an example of open space land with high scenic and historic value, and Fort Missoula Regional Park is situated on lands on the National Register of Historic Places.
- **Agricultural Lands:** Agricultural lands contain working farms, ranches, forests, and/or important agricultural soils. The River Road Farm and the South Hills Conservation Easements are examples of agricultural lands protected using open space bond funds.
- **Corridors:** Corridors connect the open space system. They include commuter and recreational trails, greenways, waterways, riparian corridors, and wildlife corridors. The Clark Fork River, Rattlesnake and Grant Creeks, Milwaukee and Bitterroot Trails, and Rattlesnake Greenbelt (power line corridors) are examples of Corridors.

C. Geography of High Open Space Value in Missoula Urban Area

Open space cornerstones are a conceptual visual tool to help geographically guide open space conservation and planning. The Missoula Urban Area Open Space Plan and the open space cornerstones identified herein are guiding tools; they are not regulatory and do not confer any authority to regulate that is not otherwise specifically provided by law.

1. Cornerstones - Description

Cornerstones broadly represent areas with high open space value. Cornerstones may contain both developed and undeveloped land, and it is important to note that land with high open space value may also exist outside of cornerstones. Cornerstone boundaries are generally drawn and purposely do not follow parcel boundaries. Lands

in cornerstones are not automatically designated as open space, and cornerstone areas do not delineate areas proposed for rezoning as parks or open space. Cornerstones also do not prohibit development, as land in cornerstone areas can be developed in accordance with subdivision and development regulations. Land may only become acquired or designated as open space land through a public process or through voluntary conservation efforts by willing landowners, such as protecting land with a conservation easement or other conservation tools.

Each cornerstone contains a unique combination of resources and open space values that make lands in that cornerstone a priority for protection. For example, a cornerstone may contain large conservation lands that serve as an anchor area, or it may contain numerous parcels of conserved agricultural lands, or it may include several small parks as urban green spaces, connected by a corridor/trail. Some cornerstones include conserved lands that serve as anchor areas, while others include mostly unprotected lands, representing possibilities for future open space conservation. Each cornerstone is unique, and the exact resource make up of a cornerstone may change over time. Historically, cornerstones have been "retired" when the lands within no longer possess open space values worthy of protection, due to development or other changed conditions. Note that open space cornerstone differs from the concept of an "Anchor Area" as discussed earlier and in Figure 2.

2. **Cornerstones – Formation**

The City first adopted open space cornerstones in the 1995 Missoula Urban Area Open Space Plan. The 2006 Missoula Urban Area Open Space Plan Update reinforced the importance of the cornerstone area concept and updated or retired many of the cornerstone areas.[7] The 1995 and 2006 cornerstones boundaries were based on the following:

- The areas had been recommended (at least in part) for protection as open space by three or more community planning documents, some of which date back to 1976;
- The areas contained undeveloped land that was likely to rank high when further evaluated against a set of open space suitability criteria; and,
- The areas contained undeveloped land or water resources that could contribute a significant element to the urban area open space system.[8]

In this 2019 plan, the cornerstones continue to represent land and water resources with high open space value. The updated cornerstone map (Figure 3) is based on community feedback, development patterns, a variety of source maps, documents, and spatial datasets, as well as a significant public outreach effort specifically related to the cornerstone mapping. The data layers include the public outreach and natural resources that are relevant to open space in Missoula County, as deemed relevant by various natural resource entities and agencies.

[7] Missoula Urban Area Open Space Plan 2006 Update www.ci.missoula.mt.us/DocumentCenter/View/652/2006-Updated-Open-Space-Plan

[8] Missoula Urban Area Open Space Plan 2006 Update www.ci.missoula.mt.us/DocumentCenter/View/652/2006-Updated-Open-Space-Plan

Appendix F includes a list of resources used in the cornerstone mapping update, a list of natural resources that support each cornerstone, and supplemental maps of those natural resources.

3. **Riparian Areas**

Riparian habitat is an essential habitat type that has historically been prioritized for open space conservation in Missoula. Riparian areas are ribbons of life. Given the small amount of land area they occupy, these ecosystems are highly diverse and provide habitat for a multitude of species. The cornerstones above do not specifically include the tributaries to the Clark Fork and Bitterroot Rivers (such as the riparian areas of Butler Creek, Lavalle Creek, Rattlesnake Creek, Grant Creek, etc.) as separate cornerstone areas. Rather, this plan identifies riparian areas as a habitat type that is a priority for open space protection and preservation.

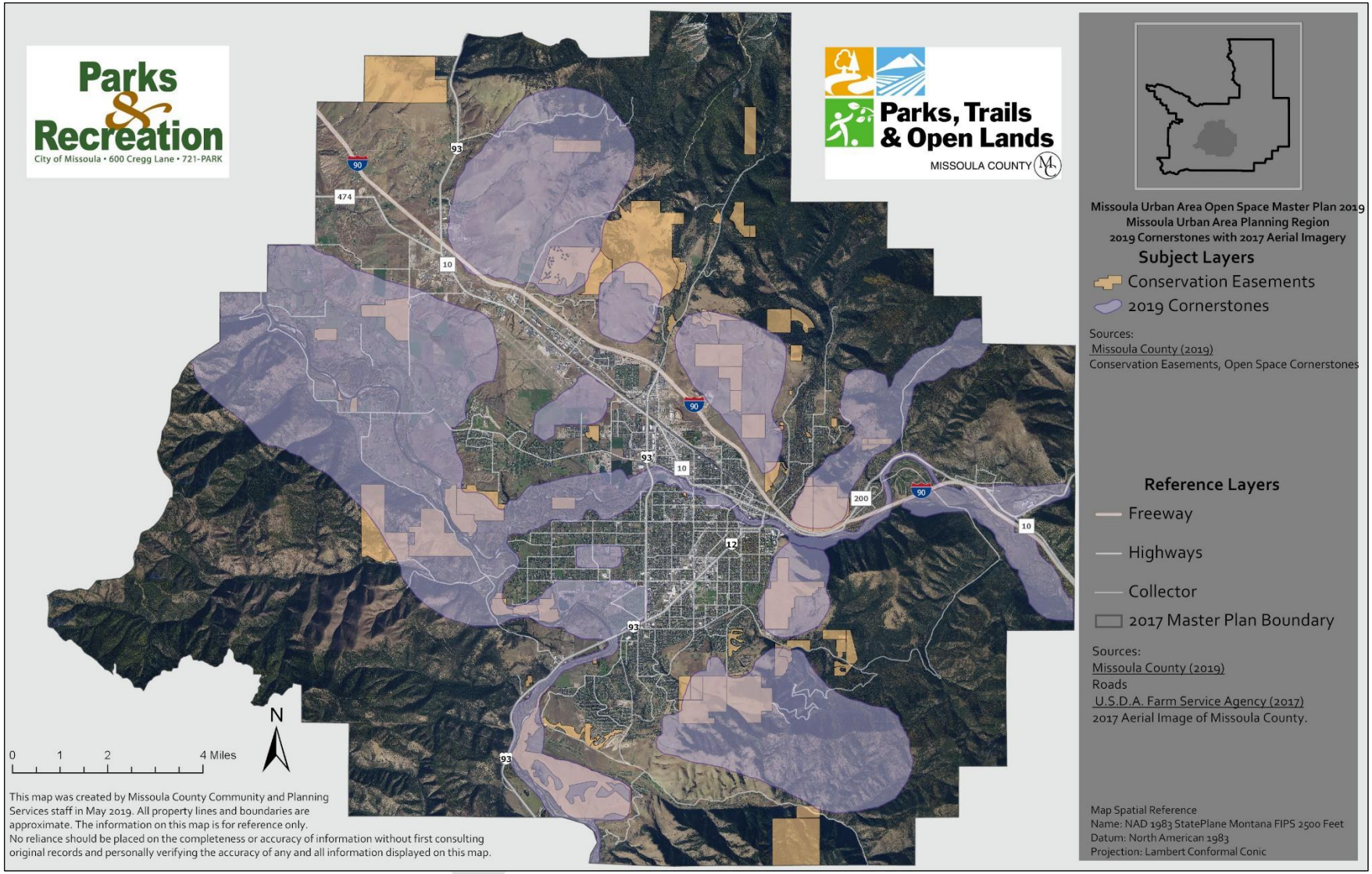

Figure 3. Updated Cornerstone Map

V. Public Input Provides the Foundation

For almost half a century, Missoulians have reaffirmed their support for open space, through planning for open space conservation and voting to support open space bonds. *The 2019 Plan addresses the current Missoula community's desire for a connected open space system that balances public access, natural habitats and resources, and population growth*. It reflects the priorities the Missoula community articulated through several key public outreach endeavors. These public outreach efforts helped inform this plan through providing a lens into our community's current priorities for parks, trails and open space.

A. Open Space Open House

The City and County jointly convened an open house in February 2018, to obtain comments and feedback from the public regarding priorities and visions for future open space planning. Each participant filled out a paper questionnaire, which was available online for an additional 30 days. In total, participants submitted 200 questionnaires. A full report of the results is included in Appendix G.

Several priorities emerged from the open space open house questionnaires as important factors to consider in future open space planning efforts:

- Population growth and increased demand for recreation are the most important trends to consider in a new open space plan.
- Wildlife habitat, corridors, fisheries, quality of life, and ecosystem services are the most important open space values and priorities to consider.
- Conservation lands and corridors are the most important types of open space.
- Prioritize access to connected conservation lands and corridors.
- Continue to provide access to a variety of open lands to improve health, quality of life, and sense of place.

B. PROST Survey

During January 2018, the City and County contracted Corona Insights, a professional consulting firm, to administer a county-wide survey to residents. Overall, 570 respondents completed the survey. Results from the survey yielded statistically-valid and valuable information about Missoula county residents' priorities and goals related to open space planning. The responses and feedback gathered from the survey provide a countywide snapshot of the most important factors to consider for the Parks, Recreation, Open Space and Trails (PROST) plan.

The most notable and relevant trends related to open space are described below. The percentages represent the number of responses from households surveyed. Specific pages of the final Corona survey executive summary are referenced parenthetically by page number. The executive summary of the survey is in Appendix H.

- The **most important features** to county residents and their households (page 25):
  - Dirt trails for hiking, biking, and running (62%)
  - Natural area/wildlife habitat (54%)
  - Paved trails for walking and biking (46%)
  - River access sites (42%)

- The **most wanted features** households want to use (page 18):
  - Natural areas/wildlife habitat (84%)
  - Dirt trails for hiking, biking, and running (84%)
  - River access sites (81%)
  - Paved trails for walking and biking (78%)

- Features with **greatest desired improvements** that reflect management of open space and recreational areas (page 19):
  - Natural areas/wildlife habitat (70%)
  - Dirt trails for hiking, biking and running (63%)
  - River access sites (63%)
  - Paved trails for walking and biking (57%)

- Actions supported (somewhat or strongly support) that relate to **benefits of protecting natural areas and open space** (page 53):
  - Protect water quality (93%)
  - Protect air quality (92%)
  - Ensure natural areas are available to visit and recreate in (90%)
  - Protect land for wildlife habitat and environmental reasons (90%)
  - Preserve views and scenic vistas (88%)
  - Protect working lands, such as farms, forests, and agricultural lands (87%)

- Actions supported (somewhat or strongly support) by households that relate to **management, restoration, or acquisition of open space** (pages 39, 42):
  - Restore river, stream, and lake natural habitats (88%)
  - Help conserve working lands such as farms, ranches, and forests (87%)
  - Manage forest health on open spaces (87%)
  - Connect existing trails to other trails (84%)
  - Restore habitats on hillsides and grasslands (83%)
  - Purchase lands for wildlife and ecological reasons (82%)

The survey results highlight the strong support for protecting all types of open space for recreational and environmental values. These insights are statistically valid and provide citizen-driven guidance to help inform planning for parks, recreation, open space, and trails.

C. Community Focus Groups

In January 2018, the City and County jointly hosted four two-hour, professionally-facilitated focus groups. A diverse array of people gathered to participate, with representatives from business, education, recreation, and economic sectors of Missoula. The intention of this group process was to actively engage members of the public in the initial stages of PROST planning and to use their responses as a snapshot of planning priorities. At each session, a professional facilitator asked participants a set of seven questions. The 393 comments showed several important trends specific to open space. Below is a synopsis of those comments. The Focus Group summary is in Appendix I.

- The **most important open space contributions made by the City and County in the Missoula urban area** since the 2006 open space planning process:
  - Connectivity between trails, open spaces and Clark Fork river corridor
  - Acquisition of cornerstone lands that increase access to open space and contribute to a cohesive system of trails, open space, and parks
  - Management that prioritizes protection of wildlife, river corridors, and combats invasive plant species
  - Trail systems, commuter networks, parks, and open lands that increase quality of life for Missoula residents and visitors
  - Access to diverse natural spaces that provide opportunity for physical, mental, and spiritual recreation

- **Priority considerations for future open space planning**:

  Connectivity:
  - Improve access and connectivity between parks, trails and open spaces by filling gaps in commuter networks and establishing parks in under-represented neighborhoods
  - Ensure all residents are within close proximity to a non-motorized trail that connects to a larger system of places and spaces
  - Expand existing commuter networks (Bitterroot Branch, Milwaukee Trail) to under-connected sectors of town and extend the networks to provide non-motorized access to surrounding National Forest recreation areas

  Environmental Protection:
  - Provide safe and sustainable access points to the Clark Fork river that minimize impacts to riparian areas and protect water quality
  - Balance demand for recreational access with adequate buffer zones to protect wildlife habitat
  - Aggressively combat invasive aquatic and terrestrial plant species
  - Identify solutions to mitigate effects of climate change, such as drought and wildfire

  Acquisition:
  - Continue acquisition of park and conservation lands that contain intrinsic value, protect wildlife habitat, and boost quality of life and economic vitality of Missoula residents
  - Invest in agricultural lands and urban farming by creating more community gardens

VI. Benefits of Open Space Today and in the Future

Open spaces provide an abundance of important benefits to humans and the environment. In addition to providing scenic vistas and natural beauty, open spaces contribute to economic vitality, help control flooding and erosion, protect wildlife habitat, supply boundless recreational opportunities, and provide access to the natural world. Communities with diverse open spaces enjoy the health benefits of clean air and water, outdoor recreation, and cultivate a sense of

environmental stewardship. The following sections summarize the most important benefits and functions of open spaces.

A. Ecosystem Services

Ecosystem services, also known as provisioning or regulating services, are benefits people derive from the natural environment; these services often have both tangible (similar to an economic service) and intangible values. *Regulating services* are those that help mitigate events like flooding and fire, or that increase carbon storage or improve water quality. Across the globe, 70% of measured regulating services have been degraded in the last 50 years.[9] Land-use change is a primary driver of the degradation of regulating services, and urbanization is the primary cause of land-use changes.[10] However, management plans that place a higher emphasis on protecting undeveloped urban open space including conservation areas, agricultural lands, urban parks, community and wildland forests, riparian areas, and greenways can enhance the regulating services provided in and around a city.[11] Some of these benefits include:

Flood Control. Undeveloped areas in flood-prone areas can reduce flood damage in two ways: (1) by reducing structures that can be damaged during flooding and (2) allowing infiltration by water due to higher soil permeability. Nationally, communities that worked to reduce flood danger through open space preservation saw a decrease in insurance claims related to flood damage equivalent to $200,000 per year.[12] Highly vegetated areas disproportionately help reduce runoff compared to areas with higher levels of development.[13] The preservation of areas that reduce flood risk, especially wetlands, can also significantly reduce the costs required to build infrastructure providing the same benefits.[14]

Surface Water Quality. Vegetation helps promote surface water quality in streams and rivers by filtering storm water, minimizing erosion and nutrient loss, and limiting flooding; these benefits are seen in both more rural areas with less development and in urban areas.[15]

[9] *Millennium Ecosystem assessment: living beyond our means-natural assets and human well-being* (Washington, DC: World Resources Institute, 2005).

[10] Eigenbrod, F., Bell, V. A., Davies, N. H., Heinemeyer, A., Armswoth, P. R., & Gaston, K. J., "The impact of projected increases in urbanization on ecosystem services," *Proceedings of the Royal Society* 278 (2011): 3201–3208. http://dx.doi.org/ 10.1098/rspb.2010.2754

[11] Zank B., Bagstad K.J., Voigt B., and Villa F., "Modeling the effects of urban expansion on natural capital stocks and ecosystem service flows: A case study in the Puget Sound, Washington, USA," *Landscape and Urban Planning* 149: (2016): 31- 42.

[12] Brody S.D., and Highfield W.E., "Open Space Protection and flood mitigation: A national study," *Land Use Policy* 32: (2013): 89-95.

[13] Yao L., Chen L., Wei W., and Sun R., "Potential reduction in urban runoff by green spaces in Beijing: A scenario analysis," *Urban Forest & Urban Greening* 14: (2015): 300-308.

[14] Fasould C.J., and Liliehom R.J., "The economic value of open space: a review and synthesis," *Environmental Management* 23: (1999): 307-320.

[15] Matteo M., Randhir T., and Bloniarz D., "Watershed-scale impacts of forest buffers on water quality and runoff in urbanizing environment," *Journal of Water Resources Planning and Management* 132: (2006): 144-152.

Groundwater Systems. The Missoula Valley aquifer is the sole source of drinking water for the Missoula community. Water enters the groundwater system via infiltration through the soil and riverbeds. In areas with high concentrations of impermeable surfaces, runoff from rainfall can be twice as high as on permeable surfaces.[16] Runoff entering storm drains also incurs costs for water treatment and increases the likelihood of flooding.

Air Quality. Forests in and around urban areas can remove significant amounts of air pollution and provide human health benefits. When air quality is combined with shading, wind reduction, and carbon sequestration benefits, urban trees can provide a net benefit three times higher than their planting and maintenance costs.[17] A large part of the air quality benefits come from the removal of particulate matter, including the most dangerous sizes that can cause lung cancer, pulmonary inflammation, and premature mortality.[18]

Carbon Sequestration. Vegetation in open space in and around urban areas can help cities reduce their carbon footprint. Even when there is not enough open space to completely offset carbon emissions, preservation of open space can provide a significant carbon sink.[19]

According to modeling and research our lands provide an untapped opportunity – proven ways of both storing carbon and reducing carbon emissions in the world's forests, grasslands and wetlands: natural climate solutions. Natural climate solutions can help address climate change in three ways:

- Reducing greenhouse gas emissions, such as carbon dioxide (CO2), related to land use and changes in land use
- Capturing and storing additional carbon dioxide from the atmosphere
- Improving resilience of ecosystems, thereby helping communities adapt to the increase in flooding and dry spells associated with climate change

Harnessing the power of natural climate solutions to improve decisions related to land use can provide at least 30% of what is needed to keep climate change under 2 degrees C, or "in check". [20]

[16] Klimas C., Williams A., Hoff M., Lawrence B., Thompson J., and Montgomery J., "Valuing ecosystem services and disservices across heterogeneous green space," *Sustainability* 8: (2016): 853-874.

[17] McPhearson D.W., Nowak D., Heisler G., Grimmond S., Souch C., Grant R., and Rowantree R., "Quantifying urban forest structure, function, and value: the Chicago Urban Forest Climate Project," *Urban Ecosystems* 1: (1997): 49-61.

[18] Nowak DJ, Hirabayahsi S, Doyle M, McGivern M, and Pasher J., "Air pollution removal by urban forests in Canada and its effects on air quality and human health," *Urban Forestry & Urban Greening* 29: (2018): 40-48.

[19] Niemala J., Saarela S.R., Soderman T., Kopperoinen L., Yli-Pelkonen V., Vare S., and Kotze D.J., "Using the ecosystem services approach for better planning and conservation of urban green spaces: a Finland case study," *Biodiversity Conservation* 19: (2010): 3225-3243

[20] The Nature Conservancy. 2019*Natural Climate Solutions. Nature's Sleeping Giant.* http://naturalclimatesolutions.org/

Fire Danger Mitigation. The Wildland-Urban Interface (WUI) can be defined as an area where housing development mixes with forest and rangeland vegetation. The number of houses in the WUI has increased annually, and in the Rocky Mountains nearly every community has a ring of WUI.[21]Areas in the WUI are likely to have the highest wildfire risk to humans and structures, and fire protection in the WUI is limited due to a lack of roads and water and a buildup of fuels.[21] Open space protection targeted at the WUI can reduce the fire risk at the county level by limiting development in these more fire-prone areas.[23]

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[21] Stein, S.M.; Menakis, J.; Carr, M.A.; Comas, S.J.; Stewart, S.I.; Cleveland, H.; Bramwell, L.; Radelo, V.C., "Wildfire, wildlands, and people: understanding and preparing for wildfire in the wildland-urban interface—a Forests on the Edge report," Gen. Tech. Rep. RMRS-GTR-299. Fort Collins, CO. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2013, 36pp.

[22] Montana DNRC. 2009. Department of Natural Resources. *Guidelines for development within the wildland-urban interface*. 2009. http://dnrc.mt.gov/divisions/forestry/docs/fire-and-aviation/prevention/guidelinesfinal.pdf

[23] Butsic V., Syphard A.D., Keely J.E., and Bar-Massad A., "Can private land conservation reduce wildfire risk to homes? A case study in San Diego County, California, USA," *Landscape and Urban Planning* 157: (2017): 161-169.

B. Wildlife Habitat and Movement Corridors

The open lands in and around Missoula provide a variety of habitats and support diverse populations of wildlife. Missoula County contains habitat for up to 73 species of threatened and endangered species and species of concern, including Canada lynx, grizzly bear, wolverine, several bat species, bull trout, westslope cutthroat trout, common loon, Coeur d'Alene salamander, Western toad, flammulated owl, black rosy-finch, golden eagle, Lewis' woodpecker, and numerous others. Many of these species can be found in the Missoula urban area.

Some of the best wildlife habitat types in our valley include woody draws, upland winter ranges, riparian areas including rivers, lakes and streams, and prairie in the valley bottoms. Some of these areas have been protected as conserved open space, helping our local wildlife survive and thrive.

Conserved open lands help to prevent habitat fragmentation, enabling wildlife to live in and move through them. Many of our open lands are designed and managed primarily for aesthetic and recreational use by people, but wildlife also uses them. While a parcel may not serve as optimal habitat, it may be the best option available or help provide permeability between one habitat and another.[24]

Wildlife use habitat for different purposes, in different patterns, and at different scales, depending on the species. Identifying and protecting areas that wildlife use for movement (i.e. the protection of wildlife linkages or wildlife corridors) is important.[25]Movements crucial to the long-term health of wildlife populations include daily feeding sessions at local food sources, seasonal migrations between summer and winter ranges, once-in-a-lifetime dispersal events to seek new territories, and multi-generational shifts in range in response to climate change.[26]The Missoula Valley sits within an important connectivity area for long-term wildlife movement between and across mountain ranges, between larger core areas such as the Crown of the Continent and Greater Yellowstone Ecosystem, and through the Sapphire Mountains surrounding Missoula into the Salmon/Selway/Bitterroot Wilderness complex to the south.[27]Our open lands can help maintain this connectivity, particularly if we work together in partnership with public land agencies, private landowners, and others to manage lands in ways that allow wildlife to thrive.

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[24] Ament, R., R. Callahan, M. McClure, M. Reuling, and G. Tabor. 2014. Wildlife Connectivity: Fundamentals for conservation action. Center for Large Landscape Conservation: Bozeman, Montana.

[25] Examples: Gilbert-Norton, L., R. Wilson, J.R. Stevens and K.H. Beard. 2010. *A Meta-Analytic Review of Corridor Effectiveness.* Conservation Biology, 24(3): 660–668; Hilty, J. W. Lidicker, Jr., and A. Merenlender in *Corridor Ecology, The Science and Practice of Linking Landscapes for Biodiversity Conservation,* Island Press publisher. 2006. 323pp.

[26]Ament, R., R. Callahan, M. McClure, M. Reuling, and G. Tabor. 2014. Wildlife Connectivity: Fundamentals for conservation action. Center for Large Landscape Conservation: Bozeman, Montana.

[27] Belote RT, Dietz MS, McRae BH, Theobald DM, McClure ML, Irwin GH, *et al*., "Identifying Corridors among large Protected Areas in the United States," *PLoS ONE* 11(No. 4 (2016): e0154223. https://doi.org/10.1371/journal.pone.0154223

C. Scenery and Viewsheds

The beautiful surrounding grasslands and hillsides, river corridors and other natural features contribute to Missoula's unique sense of place. Many of the City's early open space acquisitions focused on protecting this important scenery. Preserving the scenic views and vistas around Missoula continues to be a strong priority of open space conservation in Missoula.

D. Agricultural Land and Important Soils

Open spaces, particularly those that include soils of importance as defined by the U.S. Department of Agriculture, can support or enhance agricultural production and heritage. Agriculture is a source of livelihood, supplies food and fodder, and contributes to the local economy and food security. Access to local food and education about agriculture connect the public to their landscapes and food sources. Soil conservation is critical as the foundation of plant and animal life and is necessary for naturally filtering water supplies.

Missoula County's agricultural lands are increasingly important. Economic opportunities for nearby working farms and ranches will continue to grow in light of changing national and global circumstances such as population growth, loss of farmland, the finite character of agricultural soils, and the increasing cost of transporting food long distances.[28]The large and growing gap between land values and agricultural potential is a challenge in the Missoula region, as development has inflated the price of land beyond its agricultural worth.[29]

E. Climate Resiliency and Communities

The City and County are committed to addressing climate change and building resiliency in government operations and throughout our communities. For example, the Missoula Community Climate Smart Action Plan (2015), a joint effort of the City and Climate Smart Missoula, calls for carbon neutrality for the entire Missoula urban area by 2050.[30] The City's Conservation and Climate Action Plan, adopted in 2012, aims for carbon neutrality in government operations by 2025,[31]and the County is currently developing goals for its own operations. The County, City and Climate Smart Missoula are also jointly leading *Climate Ready Communities: Building Resilience in Missoula County*, a community-based planning effort to better understand our greatest vulnerabilities in the

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[28] Paul Hubbard and Neva Hassanein, *Losing Ground: The Future of Farms and Food in Missoula County*, Executive Summary (Missoula, MT: Community Food & Agriculture Coalition, 2010), 4.
[29] Michael Moore, "Study: Ag land exists for vegetable crops," *Missoulian*, July 24, 2010. http://missoulian.com/news/local/study-ag-land-exists-for-vegetable-crops/article_0b459ece-96de-11df-914d-001cc4c002e0.html
[30] Climate Smart Missoula and City of Missoula, Missoula Community Climate Smart Action Plan v1.0, July 2015. https://www.missoulaclimate.org/uploads/4/3/2/6/43267085/missoulacommunity_climatesmartactionplan_v1.0.pdf
[31] City of Missoula's *Conservation and Climate Action Plan*, November 6, 2012, 6. https://www.ci.missoula.mt.us/DocumentCenter/View/25578/MissoulaClimateActionPlan_Final?bidId= Last Accessed July 25, 2018.

face of climate change, and to develop a coordinated plan to prepare for the changes we are facing.[32]

Protecting open space is an important component of both reducing our contribution to climate change and increasing our resiliency. The City's Conservation and Climate Action Plan recommends expanding the open space program, noting:

> "[l]and conservation (as opposed to development) prevents greenhouse gas emissions from entering the atmosphere. The goal of carbon-related conservation management is mainly to conserve existing carbon pools in forests, soils, or rangeland vegetation as much as possible through a host of activities. These activities may include land protection, controlling deforestation, preventing development, changing harvest or grazing regimes, or controlling for other anthropogenic disturbances such as fire or pest outbreaks."[33]

Open space also provides numerous ecosystem services that support climate resiliency, such as natural storm water management, improved air and water quality, and cooling to counteract the urban heat island effect.

Planning for changes to our climate and climate-related natural disasters or weather events is fiscally responsible. Recent research shows that every $1 spent on disaster preparation and natural hazard mitigation for natural hazards such as wildfire and flooding among others can save about $6 in disaster response.[34]

F. Culture and History

Missoula's open spaces help preserve significant cultural and historic resources. The Moon-Randolph Homestead, located on City land protected using open space bond funding, includes original historic structures such as a barn, cabins and a restored winch shed. Fort Missoula Regional Park, made possible by the 1995 Open Space Bond and 2014 Parks and Trails Bond, expanded the Fort Missoula Historic District and provides important interpretation of the area's importance in the West.

The Glacial Lake Missoula high water marks are visible on hillsides around Missoula, and family farms and ranches often contain important historic features. Native peoples have used the Missoula Valley for hunting, travel, and fishing since time immemorial and have a deep and rich history and connection to the land (Figure 4).

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[32] Missoula County, Climate Smart Missoula, City of Missoula. *Climate Ready Communities: Building Resiliency in Missoula County*. https://www.missoulaclimate.org/resiliency-planning.html

[33] City of Missoula's *Conservation and Climate Action Plan*. 2012. https://www.ci.missoula.mt.us/DocumentCenter/View/25578/MissoulaClimateActionPlan_Final?bidId=

[34] *Natural Hazard Mitigation Saves, 2017 Interim Report: An Independent Study – Summary of Findings*. Porter, K.; Scawthorn, C.; Dash, N.; Santos, J.; Investigators: Eguchi, M., Ghosh., S., Huyck, C., Isteita, M., Mickey, K., Rashed, T. P. Schneider, Director, Multihazard Mitigation Council, National Institute of Building Sciences, Washington, D.C. 2017.

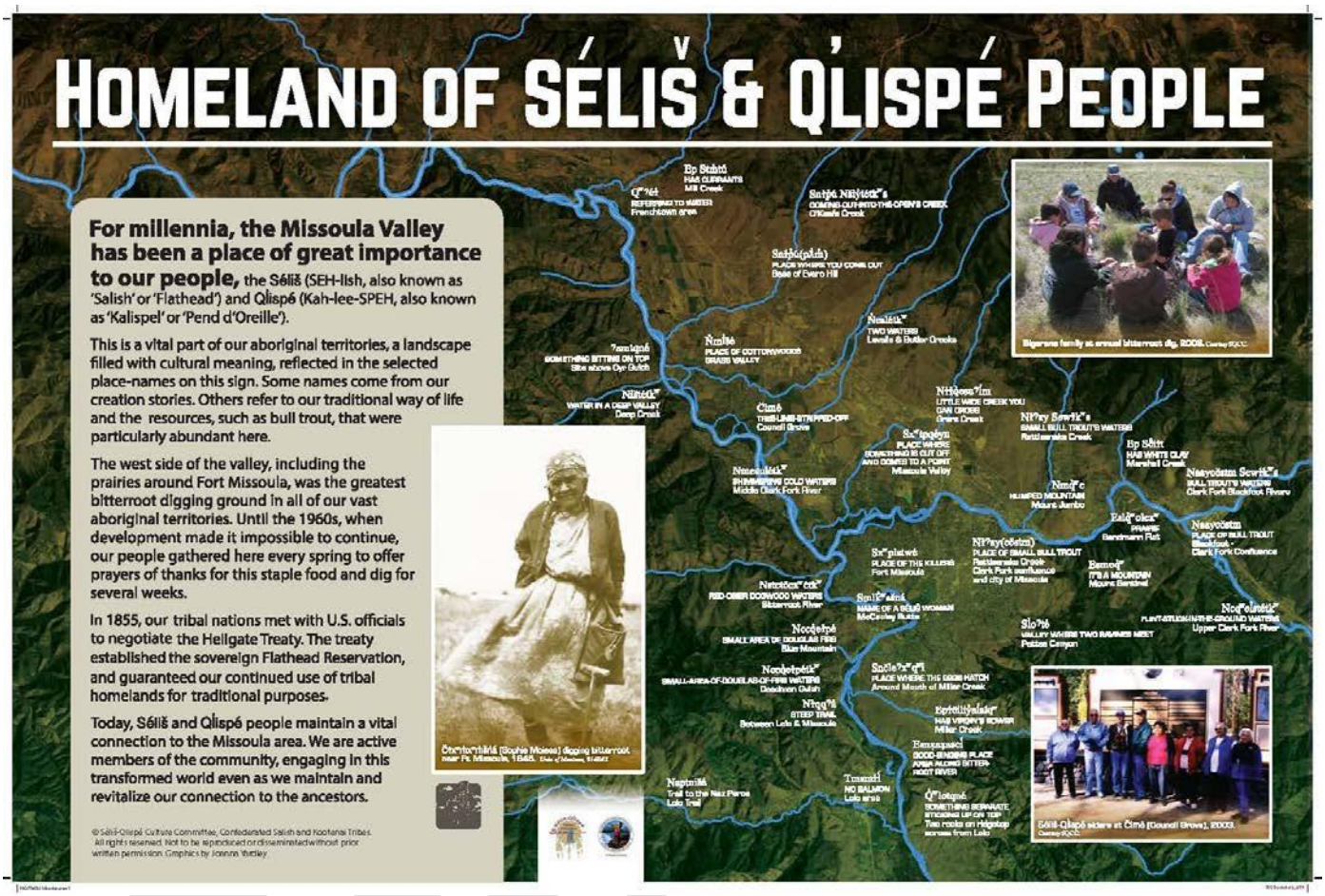

Figure 4. Confederated Salish and Kootenai Tribes Place Name Map. This panel shows place names of areas currently and historically noted by tribal nations in the Missoula Valley. It appears in a number of locations including the Fort Missoula Regional Park.[35]

G. Recreation

As Missoula's population grows, the popularity of outdoor recreation increases and the demand for recreational use of Missoula's open space lands increases. Fortunately, many areas with outstanding recreation opportunities have been preserved: Waterworks Hill, the Rattlesnake Creek corridor, Mount Jumbo, Mount Sentinel, Pattee Canyon, the North Hills, Mount Dean Stone, Miller Creek, the South Hills and Blue Mountain. Residents have access to the waterways and corridors along the Clark Fork, Blackfoot, and Bitterroot rivers. Missoula continues to improve its robust bikeway network including the Milwaukee and Bitterroot trails.[36]

Land managers must balance our community's love of and desire for land for recreation with management strategies that protect habitat and wildlife.[37]That balance, and the accompanying land management objectives, will vary depending on the type of open

[35] Séliš-Qlispé Culture Committee, Confederated Salish & Kootenai Tribes.
[36] *Activate Missoula 2045 Missoula Long Range Transportation Plan*. 2017. www.ci.missoula.mt.us/DocumentCenter/View/39171/2016-LRTP
[37] Joslin, G., and H. Youmans. *Effects of recreation on Rocky Mountain wildlife: A Review for Montana*. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society.1999. 307 pp.

space. For instance, urban green spaces, trails and lands situated closer to the urban area may be prioritized for higher levels of recreation, while conservation lands and other anchor areas may be prioritized for habitat.

H. Economic Benefits

Open space and undeveloped lands contain high economic potential. Studies show that obtaining a balance between land conservation and development is essential to economic health. Access to open space attracts skilled employees, fuels recreational tourism, and enhances property values.

Business Relocation. Open space, parks, and alternative transportation contribute to Missoula's high quality of life, helping to attract and retain a skilled workforce and businesses seeking to hire those workers.[38] Studies show business owners cite quality of life as a key reason for choosing or expanding in a location.[39] Outdoor recreation opportunities attract new business, keep established businesses competitive, and improve employee satisfaction.

Property Value Enhancement. Open space significantly influences nearby house prices.[40] Research shows positive relationships between home values and open space, urban forests, and view sheds.[41] On the other hand, this consequence of open space must be considered in conjunction with Missoula's affordable housing crisis.[42]Placing homes that are affordable adjacent to parks and commuter trails enhance the quality of life and reduce costs of transportation and other living expenses.

Green Tourism. Missoula is a primary transportation hub for Montana's larger green tourism industry, providing access to northwestern Montana's mountains and scenic areas, blue-ribbon rivers, Flathead Lake and Glacier National Park. The community does its part by preserving and enhancing Missoula. Local businesses that serve travelers benefit as a result.

I. Guiding Growth

How growth influences our communities and rural landscapes depends on where and how it takes place. In most Montana counties growth has sprawled into the countryside, including into ecologically important landscapes like riparian corridors, ungulate winter

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[38]*Missoula City Growth Policy 2035*, Adopted November 23, 2015, p. 87. www.ci.missoula.mt.us/DocumentCenter/View/34746/OurMissoulaGP_full

[39] John Crompton. Competitiveness: Parks and Open Space as Factors Shaping a Location's Success in Attracting Companies, Labor Supplies, and Retirees, in The Economic Benefits of Land Conservation. Ed. Constance T. F. de Brun. San Francisco: Trust for Public Land. 2007.

[40] Irwin, Elena G., "The Effects of Open Space on Residential Land Values," *Land Economics* 78 no. 4 (2002): 465-80.

[41] Gagney, M., and Grijalva, T., "The impact of trails on property values: a special analysis," *Ann. Reg. Sci.* 60: (2018): 73–97.

[42]Missoula Organization of Realtors. *Making Missoula Home A Path to Attainable Housing*, January 30, 2018. (https://2qn4zz20akwa476o1x36frnx-wpengine.netdna-ssl.com/wp-content/uploads/2018/01/Making-Missoula-Home.pdf)

ranges, wildlife migration corridors, and the borders of national forests and parks.[43]The impacts of sprawling exurban development on fish and wildlife habitat are of concern to many Montanans.

Since 1990, 1.3 million acres of undeveloped land in Montana have been converted to housing, which is equal to the amount of land managed by the National Park Service in Montana. Conversion of undeveloped land into residential developments creates challenges for wildlife, water quality and Montana's natural heritage of wide-open lands.[44]When large lots are created, rather than smaller lots clustered together with adjacent open space left available, it further fragments habitat, open space, and rural land ownership. From 1990 to 2016, the number of single-family homes in Montana grew by 50 percent, from roughly 224,000 homes in 1990 to 337,000 in 2016 (Figure 6).[44] Nearly half of those homes were constructed on large lots with average lot sizes exceeding 10 acres. Missoula County accounts for 10% of those homes constructed since 1990, which converted 32,320 acres of land to residential development. In Missoula County, 47% of those houses were constructed outside of incorporated areas with a third of them built on large lots.[45]

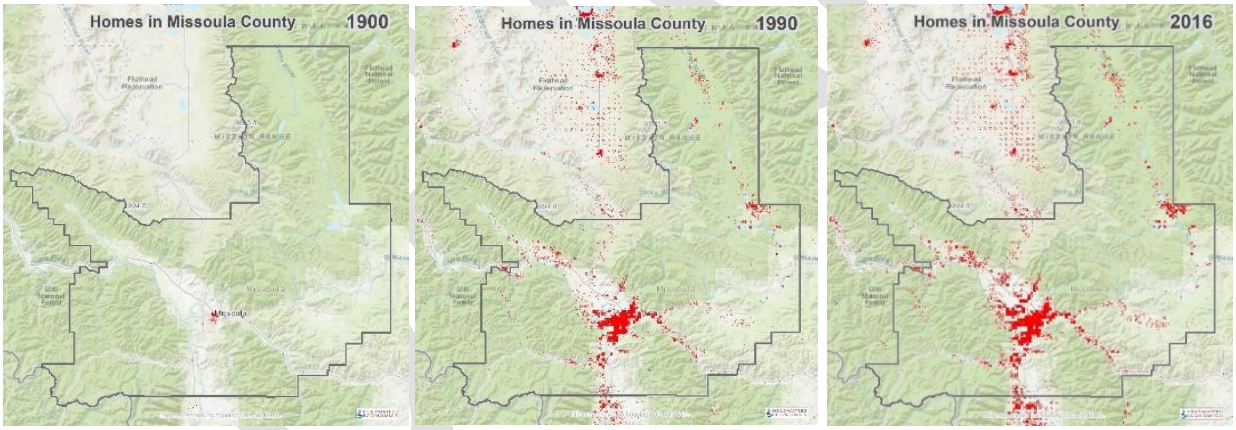

Figure 5. Number of homes built in 1900, 1990, and 2016 in Missoula County.

Growth management tools can encourage development in locations where it makes the most sense, minimizing adverse impacts on fish and wildlife habitat. Full or partial acquisition of lands by the public can help shape the growth of Missoula, which contributes to quality of life and preserves recreational opportunities.[46] Strategic management of open space can help encourage appropriate density. Accessible open

[43] Sonoran Institute. Planning for People and Wildlife: A Workbook for Montana's Citizens and Local Officials. 2009.
[44] Headwaters Economics, *Montana Losing Open Space*, April 2018. https://headwaterseconomics.org/economic-development/local-studies/montana-home-construction/

[45] Headwaters Economics, *Montana Losing Open Space*, April 2018. https://headwaterseconomics.org/economic-development/local-studies/montana-home-construction/
[46] *Missoula City Growth Policy 2035*, Adopted November 23, 2015. (www.ci.missoula.mt.us/DocumentCenter/View/34746/OurMissoulaGP_full)

space can make higher density living more attractive. Open spaces also help maintain boundaries between urban and rural areas and preserve wildlife corridors.

J. Health and Wellness

Open spaces that make physical activity convenient produce a wide range of health benefits.[47] Open spaces encourage walking, cycling, and other exercise, which is recognized as improving many aspects of health.[48] Studies show that contact with nature offers a range of medical benefits, including lower blood pressure and cholesterol levels, enhanced survival after a heart attack, more rapid recovery from surgery, fewer minor medical complaints, and lower self-reported stress. Research suggests exercise is more beneficial, leading to enhanced tranquility, and more relief of anxiety and depression, when it occurs in natural settings, like parks, rather than along urban streets.[49] In children with attention disorders and in teens with behavioral disorders, contact with nature resulted in significant improvement.[50]

In addition to aesthetic, psychological and health benefits, open spaces and the nature they contain, especially trees, enhance community and economic well-being and cultivate sense of place.[51] Through recreation in shared open spaces, social interaction between neighbors fosters strong ties between social groups. Continued exposure to nature deepens one's sense of place and belonging, which inspires environmental stewardship.

K. Educational Opportunities

Open spaces provide opportunities for children and adults to learn about the natural surroundings of their community and to discover humanity's place in nature. In Missoula**,** many teachers and nonprofit organizations use nearby open spaces as outdoor classrooms. These spaces connect with public lands and provide unique, place-based outdoor education opportunities for children, ranging from birdwatching to water quality studies.

Place-based ecological education has numerous benefits for children. Some of the most prominent are:

Improving Academic Achievement. Outdoor education improves test scores by providing students with lessons about the natural world that can be applied to all subject areas and grades.

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[47] James F Sallis, Chad Spoon, Nick Cavill, Jessa K Engelberg, Klaus Gebel, Mike Parker, Christina M Thornton, Debbie Lou, Amanda L Wilson, Carmen L Cutter and Ding Ding, , "Co-benefits of designing communities for active living: an exploration of literature," *International Journal of Behavioral Nutrition and Physical Activity* (2015), 12.

[48] *Healthy Open Spaces: A summary of the impact of open spaces on health and wellbeing*, Regional Public Health Information Paper, Lower Hutt, New Zealand, March 2010, 13.

[49] Bodin, Maria, and Terry Hartig, "Does the Outdoor Environment Matter for Psychological Restoration Gained through Running?" *Psychology of Sport and Exercise* 4, No. 2 (April 2003).

[50] Frumkin H.., "Beyond toxicity: The greening of environmental health," *American Journal of Preventive Medicine* 20: (2001): 234-40.

[51] Kuo, Frances, "Transforming inner-city landscapes: Trees, sense of safety, and preference." *Environment and Behavior* 30, (1998): 28-59.

Breaking the Indoor Habit. Children who experience school grounds or play areas with diverse natural settings are more physically active, creative, and civil to one another.

Improving Student Health. Getting students outdoors and active helps address common health issues in children today such as obesity. Increased time spent in natural environments significantly reduces symptoms of attention-deficit (hyperactivity) disorder in children. Interaction with the natural world reduces negative stress and protects psychological well-being, especially in children undergoing the most stressful life events.[52]

Supporting STEM**.** Ecological education offers an engaging platform for gaining and applying knowledge and skills in science, technology, engineering, and mathematics (STEM). In a rapidly urbanizing world threatened by climate change, place-based and environmental education have the potential to inspire future generations to work towards sustainable solutions for our planet.

Cultivating Leadership Qualities. Children in outdoor-education settings display increased self-esteem, problem solving skills, and motivation to learn. Place based education emphasizes cooperative learning with others, critical thinking and discussion, and a focus on action strategies with real-world applications.[53]

VII. Challenges Related to Open Space Conservation

Missoulians continue to recognize the importance of open space conservation and value its role in shaping the character of Missoula. Missoula is evolving and changing. Competing priorities impact our community's ability to protect land. Some of the challenges are addressed below. While there are challenges, Missoula has a unique opportunity to define and provide a new reality where quality of life, conservation, and access to open space for all can coexist.

A. Population Growth

In the 1970s, about 58,000 people lived in Missoula County and the population has now doubled to over 117,000. In the next 20 years, Missoula County is expected to grow by another 30,000 people with most of that growth happening in the Missoula Valley. Missoula and the surrounding areas will grow by 1,000 to 2,000 people per year. Missoula is a great community with a high quality of life, a major university and a diversifying economy. Missoula and its surrounding neighborhoods will continue to attract new residents.

A significant percentage of Missoula County's growth occurs in areas adjacent to the city. Policy changes in the City's growth policy and the County's land use mapping and growth policy may affect growth patterns. The City has adopted an "Inward Focus" policy, and depending on implementation, the ratio of development happening within city limits compared to the surrounding county may increase. As the community grows there will be a need for additional housing, places to work, recreate, shop and other amenities typically found in a community of this size. A healthy and accessible open space system better supports our communities' ability to grow successfully.

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[52] Louv, Richard, "Leave No Child Inside," *Orion Magazine*, 2007.

[53] Project Learning Tree (2018). *Why environmental education is important,* 2018. https://www.plt.org/about-us/why-environmental-education-is-important/

B. Housing and Affordability

To achieve both affordability and quality of life requires a commitment to good planning. The cost of housing in the Missoula market has emerged as one of the most pressing community challenges. Increased housing costs are affecting both renters and homebuyers. One matrix for determining whether housing costs are too high is measuring how many households in the community are cost-burdened, meaning renters and homeowners spend more than 30% of their income on housing. Countywide, 37% of all households are considered cost-burdened. Within city limits, that percentage increases to 41% of households. Renters are more likely to be cost-burdened than homeowners. The percentage of cost-burdened households in the County and the City is higher than in comparable communities and higher than state and national averages.

The median sale price of homes in the Missoula urban sales area has increased by nearly $100,000 since 2010, from $200,500 in 2010 to $298,000 in 2018. According to the Making Missoula Home report, nearly half of homes are out of reach for entry-level professionals and working-class residents. Rentals are also difficult to find. Vacancy rates for rentals have hovered at 2% and the costs of renting has increased.

Both the City and County's median household income and per capita income are less than the State of Montana's. While the median household income in the County and the City increased between 2000 and 2010, the increase is less than that for the State of Montana. In Missoula County overall, housing affordability is affected by lower-than-state-average median incomes and higher-than-state-average median home prices.

C. Homelessness

Homelessness is a chronic problem in Missoula. The number of homeless persons in the city has ranged from an estimated low of 180 in 2010 to a high of 585 in 2014.[54] There were 293 homeless individuals and families in January 2018.[55]

To address the homeless population and its related issues, the City and County issued a plan studying homeless prevention and rapid rehousing, a continuum of housing options, and service collaboration and coordination.[56] One of the first steps was developing a Coordinated Entry System focused on providing clients with a single point of entry to services to optimize outcomes for individuals and families.[57]

The Missoula Organization of Realtors has also intensively studied issues related to housing and gathers data related to housing supply and demand, population demographics and income disparities compared to high housing costs, for home sales as well as rentals.[58]

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[54] David Erickson, "Survey: Missoula has highest percentage of homeless in Montana despite progress," *Missoulian*, October 2, 2018.
[55] Ibid.
[56] Reaching Home: Missoula's 10-year Plan to End Homelessness 2012-2022. October 22, 2012. www.ci.missoula.mt.us/2124/Homeless-Initiatives
[57] FY 18 Reaching Home Update, Ibid.
[58] https://www.ci.missoula.mt.us/DocumentCenter/View/46177/MOR_housing_report_2018-proof-9?bidId=

Some concerned citizens perceive public policy conflicts between preserving open space and available land for building affordable housing.[59] Others believe it is a false dichotomy. Ideally, for housing to be attainable for the widest range of community members, it should be located be in the city, close to infrastructure such as jobs, public transportation and utilities. Policy decision makers will need to seek a balance between the community's need for housing and the needs to preserve important habitats, corridors, and other open spaces that contribute to quality of life.

D. Stewardship of Open Space Lands

Maintaining and stewarding open space lands is essential to protecting their open space values. The City owns and manages approximately 4300 acres of conservation lands through its Conservation Lands Program. Created in 2009, the Conservation Lands Program staff manage land in accordance with the Conservation Lands Management Plan.[60] The City's developed parkland, trails, urban forest corridors, and other lands are managed through publicly adopted land use and management plans. On lands protected with a conservation easement, the entity that holds the easement is tasked with ensuring the landowner upholds the conservation values protected pursuant to the easement, while the private landowner typically retains the responsibility for managing the land and bears the cost of management.

VIII. Conclusion

When you look around the Missoula Valley, you see the legacy of decades of open space planning and conservation. As the 2006 open space plan update stated, "Missoula's citizens have long cherished their surrounding natural environment – scenic open hillsides…river corridors, agricultural lands, and natural areas that provide important wildlife habitat. These natural amenities create a unique sense of place that defines Missoula." [61]

The City and County share a vision for our communities and rural areas, one that is centered on enhancing opportunity, quality of life, well-being of the people, and protection of the natural environment. With this vision, the City and County utilize leadership, public service, and thoughtful planning to realize our individual and collective potential, where all people can thrive through the confluence of unparalleled recreational, natural, cultural, and entrepreneurial opportunities.

At that confluence are our open spaces. Our community remains committed to protecting the lands that make Missoula unique, while also working to address the host of challenges that prevent all citizens from participating fully in our community. Some of the best answers to those challenges exist in open spaces, and our open spaces provide public benefits for all. In ongoing efforts to protect important places and resources while balancing our community's need for growth, we continue to work with residents and all partners as we together strive for a livable community for all.

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[59] David Erickson, "Advocates: New open space bond wouldn't hinder affordable housing efforts," *Missoulian*, August 8, 2018.

[60] https://www.ci.missoula.mt.us/867/Conservation-Lands-Management-Plan

[61] *Missoula Urban Area Open Space Plan 2006 Update*