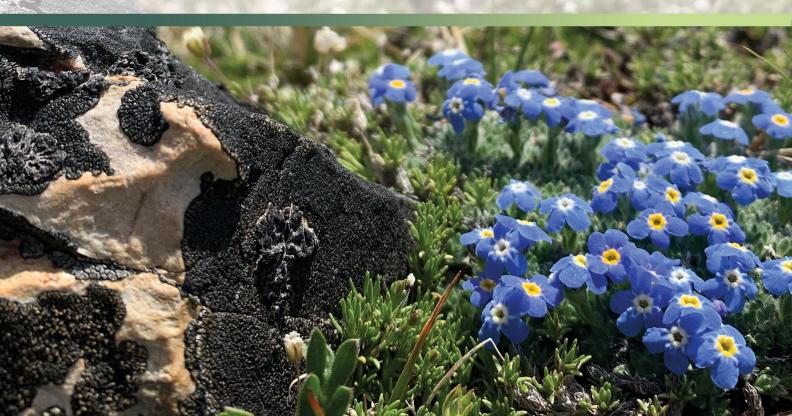
Missoula County Department of Ecology & Extension

Annual Report 2022



MISSOULA COUNTY DEPARTMENT OF ECOLOGY & EXTENSION

STAFF

JERRY MARKS DEPARTMENT HEAD

BRYCE CHRISTIAENS DISTRICT MANAGER

PIRRIE DURKEE FINANCIAL COORDINATOR

CAMPBELL BARRETT

MSU EXTENSION 4-H
YOUTH DEVELOPMENT AGENT

KELLY MOORE

MSU EXTENSION FAMILY

AND CONSUMER SCIENCES AGENT

PATRICK MANGAN
MSU EXTENSION HORTICULTURE AGENT

SANDY PERRIN
PLANT CLINIC COORDINATOR

DEIDAD WRIGHT 4-H ADMINISTRATOR

JEAN JENKINS FOUNDATION COORDINATOR

MARIROSE KUHLMAN HABITAT COORDINATOR

> CHRIS MASCARI AIS COORDINATOR

ZACH LEWIS
WATERCRAFT INSPECTION
STATION SUPERVISOR

STEFFANY ROGGE EDUCATION COORDINATOR

ELIZA GILLILAN
EDUCATION ASSISTANT/YOUTH
IN BIOCONTROL COORDINATOR

JED LITTLE
GIS COORDINATOR

MELISSA MAGGIO STATEWIDE BIOCONTROL COORDINATOR

MADELINE GAFFIGAN BIOCONTROL PROJECT ASSISTANT

SAWYER MEEGANYOUTH IN RESTORATION CREW LEAD

MOLLY ATTWATER
MSU EXTENSION EFNEP
NUTRITION EDUCATOR

KAYLA MARTIN MSU EXTENSION EFNEP NUTRITION EDUCATOR

SARAH HOLDEN
CLIMATE RESILIENCY EDUCATOR

MOLLY ANTON ROCKY MOUNTAIN GARDEN COORDINATOR

LAYNE VANLANKEN
PREVENTION COORDINATOR



DEPARTMENT OF ECOLOGY & EXTENSION

If there is one word to describe 2022, it would be transformation. In 2022 we said goodbye to the long (and growing) list of names within our department (Weed District, AIS District, EFNEP, Lolo Mosquito District, and MSU Extension) to start fresh in 2023 under a new consolidated name as the Missoula County Department of Ecology & Extension. A transition best described by the Missoula County Commission as a way to "better represent the complexity and landscape-scale" of the work we do. Whether it is serving as a lead partner in the development, rearing, and introduction of a new biological control system for flowering rush in North America, fostering a growing 4-H community, or the creation of the first county pollinator habitat conservation plan in Montana, the amazing work of our staff is certainly nothing new.

And what better time to start fresh than by pairing our new name with the opening of our brand-new facility, The Gerald W. Marks Exploration Center and Rocky Mountain Gardens! This facility, along with our partners at MSU Extension, the Missoula Conservation District and the Missoula Butterfly House & Insectarium, will allow us even more opportunities to provide our community with the programs and resources they need in youth education, horticulture, climate resiliency, land management, and community development. None of these opportunities would be available without the strength of our partnerships, nor would we be at this exciting moment without your support. Thank you for being such an important part of what we do, and we look forward to opening our new doors to you in 2023!

PROGRAM OVERVIEW

Missoula County Department of Ecology & Extension strives to provide coordination, educational outreach, and training to address the public's needs in Land Management, Youth Development, and Family and Consumer Sciences. In doing so, we actively promote and encourage cooperation with local, state, tribal, and federal partners beyond the boundaries of Missoula County to support work that advances our mission and promotes positive outcomes for the benefit of Missoula County and its residents. Our staff emphasizes work in the following program areas:

Collaborative Leadership that brings together a diversity of interests and stakeholders to develop solutions to complex problems. Program examples include the development of the Montana Cut Flower Association and serving as the home of the Montana Biocontrol Coordination Project.

Research & Monitoring that informs our education and outreach events, materials, recommendations, and on-the-ground management activities. Activities include an assessment of the impact and management implications of invasive fragrant water-lily and monitoring the mosquito populations along the lower Bitterroot for species composition and the potential for diseases like West Nile virus.

Youth Development programs that provide mentorship and service-based learning opportunities in natural resources, agriculture, and community development. Major program areas include the Missoula County 4-H Program, EFNEP, and the Youth in Restoration Program.

Adult Education in the form of hands-on learning opportunities focused on conveying science-based information to help residents in Missoula County be successful in a broad range of areas, from food preservation to land management, and everything in between. Program examples include Powerful Tools for Caregivers, Master Gardener, Healthy Acres Seminars, and Grow It, Eat It, Preserve It.

Public Assistance via 1-on-1 consultations, site visits, and demonstrations that focus on providing Missoula County residents access to the resources they need to be successful. Examples include access to our Plant Clinic for identification of plant and pest problems, Integrated Pest Management recommendations, garden demonstrations at the Rocky Mountain Gardens, and grant writing and management for landscape-scale restoration efforts on private and public lands.

Land & Resource Management focused on mitigating the economic and environmental impacts of both terrestrial and aquatic invasive species in Missoula County. This includes the active management of new invasive species like rush skeletonweed, the management of the Clearwater watercraft inspection station, and pollinator habitat restoration efforts.



YOUTH EDUCATION

Through collaborative programming, the Department of Ecology & Extension provides outdoor, place-based natural resource education as well as nutritional education to youth for acquiring the knowledge, skills, and attitudes necessary to change behaviors and well-being.

Leave No Weeds



430 5th-grade students learned about biodiversity and its benefits to healthy ecosystems



2 Miles hiked on public open space



25lbs Native seed spread



40 Bags of knapweed removed



Gained Identification skills







Expanded Food and Nutrition Education Program







80% Diet Quality

Improved their abilities to choose foods according to Federal Dietary Recommendations or gained knowledge



53% Safe Food Handling

Use safe food handling practices more often or gained knowledge



37% Physical Activity

Improved their physical activity practices or gained knowledge

Nutrition Education Reached: 700 youth in 228 classes

This work is supported by the Expanded Food and Nutrition Education Program from the USDA National Institute of Food and Agriculture. USDA is an equal opportunity provider, employer, and lender.



YOUTH DEVELOPMENT

Youth in Restoration

For the past ten years, the Youth in Restoration program has provided inquiring youth the chance to be mentored and learn from specialists in natural resources and conservation. Through partnerships with state and local agencies as well as other non-government conservation organizations, the youth crew learns valuable on-the-ground skills while supporting work prioritized by these organizations. With youthful energy and curiosity, the 4-member team hike, float, and camp their way through 9 weeks of exposure to the careers and people that restore, protect, and enhance public lands throughout Montana.







Missoula Youth in Biocontrol is a

program started in 2022 with the goals of exposing young conservationists to biocontrol, supporting biocontrol research, collection, and distribution in Montana, and educating landowners on proper biocontrol use.



Number of nights camped: 9



Distributed 610 releases (484,700 insects) to 38 individuals/agencies



3,146 miles traveled

Valued Program Partners

Missoula County Aquatic Invasive Species District

Montana Biocontrol Program

Missoula County Parks, Trails, and Open Lands

City of MissoulaConservation Lands

University of Montana Natural Areas

Five Valleys Land Trust

The Nature Conservancy

US Forest Service-Lolo National Forest

Fish, Wildlife & Parks

Bob Marshall Wilderness Foundation

Great Burn Conservation Alliance

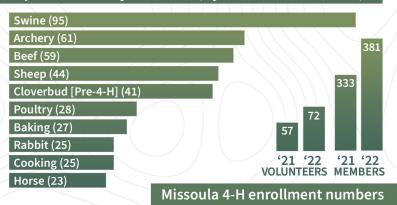
Bureau of Land Management

MISSOULA COUNTY 4-H



4-H teaches leadership, citizenship, and life skills.

Top Ten 4-H Projects 2022 (by members enrolled)



In 2022, Missoula County 4-H members were enrolled in a total of 1140 educational projects, on which they spent a combined estimated 53,550 hours either caring for animals or participating in hands-on learning, whether self-directed, or under the guidance of adult 4-H volunteers.





In 2022, Missoula County 4-H members participated in State 4-H contests at Montana 4-H Congress.

- Our Gavel Games (parliamentary procedure) team won 1st place and went on to participate in the national competition in Denver, where they also won 1st place.
- Two of Missoula 4-H's County Ambassadors were selected as Montana 4-H Ambassador Officers, an honor only 5 Montana youth each year achieve.
- Our 4-H Video Contest participant won the State 4-H contest, earning a trip to National 4-H Congress in Atlanta.



ADULT EDUCATION

The Missoula County Extension Horticulture program

worked closely with the Tribal Health Office on the Confederated Salish and Kootenai Tribes Nation to develop and offer educational programming around backyard vegetables to their employees. This program is preparing Tribal Health employees to better understand vegetable gardening, growing food locally to support their neighbors and community members, and integrating fresh foods into their lives, and the lives of those they serve. **22** participants in 2022 had garden beds in their homes.

Gardeners engaged in the Master Gardener class series to learn about successfully growing plants through in-person class offerings in Missoula, Florence, Arlee, and Condon during 2022. More than **100** new **Master Gardeners** completed the course and have been engaging in volunteer service throughout the Missoula area.

Additional educational opportunities throughout the year included tree pruning workshops, weed control, rodent control, and soil fertility, creating opportunities for Missoula County residents to learn about a wide variety of topics to support their horticultural pursuits. The Missoula County Extension office supported the educational conference for the **Montana Berry Growers Association**, helping **47** participants learn up to date information about growing and marketing the specialty berry crops across the state.





FAMILY AND CONSUMER SCIENCES





EXTENSION

Trending Topics in FCS 2022:

- Multi-cultural foods
- Food history
- Spices
- Quick healthy recipes
- Local food production
- Food purchasing & preservation
- Caregiver education & support

25 Participants Garden City Harvest/Missoula County Extension Salsa Canning Workshop

9 Community Cooking Classes at the Missoula Public Library

77 People attended Community Cooking Classes

188 YouTube views for recorded classes

2 "Powerful Tools for Caregivers" Classes in 2022 with 16 participants.

75 Food preservation, preparation, and food safety phone calls.

52 Pressure gauge checks.

25 Registered participants MTKNP/Montana Kinship Navigator Program Support Group Virtual meetings

2 "P

Valued Community Partners: Missoula Aging Services | Missoula Public Library | Garden City Harvest | Missoula Senior Center

Expanded Food and Nutrition Education Program

In the 2022 grant cycle, \$135,092 in EFNEP program support was provided to Missoula County which includes two staff members at 40 hours/week, educational supplies including food samples and other educational materials for program participants, and travel expenses to get to and from community organizations throughout Missoula County

Behavior Change in Adult Graduates



100% Diet Quality

Improvement in one or more aspects. Indicators (i.e., eating fruits, vegetables, red, orange, and dark green vegetables, drinking less regular soda (not diet), drinking less fruit punch, fruit drinks, sweet tea, or sports drinks, and cooking dinner at home.



100% Food Safety Practices

Improvement in one or more practices. (i.e., washing hands before preparing food, washing all items and surfaces after cutting raw meat or seafood, not thawing frozen food at room temperature, or using a meat thermometer.



τ 60% Physical Acitivity

Improvement in one or more behaviors (i.e., exercising for at least 30 minutes, doing workouts to build and strengthen muscles, or make small changes to be more active).



40% Food Security

Improvement in one or more indicators. (i.e., not eating less than you wanted so there was more food for your family or having enough money to get food for your family).



RESOURCE MANAGEMENT

Clearwater Watercraft Inspection Station

Clearwater Watercraft Inspection Station has been operated by Missoula County in collaboration with Montana Fish, Wildlife & Parks since 2017. Inspectors manage the station from sunrise to sunset, April-October, diligently looking for AIS on all types of watercrafts.

28,714 inspections performed since April 2022
30.4% of all state-wide inspections (92,770)

1 mussel-fouled boat interception
51 mussel-fouled boats statewide
402 high-risk inspections





New Invaders Program: Early Detection

Rush Skeletonweed is an invasive plant with great potential to spread rapidly and form dense infestations. Prior to 2021, Missoula County had 1 known infestation that has been dormant for several years. A new site was discovered above Frenchtown in 2021 and five more patches were found on I-90 in 2022.

Biological Traits of Rush Skeletonweed

3 to 7 feet Depth of taproot

15,000 to 20,000 Seeds per plant

5 Miles Distance seeds can travel



Biological Weed Control

Biocontrol is the deliberate release of a specialized natural enemy from the weed's native range to reduce the spread or abundance of the weed in the introduced range.

The Montana Biocontrol Coordination Project (MTBCP) is a soft-funded, grassroots effort initiated in 2013 by county, state, and federal agencies, non-profits, tribes, and private landowners who saw a need for increased coordination within Montana's weed biocontrol efforts. Missoula County Department of Ecology & Extension has hosted and provided support to this program since its inception.

The mission of MTBCP is to provide the leadership, coordination, and education necessary to enable land managers across Montana to successfully incorporate biological weed control into their noxious weed management programs.

Biocontrol in Missoula County



34 collection days



65,300 insects released



14 monitoring sites



Biocontrol management of 4 noxious weeds





RESEARCH AND MONITORING

AQUATIC INVASIVE SPECIES MONITORING

Research: Macrophyte Point Intercept Surveys

A macrophyte is an aquatic plant that generally falls into the categories of emergent, submergent, or floating. We survey for these species for two primary reasons. The first reason is to determine if an invasive species is present/absent within a given body of water. The second reason is to establish a baseline understanding on the aquatic habitat's biodiversity. This information allows us to create a detailed rapid response plan to combat an invasive species without harming threatened, endangered, or sensitive (TES) species in the same aquatic habitat.

7 lakes surveyed No new AIS threats detected 500+ data points surveyed



Monitoring: Veliger Monitoring

Monitoring for a veliger, or microscopic larval stages of zebra and quagga mussels, is the first line of defense for determining if the species is present within a body of water. We monitor for veligers due the high volumes of watercraft that recreate in the Missoula County area. Their high transmissibility on vessels, biological impact, and their devastating economic impact (~\$300-\$500 million annually in damages) makes veliger monitoring a key priority for the AIS District.



5 lakes monitored 114 total samples acquired 0 mussel detections

POLLINATOR HABITAT PROGRAM

This year we added a Habitat Coordinator to our staff to meet the county's growing need to support pollinator conservation and healthy plant communities. They will collaborate with and assist homeowners, land managers, and researchers to create habitat improvement and conservation projects supporting native pollinators and the plant communities they rely on. This includes agencies such as Montana Department of Transportation and Missoula County Parks, Trails, and Open Lands, as well as nonprofit land managers and private landowners. Additionally, the Habitat Coordinator is developing a Pollinator Plan for US Forest Service lands in Missoula County through an agreement with Lolo National Forest.

Looking Forward to the Future: Flowering Pollinator Lawn program

Urban and suburban landscapes are the fastest growing ecosystems globally, including in Missoula County. As Missoula County grows, more land is developed for housing and businesses and much of the green space within it is converted to monoculture turfgrass lawns, making the land unusable by pollinators. Residents can take small but significant steps to provide habitat for pollinators simply by planting flowering plants in their lawns and gardens and avoiding the use of pesticides and synthetic fertilizers. In response to public interest, this fall we initiated the Missoula County Flowering Pollinator Lawn program to encourage county residents to a) diversify their turfgrass lawns, b) learn more about local pollinating insects, and c) think differently about the roles their home landscapes can play in supporting biodiversity. Over 80 households applied to participate in this program and we accepted over 40 applicants that met our criteria. We are looking forward to growing this program in the future!





PUBLIC ASSISTANCE

Lolo Mosquito District



Bats Coming in 2023

The district installed a new bat condo at Dunrovin Ranch which can house **250** bats! We are excited to collaborate with MT Fish Wildlife & Parks and the University of Montana to monitor and research the bats that visit the new bat condo.



Skeeter & Bats Education

Traveler's Rest partnered with Lolo Mosquito to provide fun, educational afternoon learning all about mosquitoes and bats. **Eight** adults and **nine** children attended.



Mosquito Monitoring

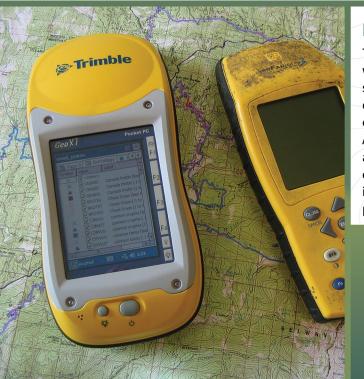
Surveillance to monitor local mosquito populations and detect presence of arbovirus disease is done annually. We trapped mosquito adults weekly over **13** weeks during the summer. Currently only one trap is set, and it had over **2200** adults after one night in July!



Survey & Mapping

We completed surveying and mapping across the Lolo community for potential and known mosquito breeding sites. **11** larvacide sites were established and treated; a specialized backpack sprayer will be used for future applications.





Mapping

The Missoula County Weed District added ArcGIS online to our queue of weed mapping tools three years ago. ArcGIS online allows us to use smart phone apps like Field Maps and Survey123 to collect and analyze data. Now, instead of needing to bring an expensive GPS unit with you everywhere, you can just use the phone you already have in your pocket. ArcGIS online has made it convenient for us to help private landowners and homeowners associations map the weeds on their property. With a quick training and free access to ArcGIS online, homeowners are able to inventory their noxious weeds, a critical first step to any weed control project.

617 POINTS MAPPED



7 LANDOWNERS



62 LINES MAPPED



4 HOAS



103 POLYGONS MAPPED



1 LAND TRUST

Climate Change and its Impact on Montana

Scientific research says that this will result in warmer, drier summers, increased wildfires, reduced snowpack, and a host of impacts to fish and wildlife habitat. Powers' research found these changes ultimately threaten 11,000 jobs and \$281 million in labor earnings in Montana's outdoor economy by 2050.





Increased Fires & Smoke

1,954 fires burned 122,503 acres this season in Montana. DNRC reported having spent close to \$15 million on fire suppression in 2022 on a muted fire season. With many prior being more robust and costly! Air quality during fires continues to be dangerous to our communities.

Excessive Droughts

Another effect of climate change is extreme drought. It is a threat to biodiversity and our cropping systems. Missoula is seeing a moderate drought, where eastern MT is in extreme drought.

Increase of Temperature

The earth's temperature is rising day by day due to various reasons including carbon emissions. Missoula and all over MT, temperatures are rising every year. Changes need to be made to deal with heat in our community.

Missoula County sees a need for Climate Resiliency education in 2022!

- Hired a Climate Resiliency Educator
- Created a new Climate Education Program through Missoula County Department of Ecology & Extension
- ◆ Plan for new programming with agriculture and climate
- Implemented ZERO waste & no plastic measures at the Western Montana Fair
- ◆ Received a \$64,500 grant for a solar array for our new green building.
- Developed new partnerships with private and public climate action groups



The Missoula County Extension Plant Clinic

provides leadership and educational opportunities to the public on the identification and integrated pest management practices (IPM) of plant diseases, pests and related plant health problems through the coordination and management of the Plant Clinic.

- The Missoula County plant clinic performed weekly scouting trips, checking on pest levels that challenge gardeners, landscapers and homeowners in maintaining healthy plant communities and environment.
- Trapping for insects such as the codling moth, cherry fruit fly and spotted wing drosophila to give Missoula County residents timely information on when to spray for those pests to control damage to the fruit. This information helps reduce unwarranted pesticide use.
- The Plant Clinic provided information to 1600 calls, walk-in clients and emails this year including information on soil testing, pruning, plant identification, and pest control.
- Scouting information is used to update the Pest Alert Hotline which is distributed through email, Missoula County Extension website and phone recording.
- Presented information on diseases and insect damage on plants in Montana to master gardeners, garden clubs & community gardeners
- Working with the Montana Cut Flower Association on securing grant funds to provide training & education opportunities the members of this newly formed association.

DEDICATION OF THE GERALD W. MARKS EXPLORATION CENTER

Welcome to the Gerald W. Marks Exploration Center!

At the end of 2022, The Missoula County Commissioners recognized Jerry Marks' lifelong dedication to agricultural education and community building by naming the future home of the Missoula County Department of Ecology & Extension and its partners in his honor. The Gerald W. Marks Exploration Center, scheduled for completion at the Missoula County Fairgrounds in 2023, will be the premier center for scientific education and community-centered learning in the Rocky Mountain West.

Jerry, who began his career as the Missoula County Extension Agent in 1969, has been instrumental in creating the vision for the Exploration Center. The project is the culmination of years of planning and dedication by Marks and the many others he brought onto the project. Jerry envisioned a center for hands-on community learning in Missoula after visiting an education center in Wyoming in the early 1990's, and worked with his team, the Missoula County Commission, The Missoula Butterfly House & Insectarium, The Missoula Conservation District, and our non-profit group Healthy Acres Healthy Communities Foundation to create something bigger and bolder than he first witnessed. At the groundbreaking on May 14, 2021, Jerry not only celebrated the realization of his vision, he also celebrated his 80th birthday with hundreds of supporters and friends. We look forward to welcoming you to our new home!



HEALTHY ACRE HEALTHY COMMUNITIES FOUNDATION

A successful public-private partnership and a HUGE thank you to our supporters. In

January of 2023, The Healthy Acres Healthy Communities Foundation and Missoula Butterfly House & Insectarium were excited to announce that they had exceeded their \$5 million capital campaign goal to create the future home of the Missoula County Department of Ecology & Extension and the state's first tropical butterfly house and premier education gardens. With a total of \$5.3 million raised, the Join the Buzz campaign celebrated the metamorphosis of its efforts and the generosity of the many donors who supported the campaign.



The Healthy Acres Healthy Communities Foundation is a 501(c)(3) organization dedicated to creating an engaged community that cultivates vibrant, thriving urban and rural lands for future generations by providing philanthropic support to the programs of Missoula County Department of Ecology and Extension. The Department of Ecology and Extension, along with the HAHC Foundation, will be the stewards of the Rocky Mountain Gardens and will offer their expansive services and programs throughout the facility. To learn more or to support the foundation visit healthyacres.org

ROCKY MOUNTAIN GARDENS

A garden built by the community, for the community

The future Rocky Mountain Gardens are envisioned as a public demonstration space that serves as a hub for inspiration, education, and innovation. The 2.5 acre garden showcases the range of plants that can be grown in our region as well as the best practices for growing in a changing world. The garden is split up into 18 distinct growing areas including a rose, pollinator, herb, native prairie, sensory, forest, vegetable, ornamental, and waterwise garden beds as well as a fruit and berry orchard.

The various working spaces emphasize experiential learning, support and expand our organizations current programming, and provide a space for our partners to engage the community. There will be an outdoor patio to expand the indoor classroom activities and conferences in addition to an adjacent flowering pollinator lawn and a drought tolerant lawn area will serve as a gathering space. The gardens will also feature a greenhouse, hoop house for season extension crops and gazebo to have small group classes in the garden.

We are thrilled to have many sponsors and partners in creating the gardens – this project would not be possible without the generosity of our community. There will be many opportunities throughout the development of the gardens to engage in our programming, become a donor, and participate in volunteer opportunities. Please contact Molly Anton at manton@missoulacounty.us for more information.

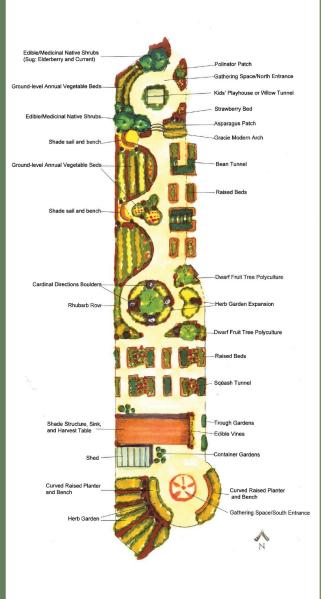
The garden features 18 distinct planting areas including a high tunnel and a four season greenhouse. Some of the themes that are associated with the garden areas include:



The construction of the garden would not be possible without the help of generous community members. We are still seeking funds and in-kind donations to build and support the gardens.









Missoula County Department of Ecology & Extension 1075 South Ave Missoula, MT 59801 www.missoulaeduplace.org P: 406.258.4200 | F: 406.258.3916