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CARDD

MEPA ROUTING MEMO

To: Mark Bostrom

Through: Autumn Coleman

From: Demi Blythe

Re: Trumbull Creek Environmental Assessment Final MEPA Decision

Project Sponsor: Flathead Conservation District

Name of Project: Trumbull Creek Restoration and Aquifer Protection

Agreement No: RRG-20-1750

Memo:

DNRC can issue a Final Finding of No Significant Impact Environmental Assessment for Flathead Conservation District Trumbull Creek Restoration and Aquifer Protection Project (attached). We scoped the project for 14 days on the DNRC Public Notice Webpage. No public comments were submitted. **SIGNATURE REQUIRED**

___/s/DEB___ MEPA/NEPA Coordinator Review

_____ Bureau Chief Review

_____ Division Administrator Signature

_____ Post for _30_ Days on DNRC's Environmental Docs page.

_____ File

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DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

GREG GIANFORTE, GOVERNOR

1539 ELEVENTH AVENUE

STATE OF MONTANA

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FINAL

ENVIRONMENTAL ASSESSMENT

Project Name:	Krause Creek Restoration
Proposed Implementation Date:	Fall 2019
Proponent:	Flathead Conservation District
Location:	Krause Creek is in Flathead County, Montana north of Echo Lake; 48.151983, -114.031313
County:	Flathead County

I. TYPE AND PURPOSE OF ACTION

Krause Creek is in Flathead County, Montana, northwest of Bigfork. The creek originates in the Swan Mountains and flows into the Flathead Valley before terminating in Echo Lake. The proposed project area is in the lower basin area at 48.151983, -114.031313 (see attached project location). This project will restore a severely degraded reach of Krause Creek and will involve completion of a final design and project construction. This project will address instability of the stream channel in the lower basin of Krause Creek by capitalizing on the natural channel evolution process. Specifically, it will create an inset floodplain and install grade control that will stabilize the channel, contain flood events, provide habitat for wildlife, and minimize the excessive sediment transport to downstream resources (Echo Lake). The purpose of this project is to implement activities that will preserve natural resources by stabilizing the stream channel and restoring its hydrologic functionality. Stabilization will ensure that it is no longer transporting excessive sediment loads downstream to Echo Lake, thus, preserving an important public renewable resource. It will also conserve forest resources by alleviating some of the dewatering of the shallow groundwater in the surrounding riparian forest, which is currently draining laterally into the channel. Creation of an inset floodplain will enhance natural water storage by promoting shallow groundwater recharge and slow release to surface water. The restored creek will also enhance habitat for wildlife by adding new riparian cover types and facilitating wildlife movement. Specific implementation tasks include project management and planning, permitting, completion of final design, topographic survey, and development of bid ready construction plans and specifications. The project implementation will include clearing and excavation of an inset floodplain, installation of grade control structures in the channel, native seeding of disturbed areas, and installation of containerized cottonwood saplings.

DNRC will approve the grant to provide funding for the Krause Creek Restoration Project.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

FCD will follow state procurement guidelines for securing contractors to complete the final design and construction phases of the project. The project sponsor will retain a qualified stream restoration specialist

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using a competitive bidding process. The specialist will complete the topographic survey and final project design, including the production of bid-ready plans and specifications. A qualified construction contractor will then be obtained through a competitive bidding process. The construction contractor's project work will be overseen by the stream restoration specialist. Valerie Kurth, FCD Resource Conservationist, is familiar with Montana state procurement law and will work with DNRC to ensure that all state requirements are followed.

The Krause Creek watershed encompasses federal (U.S. Forest Service), state (Department of Natural Resources and Conservation), and private land, and it discharges into Echo Lake, which is managed by Montana Fish, Wildlife & Parks. Representatives from all these agencies are aware of this project and may be consulted for technical advice.

FCD held a Krause Creek public meeting for interested landowners and agency personnel in the fall of 2016, and it was well-attended. FCD plans to initiate a watershed group based on this initial meeting, which will provide a venue for discussion and collaboration. The watershed group will also provide a forum for communicating with landowners and the public about the restoration project planning and implementation.

FCD will liaison among the landowners, agencies, and contractors involved in this project. Monthly status updates and detailed billing reports will be required as part of the contracts secured with the consultant and construction contractor.

Letters of support are attached to this application, confirming public approval.

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2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:
Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

Water Rights - No changes in water storage or decreases in flow are anticipated as a result of the proposed restoration activities in this project.

Sage Grouse – No activities are proposed in designated sage grouse habitat.

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3. ALTERNATIVE DEVELOPMENT:
Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why. Include the No Action alternative.

- Alternative 1, No Action (Natural Recovery): Under the No Action Alternative, Krause Creek will remain in its current degraded condition. Riparian functionality will not be improved, erosion will continue at an accelerated rate in Reach 3 and there will continue to be excess sediment contributed to Echo Lake. The creek will continue to be manipulated to push flood, erosion, and deposition problems downstream. The No Action does not fulfill the goals of the project.

- Alternative 2, Inset Floodplain with Grade Control: This alternative would accelerate the natural channel evolution towards completed downcutting followed by widening due to failure of the over-steepened streambanks, and ultimately the creation of a new inset floodplain at a lowered

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elevation (see figure in Appendix B of the application). As shown in Tables 2 and 3 (within the application) for the reference design analog at cross-section 4, this option would increase bankfull width, increase cross-sectional area, and decrease the size of sediment particle moved. This option would require excavation of an inset floodplain as well as the installation of grade control to halt channel downcutting. Because of this the monetary cost of Alternative 2 will be the highest of the three alternatives. However, the channel would be stable, able to contain flood events that are currently contained in the existing channel, would be crossable by wildlife and livestock, provide habitat for wildlife and avian species, and would fit into the landscape aesthetically as a natural feature. The excavation of high over-steepened banks to create an inset floodplain will mechanically remove sediment that would otherwise be eroded and transported downstream. Alternative 2 also includes the replacement of the undersized culvert shown in Photos 19 and 20 that is causing excessive erosion downstream of it. The replacement culvert would be approximately 5 ft. in diameter and would be able to pass the predicted 25-year flood event. Alternative 2 would cause the highest level of man-made disturbance of all three alternatives, and so would be the most susceptible to invasive species.

- Alternative 2a, Priority Inset Floodplain with Grade Control: Alternative 2a applies the same approach as Alternative 2, but prioritizes the most actively eroding section of channel in the lower basin (on the Garner Property). This segment is roughly 625 feet long, and is at the upstream end of the Garner property, upstream of the footbridge where cross-sections 1, 2 and 3 were completed (Figure 4). As with Alternative 2, Alternative 2a includes the replacement of the undersized culvert.

- Alternative 3, Flood Conveyance Channel with Grade Control: Alternative 3 would stabilize the channel 2-feet above its current elevation with rock grad-control features (see figure in Appendix B). Additional stabilization with rock at the toe of existing side-slopes would likely also be needed to prevent lateral erosion. The effect of this would be to raise the bottom elevation of the streambed which would slightly decrease the drain effect of the current channel, would maintain a channel that will contain predicted flood events, while minimizing disturbance. The channel would be stable, neither eroding nor passing sediment downstream to adjacent landowners or Echo Lake. It would be functional primarily for flood conveyance and would continue to be a barrier to local wildlife movement. As with Alternatives 2 and 2a, Alternative 3 includes the replacement of the undersized culvert. Overall disturbance would be more than the No Action Alternative, but less than Alternative 2.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

Geology

The upper Krause Creek basin is comprised of a Grinnell argillite, part of the Belt Series of sedimentary

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formations. This extremely old Proterozoic rock (1.4 billion years) is overlain by much younger glacial deposits that range from lacustrine sediments to ice-margin deposits. Lower Krause Creek is comprised of unconsolidated Quaternary alluvium (USGS 2016).

Soils
Much of the upper watershed is dominated by calcareous silty till substratum of silty loams and very gravelly silty loams (NRCS 2016). This soil type is characterized as having a high erosion potential (Kf=0.64), as well has a relatively high runoff potential (hydrologic soil group C) (NRCS 2016). Consequently, runoff from the upper watershed is flashy and can be sediment laden. The lower portion of the upper basin, into the 'throat' of Reach 2 is dominated by very gravelly and very cobbly silty and sandy loams. While these soils have a high level of infiltration/low runoff potential (hydrologic soil group A), they also have a very low water holding capacity and so do little to store or buffer the channel from runoff coming in from higher elevations. Lower Krause Creek is dominated by silt loams that are considered to be moderately erosive (Kf=0.37 to 0.49) and have relatively moderate to high potential for runoff (hydrologic soil groups of B and C) (NRCS 2016).

Proposed Alternative – No impacts are expected as the soil site is suitable for activities. There may be cumulative beneficial impacts as the project proposes to create a stable, geomorphically-balanced channel to reduce excessive sediment. In addition, the project will re-establish channel grade where the channel is incised, helping to minimize the drain effect on the surrounding forest.

No Action – No impacts to the soil or geological resources.

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5. WATER QUALITY, QUANTITY AND DISTRIBUTION:
Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

Water Rights
There are 11 active surface water rights associated with Krause Creek (Table 1 in attached report of application). Water rights must be considered by any actions moving forward that affect water storage or that decrease flows in Krause Creek.

Watershed
The 5th level watershed for this area is the Columbia Falls (HUC #1701020801). The project area falls within the Flathead River-Rose Creek 6th level sub-watershed (HUC #170102080108) that has an area of 33,004 acres. The Krause Creek watershed has three unnamed tributaries in the upper watershed and an overall drainage area of 4,103 acres where it enters Echo Lake. Krause Creek has been subdivided into three major reaches based on geomorphic process, human influences, and channel response (Figure 4). Reach 1 flows through the high elevation upper watershed. Reach 2 is the main transport section across the Krause Creek alluvial fan. Reach 3 has been subdivided into six sub-reaches to capture the variability in channel morphology and stability in this area. Reaches 3a through 3f represent the primary response section of Krause Creek, where the lower slopes through glacial geology beyond the fan toe limit sediment transport capacities resulting in mobility.

Water Quality
Krause Creek is listed by Montana DEQ as a B-1, Non-Exception Stream (Discover DEQ throughout Montana, https://gis.deq.mt.gov/portal/apps/webappviewer). Waters classified B-1 are to be maintained suitable for

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drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

Groundwater
Current groundwater levels in the project area appear to be moderately deep to shallow (static water levels range from 40 to 209 feet; Source: MBMG Groundwater Information Center Map Application).

Proposed Alternative – The proposed project will be potentially beneficial to groundwater resources as the project proponent expects shallow groundwater loss from lateral flow to be stabilized and the creation of the new floodplain may promote storage in the shallow groundwater. There may be increased turbidity because of construction activity, but this is expected to be minimal as all activity will occur when the streamflow is low to non-existent. The proposed channel restoration project and the replacement of an undersized culvert may cumulatively improve surface water quality.

No Action – The no action alternative will not correct the potential shallow groundwater loss occurring because of the unstable channel, and stream will continue to be manipulated for flood and sediment control.

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6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The project area is not listed as impaired in air quality particulates per the Montana DEQ Air Quality Nonattainment Status list (Source: Montana DEQ Air Quality Website visit).

Preferred Alternative – Potentially adverse impacts to air quality as a the project proponent expects a minimal amount of dust or emissions associated with construction activities; however, the project proponent does not expect any dust or emissions after the project is completed.

No Action – No impact to current air quality.

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7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

The National Land Cover Dataset (NLCD) indicates the Krause Creek watershed is comprised of 90% evergreen forest, 9% woody wetlands, and 1% developed open space. The project proponent did not determine the riparian landtype of Krause Creek in Reach 1 because of snow cover. The riparian landtype of Reach 2 is classified as nearly level, with a gravel and cobble bed channel (more cobble than gravel), that is dominated by the spruce/red-osier dogwood vegetation type (NL2C). The riparian landtype in Reach 3 is classified as flat, with a gravel and cobble bed channel, that is dominated by the spruce/red-osier dogwood vegetation type (FL2C). For more on riparian landtypes refer to Sirucek and Bachurski (1995).

In general willows, sedges, rushes, and other types of hydrophytic vegetation is lacking from streambanks observed along Krause Creek in Reaches 2 and 3. This suggests that the streambanks are not wet for a long

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enough time to support this type of vegetation. This calls into question the ability to establish hydrophytes for use as a bank stabilization measure (i.e., bio-engineering). The project proponent observed Cottonwood saplings on the inset floodplain at cross-section 4, one of the few locations where they were observed.

Proposed Alternative – Potentially beneficial as the land surrounding the project area and Krause Creek is primarily evergreen forest. The landowner actively manages the forest for health and fire protection and the project will benefit the surrounding forest by stabilizing the dewatering of the surrounding land. In addition, the creation of inset floodplain will enhance the riparian communities through establishing cottonwood stands.

No Action – No impact to the current conditions of the vegetation communities.

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8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:
Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

There are at least 318 bird species that occur within Flathead County, 47 of which have been designated as Species of Concern (MTNHP 2016). Of the 69 documented mammal species, 10 are Species of Concern. There are seven reptiles and eight amphibians that have been observed within the County. The U.S. Fish and Wildlife Service (USFWS) has identified five species listed as threatened or endangered (T&E) and two candidate species under the Endangered Species Act (Table 4 – from application). During the site visit at the end of March 2016, a grizzly bear was observed where Krause Creek enters Echo Lake. No formal surveys or consultations on T&E species were completed as part of this project.

Table 4. Species listed under the Endangered Species Act that potentially occur in Flathead County, Montana. (USFWS 2016)

Scientific Name	**Common Name**	**Federal Status***
Salvelinus confluentus	Bull Trout	LT
Lynx canadensis	Canada Lynx	LT
Silene spaldingii	Spalding's Campion	LT
Ursus arctos horribilis	Grizzly Bear	LT
Coccyzus americanus	Yellow-billed cuckoo (western pop.)	LT
Lednia tumana	Meltwater Lednian Stonefly	C
Pinus albicaulis	Whitebark Pine	C

*LT = listed threatened; C = candidate for listing.

The existing entrenched condition found in Reach 3b inhibits wildlife from crossing the creek channel. Because the creek is intermittent, fish do not inhabit Krause Creek.

Proposed Alternative – The project will be potentially beneficial as the creation of an inset floodplain and establishing Cottonwood stands will enhance habitat diversity for various organisms. Krause Creek has intermittent flows and does not currently support fish; however, the project will reduce sediment transport to Echo Lake and thus improve aquatic habitat for fish and other aquatic life.

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No Action – The current terrestrial, avian, and aquatic habitats would not be significantly altered by the no action alternative; however, there will be continued erosion and excess sediment transported to Echo Lake, potentially impacting fish and aquatic life for the lake.

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9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

DNRC used the National Wetlands Inventory (NWI) website to determine whether any wetlands were present within the lands adjacent to the project location (map attached). This search indicated there are wetlands present within one (1) mile of the proposed project area. The proposed project may require a pre-application consultation with the U.S. Army Corps of Engineers to determine if a 404 Permit is required.

As mentioned in the previous section, there are at least 318 bird species that occur within Flathead County, 47 of which have been designated as Species of Concern (MTNHP 2016). Of the 69 documented mammal species, 10 are Species of Concern. There are seven reptiles and eight amphibians that have been observed within the County. These listed species potentially use the project area as viable habitat.

Proposed Alternative – There are no expected impacts to Although several species of concern and threatened or endangered species have been identified in Flathead County, no threatened or endangered (T&E) species have been identified within the immediate project area. The project applicant did not perform any formal surveys or consultations on T&E species, but they did observe a grizzly bear near the mouth of Krause Creek during a March site visit. There are identifiable wetlands occurring in the project area, but the project will be potentially beneficial to those wetlands as the goal is to improve the floodplains and associated groundwater storage.

No Action – No impact to the unique, endangered, fragile or limited environmental resources as a result of the no action alternative.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:
Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

The project applicant did not identify if there are any known historical or archaeological resources in the project area. Given the project area is located within a stream channel, there are likely no to limited historical resources given the natural physical variability of the direct project area.

Proposed Alternative – No cultural or historical resource impacts are anticipated. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

No Action – No impact to historical or archaeological sites.

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11. AESTHETICS:
Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

Within the proposed project reach, channelization, flow concentration, and sediment excavation have driven channel incision that exceeds 10 feet in places and is impassable for wildlife. Some of this incision was exacerbated by the excavation of sediment traps in the bed in recent decades. Erosion within this unstable channel segment has then increased sediment loading downstream to Echo Lake.

Proposed Alternative – Potentially beneficial as stabilizing the channel and adding a floodplain will visually enhance the deeply incised area.

No Action – Channel incision will continue and sedimental loading will impact Echo Lake.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

The degraded, intermittent gully known as Krause Creek and the forested area immediately adjacent to the creek will be directly and permanently impacted through the construction of the inset floodplain. The forest in this area was previously logged, so many trees are secondary growth. Krause Creek and Echo Lake will both be positively affected through the stabilization of the channel and reduction of erosion and sedimentation.

Proposed Alternative – Potentially beneficial as Krause Creek and Echo Lake will both be positively affected through the stabilization of the channel and reduction of erosion and sedimentation of the area. These changes will likely create more beneficial habitat for forest growth and regeneration, and cottonwood survival.

No Action – No impact to the demands on environmental resources of land, water, air or energy.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:
List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

Floodplain – The project area is outside a mapped floodplain area and will not require a floodplain permit.

Water Rights - No changes in water storage or decreases in flow are anticipated as a result of the proposed restoration activities in this project.

Sage Grouse – No activities are proposed in designated sage grouse habitat.

Wetlands – A 404 permit will be required from US Army Corps of Engineers. The project will fit well within

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the Nationwide permit 27, Aquatic Habitat Restoration, Enhancement, and Establishment Activities. Under this Nationwide permit, the applicant will need to submit preconstruction notice and a wetland delineation to USACE and wait for verification from Army Corps before proceeding.

Montana State Water Plan --

- Water Supply and Demand. This project integrates natural water storage by creating an inset floodplain. The floodplain and associated riparian area will slow runoff and promote recharge to the shallow groundwater, as well as the slow release of water back to the surface water system. In addition, this project will stabilize the lateral flow of water, which is currently causing dewatering of the surrounding riparian area and upland forest. Collectively, the restoration of the natural hydrologic function of Krause Creek will help mitigate the impacts of drought cycles and will benefit wildlife and vegetation.

- Ecological Health and Environment. This project restores habitat and connectivity for wildlife by ameliorating the existing entrenched condition on one of the lower stream reaches. Banks will be sloped to make them passable and new riparian forest will be created on the floodplain, which will enhance wildlife habitat.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

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14. HUMAN HEALTH AND SAFETY:
Identify any health and safety risks posed by the project.

Krause Creek terminates at Echo Lake, a popular recreation destination for fishing, boating, and camping. Channel erosion is accelerating throughout the lower creek basin, where the unique local geology, coupled with ongoing channel maintenance and excavation efforts, have contributed to localized downcutting and excessive sediment loading and flooding downstream. Landowner observations indicate that the situation has progressively worsened over the last three decades, and, left unchecked, channel erosion, deposition, and sediment deposition will continue to have detrimental impacts to Echo Lake and surrounding landowners.

Proposed Alternative – Potentially beneficial as the proposed restoration project will improve the Krause Creek channel, allowing the creek to transport sediment and stream flows effectively.

No Action – The channel incision and subsequent flooding will continue and likely worsen over time, posing an increased risk for public safety.

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15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

The proposed project reach is located on residential private property and does not have any immediate industrial, commercial, or agricultural activities in the area. In addition, though Krause Creek enters Echo

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Lake presently, historically Krause Creek never flowed all the way to Echo Lake. Instead, when it reached the valley floor it flowed into a distributary network of small channels and infiltrated into the shallow and deep aquifers. Over the years Krause Creek has been modified by humans into a single channel that facilitates the movement of water and sediment down to Echo Lake. and the ongoing maintenance sediment excavation efforts have contributed to localized downcutting and increased sediment loading downstream.

Proposed Alternative – No impact is expected to industrial, commercial, or agricultural activities or production as these activities do not presently occur in the project area.

No Action – No impact to industrial, commercial, or agricultural activities or production.

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16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:
Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

Echo Lake is a popular hub for natural resource-based recreation, including fishing, boating, and camping. Much of the land surrounding the lake is privately owned, but there is a public fishing access and a campground available to visitors. Since Krause Creek terminates at Echo Lake, the transport of eroded sediment to the lake is a concern because of the potential impairments to water quality and aquatic habitat. This especially problematic for the nine landowners north of the causeway, where Krause Creek enters the lake, but it could also impact the several hundred other landowners on Echo Lake. High visitation to Echo Lake is suggested by the most recent survey of anglers conducted by Montana Fish, Wildlife & Parks, which found a total of 13,374 angler days on Echo Lake during 2015, as well as the general popularity of the fishing access site.

Proposed Alternative – Potentially beneficial as maintaining water quality in Echo Lake may benefit the local fishing and water recreation industry.

No Impact – Echo Lake water quality will continue to be impacted by sediment loading. The impaired water quality may negatively impact the aquatic ecology/processes of the lake.

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17. LOCAL AND STATE TAX BASE AND TAX REVENUES:
Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

As mentioned previously, Echo Lake provides various recreational activities, including fishing, boating, and camping. These activities likely bring in increased revenues during peak tourism seasons. For example, Outfitter/Guide services for Flathead County created approximately $71,450,000 in revenues (11.7% of Total Expenditures for Flathead County, 2019 data report; University of Montana Institute for Tourism and Recreation Research, http://www.itrr.umt.edu).

Proposed Alternative – Local and state tax base and revenues are not expected to be significantly impacted by the proposed project; however, the proposed project may prove an indirect, beneficial impact through the decrease in sediment loading and subsequent improvement of water quality for Echo Lake.

No Action – No impact is expected to local and state tax base revenues.

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18. DEMAND FOR GOVERNMENT SERVICES:
Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

The proposed project location is located on private land within the stream channel.

Proposed Alternative – Given the proposed location is primarily on private land and within the stream channel, there will be no impact to demand for government services in the project area.

No Action – No impact on the demand for government services.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:
List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

- The project area is outside a mapped floodplain area and will not require a floodplain permit.
- The project will benefit the Montana State Water Plan through integrating natural water storage by creating an inset floodplain. The floodplain and associated riparian area will slow runoff and promote recharge to the shallow groundwater, as well as the slow release of water back to the surface water system. In addition, this project will stabilize the lateral flow of water, which is currently causing dewatering of the surrounding riparian area and upland forest. Collectively, the restoration of the natural hydrologic function of Krause Creek will help mitigate the impacts of drought cycles and will benefit wildlife and vegetation. The proposed project also plans to restore habitat and connectivity for wildlife by ameliorating the existing entrenched condition on one of the lower stream reaches. The project proponent will slope banks to make them passable, and create new riparian forest on the floodplain, which will enhance wildlife habitat.
- The project location is within one mile of designated wetlands and will require a U.S. Army Corps of Engineers 404 permit
- There are 11 active surface water rights associated with Krause Creek (Table 1 in application). Water rights must be considered by any actions moving forward that affect water storage or that decrease flows in Krause Creek.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:
Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project location is near Echo Lake, which is a popular destination for anglers and maintain adequate access through various boat ramps and campgrounds.

Proposed Alternative – Potentially beneficial as reducing sediment transport to Echo Lake will improve water quality and aquatic habitat. In addition, Echo Lake is a popular destination for anglers and the project proposes to maintain fish habitat and thus benefit public recreation.

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No Action – No impacts to access to and quality of recreational and wilderness activities.

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21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

The population of Flathead County was estimated at approximately 105,851 individuals in 2020 (Montana Census and Economic Center (CEIC), https://ceic.mt.gov/). In addition, there were an estimated 48,785 total housing units in Flathead County in 2019, with approximately 70.1% owner-occupied (CEIC).

Proposed Alternative – The proposed project will likely pose no impact to the density or distribution of population and housing given it is a short-term project and provides more direct physical environment benefits.

No Action – No impact to density or distribution of population or housing.

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22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

The project is located primarily on private land and within the Krause Creek stream channel. As is typical of land development on alluvial fans, there have been ongoing human impacts to the Krause Creek stream channel to reduce flooding on the fan surface by concentrating flow into a primary channel. Repeated efforts at channelization, flow concentration, and sediment excavation were intended to facilitate the movement of water and sediment to Echo Lake. The result of these efforts to reduce overland flooding and promote sediment transport on Krause Creek has led to localized downcutting and increased sediment loading downstream.

Proposed Alternative – The proposed project will not disrupt native or traditional lifestyles; however, the project proposes to construct a stream channel that will be more effective at sediment-transport. These changes will likely increase landowner satisfaction with the area by minimizing flood occurrences.

No Impact – No impact to social structures and more.

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23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

Krause Creek is currently unstable due to its intentional transformation from a distributary alluvial fan system to a concentrated single thread channel. This instability transports excessive sediment downstream to Echo Lake, an important recreational area for Flathead County residents and nonresidents.

Proposed Alternative – The proposed project will benefit not only Krause Creek and local landowners potentially affected by flooding occurrences, but will also indirectly benefit Echo Lake tourism/uniqueness through maintaining water quality standards for aquatic life.

No Action – Krause Creek will continue to respond to the alterations associated with being confined to a

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single-thread channel through localized erosion, deposition, and sediment delivery to Echo Lake. Additionally, these conditions will potentially be amplified by significant changes in the upper watershed such as catastrophic wildfire or clearcut logging practices.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

The creek's current condition is characterized by extreme instability, which is creating accelerated channel erosion (downcutting and lateral erosion) and excessive sediment transport and deposition downstream. These conditions were created, at least in part, by repeated efforts to concentrate the flow path of the creek, which historically was distributed into an alluvial fan across the lower valley.

Proposed Alternative – This project benefits the citizens of Montana by preserving natural resource-based recreation in Echo Lake and minimizing flood risk in the lower basin. Echo Lake is a popular hub for natural resource-based recreation, including fishing, boating, and camping. Much of the land surrounding the lake is privately owned, but there is a public fishing access and a campground available to visitors. Since Krause Creek terminates at Echo Lake, the transport of eroded sediment to the lake is a concern because of the potential impairments to water quality and aquatic habitat. This especially problematic for the nine landowners north of the causeway, where Krause Creek enters the lake, but it could also impact the several hundred other landowners on Echo Lake. High visitation to Echo Lake is suggested by the most recent survey of anglers conducted by Montana Fish, Wildlife & Parks, which found a total of 13,374 angler days on Echo Lake during 2015, as well as the general popularity of the fishing access site.

No Action – The continued transport of excess sediment may eventually degrade water quality for Echo Lake, subsequently impacting the native aquatic flora/fauna and thus reducing the fishery for Echo Lake.

EA Prepared By:	**Name:**	Demitra Blythe	**Date:**	6/23/2021
	Title:	CARD Division MEPA/NEPA Program Officer		
	Email:	Demitra.Blythe@mt.gov		

V. FINDING

25. ALTERNATIVE SELECTED:

Alternative 2a, Priority Inset Floodplain with Grade Control: Alternative 2a applies the same approach as Alternative 2 but prioritizes the most actively eroding section of channel in the lower basin (on the Garner Property). This segment is roughly 625 feet long and is at the upstream end of the Garner property, upstream of the footbridge where cross-sections 1, 2 and 3 were completed (Figure 4 in application).

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26. SIGNIFICANCE OF POTENTIAL IMPACTS:

The Preferred Alternative (2a), Priority Inset Floodplain with Grade Control, will result in temporary environmental impacts from operating heavy equipment within the stream channel and the riparian area of Krause Creek. Construction impacts may include temporary disturbance of the vegetation and soil where the equipment is operated. The agreement with the construction contractor will include a requirement to minimize these impacts by restoring disturbed areas with native vegetation prior to project completion and final payment. In addition, the contractor will be required to pressure wash all equipment before entering the project area to minimize the risk of spreading weeds, as well as ensure that all equipment is fully functional and free of any fuel, oil, or hydraulic leakage. The landowners are already committed to weed control on their property, and they will be tasked with monitoring and removing any weeds in and around the project area as part of the ongoing project maintenance and monitoring. The construction of this project will occur in the late summer and fall, when flows in Krause Creek are low or non-existent. Thus, any increase in turbidity or downstream sediment transport to Echo Lake is likely to be minimal and temporary. All impacts are recognized as temporary and justifiable based on the net gain of the restoration activity. No impacts are associated with the topographic survey and final design of the project, permitting, or post-project maintenance and monitoring.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

DRAFT EA

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

EA Approved By:	**Name:** Mark Bostrom **Title:** CARD Division Administrator	
Signature:	DocuSigned by: Mark W Bostrom BF7A1C50B2AF4DE...	**Date**: 8/31/2021

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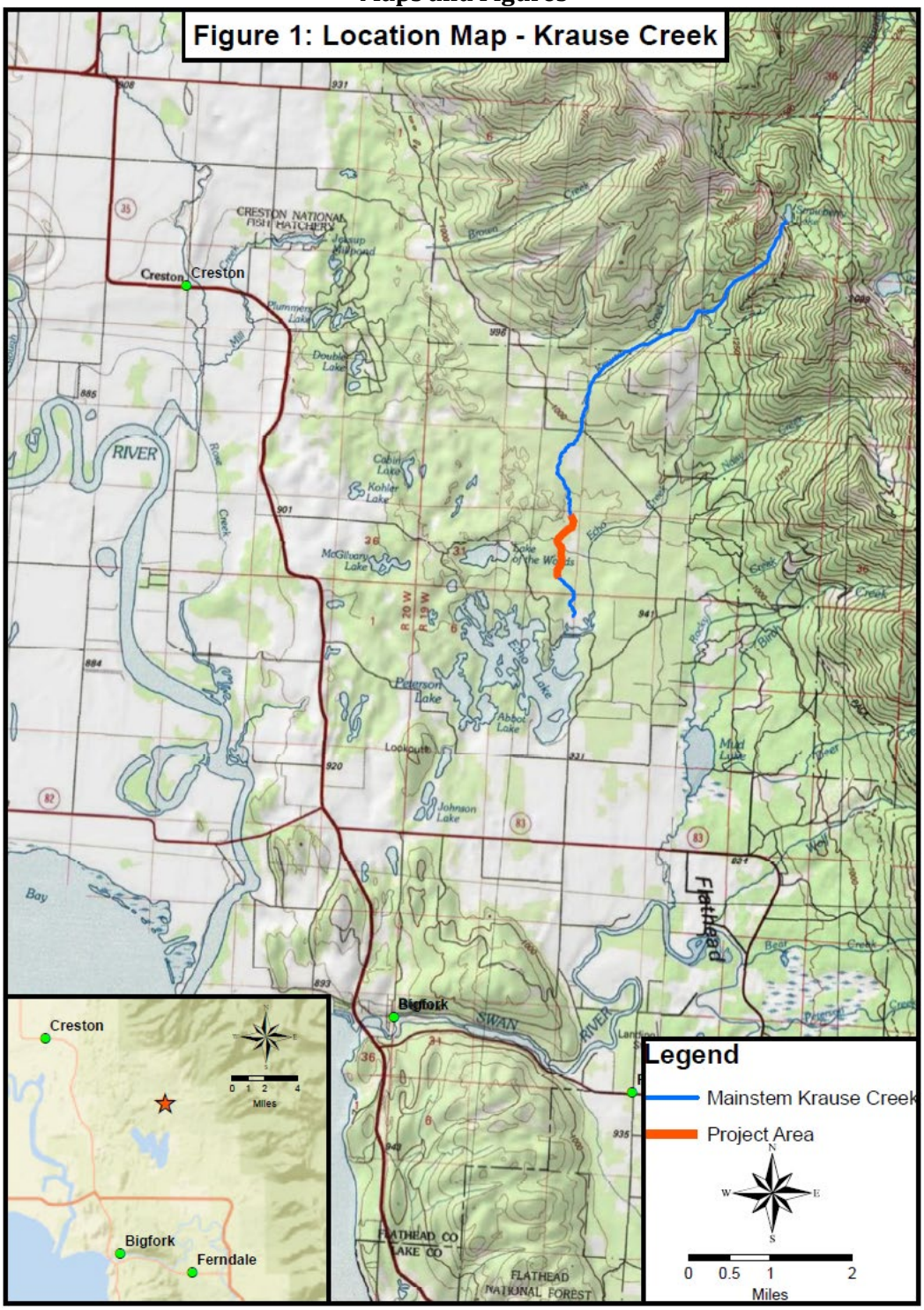
Maps and Figures



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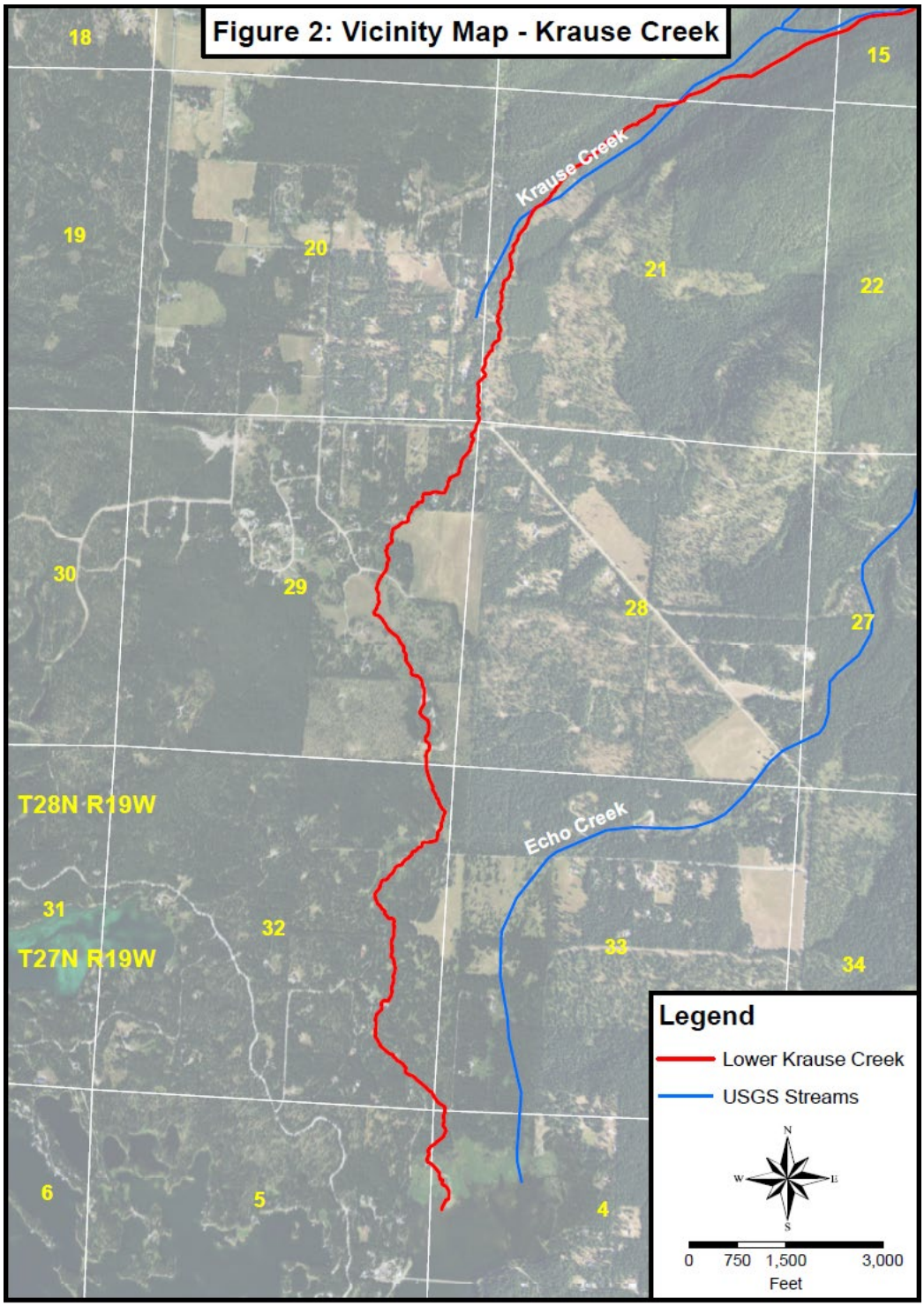

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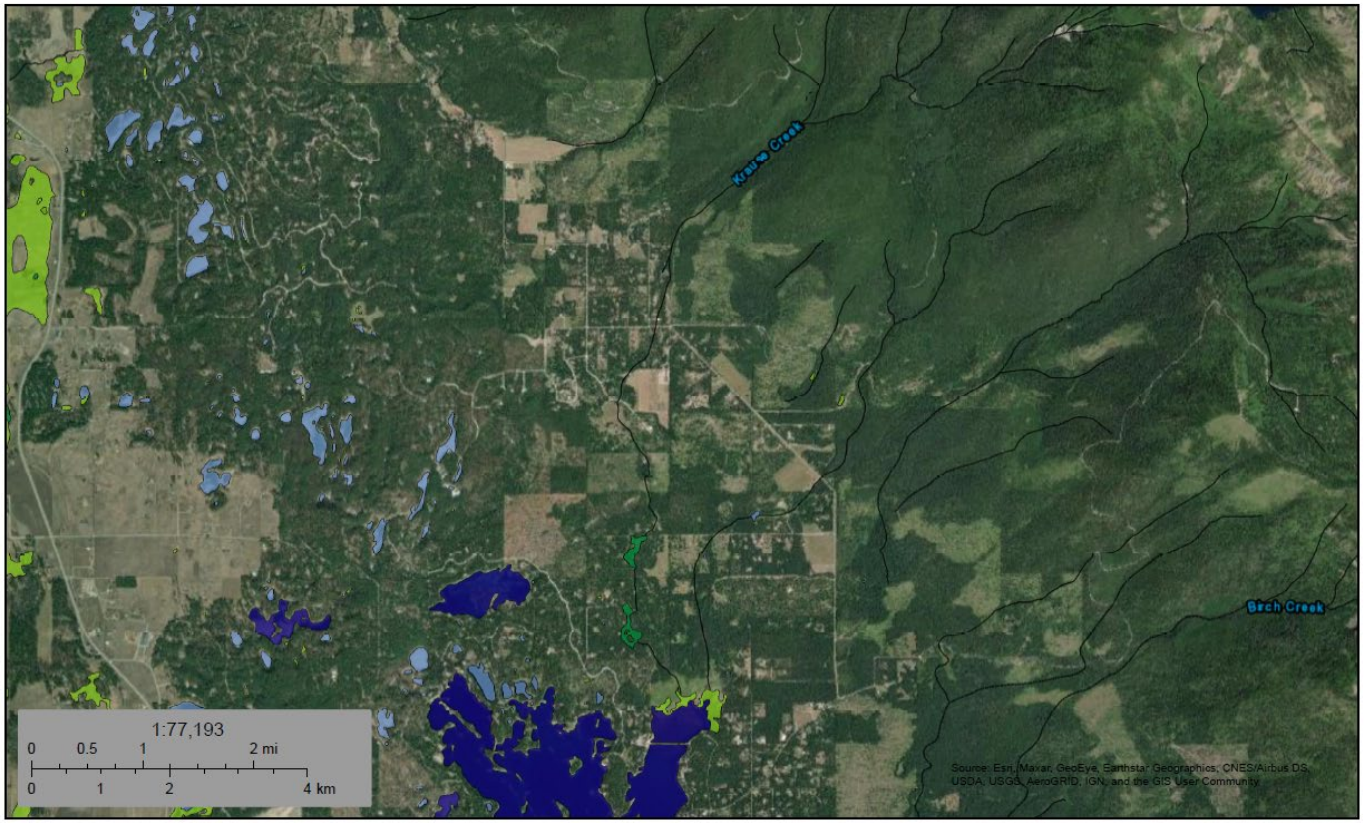
U.S. Fish and Wildlife Service
National Wetlands Inventory

Krause Creek - Wetlands



June 22, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
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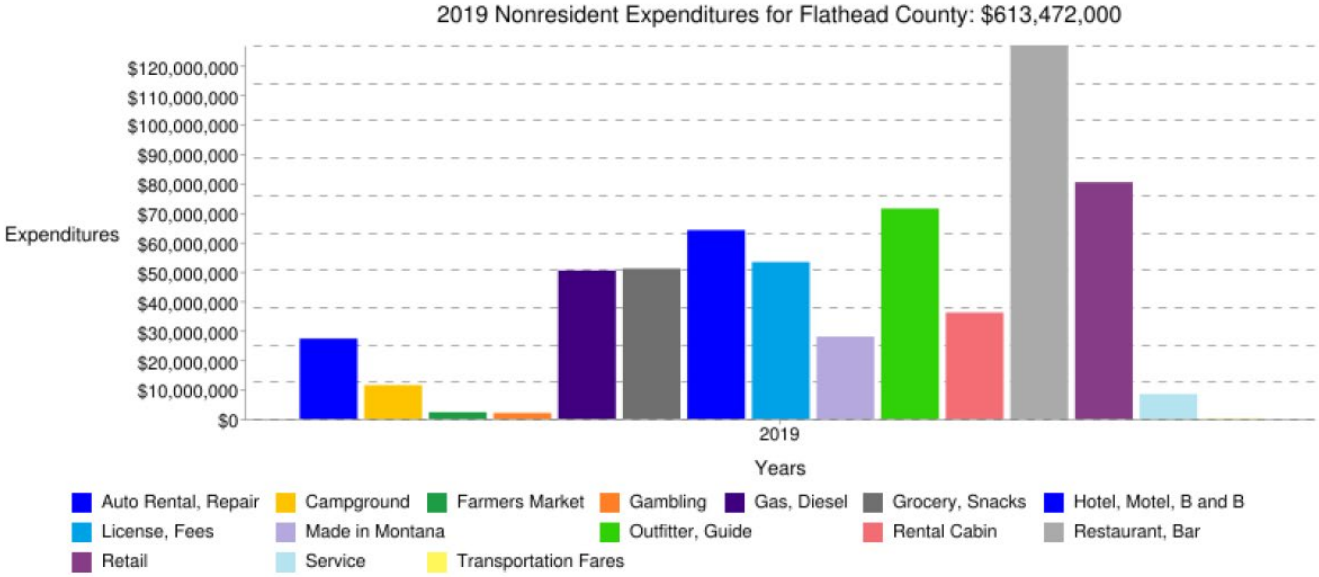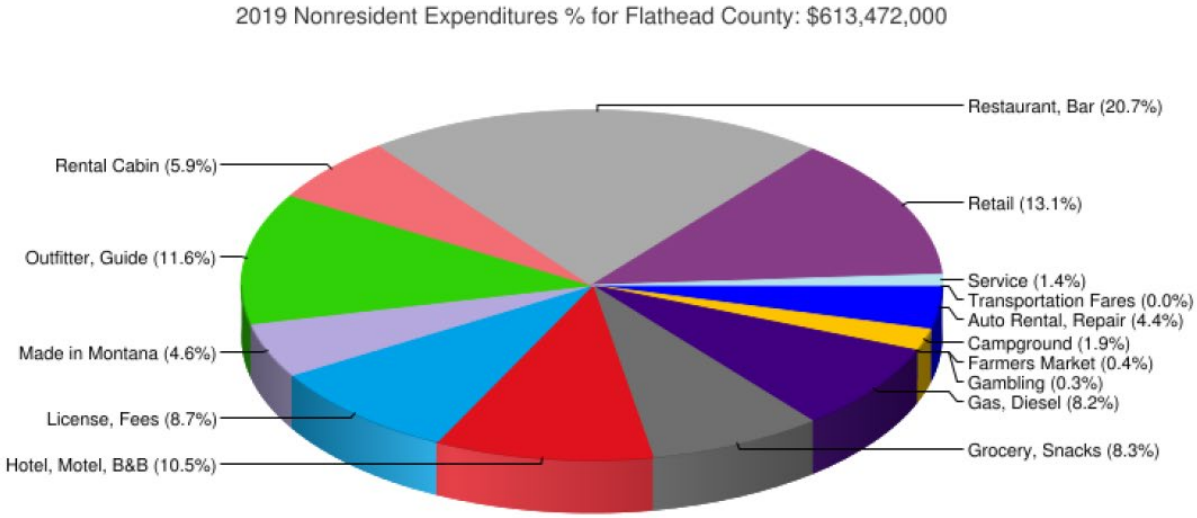
Montana Institute on Tourism and Recreation 2019 Data Summary for Flathead County