LEWIS AND CLARK COUNTY LONG RANGE PLAN – MINOR UPDATE (2023)

2020

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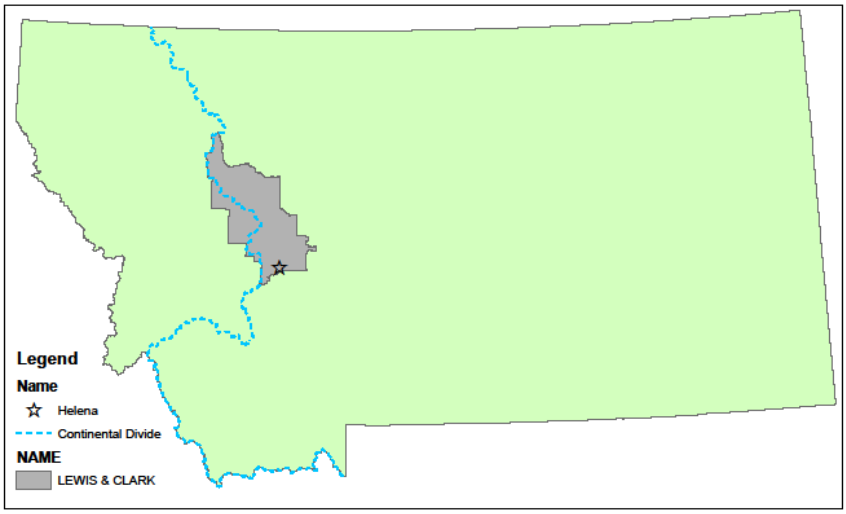


Figure 1 Location of Lewis and Clark County, Montana

I. INTRODUCTION

Lewis and Clark County is in West Central Montana. Spanning from the Rocky Mountain Front in the north to the state capital of Helena in the south and encompassing both sides of the Continental Divide. Lewis and Clark County contains a wide diversity of landscapes.

The Natural Resources Conservation Service (NRCS) Helena Field Office is establishing this document to better understand conservation needs in this complex county and as a framework to execute the mission of the agency. We deliver conservation solutions so agricultural producers can protect natural resources and feed a growing world.

The purpose of this Long-Range Plan is two-fold. First, it will be used to gather data by looking at existing conditions and summarizing the work that has been done so far. Secondly, the data will be analyzed to find and prioritize opportunities for voluntary conservation on private lands. This will be done by incorporating community input from landowners and partners, in order to facilitate a strategic approach to natural resource planning. Additionally, this analysis will guide the use of technical and financial assistance delivered by the Helena Field Office.
The authors of this plan are the staff of the Helena Field Office and the Lewis and Clark Conservation District. Comments from stakeholders gathered at a series of community meetings in addition to a mailed survey are incorporated into this plan. The following groups contributed to establishing goals and planning priorities for the next five years (2020-2025).

- Lewis and Clark County landowners, farmers, ranchers and forest owners
- Montana Fish, Wildlife and Parks (FWP)
- County commissioners
- Rural fire chiefs
- Sun River Watershed Group (SRWG)
- Lewis and Clark Conservation District

The Long-Range Plan will be revisited and updated as necessary, and at a minimum annually, at the Conservation District Local Work Group meeting.

II. NATURAL RESOURCE INVENTORY

Human Resources

POPULATION AND DEMOGRAPHICS: The population of Lewis and Clark County has grown by almost 7% over the last 8 years. The estimated population is currently 67,773 total residents. 95% of the county's population resides in the Helena Valley. County residents are not very racially diverse with only 6% of the residents reporting an ethnicity other than white at the time of the last census. There are no recognized native American tribes in the county, and no tribally held lands, however 2.3% of the population are American Indians or Alaska Natives. The largest minority group is the Hispanic and Latino population at 3.3%. Another notable group is veterans which make up 9.2% of the county's population, which is consistent with the state of Montana but higher than the country at large.

FARM CHARACTERISTICS:

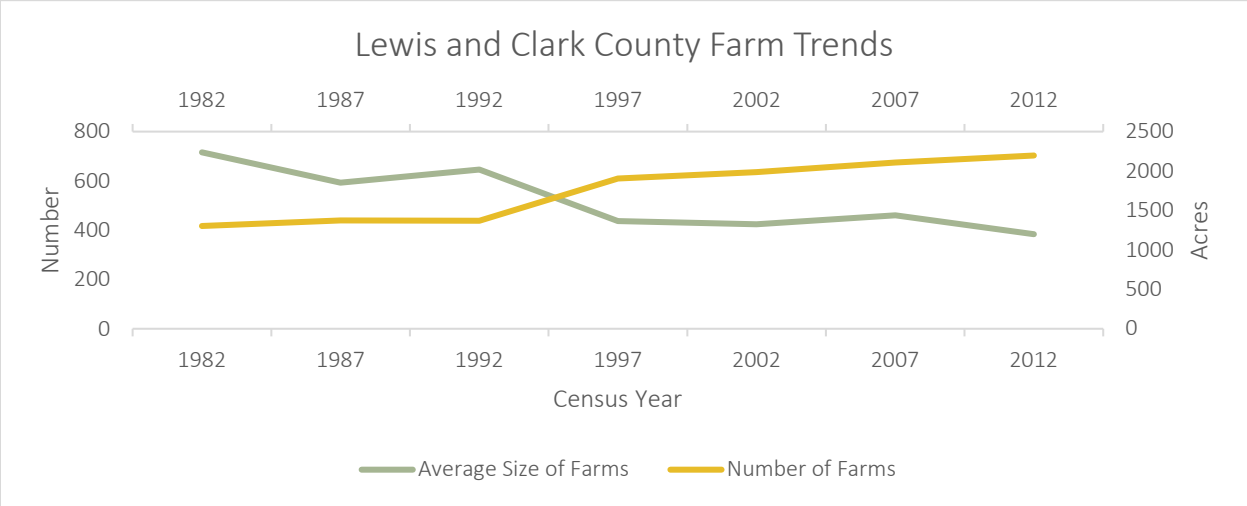


FIGURE 2 FARM CHARACTERISTICS IN LEWIS AND CLARK COUNTY (NASS)

According to the National Agricultural Statistics Survey the total amount of land in farms has declined 13% in the last five years. This corresponds with an increasing population in the county, and the downward trend in average farm size (Figure 2). Despite losing land to development, or perhaps because of it, the total number of separate farming operations has increased steadily over the last 30 years (NASS, 2017).

ECONOMIC FACTORS: The State of Montana employs the majority of the workforce in the county. This has created a very stable economy. The Lewis and Clark County Chamber of Commerce estimates that roughly 60% of the workforce is connected to state and other government positions, while 3% of the workforce is employed in agricultural industries.

The county produced $43,187,000 worth of agricultural products in 2017. The top crop produced is hay, followed by wheat, and barley (NASS, 2017). Cattle are the primary livestock produced. A few small-scale vegetable and meat producers have farms in the county. Support

for local food production, a bi-weekly farmers market in Helena, and several other farmers markets in the region have increased demand for vegetable production.

According to the University of Montana Institute for Tourism and Recreation Research, ecotourism is a significant sector of the county's economy. Local natural resources provide recreational opportunities jobs and income to the region. Data from 2017 shows that $21,000,000 was spent in Lewis and Clark county on outfitters and guides alone. Privately owned farms and ranches contribute to this market by allowing hunting, fishing and other recreational access in the county.

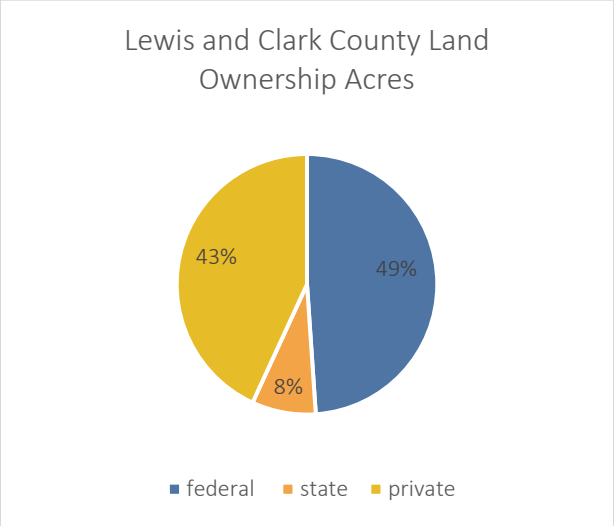


FIGURE 3 LAND OWNERSHIP

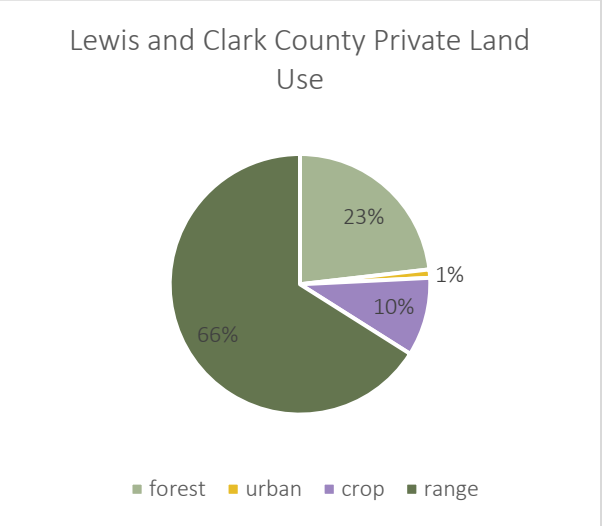


FIGURE 4 PRIVATE LAND USE

LAND USE: More than half of the land area in Lewis and Clark County is publicly owned. Most of the public land is managed by the U.S. Forest Service. The second largest landowner is the State of Montana followed by relatively small holdings held by the Bureau of Land Management and the Bureau of Reclamation. The county includes about 2,237,312 acres and about 54 percent is forest land, 42 percent range and pasture, and 4 percent is cropland and non-commercial forest. Other privately-owned designated conservation lands in the county encompass 3,076 acres owned by The Nature Conservancy (2,977ac) and Prickly Pear Land Trust (99ac).

According to county tax records, 23% of all private land in Lewis and Clark County is forested. This includes land in farms, non-industrial private forest, and residential properties. There are patented mine claims throughout the county that are inholdings often surrounded by public land. These properties derive from the history of mining in the county and are very common especially in the Helena and Lincoln areas. 66% of the private land in the county is rangeland.

Some of this land is not in traditional agriculture but is used for recreation or hobby animals instead.

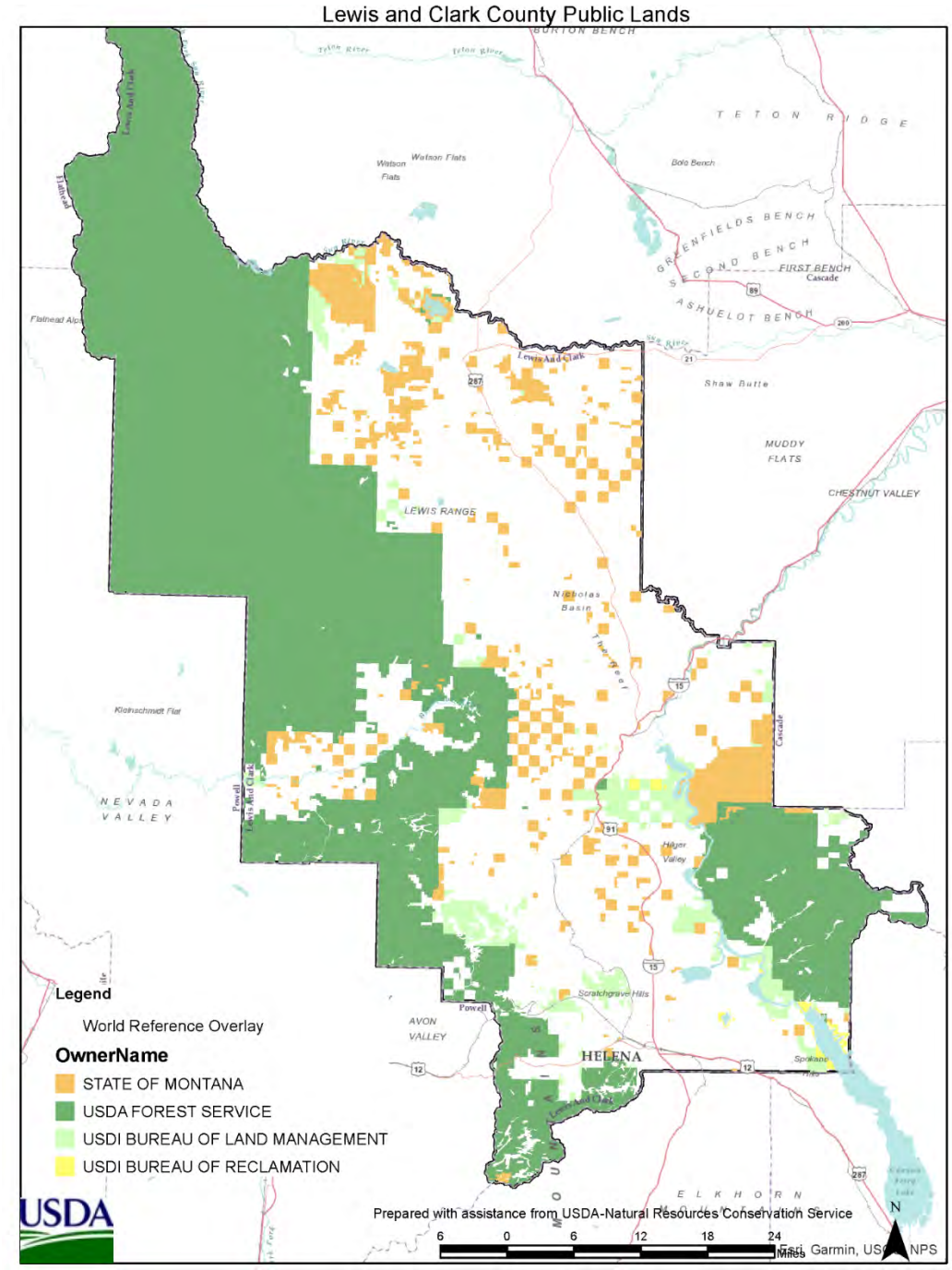
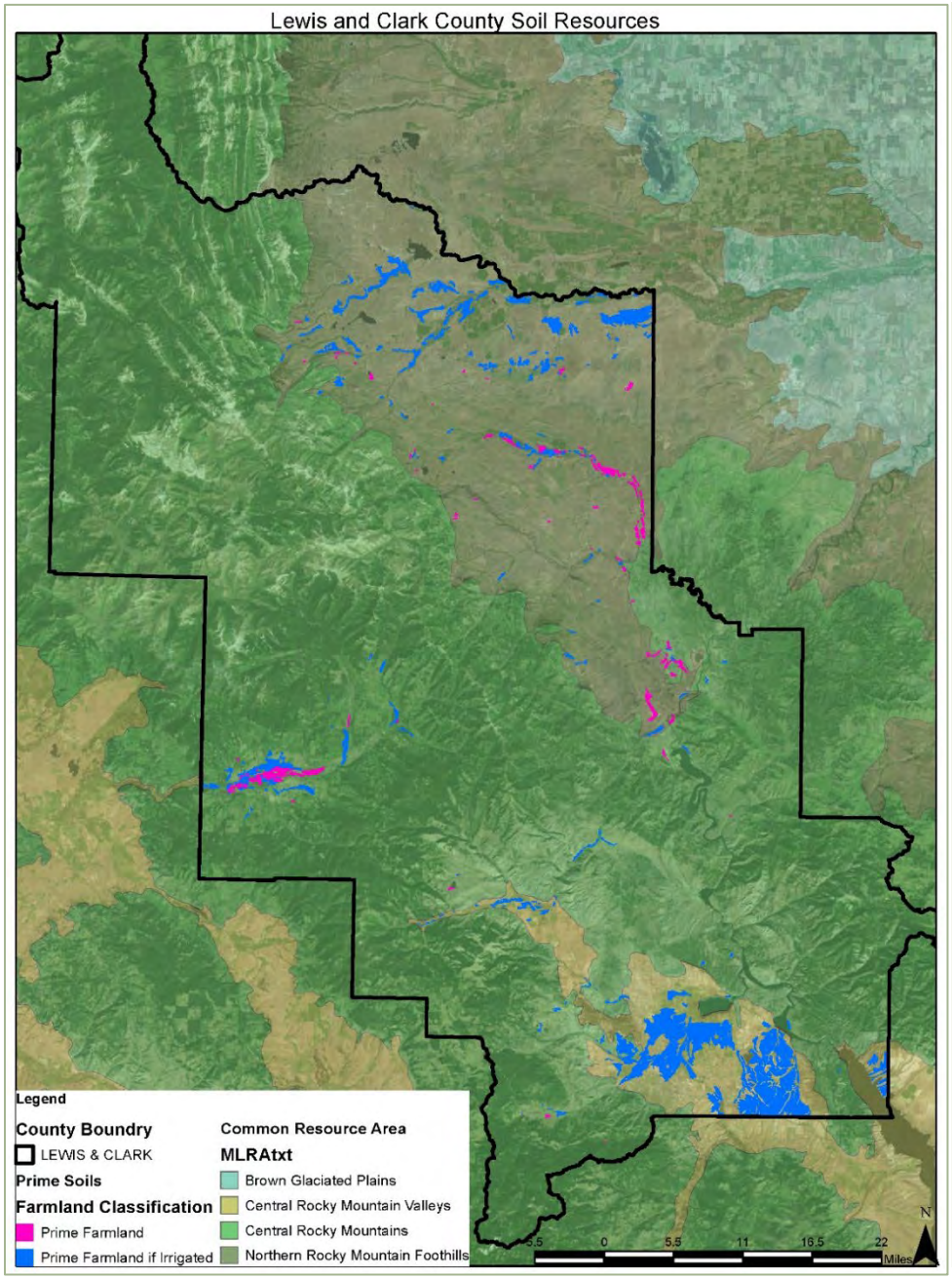


FIGURE 5 LOCATION OF PUBLIC LAND PARCELS

Soil resources

SOIL SURVEY: The first soil survey of the area, "Soils of Lewis and Clark County: Soil Reconnaissance of Montana" was published in 1947. Major fieldwork for this soil survey was

completed in 1987. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1992. Major Land Resource areas that lie within the soil survey area are 44B Central Rocky Mountain Valleys, 43B Central Rocky Mountains, and 46 Northern Rocky Mountain Foothills.



SOIL RESOURCES: Relatively small quantities of Prime Agricultural Soils are found in the county. These are concentrated in valley bottoms and river flood plains.

Highly erodible soils are common, especially in the northern plains region of the county that experience strong winds from the west. This is also where the most annual crop rotations are located. Perennial hay and alfalfa rotations are also common and reduce issues with HEL soils.

Hydric Soils are widespread in Lewis and Clark County and are concentrated mainly along waterways or in the prairie pothole region.

FIGURE 6 FARMLAND CLASSIFICATION OF SOILS

The survey area contains portions of five mountain ranges. The ranges include the Sawtooth Range in the northern portion; the Lewis and Clark Range to the northwest; the Nevada

Mountains to the southwest; the Big Belt Mountains to the southeast; and the Adel Mountains to the east.

The county lies within three Major Land Resource Areas (MLRA) including 44C – Central Rocky Mountain Valleys, 43B – Central Rocky Mountains, and 46 – Northern Rocky Mountain Foothills.

Parent Material

The soils in the survey area formed from a variety of parent materials. Some soils formed in alluvium that was derived from mixed sources. Other soils formed in material weathered from igneous rocks, limestone, sandstone, or shale. Soils that formed in material derived from igneous rocks are generally loamy and have a high content of rock fragments. Soils that formed in limestone have a high lime content. Soils that formed from sandstone are sandy while soils formed from shale are clayey.

Much of the mountainous terrain in the western part of the survey is mantled by colluvium and alluvium from argillite, igneous, and limestone rocks. Argillite, quartzite, and siltite of the Belt Supergroup, and fine-textured rocks of the Adel Volcanic, provide additional parent materials. Near the town of Lincoln, Tertiary shales, mudstones, and alpine till provide parent material for soils along with alluvium on low stream terraces and flood plains. In alluvial fans and moraines near the mountains, parent materials may contain significant amounts of limestone. East of Augusta, soils are formed in sandstone, siltstone, and shale. Near Augusta and Helena, soils formed in gravels and sands of low terraces and alluvial fans.

Farmland of Local Importance - These are primarily found on high terraces and fan remnants to the north of Helena and to the south of Augusta.

Farmland of Statewide Importance - These soils occur mainly on fan remnants and hills east of Augusta.

Prime if Irrigated - These areas are mainly on terraces and alluvial fan remnants near Helena.

Prime farmland – These are extremely limited in extent but mainly occur along river bottoms and alluvial terraces near Lincoln.

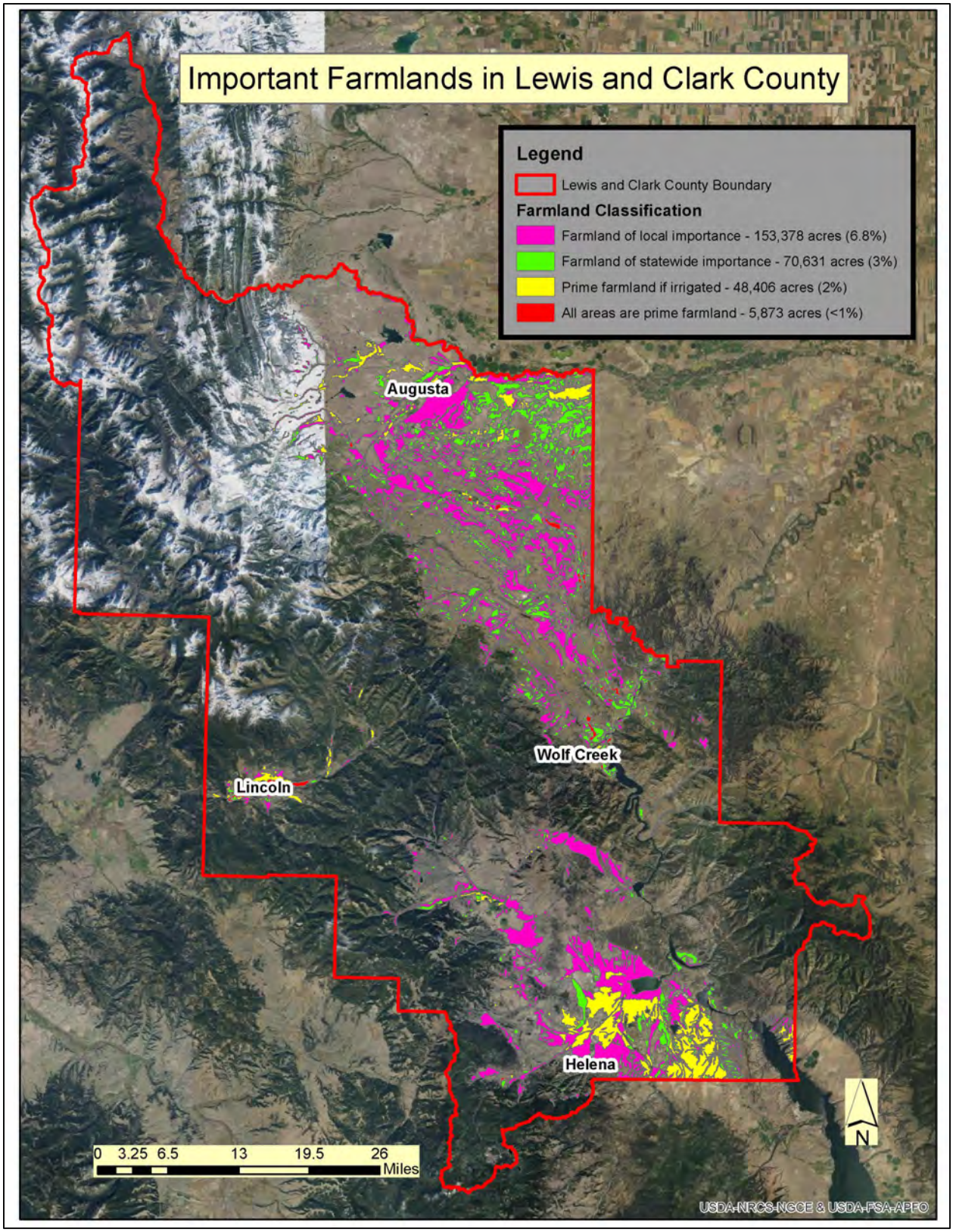


FIGURE 7 IMPORTANT FARMLAND SOILS

GEOLOGIC FEATURES: Except for the northeast corner of the county, most of the soil survey area is mountainous. West of the Missouri River, numerous linear mountain ranges were formed—known as the Lewis Thrust Sheet--when large fault blocks were thrust upward and eastward from the west and over other blocks. Many of these ranges have steep eastern slopes and gentler western slopes. Cliffs of white Madison Limestone are characteristic of these areas. The Big Belt Mountain Range exposes some of the oldest rocks in the region and lends its name to the geologic formation known as the Belt Supergroup. Stretching from Wolf Creek to Canyon Ferry on both sides of the Missouri River, the Belt Supergroup formation of Precambrian sedimentary rocks can be recognized by its red, green and grey shales (Argillites and siltstones). Farther to the south the Boulder Batholith, an igneous intrusion which is mostly granite, can be seen in the Scratch gravel Hills and extends south and west into the Elkhorn Mountains. The unique way that these volcanic rocks cooled, created the rich vein deposits of gold, silver and copper, that continue to be mined in the area (NRCS, 2003).

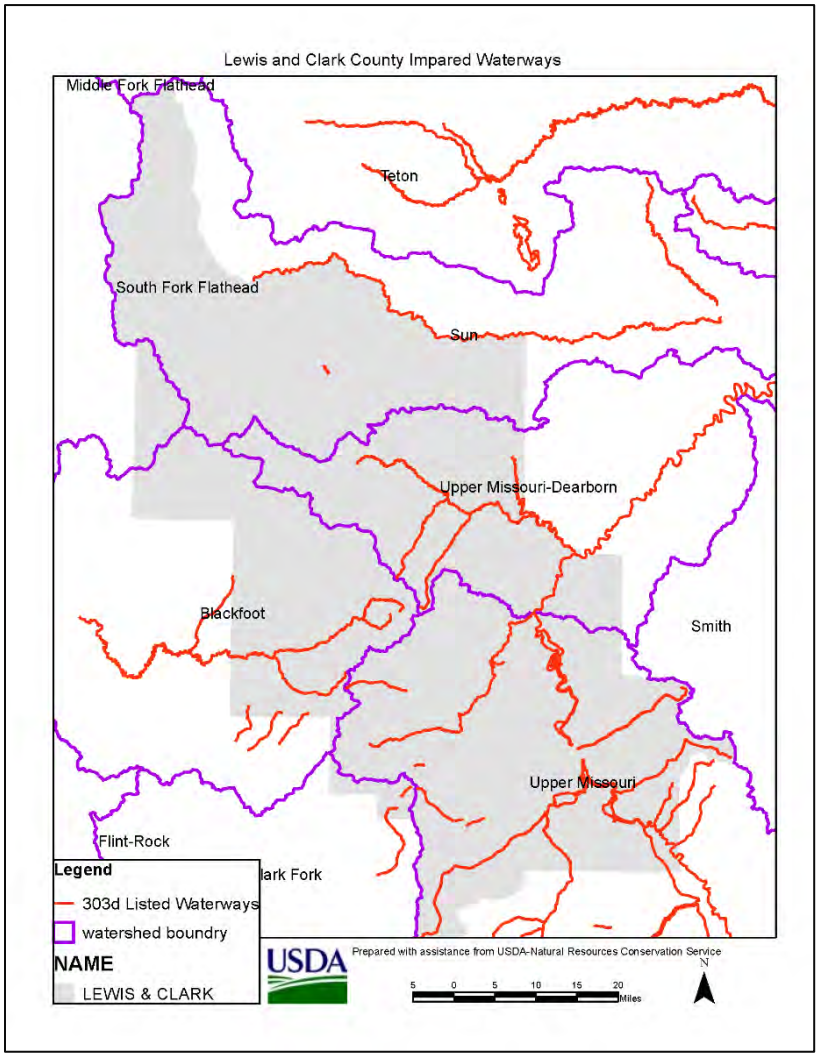


FIGURE 8 303-D LISTED STREAMS

Water resources

PRECIPITATION: Controlled largely by elevation, the precipitation in Lewis and Clark County ranges from 8-12 inches in the eastern valleys to over 70 inches on the peaks along the continental divide. Areas west of the continental divide generally receive more precipitation due to the rain shadow created by the Rocky Mountains.

WATERSHEDS AND STREAMS: Figure 8 shows the 303d listed impaired streams, and the major watersheds in the County. In the southern portion of the county, reservoirs on the Missouri River are a source of electricity, recreation and irrigation water. These reservoirs are

impacted by heavy metals, sediment and nutrients. In the upper Missouri and the Blackfoot watersheds, much of the impairments derive from past mining activity which still contribute heavy metals, sediment and nutrients into streams. East of the Divide this ultimately impacts the Missouri River. The Upper Missouri, Dearborn and Sun River drainages are impacted slightly more by agricultural activities which contribute to flow modification and temperature impairments. Various reaches in the county are impaired because of modification or lack of vegetative cover which may or may not be directly related to agricultural operations.

TABLE 1 303D LISTED WATER AND THEIR IMPAIRMENTS

Water Body	Impairment(s)
Sheep Creek, Moose Creek	*Aluminum*
Canyon Ferry Reservoir	*Ammonia (un-ionized), Arsenic, Thallium*
Prickly Pear Creek (Hwy 443 to Lake Helena)	*Ammonia (un-ionized), Temperature*
Indian Creek, East Fork Indian Creek	*Arsenic, Cadmium, Lead, Mercury*
Cottonwood Creek (Sand Coulee Creek to Missouri River)	*Arsenic, Lead, Copper*
Beaver Creek	*Cadmium, Chromium (total), Lead, Silver, Zinc, Nitrate/Nitrite, Phosphorus (total), Sedimentation/Siltation*
Confederate Gulch	*Cadmium, Nitrate/Nitrite, Phosphorus (total)*
Lake Creek	*Cadmium, Salinity, Sedimentation/Siltation, Selenium, Zinc*
Newlan Creek (headwaters to Newlan Reservoir)	*Cadmium, Sedimentation/Siltation, Phosphorus (total), Nitrogen (total)*
Crow Creek	*Copper, Lead*
Silver Creek	*DDE (Dichlorodiphenyldichloroethylene)*
Hauser Lake	*DDT (Dichlorodiphenyltrichloroethane), Endrin aldehyde, Mercury, Dissolved oxygen, Phosphorus (total), Endosulfan sulfate, Arsenic, Nitrate/Nitrite*
Benton Gulch, Camas Creek, Huber Coulee	*Escherichia coli (E. Coli)*
Virginia Creek, Number Five Coulee	*Lead*
Sand Coulee Creek (confluence with Cottonwood Creek to Missouri River)	*Lead, Salinity, Zinc*
Hellgate Gulch, Wilson Creek, Holter Lake, Carpenter Creek	*Mercury*
Jennies Fork	*Nitrate/Nitrite, Phosphorus (total)*
North Fork Smith River	*Nitrogen (total), Phosphorus (total), E. Coli*
Hound Creek	*Nitrogen (total)*
North Fork Warm Springs Creek	*Organic Enrichment*
Smith River	*Phosphorus (total), E. Coli, Temperature*
Woodsiding Gulch	*Phosphorus (total)*
Belt Creek	*Salinity, Sedimentation/Siltation, Aluminum*

Benton Lake	*Salinity, Selenium, Sulfate, Nitrogen (total)*
White Gulch, Trout Creek, Tenmile Creek, Dry Fork Belt Creek, Missouri River (Sheep Creek to Sun River)	*Sedimentation/Siltation*
Box Elder Creek, Big Otter Creek	*Sedimentation/Siltation, Nitrate/Nitrite*
Thompson Gulch	*Sedimentation/Siltation, Nitrogen (total)*
Crow Creek, Magpie Creek, Sixteenmile Creek, Cave Gulch, Little Belt Creek, Missouri River (Holter Dam to Little Prickly Pear Creek)	*Sedimentation/Siltation, Phosphorus (total), Nitrogen (total)*
Little Prickly Pear Creek	*Sedimentation/Siltation, Temperature*
Newlan Creek (Newlan reservoir to mouth)	*Sedimentation/Siltation, Temperature, E. Coli*
Battle Creek, Dry Creek	*Sedimentation/Siltation, Temperature, Phosphorus (total)*
Elk Creek	*Sedimentation/Siltation, Temperature, Phosphorus (total), Nitrogen (total)*
Deep Creek, Corbin Creek, Dearborn River (Falls Creek to mouth)	*Temperature*
Little Camas Creek	*Temperature, Nitrogen (total)*
Missouri River (Morony Dam to Marias River)	*Aluminum, Arsenic, Cadmium, Copper, Iron, Lead, Sedimentation/Siltation, Zinc, Nitrogen (total), Phosphorus (total)*
Missouri River (Rainbow Dam to Morony Dam)	*Arsenic, Copper, Sedimentation/Siltation, Temperature, Turbidity, Polychlorinated Biphenyls (PCBs)*
Missouri River (headwaters to Toston Dam) (Little Prickly Pear Creek to Sheep Creek)	*Arsenic, Sedimentation/Siltation, Nitrogen (total)*
Missouri River (Toston Dam to Canyon Ferry Reservoir)	*Cadmium, Copper, Lead, Sedimentation/Siltation*
Missouri River (Sun River to Rainbow Dam)	*Chromium (total), Mercury, Sedimentation/Siltation, Selenium, Turbidity, PCBs*

IRRIGATED LANDS: Lewis and Clark County has 3 Irrigation districts. The Helena Valley Irrigation District, Dearborn Canal & Water Company, and the Nilan Water Users Association.

Helena Valley Irrigation District, operated by the Bureau of Reclamation, is located within the county. This irrigation district takes water directly from Canyon Ferry Reservoir via a pumping station at the Canyon Ferry Dam. The water is stored in a regulating reservoir and distributed to irrigators with a canal network.

The Dearborn Canal and Water Company diverts water through a canal from the North Fork of the Dearborn River into the headwaters of Flat Creek. Flat Creek then carries the water for 1.8 miles where it is diverted via canal for private diversions. The remainder of the water that was diverted originally is taken out of Flat Creek by various private diversions.

The Nilan Water Users Association (including the Florence Canal) diverts water from Smith Creek to store in Nilan Reservoir. 2 canals are used to distribute the water from here. The east canal

diverts water into Smith Creek where the water is then used to irrigate lands on both sides of the South Fork of the Sun River near Augusta. The north canal diverts water into Willow Creek to irrigate agricultural lands along the south side of Willow Creek.

The remainder of the county does not contain formal irrigation districts, only individual water rights. All together the county has about 47,500 acres of irrigated land. Close to 80% of this land is used for irrigated crop production, with the remainder in irrigated pasture or other uses.

RIPARIAN AREAS / WETLANDS: Wetlands are among the most important and beneficial ecosystems on the landscape. Wetlands provide critical biological, ecological, and economic benefits including flood attenuation, water filtration, carbon sequestration, drought resiliency, and wildlife habitat. Wetlands are home to 31% of all U.S. plant species, half of all North American bird species use wetlands as some point in their lifecycle, and nearly half of all threatened or endangered species in the U.S. are also associated with wetlands (EPA, 2019). Lewis and Clark County contains a considerable number of wetland acres and a diverse array of wetland types. A total of 66,603 acres of wetlands can be found within the county borders. Of these, 32,732 (49%) acres are palustrine (lacking flowing water), 15,718 (24%) are lacustrine (lake associated), 6,431 (10%) acres are riverine (river associated), and 11,722 (17%) acres are located within riparian zones (MT NHP , 2019).

Air and energy

AIR QUALITY: Lewis and Clark County generally has good air quality, with few associated risks to human health. Periodic inversions occur during winter months and can last for several days. An Air Quality Management Area was created in the area around Helena to monitor and regulate air quality. Large-scale wildfire events are known to drastically reduce air quality in the summer and fall. A county wide open burning ban is in effect from December 1st to March 1st of each year during which time additional favorable weather restrictions apply to burn permits. This prevents contributions of smoke pollution during an inversion event. Air quality data is tracked daily in the county and is available, with interpretations, to the public from multiple sources.

UTILITIES: Three hydroelectric dams lie along the Missouri River in the south east portion of the county: Holter, Hauser and Canyon Ferry Dams. A solar power plant operates in Canyon Creek along the Lincoln Highway, and another located in the northern end of the Helena Valley. Several electric transmission lines run through the county connecting Great Falls, the power plants, Helena and Lincoln, continuing to the south west. The utility companies maintain clear cuts under and around the transmission lines.

Plants and Animals

LISTED SPECIES AND SPECIES OF CONCERN: Where they are found, federal and state listed plant and animal species offer valuable opportunities to partner with landowners and conservation partners to protect and improve associated habitats. The U.S. Fish and Wildlife

Service's (FWS) Ecological Services Division lists the following threatened species as present within areas of Lewis and Clark County as of December 12, 2019: Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis*), bull trout (*Salvelinus confluentus*), and red knot (*Calidris canutus rufa*). None of Montana's federally endangered species are known to reside within the county but one proposed species (wolverine, *Gulo gulo luscus)* and one candidate species (Whitebark Pine, *Pinus albicaulis*) are considered present (USFWS, 2019). Designated critical habitat occurs in the county for Canada lynx and bull trout.

According to the Montana Natural Heritage Program Species of Concern Reports dated April 16, 2020, Lewis and Clark County contains 63 state listed animal Species of Concern. These species consist of 14 mammal species, 36 bird species, 2 reptile species, 2 amphibian, 3 fish species, 3 insect species, and 3 mollusk species. Habitats generally associated with these species are diverse including both terrestrial and aquatic types and comprise mountain streams, rivers, lakes, grasslands, riparian forests, conifer forests, wetlands, and sagebrush. More specialized and geographically isolated species on the list can be found only in association with Lewis and Clark County's rocky cliffs and crevices, alpine zones, rock talus, and forest habitat caves (MNHP, 2019).

A total of 43 state listed plant Species of Concern also can be found within Lewis and Clark County. They are generally comprised of 3 fern species, 1 conifer species, 23 flowering dicot species, 5 bryophytes, 1 lichen, and 10 flowering monocot species. Most of these species exist in Lewis and Clark's common general habitat types (grasslands, riparian, sagebrush) but a few specialized species can only be found in more limited habitats including rock talus, fens, and alpine zones (MNHP, 2019).

TABLE 2 MNHP ANIMAL AND PLANT SPECIES OF CONCERN

Montana Natural Heritage Program, Animal and Plant Species of Concern		
Mammals	14 species	*Townsend's Big-eared Bat, Spotted Bat, Hoary Bat, Eastern Red Bat, Little Brown Myotis, Fringed Myotis, Black-tailed Prairie Dog, Pygmy Shrew, Preble's Shrew, Northern Bog Lemming, Fisher, Wolverine, Canada Lynx, Grizzly Bear*
Birds	36 species	*Northern Goshawk, Peregrine Falcon, Ferruginous Hawk, Golden Eagle, Great Blue Heron, Burrowing Owl, Flammulated Owl, Great Grey Owl, Pileated Woodpecker, Lewis's Woodpecker, Black-backed Woodpecker, Pinyon Jay, Clark's Nutcracker, Clark's Grebe, Trumpeter Swan, Common Loon, Harlequin Duck, Long Billed Curlew, Black-necked Stilt, White Tailed Ptarmigan, Foster's Tern, Bobolink, Sprague's Pipit, Chestnut-collared Longspur, McCown's Longspur, Veery, Baird's Sparrow, Brewer's Sparrow, Green-tailed Towhee, Varied Thrush, Brown Creeper, Evening Grosbeak, Cassin's Finch, Gray-crowned Rosy Finch, Sage Thrasher, Pacific Wren*
Reptiles	2 species	*Greater Short-horned Lizard*
Amphibians	2 species	*Western Toad, Great Plains Toad*
Fish	3 species	*Northern Redbelly Dace, Westslope Cutthroat Trout, Bull Trout*

Insects (dragonflies)	3 species	*Subarctic Darner, Boreal Whiteface, Brush-tipped Emerald*
Mollusks	3 species	*Western Pearlshell, Alpine Mountain snail, Carinate Mountain snail*
Ferns	3 species	*Limestone Maidenhair Spleenwort, Moonwort, Treelike Clubmoss*
Conifers	1 species	*Whitebark Pine*
Flowering Plants, dicots	22 species	*Western Joepye-weed, Tilesius Wormwood, Long-styled Thistle, Lackshewitz' Fleabane, Linear-leaf Fleabane, Dwarf Saw-wort, Great Basin Dowingia, Lesser Rushy Milkvetch, Wedge-leaf Saltbush, Cliff Toothwort, Dense-leaf Draba, Divide Bladderpod, Silver Bladderpod, rocky Mountain Twinpod, Kerry's Paintbrush, English Sundew, Slenderleaf Sundew, Mat Buckwheat, Pale-yellow Jewel-weed, Alpine Glacier Poppy, Low Beardtongue, Missoula Phlox.*
Flowering Plants, monocots	9 species	*Round-leaved Orchis, Sparrow's-egg Lady's Slipper, Giant Helleborine, Beaked Spikerush, Alpine Sedge, Prairie Sedge, Water Bulrush, Wood Lily, California False-hellebore*
Moss and Lichens	4 species	*Black Golf Club Moss, Fringed Bogmoss, A Scorpidium Moss, Fringed Chocolate Chip Lichen*

CONSERVATION AREAS: Three designated wilderness areas, the Bob Marshall, Scapegoat and Gates of the Mountains Wilderness Areas, can be found in Lewis and Clark County. Additional State of Montana operated game Ranges are the Beartooth Wildlife Management Area and the Sun River Wildlife Management Area are adjacent to federal wilderness areas creating large tracts of land managed for wildlife.

The Rocky Mountain Front Conservation Area is part of the larger Crown of the Continent ecosystem. This ecosystem in unique because it is the only remaining area in the continental U.S. with an intact assemblage of large carnivores. In fact, every wildlife species found in this area prior to European settlement, except for free-ranging bison, remains in stable or increasing numbers. Efforts in this area have focused on placing conservation easements on private lands to create contiguous habitat with public lands (USFWS, 2020).

Conservation easements are generally considered a valuable conservation tool. Depending on the specific written deed parameters, land can be safeguarded for decades or even perpetuity for many purposes including the conservation of plant or animal habitat, landscape features (e.g. wetlands, cultural sites), or land management activities like farming and ranching. Lewis and Clark County contains a total of 134,578 acres (6% of county total) under some form of conservation easement. Of these, 73,346 acres are associated with private easement holders

(land trusts, animal conservation organizations, etc.). The remaining easements are federally owned (25,112 acres) and state or locally owned (36,120 acres). Of the federal acres, the United States Department of Agriculture currently holds 66 acres under easement within the county.

Top Ten Noxious Weeds List

- Spotted Knapweed
- Diffuse Knapweed
- Russian Knapweed
- Canada Thistle
- Leafy Spurge
- Dalmatian Toadflax
- Yellow Toadflax
- Whitetop
- Field Bindweed
- Houndstongue

INVASIVE SPECIES: Invasive plants are monitored and controlled partially by the Lewis and Clark County Weed District. They are also a resource for information and equipment for county landowners. The Weed District reviews weed plans and keeps noxious weed lists and watch list for the county. FWP tracks aquatic invasive species in the state. Invasive invertebrates in the county are the New Zealand mud snail in the Missouri River and zebra mussels that have been detected as larvae in Canyon Ferry Reservoir. An adult population of zebra mussels has not been located. The primary invasive aquatic plant in the county is curly leaf pondweed (MT FWP, 2019).

DECLINING PLANT COMMUNITIES: The Montana Field Guide ranks ecological systems by their vulnerability. Ecological systems are classified by their limited range and/or declining footprint. The most vulnerable ecological systems in Lewis and Clark county are the Rocky Mountain Conifer Swamp, the Rocky Mountain Subalpine Woodland and Parkland, and Glacier and Ice fields. Maps of the location and extents of these habitats can be found on the Montana Field Guide website (MNHP, 2019).

WILDFIRE: Lewis and Clark County has multiple agencies and citizen groups that are concerned with the wildfire danger in the county. Tri County Fire Safe Working Group has developed a Fuel Hazard risk map for the county and provides grants for landowners to reduce fuels around their homes and escape routes. The Montana Department of Natural Resources Forestry Division also does work with prevention and preparedness. The Wildlife Urban Interface is extensive especially in the area around Helena where the city limits are adjacent to USFS property.

RANGE: Approximately 42% (945,850 acres) of Lewis & Clark County supports rangeland vegetation. In addition, 20% or 240,000 acres of forest supports forest land understory vegetation that is suitable for grazing. Animal unit months or AUMs typical for Lewis & Clark can range from 0.6-1.09 AUMs on native range and from 0.6-2.7 AUMs per acre on pasture. Cow/calf operations are one of the major farming enterprises, constituting about 69% of farm income. The average size of farm units is approximately 1,132 acres. Most grazing is on rangeland or irrigated pasture. The range is used primarily for grazing by domestic livestock; however, it also is used as recreational areas, watershed, and has esthetic value. Rangelands consist mostly of

open range and forested areas. Grassland, shrubland, and forests provide habitat for a multitude of wildlife species. Rainfall averages 14 inches annually and 52 inches of snow annually.

Poor grazing management, invasive species, periodic long-term drought and changes in fire regime are responsible for rangelands moving away from climax plant communities. According to the USDA publication "Climax Vegetation of Montana" from 1976 Lewis & Clark County had 60% of rangelands in good to excellent condition and 40% in less than good condition. While there are still some examples of excellent climax communities in Lewis & Clark County the percentage of excellent rangeland the has dropped. Some rangelands are in an invaded state or have been lost to conifer encroachment and development. Some rangelands have decreased in productivity due to overgrazing, invasive species, or any combination of these pressures.

The introduction of large numbers of livestock during the early 1900s upset the balance of native plant communities. Continuous, season-long grazing and over stocking has damaged rangelands. Native bunchgrasses declined, and undesirable shrubs, weeds and grasses increased. Exotic grass species such as timothy, redtop, smooth brome and orchardgrass were planted for hay and pasture and these plants displaced native rangeland vegetation in some areas. Spotted knapweed, leafy spurge, houndstongue, Canada thistle, and other noxious weeds were accidently introduced during the early and mid-1900s. These plants eventually outcompeted many native grasses. Annual grasses are also outcompeting native species and include cheatgrass, and most recently ventenata (JCWD, 2020). Invasive species management and correct grazing management will improve rangeland resources and bring grazing levels closer to climax community production.

III. Conservation Activity Analysis

The NRCS office in Lewis and Clark County is in the town of Helena. The office is housed in the USDA building along with the Farm Service Agency (FSA), Rural Development, and the Lewis & Clark Conservation District.

The NRCS Helena Field Office has worked with the Lewis and Clark Conservation District to address priority natural resource concerns identified by the Local Working Group. The priorities have alternated between grazing land resource conservation, forestry, and issues associated with irrigated crop production. Financial assistance has been provided primarily through the Environmental Quality Incentives Program (EQIP).

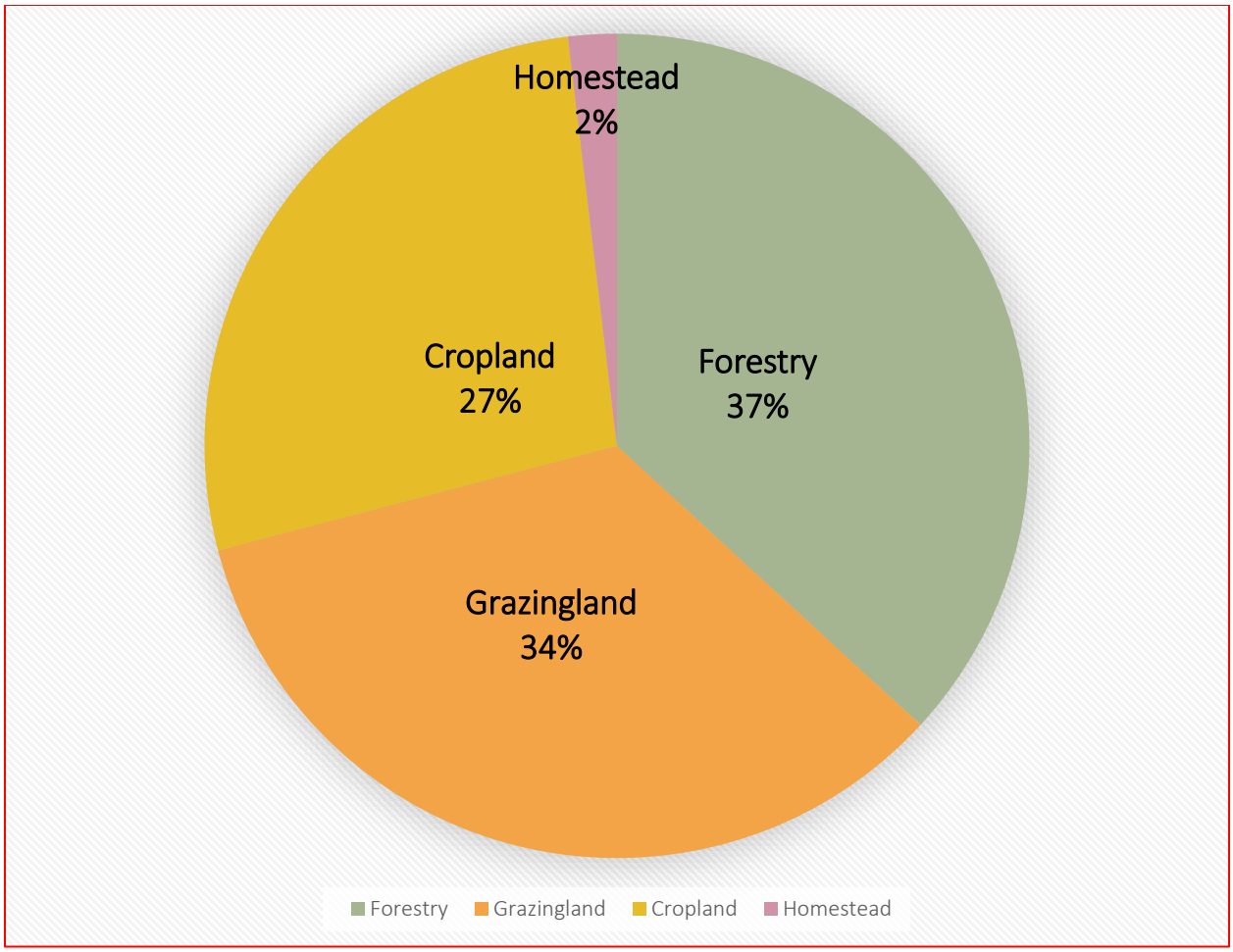


FIGURE 9 HISTORICAL LOCAL WORKING GROUP FUNDING ALLOCATIONS 2007-2019 BY LAND USE. (SOURCE?)

TABLE 2 NRCS EQIP AND WHIP COMMONLY APPLIED PRACTICES 2007-2019

Practice	Number(s)
Forest Management Plan – Written	1
Agricultural Energy Management Plan	2
Oil Spill Prevention, Control, Countermeasure	1
Waste Storage Facility	4
Brush Management	2
High Tunnel System	3
Conservation Crop Rotation (Ac)	49
Critical Area Planting	11
Residue Management Seasonal (Ac)	11

Groundwater Testing	1
Diversion	2
Windbreak Shelterbelt Establishment (Ft)	1
Fence	67
Fuel Break	229
Woody Residue Treatment	100
Riparian Forest Buffer (Ac)	7
Filter Strip	3
Filter Strip (W/ Trees and Shrubs) (Ac)	6
Firebreak	7
Irrigation Water Conveyance, Pipeline	32
Irrigation System, Sprinkler	25
Irrigation Water Management	77
Land Smoothing (Ac)	1
Lined Waterway or Outlet	1
Use Exclusion (Ac)	6
Forage Harvest Management	40
Pasture and Hay Planting	6
Livestock Pipeline	56
Prescribed Grazing	91
Pumping Plant	24
Range Planting	7
Roof Runoff Structure	1
Spring Development	30
Animal Trails and Walkways	2
Streambank and Shoreline Protection	4
Open Channel	1
Structure for Water Control	17
Nutrient management	82
Tree/Shrub Establishment	6
Watering Facility	59
Waste Utilization	7
Water Well	12
Wetland Wildlife Habitat Management (Ac)	7
Tree/Shrub Pruning	13
Forest Stand Improvement	138
Lighting System Improvement	1
Agricultural Secondary Containment	1
Herbaceous Weed Control	169

IV. NATURAL RESOURCE PROBLEMS AND DESIRED FUTURE OUTCOMES

Since the beginning of the Local Working Group meetings, the locally led process has identified resource concerns in both widely spread and targeted areas in the county.

IDENTIFIED RESOURCE CONCERNS:

The Helena Field Office staff and the Conservation District hosted four community planning meetings around the county. The county is large and has a wide variety of landscape types and resource concerns. At the meetings, NRCS staff went through how the funding allocations have changed over the years (from county to area, now from area to state) and the changes to Montana Focused Conservation.

Invasive plants: Local landowners are looking for ways to better coordinate their control efforts with State and Federal land managers to work together in the ongoing battle against invasive plants. A coordinated effort on adjoining lands will lead to a more consistent, shared outcome. This approach can help control the spread of invasive plants from State/Federal lands to private lands and vice versa. Areas affected by wildfire (federal/state/private) can to be managed better for noxious weeds with consideration given to re-seeding the highest burn intensities to reduce the spread of weeds. Areas that are logged either for fuels reduction or for commercial projects should be better managed for weeds. The other area of concern in relation to weeds is invasive species in riparian areas, especially Russian olive (JCWD, 2020).

Forestry concerns: This section included concerns related to dealing with beetle killed trees, especially since they are a fire hazard as well as being a hazard in high wind events. Downed trees also make areas impassable, especially regarding moving cattle and calves into grazing allotments. Apparently even elk avoid beetle killed areas so reduction of those standing fuels could provide better wildlife habitat. There was discussion about controlled burns on state and federal lands, specifically that coordination with adjacent private landowners would be helpful so private land could also be burned. Dalton Mountain and Lincoln Gulch in the Lincoln area were especially noted as having high fuel loads. In addition to controlled burns, there was discussion about other collaborative treatment for fuels reduction. If adequate notice could be given to private landowners, they could plan to treat their properties, which would make both projects more effective.

Roads: County and state roads and highways are outside the purview of NRCS and the Conservation District, however NRCS could potentially assist landowners on private roads where they are near streams.

Streams/Riparian systems: There was discussion about the loss of fencing in relation to repeated flooding leading to an increased need for riparian pastures rather than fences that parallel and are close to the stream banks. Riparian pastures would need to be carefully grazed. Stream improvements including riparian plantings, strategic vegetated rip rap, reduction in overgrazing especially near streams, channel migration zone identification, improvement of sections of

streams that were historically straightened were all discussed as potential tools that landowners could receive education on and assistance with implementation.

Wildlife on grazing/hay ground: There is a need for better or different fencing for some landowners

Range overgrazing: Post grazing recovery of plants solar panels and root reserves are a key process to avoid overgrazing. Rangeland can easily become overgrazed without a proper grazing management plan. Low precipitation will compound the problem. Possible solutions to this problem are to adopt a more restrictive grazing management plan, install additional cross fencing, or reduce livestock numbers.

Water quantity: Canal lining, fixing leaking ditches, improved stock-water conveyance systems, fixing old irrigation infrastructure, retrofitting old sprinklers, monitoring of measurement wells, were all discussed regarding irrigation issues. Xeriscaping education was also discussed as a need.

Water quality: There was some concern voiced about the potential for aquatic invasive species in irrigation systems. More education needs to be done on this. Portable or temporary fencing was discussed as a potential water quality tool, along with grazing plans for landowners. Riparian fencing for pastures, managed grazing, stream plantings and addressing TMDL issues on the streams in the county were all discussed as tools for improving stream health and water quality. Removal of AFO/CAFO from potential flood areas is also a need for some areas of the county.

Urbanization: Urban sprawl was noted at each of the meetings. There was discussion about the need for a channel migration zone study to determine county planning goals. Conservation easements were discussed as a possible tool, especially along streams and rivers.

Erosion (specifically wind), ground water quantity with increasing numbers of wells, and the need for increased pollinator habitat were also resource concerns that were deemed to be important.

V. PRIORITIZATION OF NATURAL RESOURCE PROBLEMS AND DESIRED OUTCOMES

At each of the community meetings participants were asked to vote on the resource concerns they were most concerned about. The concerns listed below received the most votes.

- Noxious Weeds and Invasive Species
- Forestry practices
- Fencing

- Stream impairments
- Education (Small acreage and new landowners, & new and innovative practices)
- Grazing management
- Irrigation-water use efficiencies

APPENDIX A

A1 Minutes NRC Planning Meeting

May 23, 2019
Natural Resource Community Planning Meeting
Wolf Creek School, Wolf Creek MT

John George started the meeting with the group in Wolf Creek and gave some background on the change in direction that NRCS is taking with EQIP funding. He also gave background on where the Helena Field Office has spent money in the county for the past 20+ years.

What natural resource issues in the county need to be addressed
Forestry question-what kind of treatments used on beetle kill? John talked about removal tools
Question about cost share amounts and spacing-can flex on spacing, cost share amounts have increased.
Forestry—Burned tree removal, beetle kill in some places, weed treatment on burned areas and treated areas

Stream work from flooding esp. burned areas

Reseeding burned areas (2017)
Weeds on burned areas (2017)

Tree encroachment on grazing land, mostly ponderosa pine

Not much concern about standing live forests

Grazing? Fencing. There was discussion about fences getting old, with the need for replacement and addition of cross fencing. Some would like to look at the benefit of electric fencing with an emphasis on temporary/movable electric fencing. The benefit to the resource would be to address wildlife issues, improving range health with managing grazing areas.

Predator problems—Landowners have had bears right at their homes, wolves, mountain lions, coyotes. Landowners who have sheep, predator fencing can be problematic. Wolves have even killed the guard dogs.

Creeks/grazing problems--Issues with erosion, flooding, washing places into places, multiple high-water years, degraded banks have become more of a problem.

Irrigation improvement---flood improvement to gated pipe

Weeds—see list

There were some questions about how the office will move forward with the ideas we've talked about tonight. John discussed how the TIPs will be developed off the long-range plan and then decided on at the area and state office levels. There were questions about the cost-share funding amounts. John said they'll be about the same as they've been.

Management tools for the identified problems were discussed as were the desired outcomes.

John wrapped up the meeting with a revisit on what the group had discussed.
Next steps are to:

- Consolidate information
- Hold Local Work Group meeting in Helena in July to report findings
- Develop long rang plan after review of Local Work Group meeting
- Submit to area and state office for review and approval
- Prepare TIPs for funding

A2 NRC Meeting Minutes, Lincoln, MT

May 2, 2019
Natural Resource Community Planning Meeting
Lincoln MT 59639
6 pm

The meeting started at 6:05 pm.

John George, Diane Fitzgerald, Darcy Goodson, Brooke Fitzgerald from the Helena Field Office and Chris Evans from the Lewis & Clark Conservation District were present.

John gave background on the changes coming for funding EQIP at NRCS and why we are doing public meetings to help determine the resource concerns. He also gave some background on projects for the past 10 years or so.

3 questions need to be answered
What natural resource issues do you see that need to be addressed in the county?
Forest management on national forest. Also, a concern for the fire department for forestry on private land—Excessive Fuels buildup—areas to target: Dalton Mountain and Lincoln Gulch. John asked about the Forest Service planning in those areas and it sounds like they're working on the Willow Creek project right now mainly.
John asked about fisheries, water quality concerns. No one has heard too many comments from people about those issues. The cleanup on the Upper Blackfoot Mining Complex is also addressing some of those issues. There has been concern about wolf depredation on live animals.). John asked about grizzly bears and irrigation, but that doesn't seem to be a concern. There was some concern about flooding this year, but it didn't happen much. There has been a lot of thinning on private land, and there are several easements in the area.

Beetle kill is a continued concern. Water Quality-it would be nice to see landowners keeping cattle out of the stream using water gaps etc. Willows and riparian veg should be allowed to replace itself. (streams would be more resilient to flooding too). Old mining issues/claims that need to be cleaned up (tailings).

There are concerns about illegal dumping on private property—mostly garbage but there was a trailer.

Looking at the list that we developed, the top concern—Excessive Fuels and Riparian areas.

Practices for improving those—Riparian fencing, stock water, managed grazing, plantings. For forestry-thinning as necessary for forest health; defensible space around buildings; (fuel break and pre-commercial thinning). Slash treatment too.

What kind of outcomes do people want?

Forestry-reduction of tonnage of fuels on the ground, changing the stand (monoculture, invasive juniper);
Streams-address the TMDL issues on the streams in the county, Increase stream health, SVAP or PFC

Next steps are to:

- Consolidated information
- Hold Local Work Group meeting in Helena in July to report findings
- Develop long rang plan after review of Local Work Group meeting
- Submit to area and state office for review and approval
- Prepare TIPs for funding

A3 MRC Meeting minutes, East Valley Fire Hall

Natural Resource Community Planning Meeting
East Valley Fire Hall
May 16, 2019
6 p.m.

John George, Diane Fitzgerald, Brooke Fitzgerald, Darcy Goodson from the Helena Field Office and Chris Evans from the Lewis & Clark Conservation District.

Darcy got started with the discussion, did introductions and gave some background on the Montana Focused Conservation and gave some history on how the Helena Office has used EQIP funding for the past 22 years. More recent years forestry has really taken a huge chunk of funding due to the forest death due to beetle kill. Current contracts amount to 90% on forestry projects. The applications have driven the percentages so far.

What kinds of resources would the grouplike to see addressed:
Overgrazing
Wind erosion on rangeland (north Valley overgrazed, ATV use, unused land)
Water table concerns-rural vs. urban (water availability)
Fuel reduction within the WUI
Wildlife habitat improvement in forested areas—elk stay away from beetle killed areas due to difficulty traveling (study coming out of Wyoming, another out of the Elkhorn Working Group which hasn't yet been published)
Same issues with grazing cattle on Forest Service—had to cut a path up the mountain to get the cows there(access)
River and stream and riparian corridor improvement—hands on, mechanical restoration work
Weed treatments (Russian olive too especially along streams)
Aquatic invasive in the irrigation systems
Maintenance of ditches???there is some seepage on ditches
Pollinator habitat is a huge need, wild plants
Prairie dogs in the North Valley are terrible
Horse overgrazing
Urbanization

What tools/practices could be used to address those resource concerns
Overgrazing/grazing mgt/wind erosion-education, fencing, portable fencing, grazing plans
Water quantity (groundwater concerns)-get involved with local Water Quality Protection District, monitoring your own wells, (more a residential/urban issue), timing of irrigation. (Not feasible to turn off pivots in the summer when it's hot, they have to run all the time when it's hot)—they use their phones for monitoring. Insurance won't

cover that loss. Residential lawns cost so much for upkeep and watering, xeriscaping education. John asked about retrofitting older pivot systems, if there'd be interest in retrofitting to a more efficient system. John also asked about reversion going from sprinkler to flood irrigation to recharge groundwater, especially wet bottom areas, for wildlife too.
WUI Fuels—defensible space around urbanized areas, buffer zones around houses; larger tract owners clearing down or dead beetle kill for access
Habitat improvement? Picking up downed timber for improving access and grazing. Encroachment of fir (and juniper), weed spraying in grazed timber (cheatgrass). Impacts water too. Shelterbelts? Corridor for birds and other wildlife
Access for livestock (downed timber)-mastication? Burning?
Weeds-spray, integrated mgt plans, biologics, grazing, education of landowners (collaborative effort)
Streams/riparian—riparian fencing if done properly (larger riparian pasture preferable for specific grazing, rather than complete exclusion), habitat, partner funding sources; historic straightening issues, overgrazing issues, question about watershed for focus (PP for sure), Elk Creek, Smith Creek, Ten Mile could all use some work. Some work could be minimal, fence willow sprigging etc.
AIS-practices on private lands? Warm ditches, water goes around in the system, species can spread, education is super important.
Prairie Dog towns-very destructive, harmful to landscape, carry disease, don't stay where they're supposed to, encourage raptors, introduce black footed ferret? Look for partnerships for management.
Urbanization concerns—conservation easement programs, channel migration zone easements along streams
Equine pasture-

Fencing improvements
Better grazing management

What outcomes are we trying to get?

WUI fuels-landowners safety (defensible space), safety of firefighter, more grass, thinned healthy forest (tonnage removed),

Grazing mgt/horses/
Better grass stands, more efficient use, soil/plant health, increased AUMs, rangeland/plant health.

Water quantity-

Habitat improvement-improved numbers of animals depending on what type of habitat, improved diversity of habitat types.

Weeds-improved range condition, fewer weeds

Riparian—feet of stream improved, sediment reduction, riparian vegetation health,

AIS-get ahead of potential problems, prevention

Urbanization—

Prairie dog towns-reduced population, improve range condition

The meeting wrapped up with next steps:

- Consolidate information
- Hold Local Work Group meeting in Helena in July to report findings
- Develop long rang plan after review of Local Work Group meeting
- Submit to area and state office for review and approval
- Prepare TIPs for funding

A4 NRC Meeting Minutes, Augusta, MT

May 9, 2019
Natural Resource Community Planning Meeting
Augusta Youth Center
Augusta, Montana

John George, Diane Fitzgerald, Brooke Fitzgerald, Darcy Goodson from the Helena Field Office, , Paula Gunderson, Bailey Rapp from NRCS and David Martin and Chris Evans from the Lewis & Clark Conservation District.

The meeting started at 6:05 pm. John George gave some opening comments and made introductions. He gave a brief outline of the changes coming for EQIP funding in the state and why we are doing the public meetings.

<u>What are the natural resource issues you see in the county?</u>
Weeds-fighting nonstop-knapweed and leafy spurge, hounds tongue, thistles, white top, tansy mustard, cheatgrass
Highway 287to 200 knapweed problem, near Bowman's corner
County roads and weeds (highway contracts?)

Forest-needs thinning for forest health-timber industry depression
Irrigation—stream naturally dewaters (Smith Creek)
Flooding/fences
EQIP for manure?? (Colony)
Fencing, wildlife adaptable
Overstocked forests burns on FS stop on the private land boundary---would be nice if FS would work with landowners if LO want their place burned too.
Beetle kill-Cobb ranch, thinning would also be good, but the killed trees are a fire hazard.
Flooding—willows and stuff, but things blew out last year, long term solutions
88 fire area and on—the dead fuels areas are impassable and a big fire hazard
Too much wildlife
County needs to hire more workers-roads are terrible.

John stepped in with the Ready Willing and Able component of the Focused Conservation. John said that when it comes to forests and the concern about fire, NRCS can work ahead of time to treat some stands of timber and try to work collaboratively with the FS to treat adjacent areas together. We need to look at partnerships with other groups and agencies to explore where that kind of project might go.

John asked if the interest on weeds is more biocontrol, chemical or both? There was a consensus that both are needed. We need to get an integrated program started with the county as a partner.

John asked about crop and/pasture interest such as nutrient management, soils testing. There was interest in this.

Wildlife problems—if there were a way, we could look at improving habitat so they weren't out on the fields, would people be interested in it? He specifically gave the example of eastern Oregon and the bitterbrush crashing as a species. They are working in the area to do targeted grazing to improve the habitat that would draw them off the area. Not much interest indicated.

The group had the opportunity to prioritize their concerns. Weeds, Roads, overstocked forest floated to the top.

What tools would folks use to get to those outcomes met?

Weeds-spraying and insects along with mechanical. There is a weed control practice on private land with NRCS programs. We can also work with the county on their weed programs too. Insects on county properties.

Roads—frost heaves, some lost from flooding, primarily gravel/dirt roads. NRCS may be able to help on private roads where it comes to roads near water. The CD will contact Lewis & Clark County about the county road concerns.

Forest-overstocked, beetle kill. Solutions—thinning, logging, possibly burning (coordination and communication with FS, Tri-County, DNRC, BLM).

Dewatered streams—Discussion about the problem led to the idea of potential ditch lining. Improved conveyance for irrigation/stock water. Last year's flood took out the siphon. The Florence Canal flume is rotting out (1000 feet long) canal lining is having to be patched all the time. We can talk to Nilan Water Users about potential for large scale improvements.

Flooding-the group agreed that nothing could have stopped it.
Riparian bank erosion is a problem even without flooding—Maybe the CD can do a stream workshop highlighting inexpensive and effective practices that people can do such as vegetated riprap, willow soil lifts, shaping, fencing. Sarah Howe-Cobb thinks we should try a workshop.

Stream gauges for flood alerts—CD will check into that with the Sun River Watershed Group.

The meeting wrapped up with next steps:

- Consolidate information
- Hold Local Work Group meeting in Helena in July to report findings
- Develop long rang plan after review of Local Work Group meeting
- Submit to area and state office for review and approval
- Prepare TIPs for funding

Bibliography

EPA. (2019, may 24). *Wetlands Factsheet Series*. Retrieved from Functions: https://www.epa.gov/wetlands/how-do-wetlands-function-and-why-are-they-valuable

JCWD. (2020). *Jefferson County Weed District*.

MNHP. (2019, November 5). *Animal Species of Concern*. Retrieved from Montana Natural Heritage Program -SOC Report: http://mtnhp.org/SpeciesOfConcern/?AorP=a

MNHP. (2019, October 7). *Field Guide Ecological Systems*. Retrieved from Montana Field Guides: http://fieldguide.mt.gov/displayES_LCLU.aspx

MNHP. (2019, 11 5). *Plant Species of Concern*. Retrieved from Montana Natural Heritage Program: http://mtnhp.org/SpeciesOfConcern/?AorP=p

MT FWP. (2019, April 7). *Aquatic Invasive Species*. Retrieved from Montana Fish, Wilddlife & Parks: http://fwp.mt.gov/fishAndWildlife/species/ais/

MT NHP . (2019, 10 16). *Montana Natural Heritage Program Wetlands*. Retrieved from Montana Natural Heritage Program : http://mtnhp.org/wetlands/default.asp

NASS. (2017, October 7). *United States Department of Agriculture National Agricultural Statistics Service 2017 Census.* Retrieved from County Summary Highlights: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Montana/

NRCS. (2003). Soil Survey of Jefferson County Area and Part of Silverbow County, Montana.

USFWS. (2019). *Endangered, Threatened, Poposed and Cadidate Species. Mountana Counites. Endangered Species Act.*

USFWS. (2020, March 11). *Refuge System Planning*. Retrieved from Rocky Mountain Front Conservation Area--Montana: https://www.fws.gov/mountain-prairie/refuges/lpp_rmf.php