Long Range Plan
Lincoln County, MT

Section I. Introduction

Purpose

This long range plan is intended to be a dynamic document encapsulating the current state of natural resources in Lincoln County, including resource trends and concerns. With a ten year time-frame, Its purpose is to capture the short and long term goals and priorities of the Natural Resources Conservation Service (NRCS) and its partners, and will be reviewed on an annual basis to assess changing conditions. It will also be used as a basis to pursue and implement conservation efforts, utilizing available resources and funding opportunities. Priorities outlined in this document will guide the development of specifically tailored targeted implementation plans (TIP) to address each resource concern identified. This plan therefore represents a renewed commitment to locally led conservation and outlines a path forward to accomplish specific issues and objectives expounded on in the following sections.

Partners

Conservation partnerships in Lincoln County include the following entities and agencies:

- Lincoln Conservation District (LCD)
- Montana Fish, Wildlife and Parks (FWP)
- Montana Department of Natural Resources and Conservation (DNRC)
- Montana Department of Environment Quality (DEQ)
- U.S. Fish and Wildlife Service (USFWS)
- Vital Ground Foundation
- Kootenai River Network, Inc (KRN)
- Soil and Water Conservation Districts of Montana (SWCDM)
- Montana Association of Conservation Districts (MACD)
- Lincoln FireSafe Council
- Lincoln County
- American Forest Foundation (AFF)
- Farm Service Agency (FSA)
- U.S. Forest Service (USFS)

Section II. County Profile and Natural Resource Inventory

Bordering Canada and the Idaho panhandle, Lincoln County lies in the northwest corner of Montana. It holds an abundance of impressive mountain ranges, valleys, forests, lakes, streams and diverse wildlife populations. Elevations range from the lowest point in Montana at 1800' near Troy to 8700' in the Cabinet Range. Some of the central features include the Kootenai National Forest, Lake Koocanusa, and the Kootenai River. The immense landscape and diversity in the county create some unique challenges and opportunities for the conservation of natural resources. Lincoln county is the most heavily timbered county in Montana and is the most productive in terms of growth. The abundance of timber resources has shaped the history and economy of the county, especially as private industrial operations have declined along with timber harvests in general on private and public lands. However, there is still an active forest products economy and a cultural legacy that values forest management along with conservation.

Demographics

According to the most recent statistics available from the US Bureau of Census, the population of Lincoln County was estimated at 19,794 residents in 2018 (Figure I). The median age is 52 years old with 93% being Caucasian, 3.5% Hispanic, 3.5% Native American and other.

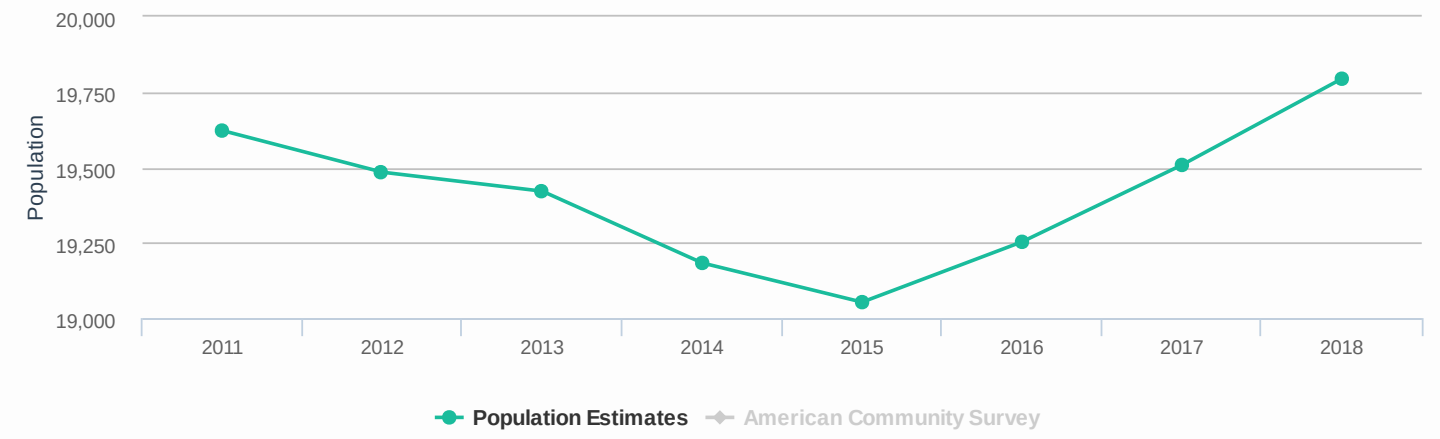


Figure I. Lincoln County population, 2011-2018 (US Bureau Census).

Libby and Eureka are the two largest municipalities in the county with Libby being the county seat. The total land area of Lincoln County is 3,675 square miles of which 1.7 percent is water. The median household income is about $37,000/yr. which is about 60% of the national average of $60,000/yr. The largest industries being health care (15.3%), retail trade (12.4%), construction (10.8%), agriculture (8.91%), and educational services (8.01%). In Lincoln County, 16.4% of the population is in poverty status compared with the nation average of 13.4%. This has been fueled, in part, by the declining forest products industry that was the most predominant sector of the local economy historically. While it still supports one of the highest timber harvest levels in the state, the total volume has been substantially reduced and will likely see further declines. Eureka has benefited some from a modest level of tourism and Canadian home ownership, which makes a small but significant percentage of the tax base.

Land Use/Land Cover

Altogether there are about 2.35 million acres in the county. Due to the influence of the Pacific Northwest, the climate is mild and moist, creating a heavily forested landscape. It contains an abundance of public land dominated by USFS ownership (73%) with a smaller component of state land (3%). Most of the public lands are dominated by rugged mountainous landscapes ranging in elevations and habitat types. Private lands include Non-industrial Private Forests (NIPF) (8%) and industrial timber company lands (13%).

The land uses in the county are shaped by the abundance of timber lands. Even with the steady decline of the forest products industry, there is still an active timber economy which makes up the majority of agriculture in the county through timber management and harvesting on public and private land holdings.

Ranching and farming make up a small proportion of the landscape which is mostly restricted to the Tobacco Valley north of Eureka and some smaller drainages scattered around the county. Grazing is the next largest land use behind timber and is focused around the valleys but also extends into state and federal lands with historic grazing allotments. Native grasslands are also present in small amounts and located in the dryer valleys around Eureka and Libby. Hay production is the next common practice with the majority of production coming from irrigated operations.

Conservation easements also make up a small but significant portion of the county land uses and are a valuable conservation tool. Depending on the parameters contained in the deed language, land can be protected for decades or even perpetuity for the purposes of protecting plant or animal habitat, landscape features (e.g. wetlands) or land management activities like farming and ranching. Lincoln County contains a total of 92,527 acres (4%) under some form of conservation easement. Of these, 5,918 acres are associated with private easement holders (land trusts, animal conservation organizations, etc.). The remaining easements are federally owned (732 acres) and state or locally owned (85,877 acres). Of the federal acres, the United States Department of Agriculture currently holds 732 acres under easement within the county. Lincoln County is located in the North American Bird Conservation Initiative's Bird Conservation Region 10 but does not currently hold any designated Important Bird Areas. However, there are privately owned designated conservation lands in the county which encompass at total of 751 acres (<1%); owned by The Nature Conservancy (678 acres) and Vital Ground Foundation (73 acres).

The following map illustrates the distribution of land uses through the county including their percentages:

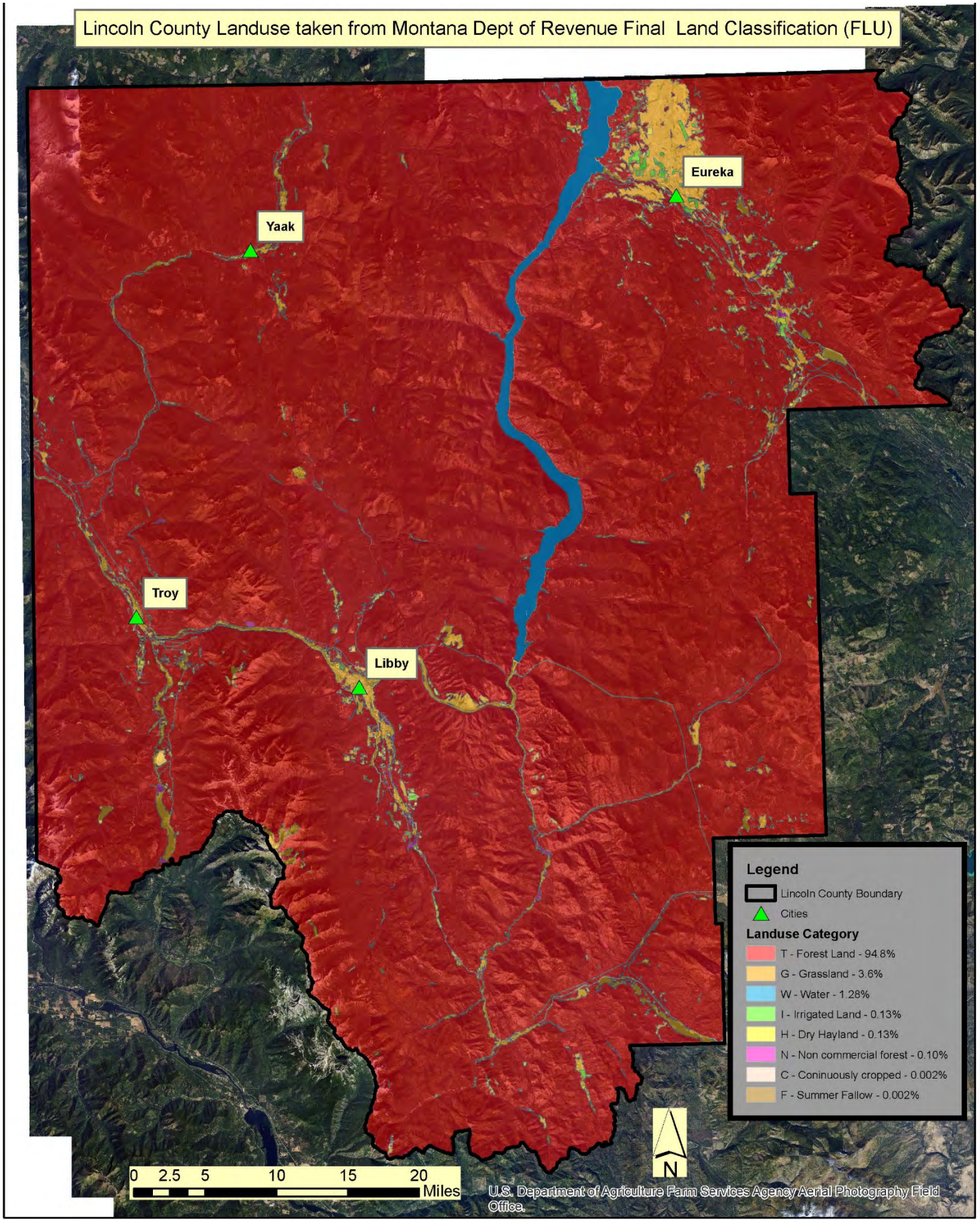


Figure II. Lincoln County Land Cover Map from Dept. of Revenue.

Land uses can be further broken down and analyzed by their ownership. This can be helpful when deciphering trends and identifying stakeholders and partners. The follow map illustrates the location and ownership types:

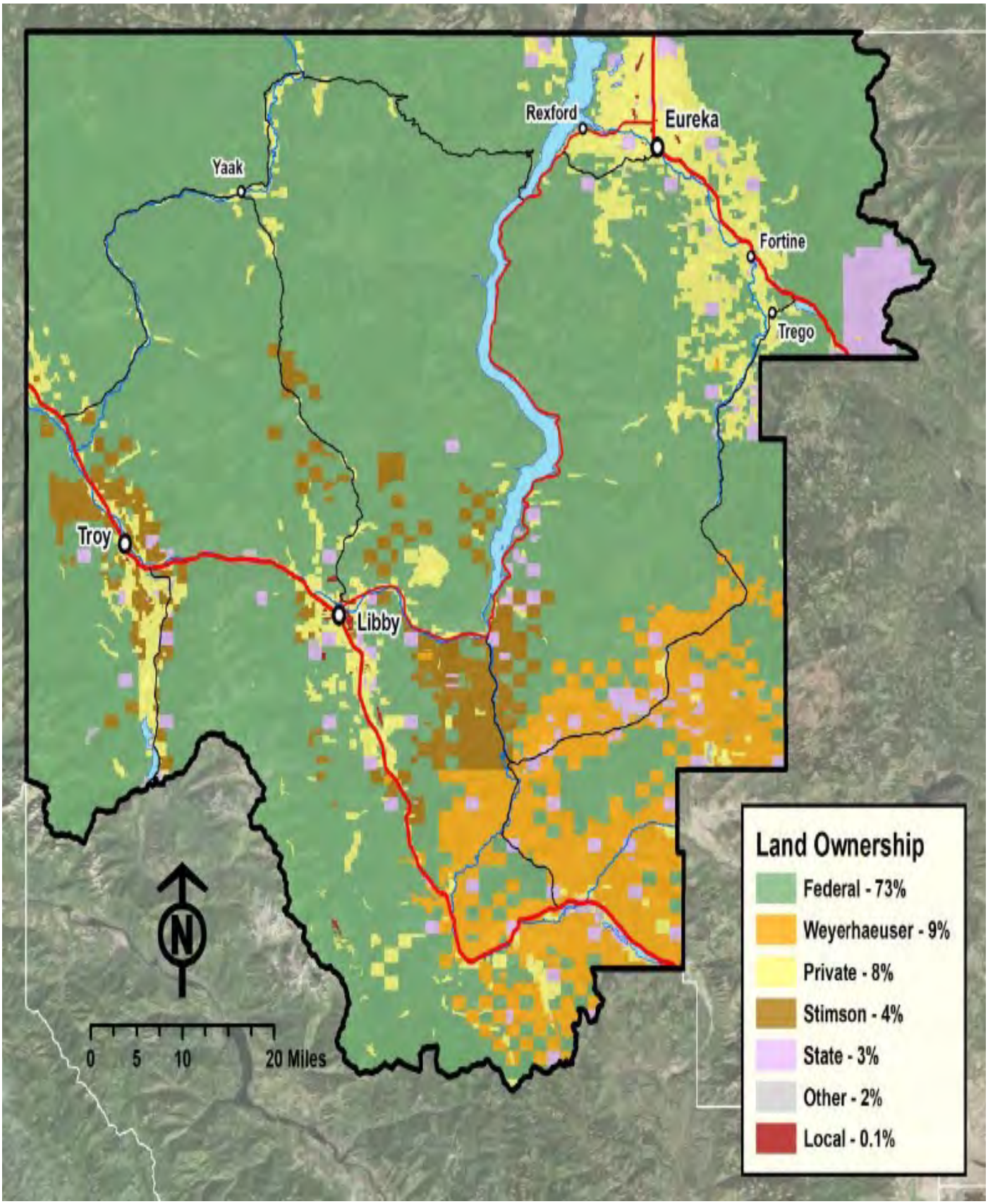


Figure III. Lincoln County Land use Map from Lincoln County Planning and Growth Dept.

Table A. Land ownership according to Lincoln County Planning Dept.

Ownership	Acres	Percent of Total
Federal	1,726,100	73%
Private Industrial Forest Lands	301,946	13%
General Private	199,734	8%
State	75,115	3%
Other	44,852	2%
Local Government	3,064	0.1%

Agricultural production has historically been an important part of the economy from the very early homesteading days to the present. Many changes in products and practices have taken places, but the most significant has been the decline in the number and size of individual farms. This has been mainly due to periods of population growth and land development which has expanded into rural areas. The following are the most recent statistics analyzing the current state of agricultural operations in Lincoln County:

Table B. Farm records from USDA National Agricultural Statistics Survey from 2017.

Farm Statistics from, 1997, 2002, 2007, 2012, and 2017	2017	2012	2007	2002	1997
Number of Farms	345	325	350	310	252
Average Size (Acres)	139	145	148	175	183
Land in Farms (Acres)	47,783	47,284	51,885	54,236	46,167
Irrigated Land (Acres)	24,922	22,279	22,731	28,685	22,931

Geology and Soils

Lincoln County contains portions of four different soil survey areas: Flathead County Area and Part of Lincoln County (MT618); Flathead National Forest Area (MT619); Kootenai National Forest Area (MT634); and a small part of Idaho Panhandle National Forest (ID670). The majority of the county falls within the Kootenai National Forest Area Soil Survey, which was completed in 1988. Portions of that survey area, including the Tobacco Valley near Eureka and the Troy-Bull Lake area, were recently updated in 2018. Much of the information in this section was taken from that manuscript along with land-use data from the Montana Department of Revenue Final Land Unit Classification.

Lincoln County contains portions of five mountain ranges: the Purcell Mountains, the Cabinet Mountains, the Salish Mountains, the Galton Range, and the Whitefish Range. The soil survey lies within two Major Land Resource Areas including: 43A – Northern Rocky Mountains and 44A – Northern Rocky Mountain Valleys.

Most of the soils have a surface layer of loess that has been influenced by volcanic ash. Most of the volcanic ash is from the eruption of Mt. Mazama (Crater Lake, Oregon) approximately 7,600 years ago. Volcanic ash from other sources, such as Glacier Peak and several eruptions of Mt. St. Helens, also have been identified in the area. The depth of the loess surface layer is partially correlated with landscape position. The loess surface layer tends to be thicker on north-facing slopes and on concave slopes than on other slopes. It generally is dark brown to reddish brown.

The parent material of the subsoil and substratum is derived from the underlying rocks, glacial drift, or lacustrine deposits. The subsoil and substratum from local rocks are dominantly medium textured to coarse textured. Those formed in weathered glacial till or lacustrine deposits can be moderately fine textured or fine textured. Some of the parent material is calcareous, and the soils that formed in this parent material can have free lime in the subsoil. If formed in compact glacial till, the substratum has bulk density of 1.5 to 1.8 grams per cubic centimeters when dry and is hard and brittle when moist.

The Tobacco Valley area near Eureka is the major crop producing region in the county and includes small grains, hay and pasture grown under irrigation. Wet soils are mainly used for hay production and pasture. Forage production is used mainly to support the large number of cattle in the valley.

Important Farmland Designation:

- Farmland of Statewide Importance - These are mainly found on along the major river valleys and make up around 2.5 percent of total acres in the county.
- Prime if Irrigated - These areas are mainly in glaciated landscapes near Eureka in the Tobacco Valley and make up about 0.3 percent.
- Farmland of Local Importance - These are only designated for the southeast part of the county, adjacent to Sanders County and include areas that are too limited by climate to be included with the other designations but still produce good yields of hay and pasture. These lands make up around 0.15 percent of total acreage in the county.

The following map illustrates the location and extend of farmland designations in Lincoln County:

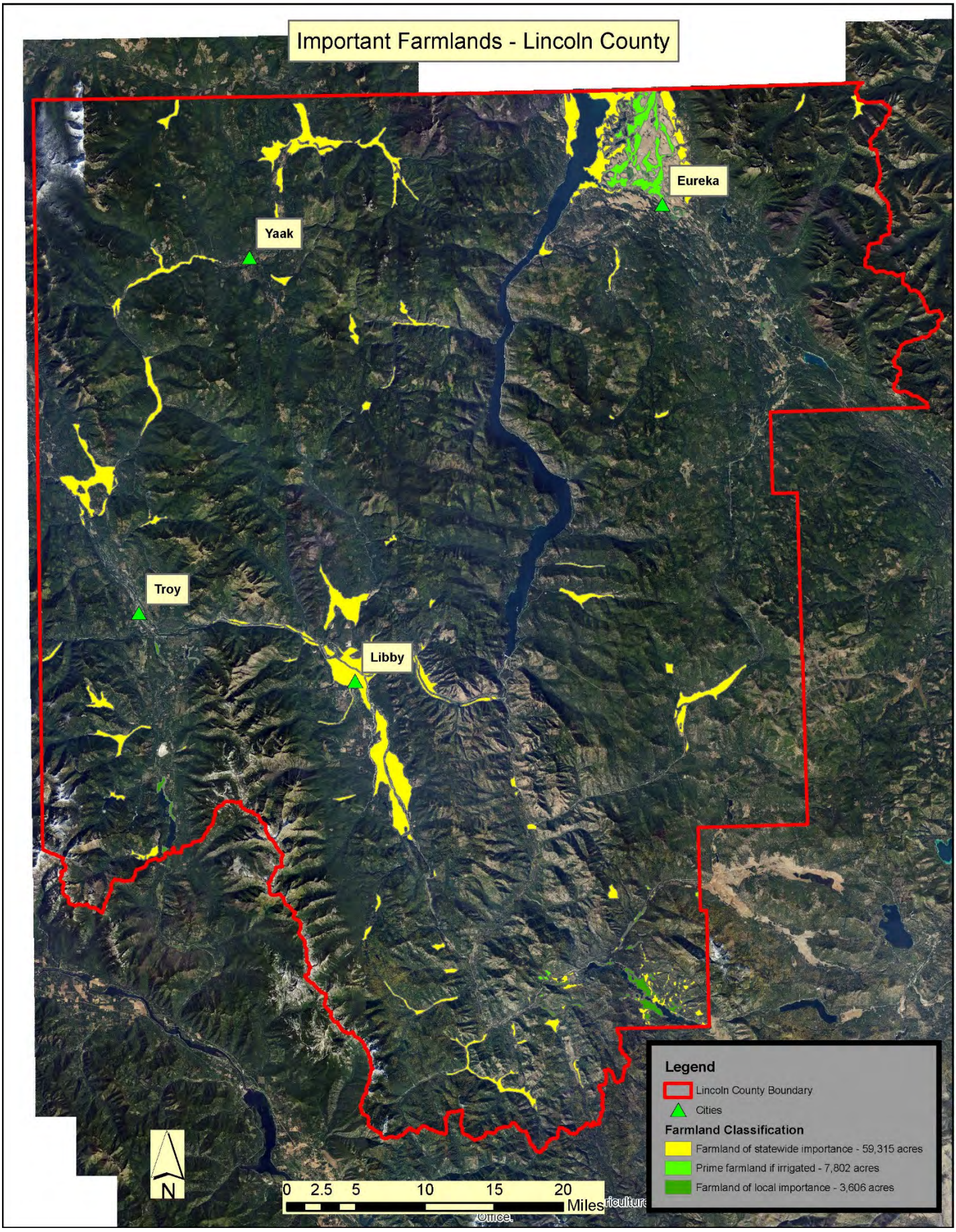


Figure IV. Lincoln County Important Farmlands Classifications

Water

Watershed & Streams:

Lincoln County is a part of the Kootenai River Basin. This is an international basin that encompasses about 18,000 square miles and is the second largest tributary to the Columbia River in terms of volume of runoff. The Kootenai River starts in British Columbia north of Kootenai National Park flowing south to Montana through Lake Koocanusa (Libby Reservoir) then west to Idaho before flowing back north to British Columbia and through Kootenay Lake and then joining the Columbia River. Most of the Basin has steep forested mountains with few grassland openings. The tributaries to the Kootenai River are mostly characterized as having a high channel gradient especially in the headwaters. Rivers and streams within the basin generally see the highest flows in May and June caused by snowmelt with lower flows in the winter months. The major tributaries to the Kootenai River in Lincoln County are the Fisher and Yaak Rivers. Within Lincoln County is the Libby Dam which makes Lake Koocanusa (Libby Reservoir) and is the largest man-made structure in the basin. The dam was built in 1972 and creates the 90-mile international reservoir that fluctuates levels depending on the season. The dam is used to create hydroelectric energy. Another notable feature in the Kootenai River Basin is Kootenai Falls, a 200-foot waterfall that acts as a natural fish migration barrier (Figure V) (Kootenai River Network, Inc.).

Figure V. Kootenai Falls. Photo by Karli Becher.

Along with the abundance of streams and rivers in the Kootenai River Basin come water quality issues. The full 303d list from the Montana DEQ can be seen in Figure VI. Some of the major issues that occur in Lincoln County have been caused by human activities either with mining or abandoned mines along with other activities adding nutrients and sediment into streams and rivers. One issue that has been caused by mining in the Elk River Valley, British Columbia, is the increased levels of selenium in Lake Koocanusa. Selenium levels increased from 2,600 kg in 1992 to over 13,000 kg in 2012 (Kootenai Basin Watershed Restoration Plan). These levels pose threats to wildlife; mainly reproductive

success of fish. Teck Resources Limited, the coal mine at the headwaters of the Elk River Valley, has made a water quality plan, that was approved in 2014, to manage the level of selenium leaving the mine. The plan includes installing structures to treat water leaving the mine, with the first of these structures operating in 2016 (Kootenai River Network, Inc.).

The Tobacco River is impaired for sedimentation and was identified in meetings for the Kootenai River Basin Watershed Restoration Plan (WRP) as a priority. Projects that have been identified in the plan include streambank bioengineering and revegetation, riparian buffer enhancement, unpaved road improvements, forestry best management practices (BMPs), and agricultural BMPs (Kootenai River Basin WRP). Restoration on portions of the Tobacco River have been completed and are in progress (Lincoln Conservation District).

The Montana DEQ goes into detail about water impairments in the area surrounding Libby in the Kootenai-Fisher Project Area, including: Metals, Nutrients, Sediment, and Temperature Total Maximum Dailey Loads (TMDL) and Water Quality Improvement Plan. In the project area there have been 220 abandoned and inactive mines identified. The two sites that were of highest priority, the Snowshoe Mine and Cherry Creek Mill site, have had reclamation efforts that have been started. The TMDL goes into more detail about reclamation efforts that still need to be completed on Big Cherry Creek, Lake Creek, Libby Creek, Raven Creek, Snowshoe Creek, Stanley Creek, and Wolf Creek to meet water quality standards (MT DEQ). These creeks are now included in the Kootenai River Basin WRP and have restoration plans anywhere from 2 to 20 years long.

TMDL Planning Area	**Waterbody Name/Location**	**Impairment**																		**Impaired Use**		
		Temperature, Water	**Copper**	**Lead**	**Nitrate/Nitrite**	**Total Nitrogen**	**Zinc**	**Cadmium**	**Arsenic**	**Selenium**	**Total Phosphorus**	**Chlorophyll a**	**Physical substrate habitat alterations**	**Low flow alterations**	**Alteration in stream-side or littoral vegetative**	**High flow regime**	**Other flow regime alterations**	**Excess algal growth**	**Sediment/siltation**	**Turbidity**	**Aquatic Life**	**Drinking Water**	**Recreation**
Kootenai	**Kootenai River**, Libby dam to Yaak River	x															x				x		
	Stanley Creek, headwaters to mouth (Lake Creek)		x	x	x		x														x		x
	Dry Creek, 1 mile upstream from State Hwy 56 to mouth (Lake Creek)												x				x				x		x
	Keeler Creek, headwaters to Lake Creek												x	x							x		
	Snowshoe Creek, Cabinet Wilderness boundary to mouth (Big Cherry Creek)			x			x	x	x						x						x	x	
	Big Cherry Creek, Snowshoe Creek to Mouth (Libby Creek)			x			x	x					x		x						x		
	Libby Creek, from 1 mi. above Howard Creek to Hwy 2 bridge												x		x						x		
	Libby Creek, from Hwy 2 bridge to mouth (Kootenai River)												x						x		x		
	Lake Creek, Bull Lake outlet to mouth (Kootenai River)		x	x	x														x		x		x
	Cripple Horse Creek, headwaters to mouth (Lake Kootenai)												x	x							x		
	Lake Koocanusa									x							x						

Bobtail Creek	**Bobtail Creek**, headwaters to mouth (Kootenai River)																X		X	X	X		X
Tobacco	**Tobacco River,** confluence of Grave Creek & Fortine Creek to mouth (Lake Koocanusa)											X						X		X			
	Fortine Creek, headwaters to mouth (Grave Creek)	X											X	X				X	X		X		X
	Edna Creek, headwaters to mouth (Fortine Creek)																		X		X		
	Swamp Creek, headwaters to mouth (Fortine Creek)												X	X					X		X		X
	Lime Creek, headwaters to mouth (Tobacco River)					X				X	X			X					X		X		X
	Therriault Creek, headwaters to mouth (Tobacco River)																		X		X		
	Deep Creek, headwaters to mouth (Tobacco River)													X				X	X		X		X
	Sinclair Creek, confluence of unnamed tributary, Lat 114-945 Long 48.908 to mouth (Tobacco River)																		X		X		
Grave Creek	**Grave Creek**, Foundation Creek to mouth (Fortine Creek)													X		X			X		X		X
Fisher	**Fisher River**, the Silver Butte/Pleasant Valley junction to mouth (Kootenai River)														X						X		
	Wolf Creek, headwaters to mouth (Fisher River)	X												X					X		X		
	Raven Creek, headwaters to mouth (Pleasant Valley Fisher Viver)									X				X					X		X		X
Yaak	**Seventeen Mile Creek**, headwaters to mouth (Yaak River)																		X		X		
	Lap Creek, headwaters to mouth (Yaak River)																		X		X		
	South Fork Yaak River, headwaters to mouth (Yaak River)																		X		X		
	East Fork Yaak River, headwaters to mouth (Yaak River)				X																X		X

Figure VI. Streams listed on the Montana DEQ 303d list with impairments. Streams and/or rivers highlighted in yellow have impairments that are explained more in this plan.

Snowpack and Precipitation:

Snowpack as well as other climatic data is measured at designated sites throughout the west through the National Water and Climate Center that is part of NRCS. There are seven SNOTEL sites located in Lincoln County, which are locations with automatic data collection. The sites are shown in the map to the right and measure snow depth, snow water equivalent, and annual precipitation at these seven sites for the past 20 years (Jan 1990 to Dec 2019). This data shows variation throughout the years with highs and lows corresponding in the snow depth and snow water equivalent. Annual precipitation varies slightly from the snow depth and snow water equivalent meaning there was more precipitation in the form of rain than snow in some years. Average annual precipitation is also shown in Figure VII with lower precipitation amounts in the valley bottoms and higher precipitation amounts in the mountains.

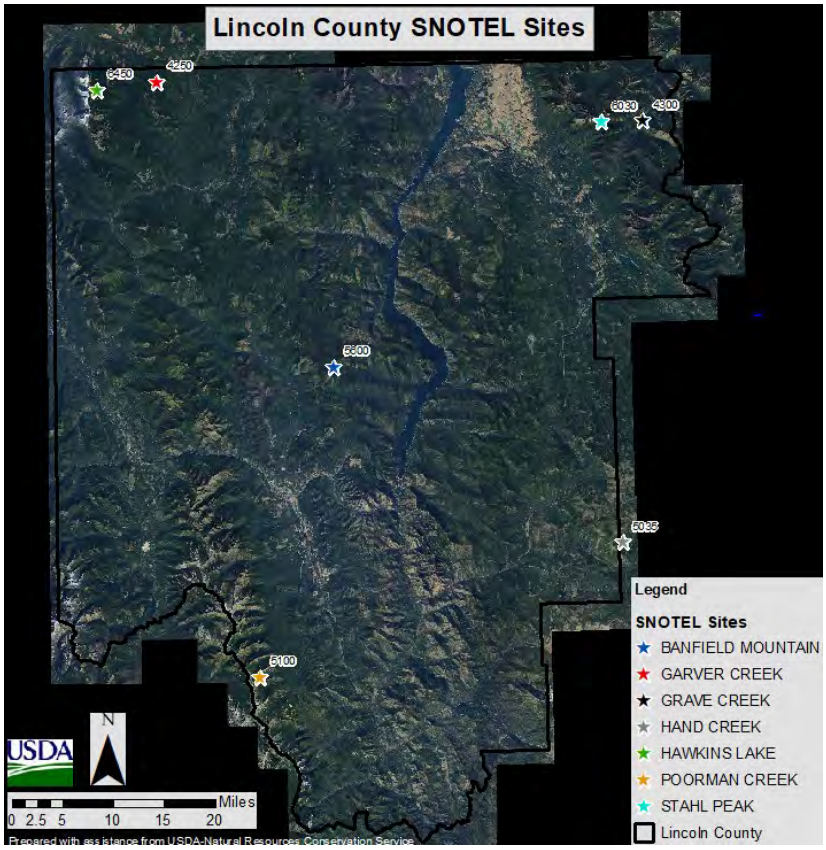


Figure VII. Map of SNOTEL sites in Lincoln County with elevations.

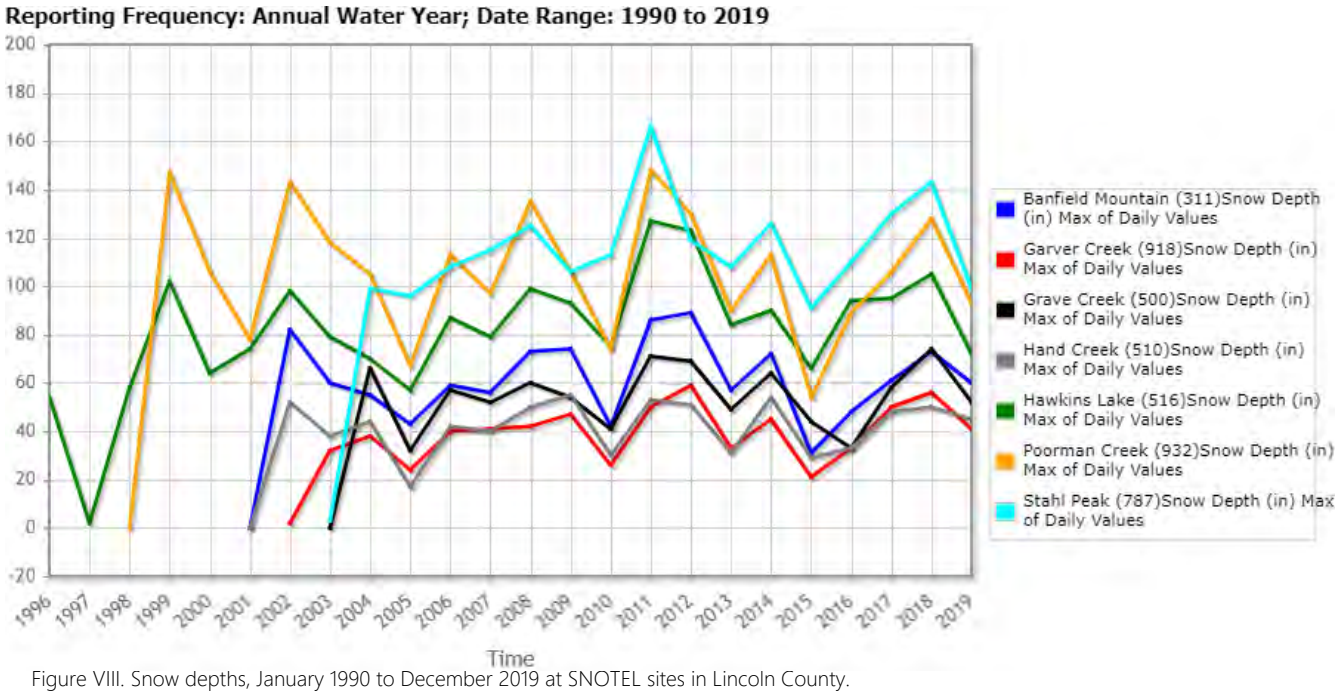


Figure VIII. Snow depths, January 1990 to December 2019 at SNOTEL sites in Lincoln County.

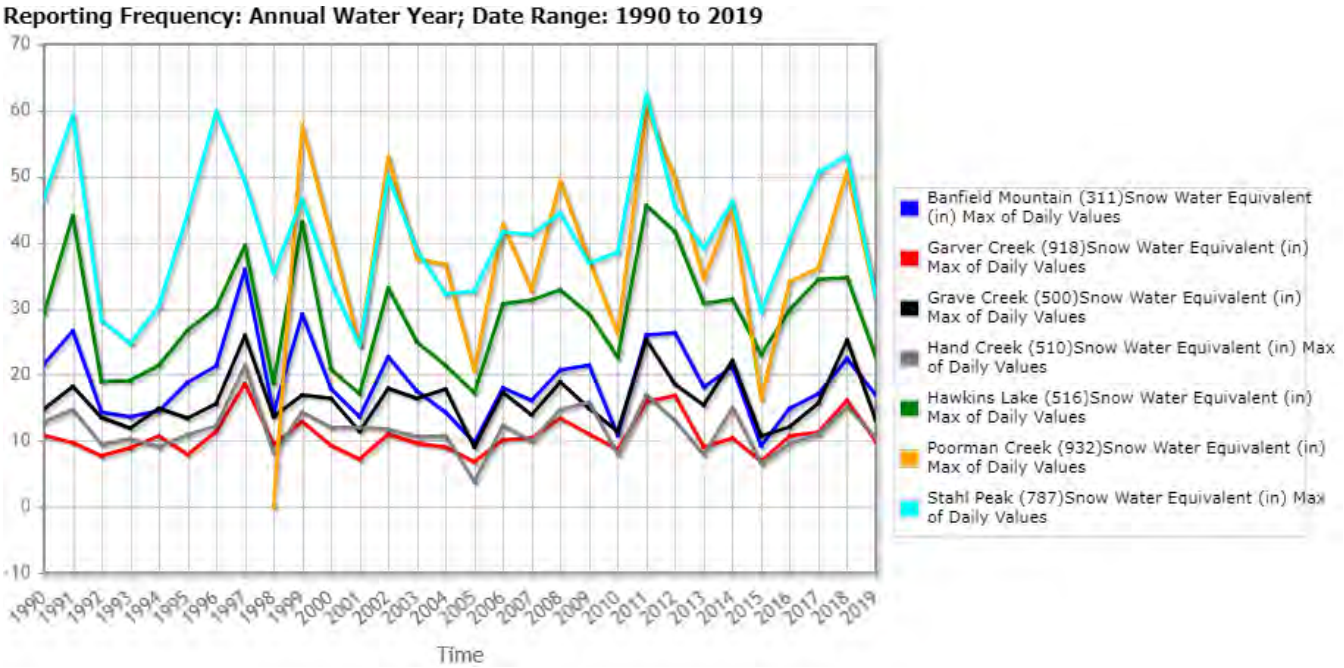


Figure IX. Snow water equivalent, January 1990 to December 2019 at SNOTEL sites in Lincoln County.

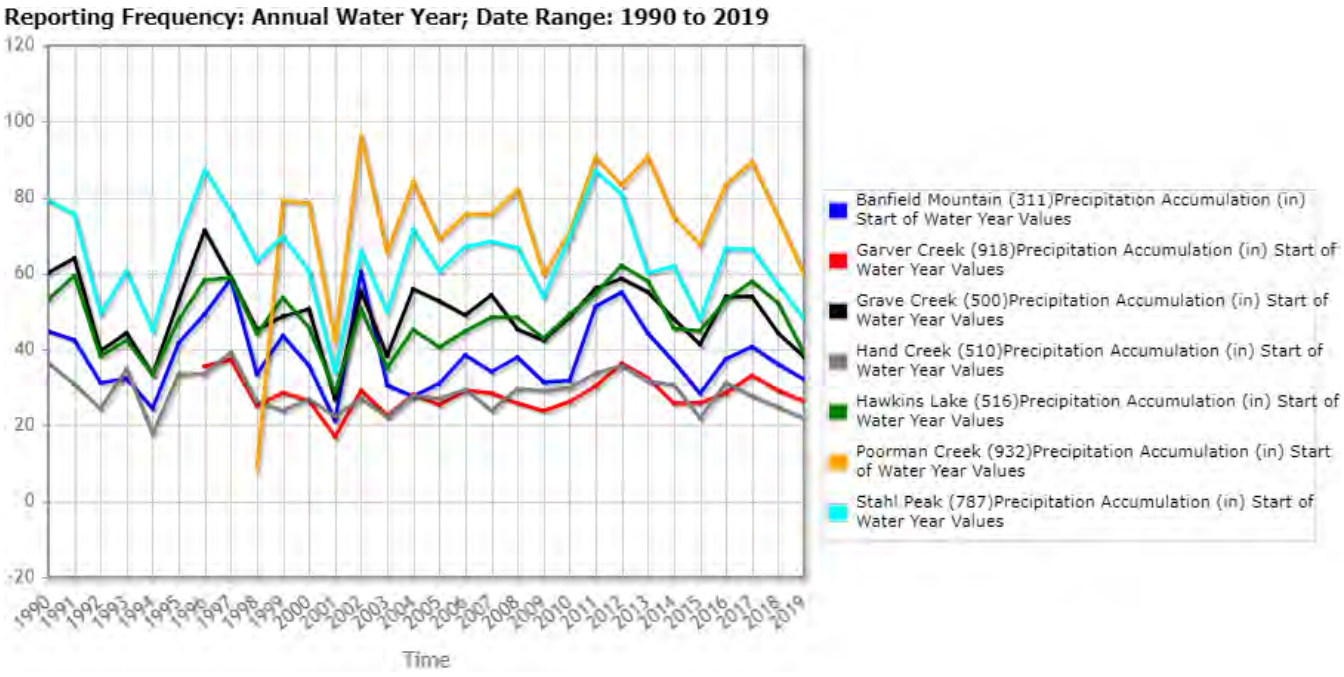


Figure X. Precipitation accumulation, January 1990 to December 2019 at SNOTEL sites in Lincoln

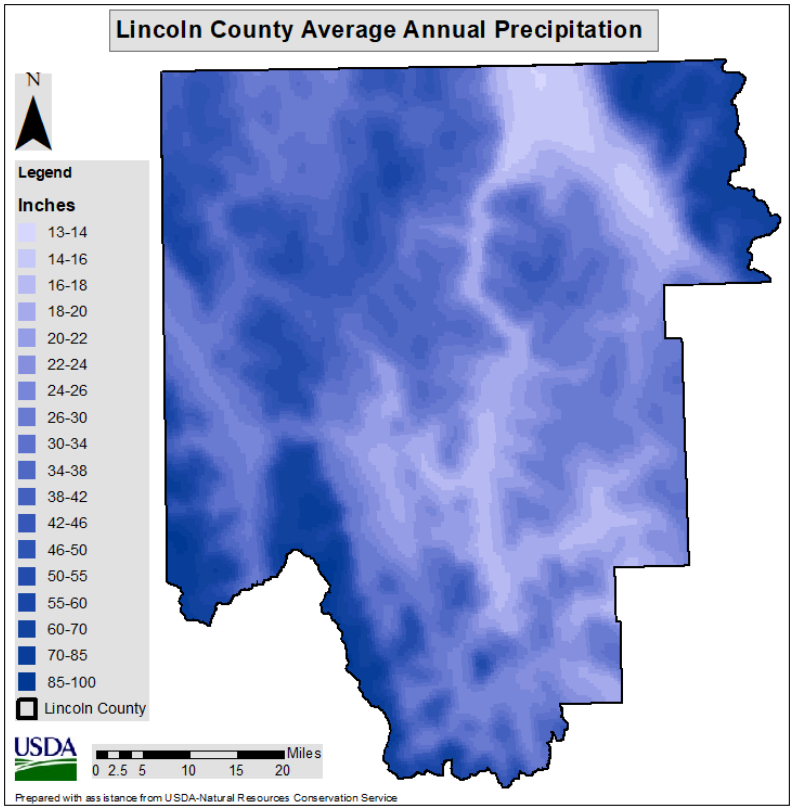


Figure XI. Annual average precipitation in Lincoln County.

Wetlands/Riparian Areas:

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. Lincoln County contains a diverse array of wetland types. A total of 99,823 acres of wetlands can be found within the county borders. Of these, 29,918 acres are palustrine (lacking flowing water), 35,575 are lacustrine (lake associated) in nature, 7,549 acres are riverine (river associated), and 26,599 acres are located within riparian zones.

Groundwater:

Groundwater wells in Lincoln County are mostly used for domestic, monitoring, public water, irrigation and stock water. Wells are anywhere from 1 to over 1000 feet with most being between 1 and 199 feet deep. There are over 7000 wells in Lincoln County located in a variety of different geologic sources such as glacial drift, belt supergroup, and alluvium (Ground Water Information Center). There have been issues with groundwater contamination in Libby. This was caused by a lumber and plywood mill using creosote, pentachlorophenol and other chemicals that contaminated the soil, groundwater, surface water and sediment. Cleanup efforts have been started and studies are continuing to determine final cleanup methods, these efforts are predicted to start in the summer of 2021 (EPA).

Air Quality

Libby Montana has had a long and dark history of air quality issues stemming from asbestos poisonings due to vermiculite mining and the products widespread use in the community. Although mining activities have ceased, asbestos is still contained in many soils and even tree bark within a certain radius around the abandoned mine site which can pose significant health risks when exposed. This has been designated as a "super fund" site by the EPA with a large-scale effort to mitigate the risks still underway.

The second air quality concern is from a high concentrate of fine particulate matter ($PM_{10\ \&\ 2.5}$) exceeding DEQ guidelines and applies to several areas in the county including Eureka, Troy, and Libby. Of the three, Libby faces the greatest challenge due in part to its low elevation prone to inversions and being surrounded by mountains which impede winter winds from sweeping through the valley and removing smoke from slash burning and improperly maintained wood burning stoves. For years the county government has struggled to bring Libby's air quality into compliance with federal regulations. Strict burning regulations and seasons are enforced to try and combat the problem.

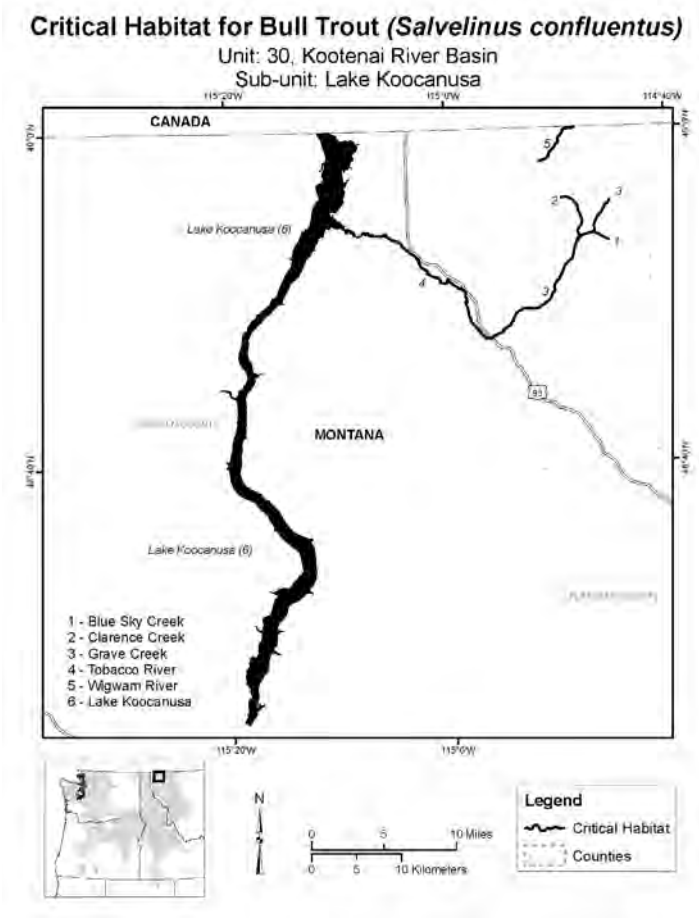
Plants and Animals

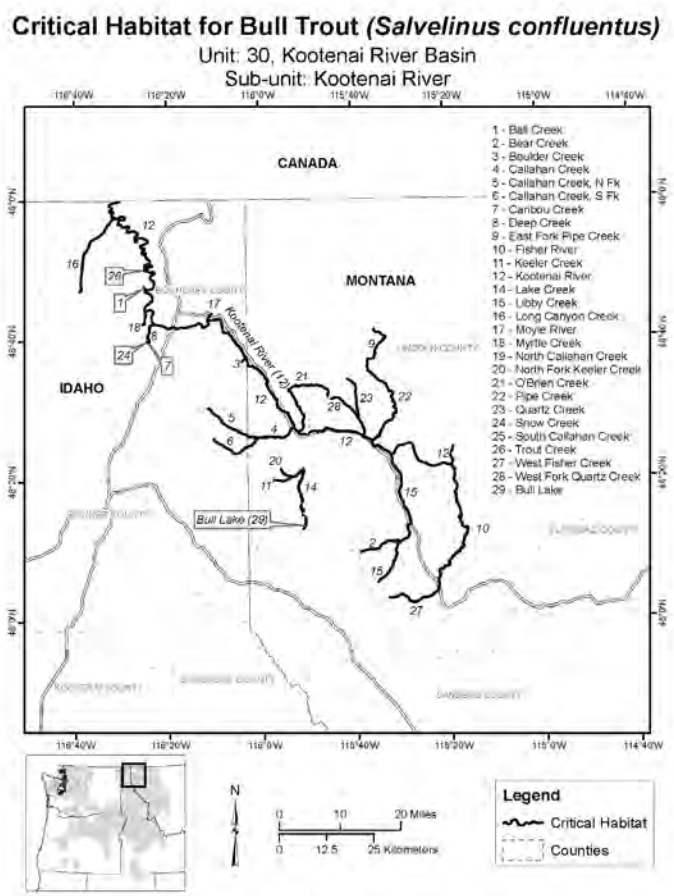
Where they are found, federal and state listed plant and animal species offer valuable opportunities to partner with landowners and partners to protect and improve associated habitats.

The U.S. Fish and Wildlife Service's Ecological Services Division lists the following threatened plant and animal species as present within areas of Lincoln County as of June 10, 2020: bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis*), and Spaulding's campion (*Silene spaldingii*). Lincoln County is also residence to an endangered species, the white sturgeon (*Acipenser transmontanus*), as well as of one candidate species, the wolverine (*Gulo gulo luscus),* and one proposed species, whitebark pine (*Pinus albicaulis*).

According to the Montana Natural Heritage Program Species of Concern Report last updated April 16, 2020, Lincoln County contains 60 state listed animal Species of Concern. These species consist of 11 mammal species, 21 bird species, 2 reptile species, 3 amphibian species, 6 fish species, 6 insect species, 1 millipede species, and 10 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 species on the list can be found in association with Lincoln County's rarer habitats including rock outcrops/cliffs, waterfalls, burned forests, and aspen groves. A total of 77 state listed plant Species of Concern also can be found within Lincoln County. They are generally comprised of 9 fern species, 1 conifer, 26 dicot species, 20 monocot species, 17 bryophytes, and 4 lichens. Most of these species subsist in Lincoln's general habitat types (grasslands, wetlands, riparian, forests) but a few specialized species can only be found in more limited habitats including alpine, talus slopes, and fens. A full list of both animal and plant Species of Concern can be found on the Montana natural Heritage Program website.

Bull Trout (Salvelinus confluentus)
Bull trout are listed as a 'threatened' species in Lincoln County. Bull trout require a specific habitat and are more vulnerable to environmental degradation than are other fish species. They require clean, cold, clear, complex and connected habitat. Bull trout populations have declined due to habitat loss and degradation from a variety of human-caused factors. Critical habitat for bull trout is shown in figures XII & XIII.





Figures XII & XIII. Bull trout critical habitat in Lincoln County.

Canada Lynx (Lynx canadensis):

Canada lynx are listed as a 'threatened' species and reside within portions of Lincoln County. Canada lynx are limited to areas occupied by their main prey source, the snowshoe hare (Lepus americanus). Both the lynx and hare are typically found inhabiting moist, cool, boreal forests, typically above 4,000 feet in elevation. As snowshoes make up approximately 90% of the lynx diet in winter, any degradation to snowshoe hare habitat that reduces hare populations has a direct commensurate negative impact on lynx populations as well.

Critical habitat has been designated for Canada lynx and a portion of the area is in Lincoln County, specifically the northern mountainous portions of the county (Figure XIV). Protection of habitat quality within the designated critical habitat boundary is essential to the long term survival of the species. Both these areas have land use restrictions that are beneficial to lynx. Lynx habitat outside areas designated as critical habitat have fewer protections and as such are susceptible to practices and uses which have the potential to result in negative impacts to local populations.

Historic lynx population declines in Flathead County mimic those found in other occupied Montana counties and are largely a result of anthropogenic causes including timber harvest, infrastructure establishment, overharvest, and wildfire suppression. Currently, although exact populations levels are uncertain for the area, according to the USFWS 2017 Species Status Assessment for the Canada lynx, recent studies have indicated that both lynx reproduction and recruitment are occurring at healthy levels. To maintain these healthy numbers, conservation partners should seek to implement the Interagency Lynx Biology Team's Conservation Assessment and Strategy (2013) including: managing vegetation for a mosaic of successional stages, reducing habitat fragmentation, minimizing winter related recreational disturbances, avoiding backcountry road construction, and where possible maintaining fire as a key ecological process and disturbance mechanism.

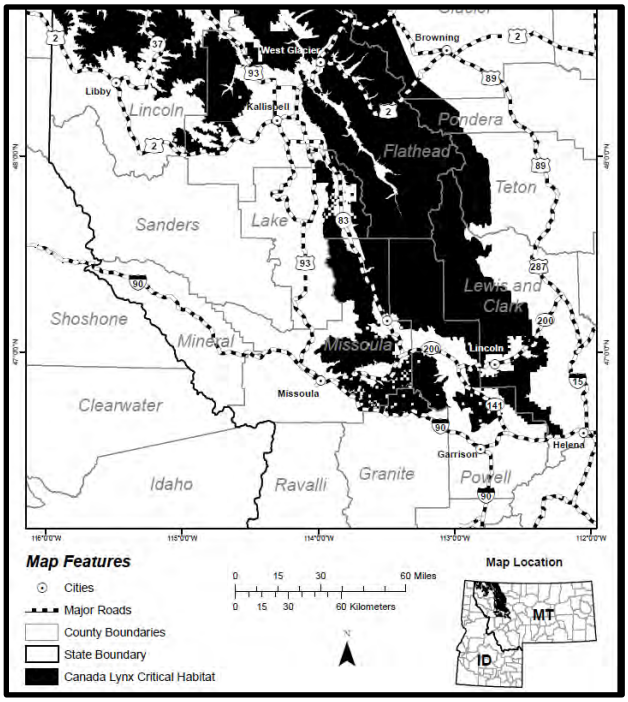
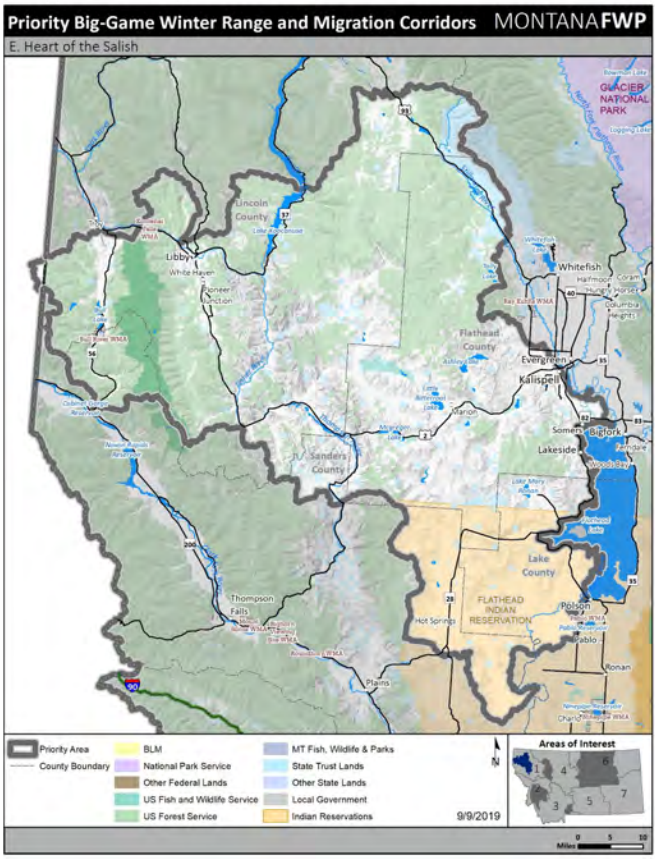


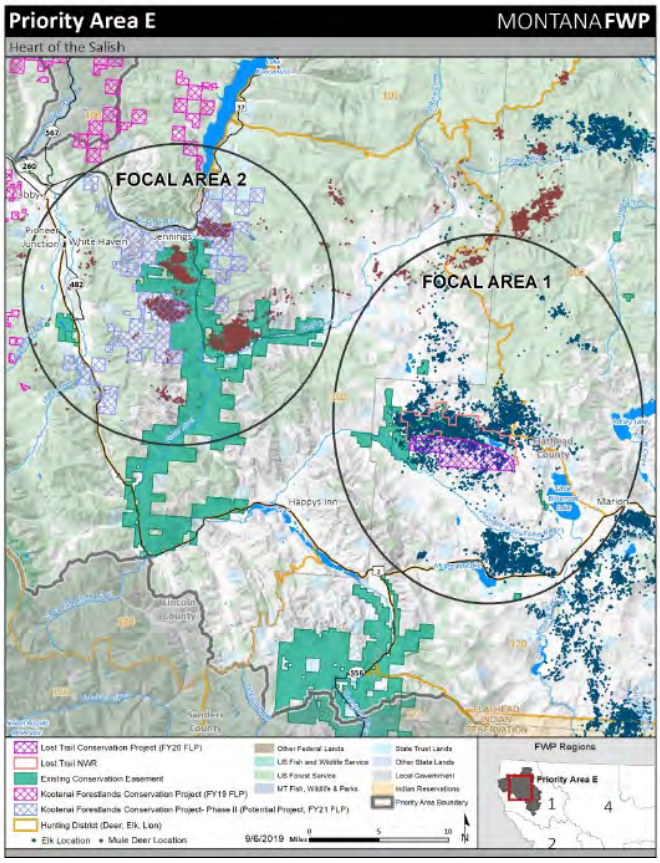
Figure XIV. Canada lynx critical habitat in Western Montana.

Big Game Species:

Big game species present within Lincoln County include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces),* elk (*Cervus canadensis*), black bear (*Ursus americanus),* mountain goats (*Oreamnos americanus*), bighorn sheep (*Ovis canadensis*) as well as small number of pronghorn antelope (*Antilocapra Americana*).

FWP has identified the Heart of the Salish Priority Area as a priority big-game winter range and migration corridor. A portion of this priority area and one of the two focal areas within the priority area lies within Lincoln County (Figures XV & XVI). The area serves as a migration corridor and wintering ground for both mule deer and elk as well as providing essential habitat for several species protected under the ESA. Risks for this area include habitat fragmentation due to conversion of timber lands to private residential use as well as degradation of habitat quality via the spread of noxious weeds (FWP Montana Action Plan).





Figures XV & XVI. Left: Migratory corridors located in Flathead County defined by FWP in their Montana Action Plan. Right: Focal areas within the Heart of the Salish Priority Area defined by FWP in their Montana Action Plan.

Fisheries:

The Kootenai River and its tributaries has 16 native fish species and 11 nonnative fish species. Native fish include bull trout, white sturgeon, Columbia Basin redband trout, westslope cutthroat trout, burbot, kokanee salmon, mountain and pygmy whitefish, northern pike minnow, peamouth chub, longnose dace, redside shiner, longnose and largescale suckers, and torrent and Columbia Slimy sculpins. Nonnative fish include brook trout, brown trout, rainbow trout, lake trout, northern pike, smallmouth and largemouth bass, yellow perch, black crappie, pumpkinseeds and black bullheads. Management of this fishy puts an emphasize on natural reproduction and is managed as a wild trout fisheries (Statewide Fisheries Management Program and Guide, FWP).

Noxious & Invasive Species

Lincoln County, along with the state of Montana and the Kootenai National Forest have a long list of noxious weeds. Below is the list of all the noxious weeds in both Montana, Lincoln County, and the Kootenai National Forest. Priority levels are as defined below:

Kootenai National Forest Definitions:

- Priority IA. (Potential Invaders) - Noxious weeds not known to exist on the Kootenai National Forest but have a high probability of causing severe economic or environmental damage. Management criteria include prevention and eradication.

- Priority IB. (New Invaders) – Noxious weeds known to exist in small populations at limited sites. They have a high probability of causing severe economic or environmental damage. Management criterion is eradication.
- Priority IC. (New Invaders) – Noxious weeds currently established and known to exist in medium populations at limited sites. They have a high probability of causing severe economic or environmental damage. Management criteria include containment within main body of infestation and eradication of outlier populations.
- Priority II. (Existing Infestation) – Noxious weeds currently established and known to exist in large population. They have a high probability of causing environmental or economic damage. Management criteria include prioritizing areas to be treated, reduction of plant populations, and reducing the rate of spread.
- Priority III. (Species of Undetermined Status) – Noxious weeds of variable status (some new, some well-established). The threat is undetermined but with the potential of causing environmental or economic damage. Management criterion is to monitor known populations for trends.

Lincoln County Definitions:

- Category IIIa: (Potential Invaders) – Noxious weeds which are not currently known to exist within Lincoln County but have a high probability of causing severe environmental or economic degradation.
- Category IIIb: (New Invaders) – include noxious weeds, in limited areas, known to exist within Lincoln County but have a high probability of causing severe environmental or economic degradation.
- Category II: (Established Pests) – noxious weeds with a suspected potential of causing environmental or economic degradation and targeted for management.
- Category I: (Established Pests) – include noxious weeds which are known to exist within Lincoln County in extensive acreages and have a high probability of causing environmental or economic degradation.

State Weed List:

- 1A – Weeds that are not known to be present in Montana. Management required is to eradication if detected; education; and prevention.
- 1B – Weeds that have limited presence in Montana. Management required is to eradicate or contain and to educate.
- 2A – Weeds are common in isolated areas of Montana. Management required is to eradicate or contain where less abundant.
- 2B – Weeds are abundant and widespread in my counties. Management required is to eradicate or contain where less abundant.
- 3 – Weeds that are regulated and have potential to have significate negative impacts. These plants may not be intentionally spread or sold other than as a contaminant in agricultural products. Management recommended is to research, educate, and prevent the spread.

Table C. List of Noxious Weeds in Lincoln County from the Lincoln County Weed Dept. State list of noxious weeds from Montana State University.

Common Name	Latin Name	State Priority	KNF Priority	County List w/ priority
Potential Invaders				
Plumeless thistle	*Carduus acan.*		IA	IIIa
Yellow starthistle	*Centaurea solstitialis*	1A	IA	IIIa
Common crupina	*Crupina vulgaris*		IA	IIIa
Dyer's woad	*Isatis tinctoria*	1A	IA	IIIa
Purple loosestrife	*Lythrum salicaria / virgatum*	1B	IA	IIIa

Eurasian water-milfoil	*Myriophyllum spicatum*	2A	IA	IIIa
Tamarisk	*Tamarix spp.*	2B	IA	IIIa
Yellowflag Iris	*Iris pseudacorus*	2A		IIIb
Flowering Rush	*Butomus umbellatus*	2A		IIIa
Hoary Alyssum	*Berteroa incana*	2B		IIIa
Common reed	*Phragmites australis ssp. australis*	1A		
Medusahead	*Taeniatherum caput-medusae*	1A		
New Invaders				
Bugloss	*Anchusa officinalis*		IB	IIIa
Whitetop	*Cardaria draba*	2B	IB	IIIb
Musk thistle	*Carduus natans*		IB	IIIb
Diffuse knapweed	*Centaurea diffusa*	2B	IB	I
Russian knapweed	*Centaurea repens*	2B	IB	IIIb
Dwarf snapdragon	*Chaenorrhinum minus*		IB	IIIa
Rush skeletonweed	*Chondrilla juncea*	1B	IB	IIIb
Scotch thistle	*Onopordum acanthium*		IB	IIIa
Knotweed complex	*Polygonum cuspidatum*	1B	IB	IIIb
Tall buttercup	*Ranunculus acris*	2A	IB	IIIa
Blueweed	*Echium vulgare*	1B	IC	IIIa
Leafy spurge	*Euphorbia esula*	2B	IC	IIIb
Dalmatian toadflax	*Linaria dalmatica*	2B	IC	I
Yellow toadflax	*Linaria vulgaris*	2B	IC	I
Tansy ragwort	*Senecio jacobaea*	2A	IC	IIIb
Scotch broom	*Cytisus scoparius*	1B		
Existing Infestations				
Common burdock	*Arctium minus*		II	I
Absinth wormwood	*Artemisia absinthium*		II	I
Spotted knapweed	*Centaurea maculosa*	2B	II	I
Oxeye daisy	*Chrysanthemum leucanthemum*	2B	II	I
Canada thistle	*Cirsium arvense*	2B	II	II
Field bindweed	*Convolvulus arvensis*	2B	II	II
Houndstongue	*Cynoglossum officinale*	2B	II	II
Orange hawkweed	*Hieracium aurantiacum*	2A	II	I
Meadow hawkweed	*Hieracium pratense*	2A	II	I
St. Johnswort	*Hypericum perforatum*	2B	II	I
Perennial pepperweed	*Lepidium latifolium*	2A		
Common buckthorn	*Rhamnus cathartica*	2A		
Sulfur cinquefoil	*Potentilla recta*	2B		
Common tansy	*Tanacetum vulgaris*	2B		
Curlyleaf pondweed	*Potamogeton crispus*	2B		
Cheatgrass	*Bromus tectorum*	3		
Hydrilla	*Hydrilla verticillata*	3		
Russian olive	*Elaeagnus angustifolia*	3		
Brazilian waterweed	*Egeria densa*	3		
Parrot feather watermilfoil	*Myriophyllum aquaticum, brasiliense*	3		

It is important to remain vigilant regarding new and invasive weeds. New weed species of concern include the annual grass *Ventenata dubia*. Ventenata is known to take over native range, forest understories, pastures, hay fields, and right of ways. It is also found in Idaho where they have seen a 50% decrease in production of land that this species has invaded (MSU Extension – Ventenata, 2018).

Montana has recently had a positive detection for invasive mussels. Since this detection the state of Montana has set up check stations around the state. There have not been any detections of zebra or quagga mussels in Lincoln County yet.

Section III. Conservation Activity Analysis

NRCS Eureka Field Office

Over the past decade, the Eureka NRCS Field Office has made some notable accomplishments, implementing a range of conservation practices on various land uses. Although the primary focus has been addressing forest health and wildfire concerns on forestland, we have also made a concerted effort to diversify the types of issues and clientele that we service. Our efforts have expanded into areas such as soil health, water conservation, grazing management, conservation easements and small-scale organic production. The following is a table of all the conservation practices that have been implemented in Lincoln County for the past 10 years:

Table D. List of Conservation Practices

Practice Name	Unit Type	Applied Amount	# of Projects
Herbaceous Weed Control	ac	489	98
High Tunnel System	-	-	6
Non-Commercial Thinning	ac	3,532	614
Slash Treatment	ac	3,587	597
Tree Pruning	ac	13	9
Tree/Shrub Establishment	ac	51	13
Critical Area Seeding	ac	40	2
Fence	ft	13,321	8
Sprinkler Irrigation System	-	-	10
Irrigation Pipeline	ft	4,160	7
Pumping Plant	ea.	4	4
Diversion Structure	ea.	2	2
Fish Screen	ea.	2	2
Prescribed Grazing	ac	79	1
Cover Crop	ac	5.1	2
Irrigation Water Management	ac	839	21

One of the focuses of this long range plan is to identify natural resource trends in order to be proactive with our conservation delivery. One of the starkest trends in the past 5 to 10 years has been the increase in the frequency and severity of severe wildfires. This coupled with steady population growth and development has created an increased awareness and interest in addressing concerns related to forest health and excess fuels. Although the Eureka Field Office has expended considerable resources addressing this concern over the past 15 years, there is much more work to be done. Future efforts will be more focused in nature, prioritizing areas and leveraging partnerships to accomplish outcomes that are more measurable than past initiatives.

Noxious weeds have been another concern that has continued to grow. In the past five years we have seen several new Montana listed invasive species appear in the county, while existing infestation have continued to spread. One recent positive development has been the rapid decline in houndstongue. We have heard anecdotally that a biological control released in Canada, not approved in the US, has been spreading to our area. This has yet to be confirmed but would explain the noticeable decline.

The last significant change has been the addition of selenium into the Kootenai River watershed has mentioned previously as a result of coal mining efforts in the Elk River Valley in British Columbia.

Notable Partners

Lincoln Conservation District

The mission of the Lincoln Conservation District is to conserve the soil and water resources of Lincoln County through education and outreach, on the ground restoration projects, landowner assistance programs, and administration of the Montana Natural Streambed and Land Preservation Act, known as the 310 Law. The District's priority is to facilitate conservation through partnership development and targeted projects to improve water quality in and along impaired waterways.

The district has put a special emphasis on stream restoration work and has put together a coalition of partners to obtain grant funding and complete several important projects on the Tobacco River, Grave Creek, Sinclair Creek, Mud Creek, and Therriault Creek.

Montana DNRC

The DNRC has been a reliable partner for us, especially over the past decade. Their service forester has been instrumental in obtaining new customers for our projects, writing forest management plans, and doing technical consultations for private landowners. Through their land bureau, they have also worked closely with NRCS and American Forest Foundation (AFF) to obtain funding for the Kootenai Forest to Rivers Initiative which provided funding for forester visits, management plans, and forest management practices. Most recently they have partnered with NRCS to hire an NRCS service forester that will help with planning and implementation of forest management projects throughout the county.

American Forest Foundation

AFF has been invested in Lincoln County for several decades with a scope that overlaps heavily with NRCS. One of their primary focuses has been with the tree farm program and working with us to help implement management practices on NIPF. They have been awarded several grants to help provide funding for management plan development and fuels reduction projects. One of the biggest contributions to NRCS has been their outreach efforts on behalf of our Edna-Fortine Creek Forest Resiliency Project. They have sent out mailing campaigns to inform landowners of our programs and have referred many interested customers.

Lincoln County

The Lincoln County staff forester has been a partner in many of our forest management projects, not only providing expertise, but also co funding several projects. They have consulted on many projects and have been instrumental in the development of the County Wildfire Protection Plan.

Lincoln FireSafe Council

The goal of the Lincoln FireSafe Council is to bring interested members of the community together, including individuals, agencies, organizations and neighborhoods, to work together to promote fire adapted communities. This group gets together once a month to discuss and share ideas, opportunities and resources related to wildfire protection. This group has been specifically helpful to the NRCS Eureka Field Office in making partnerships and collaborations for future TIP ideas.

Kootenai River Network

Kootenai River Network, Inc. is a U.S. 501(c)(3) non-profit organization that accomplishes its goals through grants and contributions from collaborators. The group formed late in 1991 in response to citizens' concerns of threatened or deteriorating water quality and aquatic resources in the Kootenai River Basin. The primary purpose of the Kootenai River Network is to foster communication and implement collaborative processes among private and public interests in the watershed. These cooperative programs lead to improved resource management practices and the restoration of water quality and aquatic resources in the basin. They seek to empower local citizens and groups from two states, one province, two countries and affected tribal nations to collaborate in natural resource management in the basin.

KRN has been the lead partner in accomplishing most of the important stream restoration work mentioned above. It has also been instrumental in authoring a county wide WRP is been widely used as a basis for planning and implementing projects that address water quality, fisheries, and riparian health.

Section IV. Natural Resource Problems, Desired Outcomes & County Priorities

Lincoln County has an abundance of identified natural resource issues. Some of the concerns are being addressed currently by NRCS and partners as expressed above while others need more attention. Below are some of the most pressing natural resource issues in the county that the NRCS Eureka Field Office, along with its partners, plans to address in the future.

The natural resource issues are determined and prioritized through a collaborative process with partners and stakeholder called the Local Working Group (LWG). The LWG has an annual meeting which is open to the public in which the state of natural resources in the county is discussed and recommendations on where to focus time and resources are made. In 2019, Montana NRCS implemented a new conservation approach known as "Montana Focused Conservation". This new strategy prioritizes specific issues and geographic areas in order to address the concerns in a way that is measurable and has the greatest impact. The LWG was asked to identify the top five resource concerns in the county and decide which areas in the county should be the top priority. The follow resource concerns are listed in order of importance and includes a map or description of the top priority areas:

1) Fuels Reduction/Forest Resiliency

   Lincoln County is among the most heavily timbered counties in Montana, with about 95% of the land base in forested. There a variety of resource concerns that have developed over the last century, mostly related to human activity such as forest management and fire suppression. This has caused a dramatic change in forest composition and overall health. Forests are now more densely stocked and have a much higher component of shade tolerant species less adapted to withstand fire. Because of this build-up of fuels, and the exasperating effects of recent droughts and high temperatures, fires have become measurably more intense,

often being a stand replacing event and posing significant risks to structures and human safety. The Lincoln Community Wildfire Protection Plan (CWPP) has identified many areas in the county as being "at risk" because of various factors such as biomass accumulation and growing populations. Due to this continuing development and an upward trend in the number and severity of wildfires, impacts to personal property have been on the rise, underscoring the need for fuel management of these areas.

In contrast with past efforts, the strategy for addressing these concerns will be much more focused. TIPs will be deployed into areas delineated by specific watersheds or residential areas. Project success will be determined by measurable outcomes using scientific metrics such as technical assessments or models.

The local working group has identified the top 10 forest management priority areas in the county which were named and delineated with a consensus from the group. These areas include:

1) Edna Creek
2) Pinkham Meadow
3) Glen Lake
4) West Kootenai
5) East Fisher River
6) Old Highway 2 - Troy
7) Yaak
8) Libby Creek
9) Lake Creek
10) Pinkham Creek

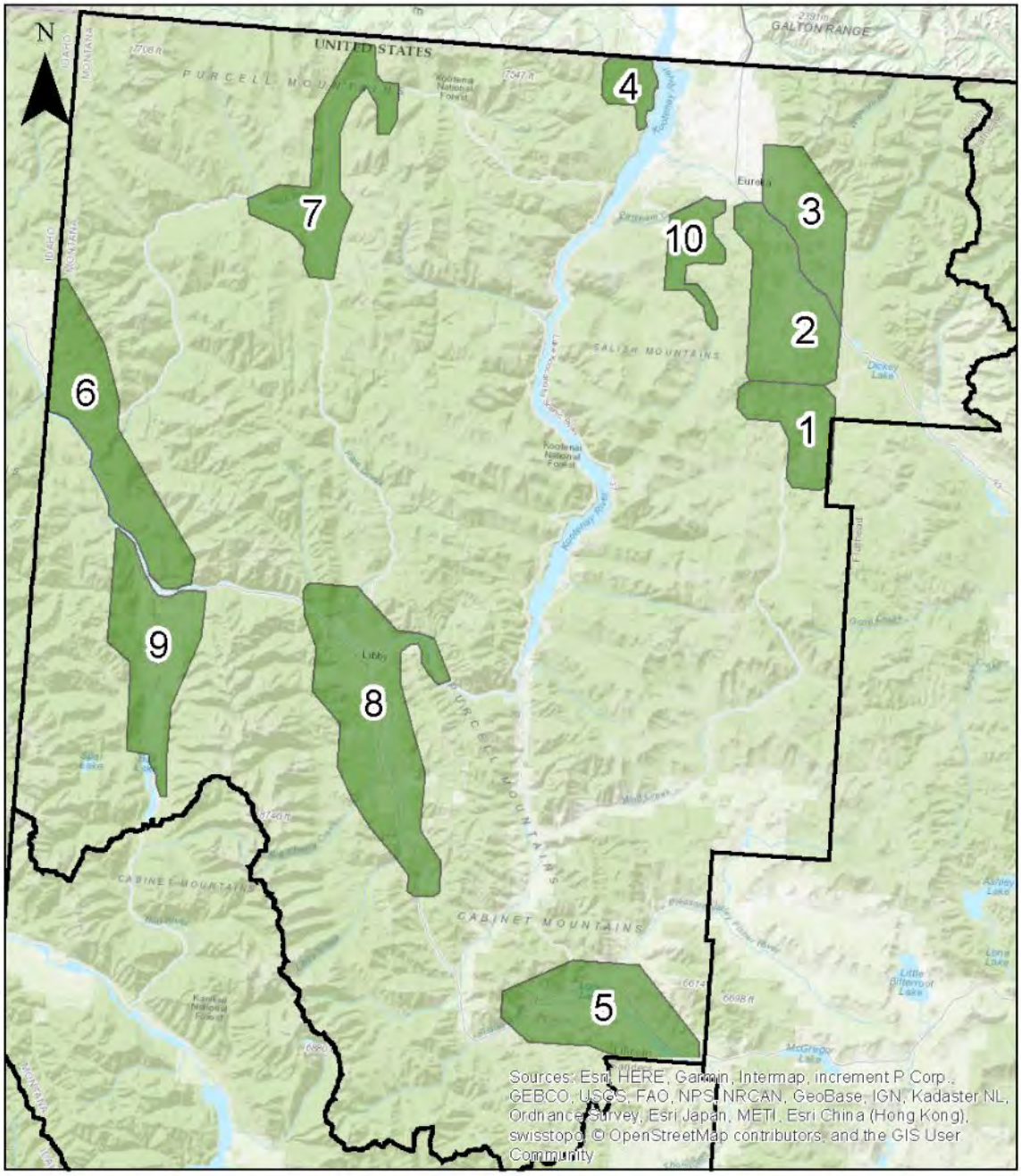
The following map was then developed and corresponds to the above areas in order of priority:

Lincoln County Forestry Focus Areas

USDA

Natural Resources Conservation Service
Eureka Field Office - 4/30/2020

Brian Ressel
District Conservationist



Legend

- County Boundaries
- Forestry Focus Areas

0 3.25 6.5 13 19.5 26 Miles

Figure XVII. Future Fuels Reduction Targeted Implementation Plan Areas.

2) Noxious Weed Management

Montana is home to many exotic and introduced species, many of which are considered noxious and invasive. Lincoln County is no exception and continues to be a challenge for resource managers as we see the extend and diversity of noxious weeds continue to expand throughout the county. The most notable species includes spotted knapweed, Canada thistle, oxeye daisy, St. Johnswort, hawkweed, and houndstongue. A full list, along with classifications, is available in the above section under Noxious & Invasive Species. Many of these weeds have a detrimental effect to native species, some of which are threatened and endangered. They also can create challenges for agricultural activity and may require the modification or addition of certain management practices. For example, grazing management can have a detrimental effect and help proliferate noxious weeds if fields are overgrazed and not given adequate time to rest and recover. Other practices from farming or logging that disturb the soil such as the creation of log roads, skid trails, landing, and tillage of fields are some other examples.

The most common management practice to treat noxious weeds is with herbicide applications. Utilizing the right chemical with the proper timing can be an effective short term solution but is often used as a band aid to cover up poor management practices. Biological controls are being developed and show some promise on a variety species. Lincoln County High School, through their biology department, has developed and insectarium to breed spotted knapweed root and seed head weevils for control of spotted knapweed. They have been distributing them throughout the county with some positive results. Other biological agents are being developed and starting to gain momentum with resource managers. Integrated Pest Management (IPM) is considered the best approach and utilizes any and all tools available to manage noxious weeds. This uses the best science and best management practices to achieve a positive long term goal.

The following areas have been determined to be top priorities from the LWG because of the vulnerability and extent of invasion:

1) Troy to Libby (Kootenai River corridor)
2) Thomspson Chain of Lakes/Fisher River
3) Tobacco River
4) Tobacco Plains

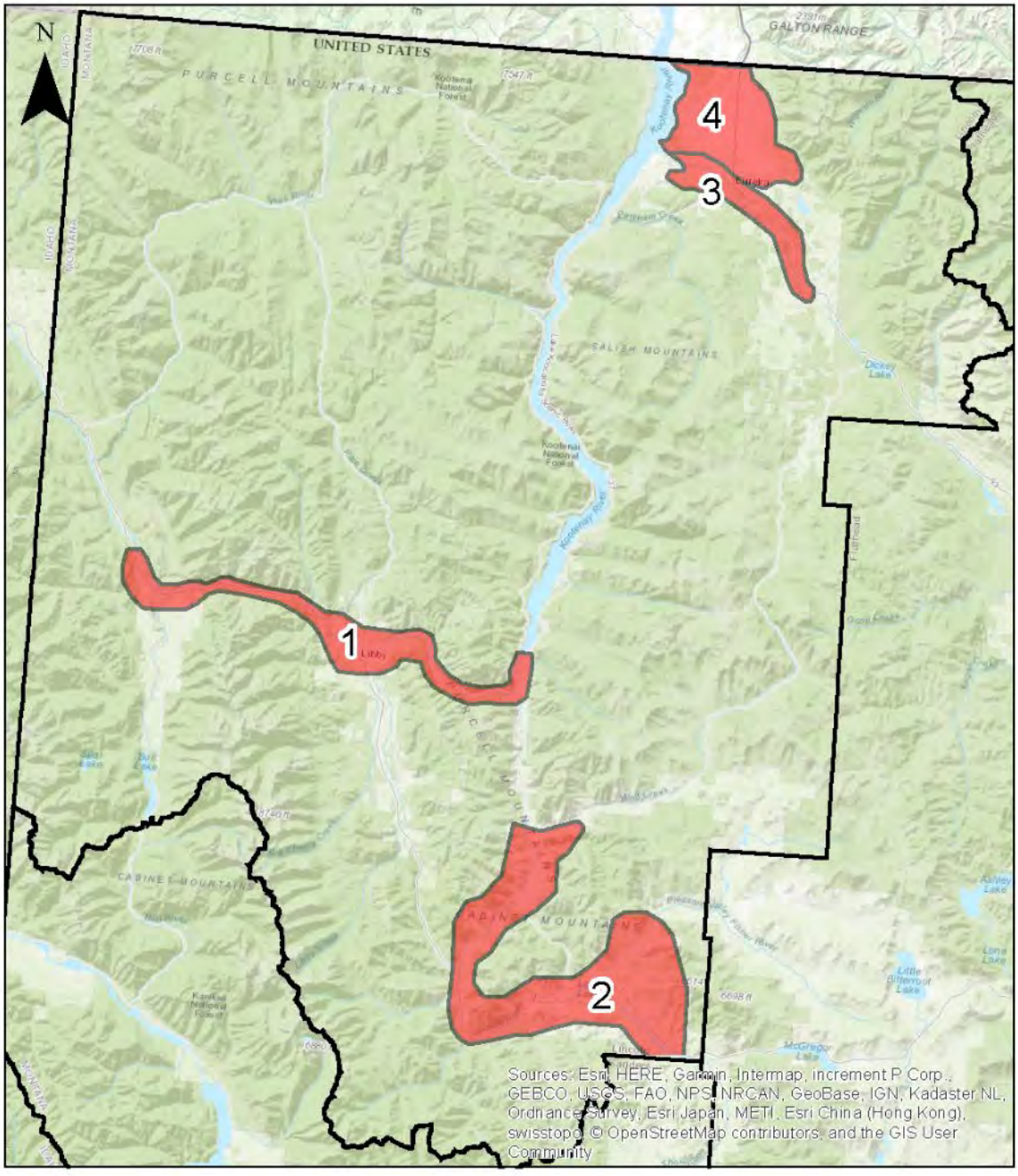
The following map was developed to correspond with the above areas and are labeled in order of priority:

Lincoln County Weed Management Focus Areas

USDA

Natural Resources Conservation Service
Eureka Field Office - 4/30/2020

Brian Ressel
District Conservationist



Legend

County Boundaries

Weed Management Focus Areas

0 3.25 6.5 13 19.5 26
Miles

Figure XVIII. Future Noxious Weed Implementation Plan Areas.

3) Soil Health

Soil Health continues to be a high priority for the NRCS and the Eureka field office. Many of the agricultural lands in the county suffer from symptoms of poor soil health.

A simple definition of soil health is "the capacity of a soil to function." Soil is a living factory of macroscopic and microscopic organisms that need food to eat and places to live. Without these organisms, soil does not function efficiently. These organisms control soil's ability to supply water and nutrients to plants, and they ultimately determine how successful ranching, forestry, and farming operations will be. A healthy soil contains a multitude of individual organisms, including bacteria, protozoa, nematodes, fungi, molds, and yeasts and can be decomposers, pathogens, parasites, predators or grazers. Beetles, mites, and small animals feed on the tinier creatures to cycle nutrients.

Low yields and noxious weed proliferation are just a few symptoms of poor soil health. These are common complaints from agricultural producers in the county and is typically the result of management practices that have been popular for the better part of the past century. The two major practices that have had the most detrimental impact on soil health in the county are over grazing and the lack of diversity in crop rotations.

NRCS in Montana has developed a strategy for improving soil health on agricultural lands. Since the majority of ag production in the county is located in the Tobacco Valley north of Eureka, this is where the bulk of the efforts will continue to take place. The Eureka field office will continue to work with producers, through available cost share programs and technical assistance, to implement practices and principles that will build soil health and address specific resource concerns.

4) Water Quality and Quantity

Addressing water quality and quantity are an important part of the Eureka Field Office's comprehensive approach to conservation in Lincoln County. The basin is vital to the health and economy of our area. Lead by KRN, there continues to be a comprehensive effort to protect our lakes and waterways. Although the county has a vast number of lakes and streams, the LWG has identified some priority areas that have unique challenges.

The first major concern is selenium in Lake Koocanusa. Coal mining in the Elk River Valley to the north in British Columbia has resulted in an elevated level of this mineral in the lake, including the Kootenai River below Libby Dam. Increased selenium in water can have a negative impact on fish reproduction and pose a health risk to humans if fish are consumed above the recommended levels. Progress is being made on this front with new technologies being employed by Teck Mine in BC, to slow the selenium seepage, but there is still a long way to go. KRN has been actively gathering information and making it available to the public through their website along with hosting public meeting annual to discuss the issue and press towards a resolution.

The second priority for the LWG is the lower Tobacco River from Deep Creek to the mouth where it enters Lake Koocanusa. Channelization and agricultural practices have contributed to the stream being listed on the TMDL 303d list for sedimentation impairment. NRCS continues to work with agricultural producers and the Lincoln Conservation District to implement practices such as riparian fencing, stream restoration, and prescribed grazing to improve water quality on the Tobacco River. Most recently, Lincoln Conservation District, has completed a large river restoration project encompassing over one mile of the Tobacco River on

multiple ownerships. This was obtained through several grants with a total cost approaching 1.5 million dollars.

The last identified priority is the Fisher River in the southern part of the county. Although a smaller stream than the Tobacco, it has similar issues with bank erosion and a history of manipulation. This river has been the focus of partner restoration efforts and continues to be a top priority. There have been multiple restoration projects completed over the last decade that focus on fish habitat and bank stability, with more activity planned by partners in the near future.

5) Land Conversion/Fragmentation

Lincoln County continues to experience steady growth and development which has created some concerns related to loss of critical habitat, ag land conversion, and noxious weed proliferation. It is a priority of the NRCS, and its partners, to preserve the legacy of agricultural and timber lands in the county. Through available tools, such as cost share programs and conservation easements, the Eureka Field Office will continue to pursue land protection. We will also continue to educate and encourage the next generation of producers to teach them the importance of conservation and strategic planning as our communities continue to grow.

Section V. Targeted Implementation Plans and Investment Portfolio

Edna – Fortine Creek Forest Resiliency Project

This project was one of the first NRCS Targeted Implementation Plans to be adopted in Montana. It started in 2019 with the goal of reducing hazardous fuels and promoting forest health in the Edna and Upper Fortine Creek drainages. This area is considered the largest urban interface in the county (see Forestry Focus Area map above) and is one of the communities most at risk to severe wildfire due to its location and prevalence of overstocked timber stands. Cost share is currently available for private landowners, with additional opportunities until 2023. We are offering a number of practices including forest stand improvement, fuel breaks, woody residue treatment, and herbaceous weed control to address resource concerns on the ground. The goal is to treat approximately 1,500 ac of forestland over a 5-year period, pledging about 1.3 million dollars. It also capitalizes on several partnership efforts including the Kootenai Forest to Rivers Initiative underway through the American Forest Foundation and the Montana Department of Natural Resources and Conservation. The following is a link to the full Targeted Implementation Plan:

https://www.nrcs.usda.gov/wps/portal/nrcs/mt/programs/financial/eqip/21ec0944-e876-4853-9152-5006f34ad88b/

Glen Lake Fuels Reduction Project

This is a proposed project that came about in response to partner concerns regarding the areas surrounding Glen Lake just south east of the community of Eureka. This 11,000 ac area is a mixture of private and public lands and has a very high concentration of homes with a relatively small average parcel size compared to the rest of the county. It is at a very high risk for severe wildfire due to its location, population density and current timber stand conditions and has been identified in the CWPP as a priority for targeted fuels reduction treatments. The goal of this effort will be to treat approximately 1,000 acres over a 5-year period with a suite of practices that will reduce hazardous fuels while protecting natural resources, personal property, and human life. It will be administered in conjunction with the American Forest Foundation's outreach campaign and utilize DNRC personnel and resources through the signing of several recent agreements. If approved, open enrollment would begin in 2021 with annual sign ups until 2026.

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