FINAL

AGRICULTURAL RESOURCE MANAGEMENT PLAN AND PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

January 2018

Fort Belknap Indian Community
656 Agency Main St.
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Fort Belknap Indian Community's Agricultural Resource Management Plan and Programmatic Environmental Assessment

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The Fort Belknap Indian Community (FBIC) Tribal Council determined that an agricultural resource management plan (ARMP) was needed for the Fort Belknap Indian Reservation (Reservation). The Reservation, which is home to the FBIC (i.e., members of the Gros Ventre and Assiniboine Tribes [Tribes]), is predominately rural and agricultural activities are the prevailing land use. The United States (U.S.) Bureau of Indian Affairs (BIA) Fort Belknap Agency, under the direction of the FBIC Tribal Council, solicited a request for proposal for the development of an ARMP due to the advanced technical expertise and coordination needed for the project. In April 2017, Trihydro Corporation (Trihydro) was competitively awarded the contract.

In accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the regulations of the Council on Environmental Quality (CEQ), 40 Code of Federal Regulations (CFR) parts 1500 through 1508, the implementation of the ARMP must undergo an environmental review. In order to streamline the ARMP development and NEPA review processes and to provide a stronger, more informed land use plan that is of the most benefit to the Tribes, the NEPA review was conducted concurrently with the development of the ARMP. This document contains not only the FBIC ARMP, but also the associated NEPA environmental review (i.e., the FBIC ARMP Programmatic Environmental Assessment [PEA]). Together, these two documents are hereafter referred to as the FBIC ARMP/PEA.

The FBIC ARMP/PEA is organized in the following manner:

- Section 1 provides the project introduction and background, along with an overview of the available agricultural resources.
- Section 2 identifies and establishes ARMP-specific tribal agricultural resource goals and objectives, management objectives for those resources, and actions to be taken to reach those established objectives.
- Section 3 provides the NEPA Purpose and Need and the associated alternatives.
- Section 4 provides resource descriptions and analyzes potential impacts to those resources from the alternatives, in accordance with NEPA.
- Section 5 provides a cumulative impact analysis, in accordance with NEPA.
- Section 6 provides information on the consultation and coordination and preparers of the FBIC ARMP/PEA.
- Section 7 provides a list of references for the FBIC ARMP/PEA.

1.1.1 AGRICULTURAL RESOURCE MANAGEMENT PLAN

The FBIC ARMP was developed under and in accordance with the American Indian Agricultural Resource Management Act (AIARMA) (25 United States Code [U.S.C.] 3711). AIARMA was passed in 1993 by the U.S. Congress to improve the management, productivity, and use of Indian agricultural lands and resources. Congress passed AIARMA with the belief that the development and management of Indian agricultural lands in accordance with integrated resource management plans, would ensure the proper management of Indian agricultural lands and would produce increased economic returns, enhance Indian self-determination, promote economic opportunities, and improve the social and economic well-being of Indian and surrounding communities. AIARMA was also passed to increase the educational and training opportunities available to Indian people and communities in the practical, technical, and professional aspects of agriculture and land management to improve the expertise and technical abilities of Indian tribes and their members. AIARMA also carries out the U.S.' trust responsibility to promote the self-determination of Indian tribes by providing for the management of Indian agricultural lands and renewable resources in a manner consistent with identified tribal goals and priorities for conservation, multiple use, and sustained yield.

To meet the provisions of AIARMA, American Indian tribes are encouraged to develop and implement a 10-year ARMP. An ARMP must:

- Determine available agricultural resources
- Identify specific tribal agricultural resource goals and objectives
- Establish management objectives for the resources
- Define critical values of the Indian tribe and its members and provide identified holistic management objectives
- Identify actions to be taken to reach established objectives
- Be developed through public meetings
- Use the public meeting records, existing survey documents, reports, and other research from federal agencies, tribal community colleges, and land grant universities
- Be completed within 3 years of the initiation of activity to establish the plan

Once approved, the BIA and tribal governments are to use the ARMP to govern the management and administration of Indian agricultural resources and Indian agricultural lands in accordance with all tribal laws and ordinances. Therefore, once adopted by the FBIC Tribal Council, the FBIC ARMP will apply to all tribal trust, tribal fee, and allotted lands located within the exterior boundaries of the Reservation, and to the FBIC lands located outside the exterior boundaries of the Reservation. The FBIC ARMP will also apply to state school lands, over which the FBIC has management jurisdiction. The ARMP will be followed and enforced by the BIA, the FBIC Tribal Council, and all other tribal departments, as applicable. FBIC members will ultimately benefit from the implementation of ARMP due to the

anticipated future opportunities for intergovernmental and inter-agency collaboration, increased funding opportunities, and increased and sustained revenues associated with the sustainable management of FBIC natural and agricultural resources.

1.1.2 NATIONAL ENVIRONMENTAL POLICY ACT

The PEA portion of the FBIC ARMP/PEA was developed under and in accordance with NEPA. NEPA was enacted as the U.S.' basic national charter for protection of the human environment. It established policy, set goals (Section 101), and provided means (Section 102) for carrying out the policy. The CEQ regulations (40 CFR 1500-1508) promulgate Section 102(2) of NEPA. Federal agencies are required to comply with NEPA and the CEQ regulations for all of their actions that may potentially impact the human environment. NEPA compliance may take three forms: a categorical exclusion (CE) (per Department Manual [DM] 516-2), an environmental assessment (EA), and/or an environmental impact statement (EIS). At the completion of an EA, the federal agency may issue a Finding of No Significant Impact (FONSI)/Decision Record or may determine that preparation of an EIS is warranted.

PEAs or EISs are prepared for broad-scale programs and/or for multiple similar individual actions that are likely to occur over time in a defined geographic area and have similar potential for environmental impacts. PEAs or EISs may be terminal in nature, such as analysis of potential effects of the proposed use of a pesticide, or may provide a basis for focused further analysis of individual actions. A PEA is appropriate for analysis of the implementation of the FBIC ARMP because multiple and similar leasing, permitting, and improvement actions are anticipated on FBIC trust lands over the period of 2018-2028. Those actions may include, but are not limited to, the following:

- Development and implementation of farming and livestock grazing practices to protect, improve, and increase the utilization and yield of agricultural lands through improved water quality and availability and improved soil health, including the implementation of noxious weed prevention and management practices.
- Improvements to facilitate the sustainable use of trust agricultural lands, including installation of wells, dams, stock watering tanks, and irrigation repairs.
- Improvements to the farm/pasture leasing and the grazing permitting processes to facilitate tribal member use of trust lands for agricultural activities that promote tribal economic self-sufficiency and self-determination.
- Improvements to communication, coordination, and transparency among the FBIC Tribal Council, tribal departments, the BIA, and the public.

The FBIC PEA is intended for use by both decision-makers and the public, as it discloses relevant environmental information including the analyses of potential direct, indirect, and cumulative impacts that could occur through the implementation of the FBIC ARMP. The Project Area for the FBIC PEA, as shown in Figures 1-1 and 1-2 and Table 1-1, includes all trust and tribal fee lands located within and outside the exterior boundaries of the Reservation, and the fee lands located within the exterior boundaries of the Reservation. Note, the trust and tribal fee lands located outside

of and adjacent to the exterior boundaries of the Reservation are known as the *submarginal lands*. Additionally, although the BIA does not have jurisdiction over the fee lands located within the exterior boundaries of the Reservation, these lands could come into tribal ownership and would therefore be subject to the agricultural leasing and permitting provisions of this PEA. Therefore, those fee lands are included in the Project Area and as part of the FBIC PEA analysis.

TABLE 1-1. LAND OWNERSHIP IN THE PROJECT AREA

Land Ownership Type	Approximate Acreage[1]	Approximate Percentage of the Project Area (%)
Allotted[2]	359,650	54
Tribal[2]	203,040	31
Submarginal Lands	28,395	4
Total Trust Lands	**591,085**	**90**
Federal/State Government	23,504	4
Fee/No Data	36,730	6
Tribal Fee	8,998	1
Total Non-trust Lands	**69,232**	**10**
Overall Total	**660,317**	

Source: BIA 2016; FBIC 2017a
[1] Acreages and totals are not exact due to rounding of numbers and geospatial outputs.
[2] Includes only those acreages located within the exterior boundaries of the Reservation.

FIGURE 1-1. PROJECT AREA

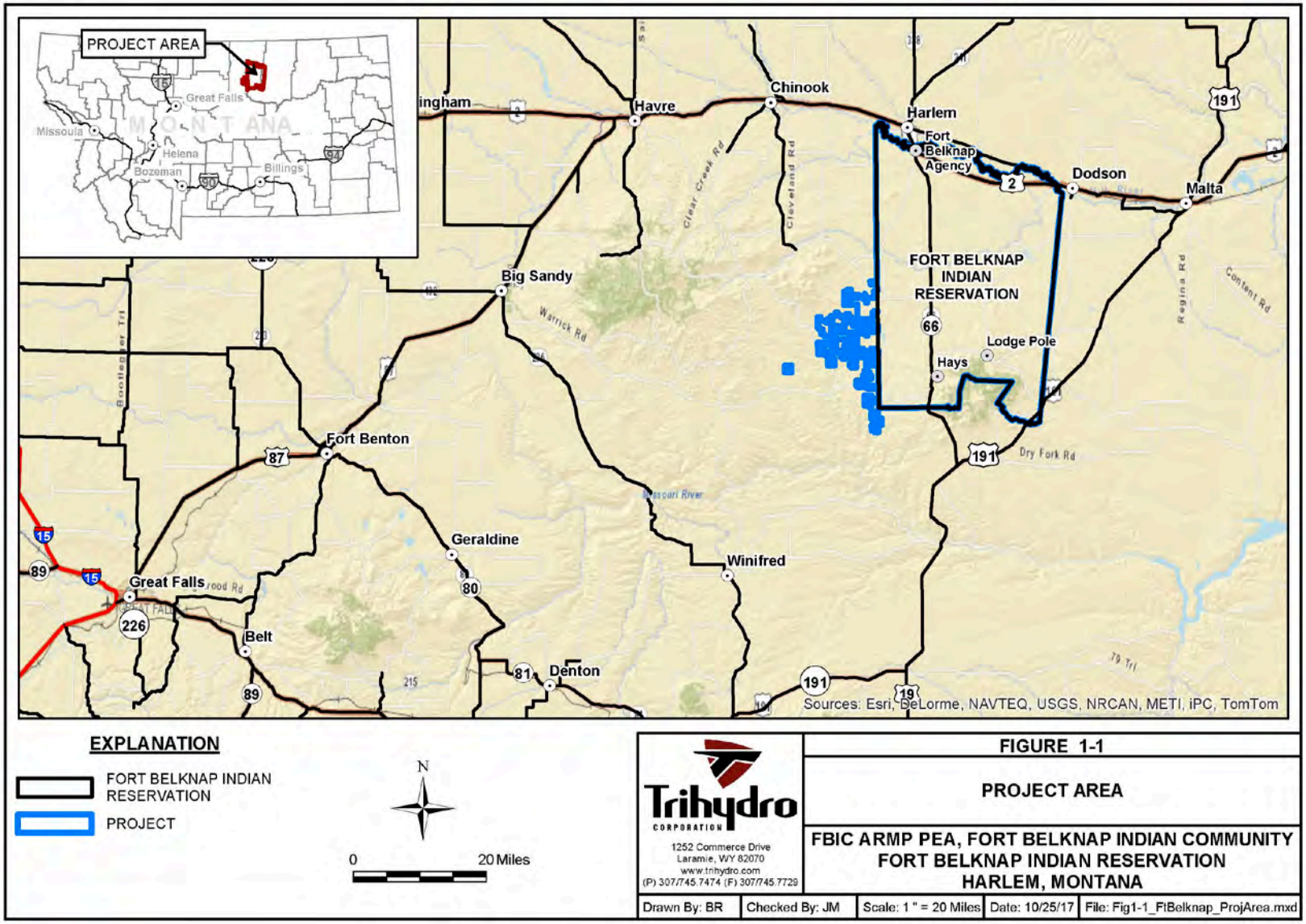

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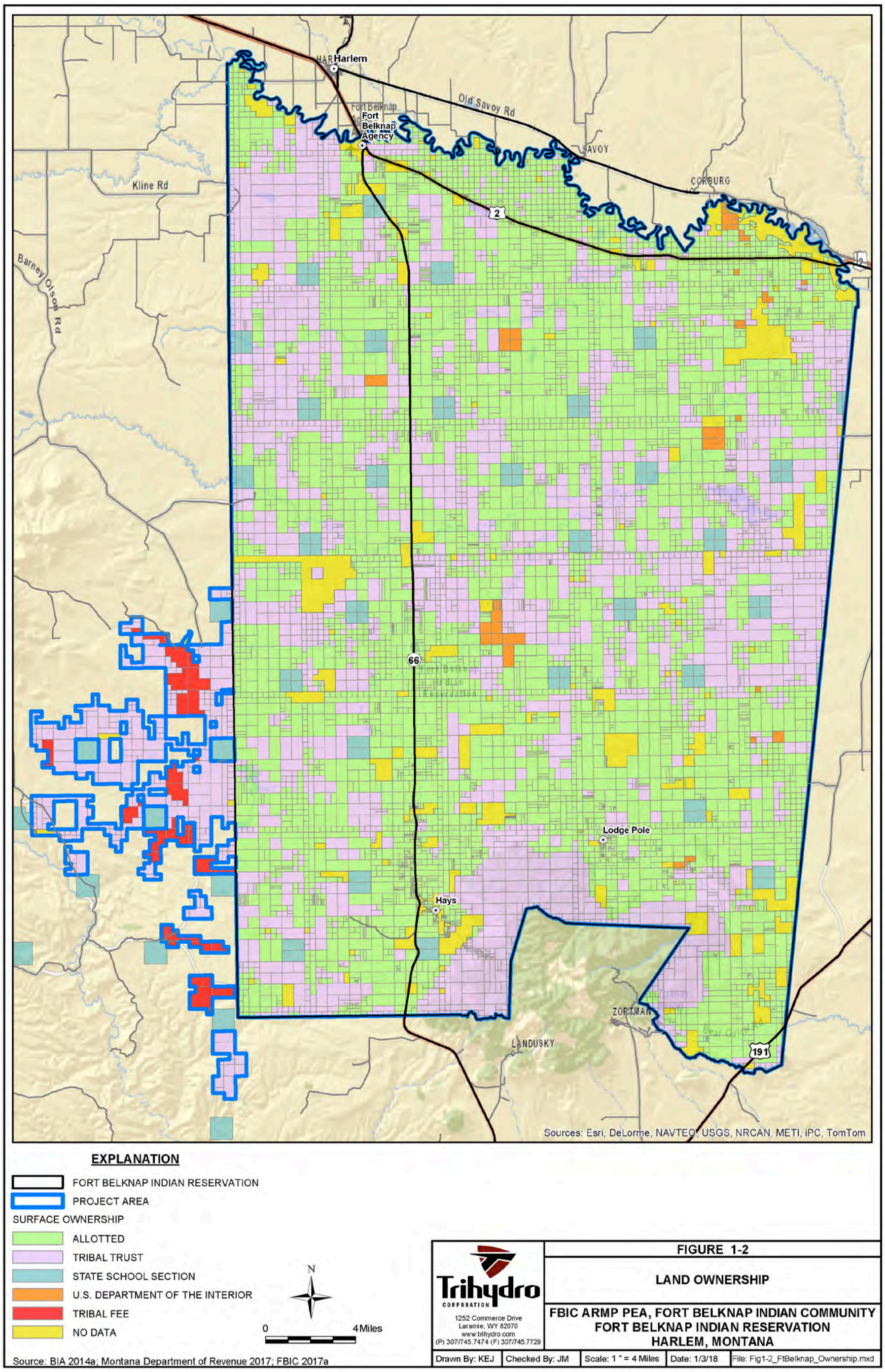
FIGURE 1-2. LAND OWNERSHIP



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1.1.3 RELEVANT FEDERAL STATUTES, REGULATIONS, POLICIES, AND EXECUTIVE ORDERS

BIA uses permitting and leasing as a means to protect and manage FBIC trust agricultural lands. In addition to AIARMA, NEPA, and the proposed FBIC ARMP/PEA, the following statutes, regulations, and executive orders impose requirements on the BIA regarding the management of FBIC agricultural resources.

- 5 U.S.C. 552, Freedom of Information Act
- 5 U.S.C. 552a, Privacy Act
- 7 U.S.C. 136-136y, Federal Insecticide, Fungicide, and Rodenticide Act
- 7 U.S.C. 2801-2813, Federal Noxious Weed Act
- 16 U.S.C. 470, National Historic Preservation Act
- 16 U.S.C. 470aa, Archaeological Resources Protection Act
- 16 U.S.C. 1531 et seq., Endangered Species Act (ESA)
- 25 U.S.C. 466, Indian Forestry Units; rules and regulations
- 25 U.S.C. 2201, Indian Land Consolidation Act
- 25 U.S.C. 3001, Native American Graves Protection and Repatriation Act
- 25 U.S.C. 3745, American Indian Probate Reform Act
- 29 U.S.C. 61 et seq., Occupational Safety and Health Act
- 33 U.S.C. 1251-1387, Federal Water Pollution Control Act, as amended
- 43 U.S.C. 315, Taylor Grazing Act
- 44 U.S.C. 3101 et seq., Records Management
- Executive Order 11514, Protection and Enhancement of Environmental Quality, as amended by Executive Order11991, relating to Protection and Enhancement of Environmental Quality
- Executive Order 13084, Consultation and Coordination with Indian Tribal Governments
- Secretarial Order 3175, Departmental Responsibilities for Indian Trust Resources
- Secretarial Order 3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the ESA
- Secretarial Order 3215, Principles for the Discharge of the Secretary's Trust Responsibilities

1.1.4 TRIBAL AUTHORITIES

The FBIC also uses permitting and leasing as a means to protect and manage tribal agricultural lands. The following resolutions and ordinances impose requirements on the FBIC Tribal Council and FBIC members regarding the management of tribal agricultural resources. Note that the list below is not comprehensive.

- Constitution of the Fort Belknap Indian Community of the Fort Belknap Indian Reservation, amended August 2001
- By-Laws of the Fort Belknap Indian Community of the Fort Belknap Indian Reservation, September 1935
- Fort Belknap Indian Community Code of Ethics, April 1994
- Ordinance No. 250-2005 2005 – 2008 Grazing Ordinance Fort Belknap Indian Reservation
- Farm/Pasture Ordinance, amended February 2000
- Resolution #65-92, amended June 18, 1999 Land Management Plan of Operations of the Fort Belknap Indian Community
- Cultural Property Code of the Fort Belknap Indian Community
- Ordinance No. 1-90 Livestock Health Ordinance, Trichomoniasis Code
- FBIC Aquatic Resource Protection Ordinance
- Resolution No. 173-2012 Development and Implementation of a Noxious Weed Management Plan

1.2 COMMUNITY INVOLVEMENT/PUBLIC SCOPING

Community involvement was essential for the development of the FBIC ARMP/PEA. Not only is community involvement required per AIARMA and NEPA (i.e., public scoping), community input was used to ensure that the FBIC ARMP/PEA reflected the needs, wishes, and concerns of the FBIC, FBIC Tribal Council, and BIA Fort Belknap Agency. The community involvement opportunities/activities are described in more detail below.

1.2.1 INTERNAL SCOPING

An internal project kickoff meeting was held in Fort Belknap Agency, Montana, in the FBIC Tribal Council Chambers in April 2017. Representatives from the FBIC Tribal Council, BIA Fort Belknap Agency, and Trihydro met to discuss the scope of the ARMP, the potential alternatives for the PEA, the project schedule, and next steps. In addition, the FBIC Tribal Council indicated they believed that the creation of an Advisory Group made up of the FBIC Tribal Council members, personnel from FBIC tribal departments, BIA Fort Belknap Agency personnel, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) representatives, FBIC members, Indian Nations Conservation Alliance (INCA) representatives, and subsequently USDA Farm Service Agency (FSA) representatives would aid in the development of a comprehensive and accurate ARMP.

1.2.2 EXTERNAL SCOPING

The opportunity for public participation in the NEPA process began with the publication of the Notice of Intent (NOI) on June 28, 2017 through July 28, 2017. The NOI was repeatedly announced on local radio stations, posted at the BIA Fort Belknap Agency, and published in the Phillips County News and Blaine County Journal on June 28, 2017. The NOI was also posted in and around the Reservation at the following locations:

- Fort Belknap Agency/Harlem, MT
  - BIA Fort Belknap Agency Office
  - Tribal Office
  - Indian Health Service Office
  - U.S. Post Office
  - Kwikstop Store
  - EZ-Mart Store
  - Albertsons Grocery Store
- Hays, MT
  - Martins' Grocery Store
  - U.S. Post Office
- LodgePole, MT
  - Chief Nosey Center
- Zortman, MT
  - Zortman Store
- Dodson, MT
  - U.S. Post Office

Four public scoping/community meetings were held in each community on the Reservation to solicit public scoping comments and general feedback on the proposed FBIC ARMP/PEA, including the proposed NEPA alternatives and potential resource concerns. The meetings were announced on local radio stations, and flyers that advertised the meetings were posted throughout the Reservation at public venues (e.g., stores, post office, tribal offices, etc.). The meetings were held at the locations and dates shown in Table 1-2.

TABLE 1-2. PUBLIC SCOPING MEETING/COMMUNITY MEETING LOCATIONS AND TIMES

Location	Date	Time
Aaniiih Nakoda College, Fort Belknap Agency	July 17, 2017	6:00 p.m. – 7:30 p.m.
St. Thomas Church/Two Kills Parish Center, Lodgepole	July 18, 2017	6:00 p.m. – 7:30 p.m.
Kills At Night Center, Hays	July 19, 2017	6:00 p.m. – 7:30 p.m.
Sacred Heart Church, Dodson	July 20, 2017	6:00 p.m. – 7:30 p.m.

Fifteen formal scoping comments were received during the 30-day NOI comment period in addition to the general feedback received as verbal comments throughout the meetings. Based on the formal scoping comments, the FBIC would like to see improved approaches to agricultural land management; specifically, increased tribal agricultural assistance, reassessment of the current animal unit months (AUMs) allotted for each range unit and the process used to

determine the leasing and grazing rates and AUMs, and changes to the current farm/pasture lease and grazing permit processes.

The use and lack of agricultural water resources were additional commonly expressed concerns identified in the public scoping comments. Specific comments focused on the need for the implementation of sustainable water use practices, improvement of the quality of crucial water resources, and the improvement and increase in use of existing and historical irrigation systems (e.g., natural springs, Milk River, Lake 17, etc.).

Comments also expressed concerns about the control and treatment of noxious weeds throughout the Project Area. Specific concerns included the need for an increase in noxious weed monitoring efforts, an increase in regulations on the transportation of hay throughout the Project Area, and additional regulations on the use of herbicides, pesticides, and fertilizers.

Comments also suggested that agricultural operators should be given precedence in the farm/pasture leasing and grazing permitting processes, and that farm/pasture lease and grazing permit rates should not present obstacles to tribal producers. Additional comments suggest the need for communal spaces to accommodate cultural activities, such as the husbandry of horses and the cultivation of medicinal herbs.

Additional comments also focused on concerns regarding the process for developing the FBIC ARMP/PEA; in particular, it was suggested that increased communication with individual agricultural operators during the development of the FBIC ARMP/PEA should occur, even if it requires an expanded scope of work/increased project length. A request to review the draft ARMP/PEA was also noted.

1.2.3 COMMUNITY ENGAGEMENT

1.2.3.1 FBIC ADVISORY GROUP

Under direction from the FBIC Tribal Council, the FBIC Advisory Group was organized to provide feedback and guidance on the development of the FBIC ARMP. The FBIC Advisory Group met bi-weekly (generally via conference call) throughout the entire development of the FBIC ARMP/PEA. The meetings typically consisted of updates on the project process provided by Trihydro, input on the project process, and discussion of pending project items and upcoming project objectives. The feedback and guidance received from the FBIC Advisory Group helped to ensure that the final FBIC ARMP/PEA reflected FBIC worldviews, desires of the community, and current agricultural conditions and practices on the Reservation. The FBIC Advisory Group was made up of the following members, as suggested by the FBIC Tribal Council:

- Mark Azure – Tribal Council President
- Andy Werk – Tribal Council President
- George Horse Capture, Jr. – Tribal Council Vice President/White Clay Society
- Gerald “Manny” Healy – Tribal Council Vice President
- Alvin "Jim" Kennedy – Tribal Council Member
- Curtis Horn – Tribal Council Member
- Dominic Messerly – Tribal Council Member
- Donovan Archambault Sr. – Tribal Council Member
- John Hawley – Tribal Council Member
- Kyle Bigby – Tribal Council Member
- Lynn Cliff Jr. – Tribal Council Member
- Robert Bearcub – Tribal Council Member
- Warren Morin – Tribal Council Member
- Phillip Shortman – Tribal Council Member
- Brandi King – Tribal Council Member
- Jeffrey Stiffarm – Tribal Council Member
- Nathaniel Mount – Tribal Council Member
- Bronc SpeakThunder – FBIC Buffalo Program
- Ina Nez Perce – FBIC Environmental Department
- Harold "Jiggs" Main – FBIC Fish and Wildlife Department/White Clay Society
- Kristal Hawley-Fox – FBIC Irrigation Department
- Carl Healy Sr. – FBIC Transportation Department
- Peggy Doney – FBIC Land Department
- Michael Black Wolf – Tribal Historic Preservation Officer (THPO)
- Joey Kill Eagle – FBIC Conservation District
- Dennis Longknife – Climate Change Coordinator
- John Allen – Buffalo Chasers Society
- Jerry Lankford – FBIC Farmer
- Ryan Lankford – FBIC Farmer
- Dave Kirkaldie – FBIC Rancher
- Gerald Wash – FBIC Rancher
- John St. Pierre – BIA Fort Belknap Agency
- Gerald Hockhalter – BIA Fort Belknap Agency
- Lorraine Brien – BIA Fort Belknap Agency
- Rochelle LaMere – BIA Fort Belknap Agency
- Roc Becenti – INCA
- Dick Gooby – INCA
- Shaun Holcomb – USDA NRCS
- Blake Stiffarm – USDA NRCS
- Tracy Harshman – USDA FSA
- Miranda Skoyen – USDA FSA

Note that a tribal council election was held in November 2017, and new tribal council members were elected, including a new president and vice president.

1.2.3.2 COMMUNITY MEETINGS

In addition to the public scoping meetings/community meetings held in July, a second set of community meetings were held in October. The purpose of the meetings was to share the draft FBIC ARMP with the public and to gather community input on the draft document. The meetings were announced on local radio stations, and flyers that advertised the meetings were posted throughout the Reservation at public venues (e.g., stores, post office, tribal offices, etc.). The meetings were held at the locations and the dates shown in Table 1-3.

TABLE 1-3. COMMUNITY MEETING LOCATIONS AND TIMES

Location	Date	Time
Aaniiih Nakoda College, Fort Belknap Agency	October 9, 2017	5:30 p.m. – 7:00 p.m.
Sacred Heart Church, Dodson	October 10, 2017	5:30 p.m. – 7:00 p.m.
St. Thomas Church/Two Kills Parish Center, Lodgepole	October 11, 2017	5:30 p.m. – 7:00 p.m.
Kills at Night Center, Hays	October 12, 2017	5:30 p.m. – 7:00 p.m.

The draft FBIC ARMP/PEA was made available online for public review on September 28, 2017. In addition, copies of the draft document were placed throughout the Reservation to facilitate the community review process beginning October 2, 2017. Public review of the draft document was scheduled to end October 13, 2017; however, after receiving community requests to extend the public review period, the FBIC Tribal Council extended the review period through November 13, 2017.

Public comments received during the public comment period were expressed in writing, as well as verbally during the community meetings. Comments addressed several topics including the goals and objectives of the draft ARMP. Generally, the community expressed concerns that the length of the public comment period was not adequate and should be extended to allow for a more thorough public review of the draft ARMP. Specific recommendations for an extended comment period ranged from two weeks to several months.

Some of the comments received concerned specific language in the document; particularly, the proposal of specific words and phrases, which would further expand on or clarify existing material in the draft ARMP. Additional suggestions pertaining to the ARMP included outlining the specific phases for certain proposed processes and identifying the personnel responsible for implementing each phase. Another commonly expressed concern received pertained to the leasing and permitting of land. Specifically, many community members suggested that enrolled tribal members should be offered leasing preference over non-members in all situations. Similarly, several community members proposed that enrolled tribal members should not have to compete with non-members for the highest bid. Conversely, several landowners expressed that they would like to receive the highest bid for the use of their land.

Additionally, comments suggested that individual tribal members should be offered leasing preference over corporations in all situations.

Tribal fees were a widely expressed concern during the public comment period. The current fee levied on non-members for the right-to-do business was commonly identified by members as necessary to gain capital used to fund community services. It was noted that although an exemption of this fee may benefit tribal members who are agricultural operators and married to non-members, the community, as a whole, may lose income. Conversely, some tribal members expressed concern that they are required to pay the fee based solely on the fact that they are married to a non-member.

The treatment of noxious weeds in the Project Area was another commonly expressed concern received during the public comment period. Specifically, community members expressed concerns regarding the presence of noxious weeds along the highway rights-of-way (ROWs); the aerial application of chemicals; and the inadvertent distribution of noxious weeds across the Reservation from sources such as vehicles and/or the transportation of hay for hay sales. Examples of specific recommendations provided by the community for noxious weed control included increased traffic control and restricted chemical application. Community members also requested that specific processes for controlling noxious weeds be included in the ARMP, such as biological, mechanical, and chemical control methods.

Enforcement of existing tribal ordinances was another widely expressed concern received during the public comment period. Primarily, these comments concerned the responsibility of lessees and permittees to make payments, as well as the obligation of the Land Department to enforcement penalties imposed on individuals in the event that lease or permit terms are violated.

Comments concerning water resources and irrigation within the Project Area were also expressed by the community. Specifically, community members wanted to see the restoration of existing livestock water sources and additional information added to the ARMP about the historical irrigation projects and the FBIC water rights compact (i.e., the *2001 ratification of the Water Rights Compact Entered Into By the State of Montana, the Fort Belknap Indian Community of the Fort Belknap Reservation, and the United States of America*; hereafter "Water Rights Compact").

Lastly, public comments called for an increase in the number of opportunities available for young and inexperienced community members interested in farming and/or ranching. Suggestions to increase opportunities generally focused on the development of a mentoring program, which would allow established ranchers and agricultural operators to provide aspiring community members with skills and advice necessary to successfully ranch and farm in the Project Area. Similarly, some community members suggested that young or inexperienced community members (e.g., less than 5 years of experience) could be offered incentive to lease lands by setting aside a subset of allocated lands specifically for this purpose. This approach could help promote future generations of local ranch and agricultural operators, as

community members indicated these career paths are difficult to successfully achieve in the Project Area without assistance.

Additional community involvement resulted in identifying issues with the lack of the enforcement of the hunting ordinance, which has led to gates routinely being left open and fences being cut. In addition, community members noted that damage to the land is occurring from vehicles being driven on the grasslands in the range units. A recommendation to address this issue was to increase hunter education, as some community members expressed concerns that violations of the hunting ordinance may be a result of limited hunter education.

1.2.3.3 SITE VISITS

In an effort to develop an ARMP that was as comprehensive as possible and reflective of FBIC agricultural conditions, Trihydro personnel spent time on the Reservation throughout the development of the document, meeting with FBIC members and FBIC tribal departments, and conducting site visits at various locations throughout the Reservation. Details of these visits and meetings are summarized below.

1.2.3.3.1 JUNE 2017

In June 2017, the Trihydro FBIC ARMP/PEA Project Manager spent a week participating in site visits and attending tribal department meetings throughout the Reservation. During that week, the Trihydro FBIC ARMP/PEA Project Manager met with the BIA and FBIC Land Department to begin discussing and documenting leasing and permitting processes; attended a site visit of the Gilbert Ranch and spoke with Mr. Jay Smith; attended a site visit of the Dead River with the BIA; attended a site visit of the Lankford Farm and spoke with Mr. Ryan Lankford; attended a site visit of Lake 17 and Milk River Dam and drainage ditches; and met with Ms. Kristal Hawley-Fox with the FBIC Irrigation Department. The purpose of the site visits was to provide the Trihydro FBIC ARMP/PEA Project Manager with a better understanding of the farming, ranching, and irrigation operations on the Reservation and an opportunity to make field observations of the ongoing agricultural operations. The purpose of the meetings was to begin discussions in an effort to gain an understanding of the different responsibilities of various FBIC tribal departments, and to better understand FBIC members' thoughts and concerns regarding agricultural management on the Reservation.

1.2.3.3.2 JULY 2017

The Trihydro FBIC ARMP/PEA Project Manager and the Deputy Project Manager spent the week of July 17, 2017, on the Reservation facilitating public scoping meetings/community meetings in the evening and participating in site visits and tribal department meetings during the day. During that week, the Trihydro project team members spoke with Mr. SpeakThunder and attended a site visit of both buffalo pastures; spoke with Mr. Black Wolf and attended a site visit of some cultural sites; spoke with Mr. McCabe and attended a site visit of his ranch; spoke with Mr. and Mrs. Walsh who are ranchers; met with the FBIC Environmental Department; met with Mr. Main with the FBIC Fish

and Game Department; and met with the BIA and FBIC Land Department to discuss leasing and permitting processes. The purpose of the meetings and site visits was to provide Trihydro project team members with a better understanding of the different responsibilities of various FBIC tribal departments and to encourage FBIC tribal department employees and FBIC members to share their questions, thoughts, and concerns regarding agricultural management on the Reservation.

1.2.3.3.3 AUGUST 2017

During the week of August 15, 2017, Trihydro FBIC ARMP Senior Water Resources Engineer spent three days participating in site visits and attending tribal department meetings and discussions throughout the Reservation, focusing primarily on irrigation. During that week, the FBIC ARMP Senior Water Resources Engineer met with the BIA, USDA NRCS, and FBIC Irrigation Department personnel along with a number of irrigators. Discussions focused on irrigation facilities and their conditions as well as issues of concern from the irrigation community. A thorough site visit of the Milk River Dam and associated irrigation ditches, laterals, and drains was conducted by BIA staff, Ms. Kristal Hawley-Fox (FBIC Irrigation Department) and Tribal Councilman Archambault. The purpose of the site visits, meetings, and discussions was to provide the Trihydro FBIC ARMP staff with an understanding of the different responsibilities of various FBIC tribal departments, and to assist Trihydro FBIC ARMP staff with better understanding FBIC members' thoughts and concerns regarding irrigation management on the Reservation. Additionally, Trihydro FBIC ARMP staff left with a good understanding of the farming and irrigation operations on the Reservation, which was facilitated by the opportunity he had to make field observations of ongoing agricultural operations as well as of facility conditions. Other irrigation sites visited include the old, abandoned Ereaux and Hays Irrigation Projects. During the week an extensive meeting was also held with USDA NRCS District Conservationist, Mr. Shaun Holcomb and Soil Conservationist and FBIC member, Mr. Blake Stiffarm to gain information on the Lake 17 Project as well as funding opportunities through the USDA NRCS.

The Trihydro FBIC ARMP Rangeland Plant Ecologist and Senior Water Resources Engineer spent the week of August 29, 2017, on the Reservation meeting with members of the FBIC Advisory Group, BIA staff members, and tribal staff members, and participating in site visits in the Project Area. During the three day visit to the Reservation, the Trihydro ARMP Rangeland Plant Ecologist spoke with Mr. Holcomb regarding the 2006 Rangeland Inventory Reports that were compiled for range units; met with Mr. Main with the FBIC Fish and Game Department and his staff regarding the greater sage grouse (*Centrocercus urophasianus*) population and habitat use within the Reservation; toured numerous range units throughout the Project Area with Mr. Longfox, Mr. Hockhalter, Ms. LaMere, and Mr. Holcomb; and spoke with the BIA and tribal range riders regarding existing and previously developed, but currently inoperable, water resources. The Trihydro FBIC ARMP Senior Water Resources Engineer also spent an afternoon inspecting and inventorying the lower portions of the Milk River Irrigation System below Whitebear with ditch-rider and irrigator Mr. Craig Adams.

Site visits to range units were selected to visually evaluate grazing intensity, utilization, and spatial patterns of livestock use; observe the current vegetation communities that are distributed across the Project Area; assess the distribution and abundance of noxious weeds and/or invasive species; and observe the current distribution of water resources for livestock and how the distribution of the water resources influences grazing patterns.

The purpose of the meetings, discussions, and range unit site visits was to provide the Trihydro project team members with a better understanding of current vegetation conditions, the availability, distribution, and condition of livestock watering facilities within range units, and the ongoing challenges associated with administering grazing leases and enforcing grazing policies.

1.3 FBIC AGRICULTURAL RESOURCES

Agriculture is the predominate land use in the Project Area. Approximately 60 percent (%) of land is used for farming or ranching activities (i.e., approximately 388,900 acres)[1]. Ranching is the principal agricultural activity, accounting for approximately 42% of the land in the Project Area, while farming accounts for approximately 23%. Ranching and farming practices on lands under the jurisdiction of the FBIC Tribal Council in the Project Area are generally governed by the 2005 – 2008 Grazing Ordinance (hereafter Grazing Ordinance), the 2000 Farm/Pasture Ordinance (hereafter Farm/Pasture Ordinance), and the 1999 Land Management Plan of Operations of the Fort Belknap Indian Community (hereafter Land Management Plan of Operations). The general leasing and permitting processes are described below for the FBIC agricultural resources and are further detailed in Appendix A. The FBIC Tribal Council oversees and works with the Tribal Land Department in administrating the leasing and permitting processes for tribal lands and lands in which the Tribes own greater than 50% interest. The FBIC Tribal Council is also in charge of the grazing unit allocation process, which includes all trust lands assigned to a range unit.

Generally, available farm/pasture tribal tracts and allotted lands in which the Tribes own more than 50% interest are advertised annually for farm/pasture leasing by the Tribal Land Department. Interested parties bid on the available lease, and the FBIC Tribal Council makes the final decision as to who is awarded the farm/pasture lease. A resolution for that lease must then be drafted and approved by the FBIC Tribal Council. The BIA Fort Belknap Agency follows a similar process for leasing allotted lands; the BIA Fort Belknap Agency advertises available allotted tracts annually for farm/pasture leasing through a bid notice. The farm/pasture lease is awarded to the highest bidder.

In terms of grazing permits, the FBIC Tribal Council awards range units/AUMs per the grazing unit allocation process every 10 years. AUMs, which are defined as the amount of forage required to sustain one cow or one cow with one

[1] Note that the total acreage for farming and ranching activities is approximately 388,900 acres; however, based on the rangeland inventory, which includes FBIC range units and farm/pasture lands as of 2006 account for approximately 359,980 acres of land in the Project Area (per USDA NRCS et al [2006] and BIA [2017]). The FBIC range units and farm/pasture lands (as of 2006) data are used when describing rangeland health because it is the latest rangeland inventory.

calf for 1 month, are used to determine stocking rates for range units. After all of the AUMs are allocated to interested FBIC tribal members, surplus AUMs are made available via a competitive bid process and awarded to the highest bidder. If during the course of the 10-year permit period, AUMs are relinquished in any manner, the AUMs will be available for a negotiated price to the existing co-permittee, available for a negotiated price to interested FBIC tribal members, or made available via the competitive bid process. The BIA and FBIC farm/pasture leasing and grazing permit processes are further detailed in Appendix A.

1.3.1 RANGELANDS

FBIC rangelands, which account for approximately 272,000 acres of land in the Project Area, were consolidated to form units of land (i.e., range units) for the management and administration of grazing under a permit. Range units are located throughout the Project Area (Figure 1-3) (BIA 2014a and 2017a). Note that the rangeland data shown on Figure 1-3 and described below, include information from the rangeland inventory that was conducted in 2005-2006 (USDA NRCS et al. 2006) and from the rangeland unit data files from 2014 (BIA 2014a and 2017a). Additionally, the range unit spatial layer providing these data and information is the best available data provided to Trihydro for the purposes of this ARMP; however, some FBIC Advisory Group members have noted that the data is not current. Currently, 47 range units exist in the Project Area with 66 grazing unit permits, all of which are held by tribal members (BIA 2017a).

In addition to livestock grazing, range units are also used for the Tribes' two buffalo (*Bison bison*) herds. The FBIC Buffalo Program manages two buffalo herds in the Project Area. Buffalo were reintroduced to the Reservation in 1974. Today, those buffalo are known as the Snake Butte Herd. The Snake Butte Herd is comprised of approximately 550 buffalo grazing in a 24,000 acre range unit. The FBIC Buffalo Program manages this herd through live sales and hunts. In 2013, the FBIC received 34 genetically pure buffalo from Yellowstone National Park. Today this herd, known as the Yellowstone Herd, numbers 44 and grazes on an approximately 1,000-acre range unit in the central portion of the Reservation.

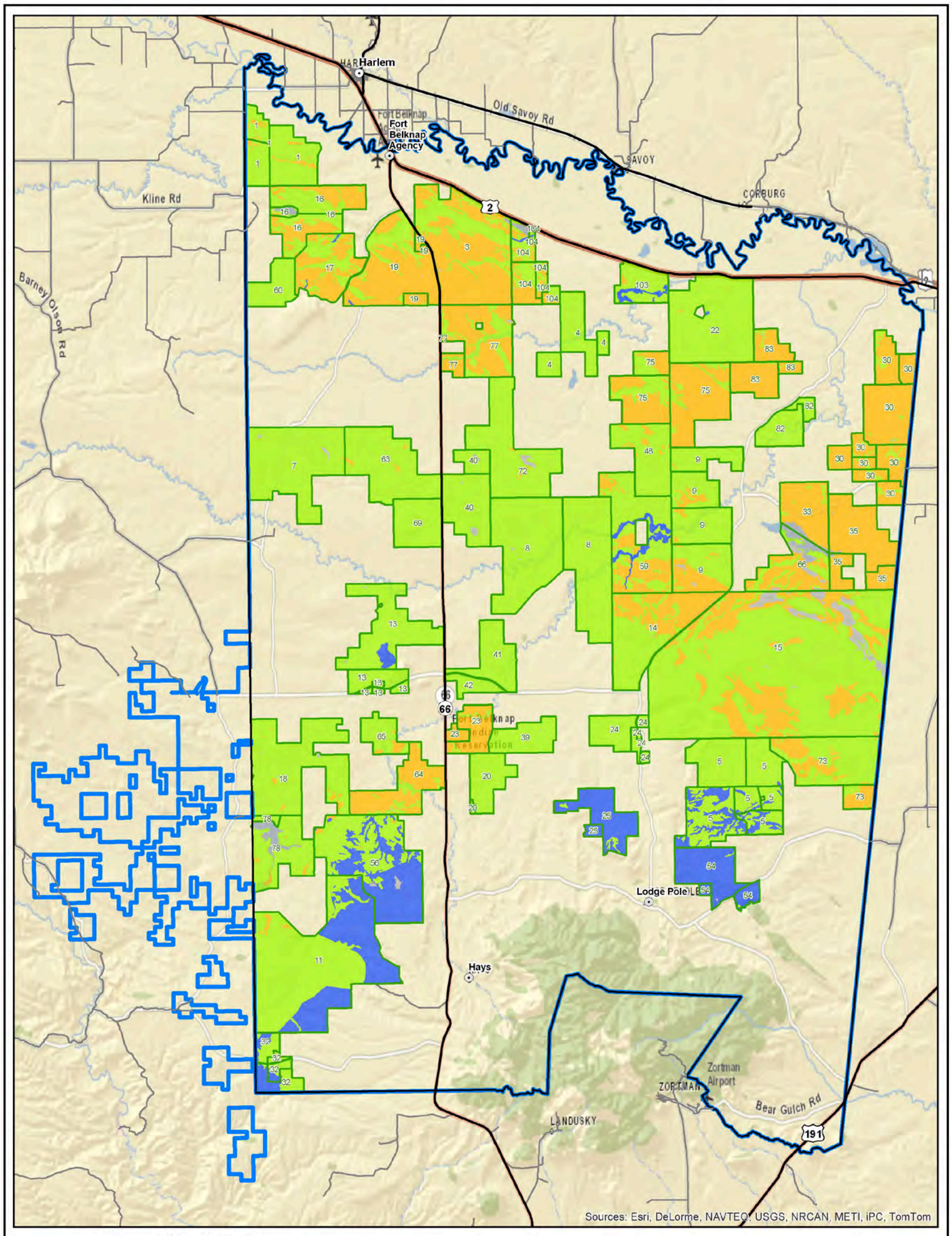
A list of the range units and their associated size and production attributes is available in Appendix B and this information is further discussed below. Please note that the data used to describe the existing rangeland health within the Project Area (following sections) are from data that are over 10 years old and the data also describes farm/pasture land health (USDA NRCS et al. 2006; BIA 2017a). Some general observations of the current rangelands from the site visits conducted in August 2017, and the associated recommendations, can be found in Appendix C (also further discussed in Section 2.2). Note that in Appendices C and D, the term, "rangelands", refers to lands in both range units and farm/pasture units used for grazing.

As of 2017, there were 47 range units located within the Project Area (BIA 2017a). The majority of range units are comprised of 2,000 to 4,000 acres. The total annual production (i.e., above ground vegetation growth) for each range unit, represented by pounds of production per acre (lbs/acre), was calculated by using the reconstructed dry weights of herbaceous species sampled during rangeland inventory events conducted in 2004 and 2005. The average annual production of the range units ranged between 461 lbs/acre and 1,867 lbs/acre. Approximately 98% of the range units produced between 500 lbs/acre and 800 lbs/acre, and the average total production was 664 lbs/acre. The most productive range units were generally larger than 2,000 acres (USDA NRCS et al. 2006).

Soils also play an integral role in rangeland health, as indicated by the most productive range units being located in riparian areas that contain clayey, thin clayey, overflow, and thin silty to silty soils. These soil types are indicative of moisture content comparable to 15 inches to 19 inches of annual precipitation. The least productive range units are dryer, and exhibit saline upland, shallow clay, and silty soils. Soil properties in the Project Area are discussed in greater detail in Section 4.2.

Total annual production can be further refined based on the presence of vegetation that is palatable to livestock. Based on the USDA NRCS et al. (2006) rangeland inventory, production deemed suitable for use by cattle for forage ranged between 320 lbs/acre and 621 lbs/acre on the range units located within the Project Area. On average, those range units produced 450 lbs/acre of cattle forage. Determining production rates assists with the determination of AUMs. Based on those production rates, the average stocking rates for the range units ranged between 0.12 AUM/acre and 0.23 AUM/acre. Per the Grazing Ordinance, cows, horses, sheep, goats, and buffalo are permitted to graze on FBIC rangelands. The animal units (AUs) per species vary, and currently one 1,000-pound cow and calf are defined as 1.0 AU. The AU for a horse and colt is 1.25, 0.2 for a sheep, 0.15 for a goat, and 1.0 for a buffalo. Based on the average stocking rate (0.16 AUM/acre), one 1,000 pound cow and calf would require approximately six acres per month to forage adequately within the Project Area.

FIGURE 1-3. RANGELANDS



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1.3.1.1 RANGELAND SIMILARITY INDEX

Although the total annual production for each of the range units has been determined, one can predict if the annual production rate in each range unit could be increased by comparing it to a reference community using a Similarity Index. A Similarity Index is a value derived from the comparison of existing vegetation communities to the characteristics of natural communities or other reference communities (U.S. Bureau of Land Management [BLM] 2001). For the purposes of this ARMP/PEA, the Similarity Index, identified as a value between 0% and 100%, indicates how close the community is to the Historic Climax Plant Community (HCPC) (USDA NRCS et al. 2006). HCPC can be interpreted as the potential for an ecological site and the plant community and production value that is characteristic of the conditions under which it may have evolved (USDA NRCS 2005). A vegetation community with a 77% or greater Similarity Index value indicates that that current or existing vegetation community is very similar to the HCPC, and that the vegetation in the area is approaching its greatest production potential (BLM 2001). On average, the range units within the Project Area are characterized by a Similarity Index of approximately 33%. Approximately 72% of range units are characterized by Similarity Indices between 30% and 40%. Range Unit 83 (located in the northeast portion of the Project Area) is characterized by the lowest average Similarity Index (26%), while Range Unit 25 (located in the south central portion of the Project Area) is characterized by the highest average Similarity Index (44%). A vegetation community is considered to be in the early to moderate successional stage if it is characterized by a Similarity Index of less than 25% or 50%, respectively (BLM 2001). As such, the majority of range units exhibit moderately successional vegetation communities. These Similarity Indices should be considered as reflective of the potential for this area, as opposed to the plant community that is expected to be found throughout. Departures from the HCPC can be brought about by management actions, drought, a change in the nature fire regime, or the colonization and spread of invasive species and/or noxious weeds (USDA NRCS 2005).

1.3.2 FARM/PASTURE LANDS

Lands that are used as farmlands (including cropland and irrigated lands), pasturelands, and/or are hay lands account for approximately 23% of the Project Area (per BIA 2017b). Per the FBIC 2000 Farm/Pasture Ordinance, farmlands are those lands that are cultivated and used for the purpose of growing small grains or other cash crops. Crops commonly grown in the Project Area generally consist of small grains such as wheat and barley. In addition, other crops that have or are currently being grown in the Project Area generally include canola, lentils, garbanzo beans, alfalfa, mustard, flax, and yellow and green peas. Hay, haylage, winter wheat, and grass silage are also commonly grown in the Project Area on hay lands for the purpose of cutting forage for feeding livestock. Pasturelands are lands that are used for grazing livestock which are not normally accounted for under the range unit permit system. The use of trust lands within the Project Area as farmlands, pasturelands, and/or hay lands must be approved via a farm/pasture lease. Note, a farm/pasture lease is not required for farming activities undertaken by a landowner on his/her land, if he/she is the only landowner for that allotment.

As of December 2017, 1,187 farm/pasture leases were in place throughout the Reservation. Farm/pasture leases cover areas ranging in size from less than 1 acre to over 4,000 acres, with the median amount of land covered by a farm/pasture lease being approximately 50 acres (BIA 2017b). Table 1-4 shows the various types of farm/pasture leases in place, the total number of the various types of farm/pasture leases, and the associated acreages.

TABLE 1-4. TOTAL NUMBER OF FARM/PASTURE LEASES AND ASSOCIATED ACREAGES

Type of Lease	Number of Leases	Approximate Total Acreage Leased
Cropland	8	2,763
Dryland	224	40,158
Irrigated Land	27	925
Pasture Land	752	96,645
ROW	11	104
Other	158	10,990
Unknown	7	519
Total	**1,187**	**152,104**

Source: BIA 2017b

Based on a review of the current acreages held in each farm/pasture lease, the greatest amount of acreage is used for pasture lands; 96,645 acres or 64% of all lands are held in farm/pasture leases. Note, pasture land leases are also the most common type of lease, making up 63% of all of the leases. Cropland leases, which account for approximately 2% of the land leased under farm/pasture leases, are the least common type of lease in place on the Reservation (0.7%) (BIA 2017b).

Croplands are delineated by the USDA FSA and are considered to be lands currently cultivated for crops, or proven to be historically used for cultivation of crops, even if the land no longer supports these activities (USDA FSA 2004). The USDA FSA establishes cropland boundaries by utilizing existing visible, management, and ownership boundary lines (USDA FSA 2004). According to the USDA FSA, croplands make up 116,831 acres of the Project Area (USDA 2017). Note that this does not include farm/pasture units, which are described above and below. Similarly, vegetation data obtained from the Montana Natural Heritage Program (MTNHP) indicate that a total of 116,879 total acres of vegetation in the Project Area are deemed a "Cultivated Cropland Ecological System," which accounts for 100% of the cropland acreage identified by the USDA FSA. Vegetation cover/habitat types are discussed in further detail in Section 4.5. As shown on Figure 1-4, the central, western, and northern portions of the Reservation encompass most of the cropland, while the southcentral and southeast portions of the Reservation contain few and dispersed croplands. The dispersed nature of croplands in the southern portion of the Reservation may be due to the soils in that area. That area of the Reservation exhibits soils associated with moderately steep to steep slopes, which are generally not as conducive

to agricultural production as the soils found in the central and northern portions of the Project Area. Conversely, the central and northern portions of the Reservation exhibit greater surface hydrology, which is associated with soils that contain more moisture and are generally more conducive to agricultural production. Soil properties in the Project Area are discussed in greater detail in Section 4.2.

Based on the most recently rangeland inventory (BIA 2014a), the total annual production of the farm/pasture lands varied from 479 lbs/acre to 1,867 lbs/acre, and the average total annual production was approximately 765 lbs/acre. The cattle forage production ranged between 311 lbs/acre and 854 lbs/acre, and averaged 481 lbs/acre. Stocking rates for the farm/pasture lands ranged between 0.11 AUM/acre and 0.31 AUM/acre. The average stocking rate for the farm/pasture lands is the same as the average stocking rate for the FBIC rangelands (i.e., 0.17 AUM/acre) (BIA 2014a and 2017a). Therefore, one 1,000 pound cow and calf would require approximately six acres per month to forage adequately in the farm/pasture units located within the Project Area. Appendix C includes recommendations for farm/pasture lands. Note, production values discussed above are based upon the most recent rangeland inventory (BIA 2014a) and do not necessarily reflect the production values associated with the farm/pasture leases included in Table 1-4.

1.3.2.1.1 FARM/PASTURE LAND SIMILARITY INDEX

The Similarity Indices for farm/pasture lands ranged from 21% to 45%, with an average Similarity Index of approximately 35%. Farm/Pasture Unit 999 (the northernmost tract of the submarginal lands) is characterized by the lowest Similarity Index value (21%), while Farm/Pasture Unit 252 (located in the southern portion the Project Area) is characterized by the highest Similarity Index value (45%) (BIA 2014a; BIA 2017a). Overall, most of the vegetation communities located on the farm/pasture units are considered moderately successional, which should be considered as reflective of the potential for this area, as opposed to the plant community that is expected to be found throughout the Project Area (USDA NRCS 2005).

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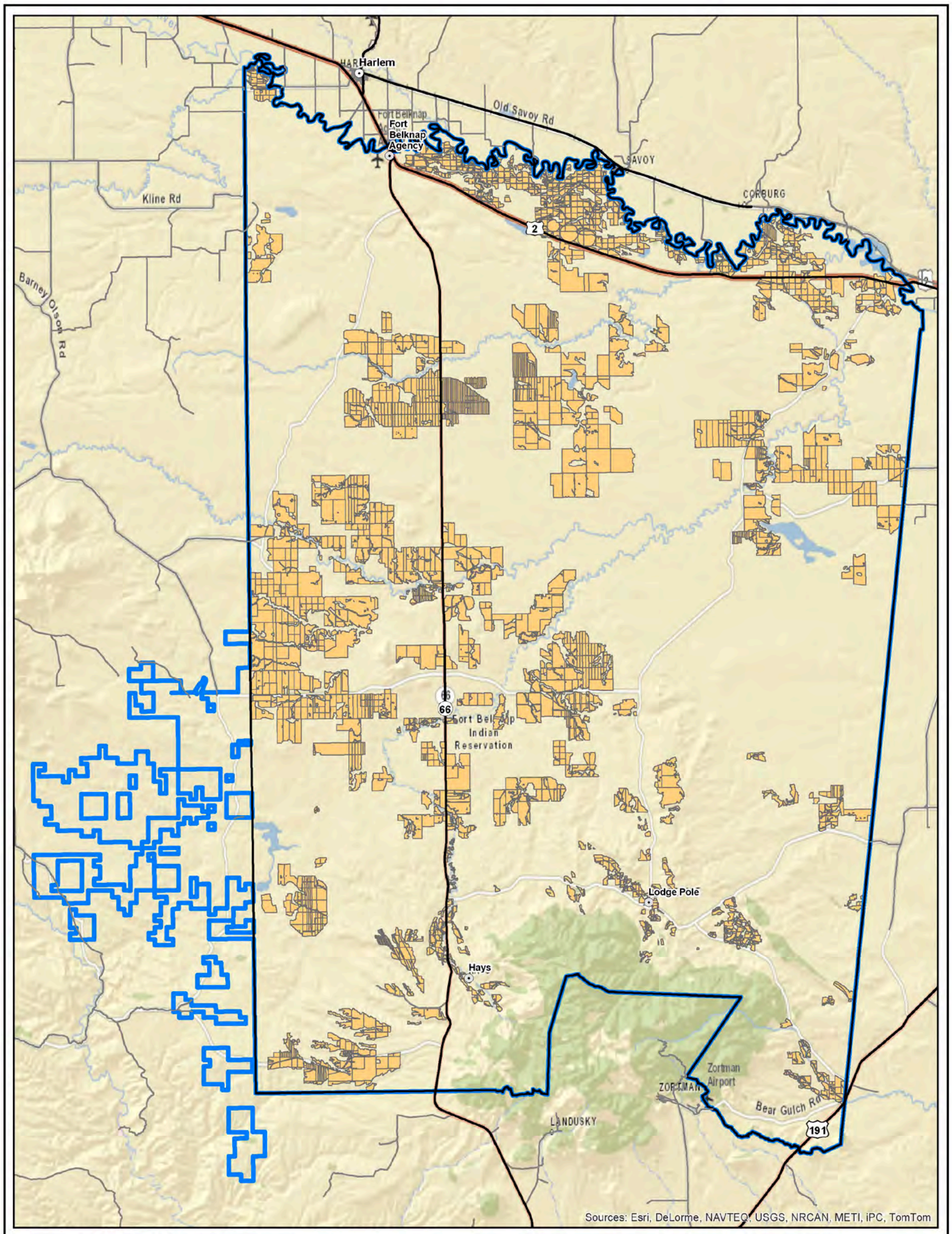
FIGURE 1-4. USDA FSA CROPLANDS



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1.3.3 NOXIOUS WEEDS AND INVASIVE SPECIES

Noxious weeds and invasive species are present on thousands of acres throughout Project Area and effectively displace desirable species within farm/pasture lands and native species along roadsides and within rangelands. Collectively, the presence of noxious weeds can negatively affect the overall revenue associated with agricultural activities in the Project Area. These effects are fully described in the 2013 FBIC Noxious Weed Strategic Plan (hereafter, Noxious Weed Strategic Plan) and associated 2016 Noxious Weed Management PEA. Currently, there are 32 weeds listed on the Montana statewide noxious weed list that infest about 7.6 million acres statewide. Over the past 150 years, the rate of introduction and spread of noxious weeds has increased dramatically, due to increases in human activities, trade, and commerce (Montana Weed Control Association 2016a). Based on public input received and observations made during the 2017 site visits and community meetings, the following species are the most problematic on agricultural lands located within the Project Area: knapweed (i.e., diffuse knapweed [*Centaurea diffusa*], Russian knapweed [*Acroptilon repens*], spotted knapweed [*Centaurea stoebe*]), kochia (*Bassia scoparia*), leafy spurge (*Euphorbia esula*), Russian olive (*Elaeagnus angustifolia*), and cheatgrass (*Bromus tectorum*). Many known infestations and their locations are described and shown in Section 4.5.

Noxious weeds can cause economic impacts to farmers and ranchers in many ways. Nationwide, noxious weeds are responsible for an estimated $34 billion in economic losses, each year (Fuller and Mangold 2017). For example, economic losses are incurred by landowners, farmers, and ranchers from the presence of noxious weed infestations on grazing lands through reduced AUMs, reduced livestock sales, and decreased land values; through reduced cropland and crop production; and through direct and secondary impacts that noxious weed infestations can have on state and regional economies. For example, based on Bangsund and Leistritz (1991), within 5 years, Montana lost approximately 159,020 AUMs due to leafy spurge infestations, which is estimated to be an approximately $2.2 million loss due to reduced rangeland cash rents and the diminished value of the AUMs. The impact on livestock sales due to leafy spurge infestations in Montana was also estimated; in 1990, the lost AUMs could have supported 17,032 cows, which would have generated $6.9 million in livestock sales. The total direct economic impacts (value of lost AUMs and expenditure reductions) of leafy spurge infestation on grazing lands in Montana in 1990 were $5.7 million. If leafy spurge infestations in Montana were assumed to grow unrestricted for 5 years, a total of $25.6 million total economic impacts are estimated in 1995. Another example is provided by Thompson et al. (1990) with impacts to croplands in North Dakota. An estimated $10.7 million was lost in agricultural crops due to losses associated with present leafy spurge infestation. Based on Hirsch and Leitch (1996), approximately $3.2 million, the value of lost AUMs due to reduced forage output on private and public grazing land in Montana, was the direct economic impact on ranchers and landowners due to knapweed infestations.

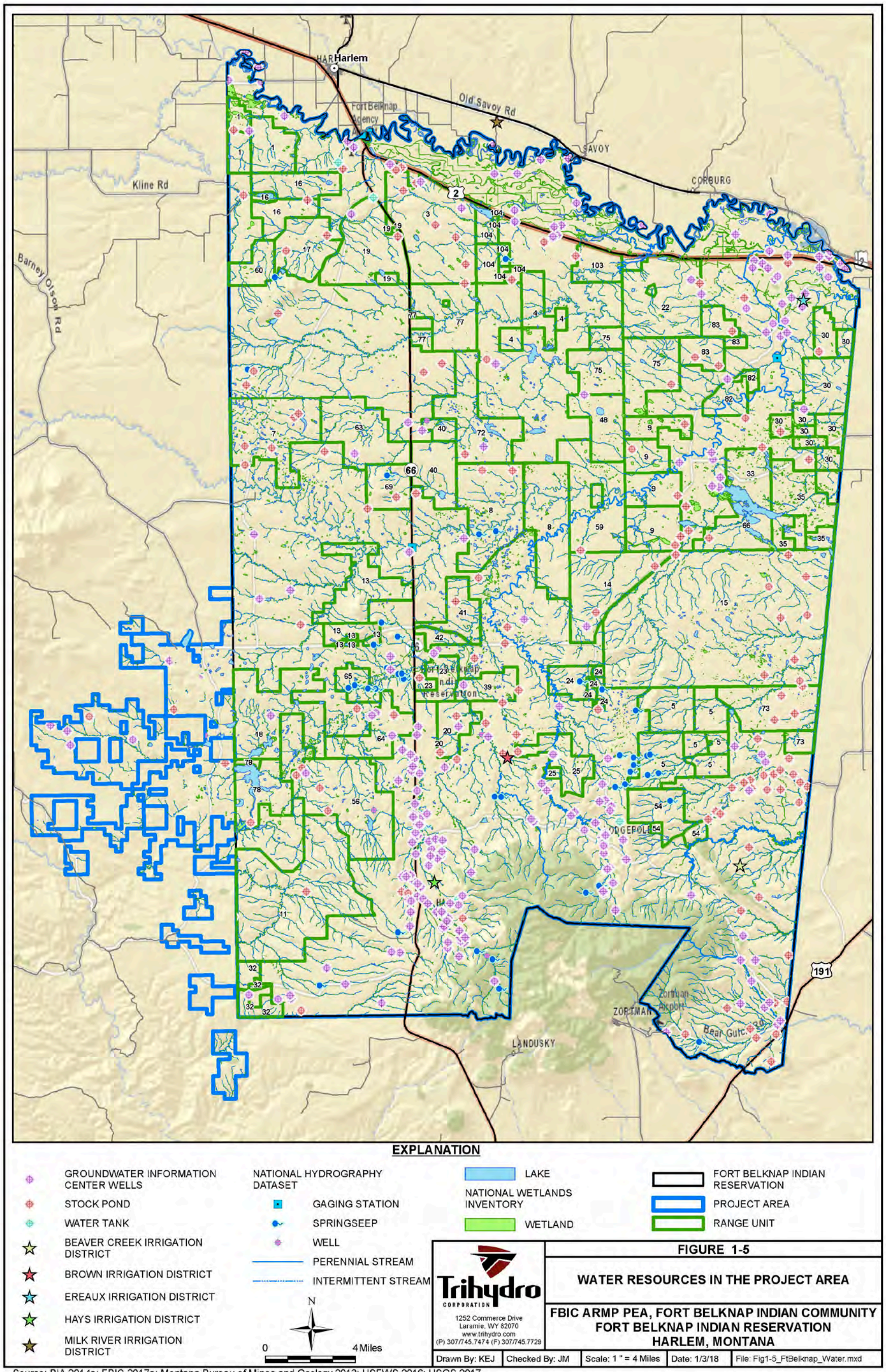
Another problematic plant species is Clubmoss (*Selaginella densa*), which is native to eastern Montana. It is considered problematic and can degrade rangeland quality and productivity, due to its mat-forming properties and

extensive, shallow root system, which quickly absorb most of the precipitation and limits moisture available for other species. Clubmoss often establishes a dominant presence in rangelands that have been heavily grazed, and it reduces diversity and overall potential livestock forage. This species is known to be problematic in Montana, and federal funding has facilitated the trial of mechanical and biological treatments to control established populations (USDA NRCS n.d.).

1.3.4 AGRICULTURAL WATER RESOURCES

An inventory of the agricultural surface water sources, such as springs, water wells, water tanks, stock ponds, etc., on the Reservation is shown on Figure 1-5 and further described in Section 4.3 (as general water sources). Generally, springs and water wells are distributed throughout each range unit; however most of the water sources are in some state of disrepair. Additionally, due to changes in land ownership, some range units are lacking surface water sources. Irrigation waters are provided through the Fort Belknap Milk River Irrigation Project, which serves approximately 9,000 acres. Appendices D-E provide additional information on agricultural water resources in both the range units and farm/pasture units associated with livestock watering and irrigated farmlands, generally located along the Milk River.

FIGURE 1-5. WATER RESOURCES IN THE PROJECT AREA



Source: BIA 2014a; FBIC 2017a; Montana Bureau of Mines and Geology 2013; USFWS 2016; USGS 2017

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2.0 ARMP MANAGEMENT GOALS AND OBJECTIVES

The following section provides the Tribes' critical values and the associated holistic goals, objectives, and recommendations. Additionally, the following section (and accompanying appendices) provide specific actions for reaching the established measurable objectives.

2.1 CRITICAL TRIBAL VALUES

It is imperative to consider the critical tribal values related to agricultural resources on the Reservation to confirm that the ARMP does not conflict with critical tribal values. The critical tribal values were developed based on the Constitution of the Fort Belknap Indian Community of the Fort Belknap Reservation (FBIC 2001), the Integrated Resource Management Plan and Environmental Assessment (FBIC 1988), and feedback and direction received from FBIC members, and the FBIC Advisory Group, including the FBIC Tribal Council. The tribal critical values for agricultural lands include the following:

- Promote the advancement and welfare of the FBIC tribal members.
- Establish and enforce rules necessary to safeguard FBIC tribal members' property for the use of present and future generations.
- Promote the use of agricultural resources by FBIC tribal members to enable them to earn a living, in whole or in part, through the use of trust and tribal fee lands for farming and ranching.
- Preserve, through proper agricultural management, the land, water, forest, prairie, wildlife, cultural resources, and recreational values on the Reservation and improve and protect these resources.
- Provide for the administration of grazing privileges in a manner that will yield the highest return consistent with sustained land management principals and the fulfillment of the rights and objectives of the FBIC Tribal Council and individual land owners.
- Farming and irrigation operations shall be conducted in accordance with recognized principles of good practices and prudent management.
- Land use stipulations or conservation plans necessary to define such practices and management shall be incorporated into farm/pasture leases and grazing permits.

2.2 ARMP GOALS AND OBJECTIVES

2.2.1 COORDINATION AND COMMUNICATION GOAL

GOAL: Improve agriculture related communication, coordination, and transparency among the FBIC Tribal Council, tribal departments, and the BIA.

FBIC members and tribal and BIA employees indicated that enhanced communication and transparency between tribal departments, the FBIC Tribal Council, the BIA, and the FBIC would improve leasing, permitting, and land transfer actions/processes. For example, some lessees and permittees indicated lease, permit, and/or land transfer approvals are delayed due to the lack of communication amongst and between the BIA, Land Department, and FBIC Tribal Council. In addition, FBIC members expressed concerns regarding the limited agriculture knowledge some personnel have who are involved in leasing and permitting decisions; the perceived loss of tribal monies from the FBIC Buffalo Management Program and the future goals for the program, the lack of funding and staffing for Land Department operations and the lack of a transparent and time-sensitive process to track the review of documents (e.g., farm/pasture leases, grazing permits, etc.). Some FBIC members suggested that increased consultation with experienced farmers and ranchers could be beneficial for young/beginning farmers and ranchers; and members proposed that a mentoring program would allow inexperienced members to receive advice from established farmers and ranchers to help them establish their own operation. Additionally, FBIC members requested that the revenue from the agricultural leases and permits be used for the Land Department's annual agricultural operating budget and not for other departments or programs.

OBJECTIVE: IMPROVE CONSISTENCY IN COMMUNICATION AND INFORMATION SHARING BETWEEN THE FBIC TRIBAL COUNCIL, FBIC TRIBAL DEPARTMENTS, THE BIA, AND WITH FBIC MEMBERS WITHIN 5 YEARS.

Recommendations

- The BIA, FBIC Tribal Council, FBIC Environmental Department, and Land Department should work together to identify funding for the purpose of a new department titled the Agriculture Department within 1 year. The Agriculture Department should serve as a liaison between agricultural operators, the Land Department, and the BIA by facilitating coordination and encouraging transparency with and among the BIA, FBIC Tribal Council, FBIC Environmental Department, and Land Department. In addition, the Agriculture Department should assist the Land Department and the BIA with mapping (via Geographic Information Systems [GIS]), land improvements, permits and lease processing, data sharing, and sustainable management of agriculture lands.
- Improve the FBIC Tribal Council members' understanding of agricultural practices and status of processes through quarterly webinars and updates from BIA and the Agriculture Department.

- The BIA, the Land Department, the FBIC Tribal Council, and the Agriculture Department should develop and follow an internal land management tracking system that identifies the steps required (e.g., resolution, signed lease, etc.), with specified durations, for the approval of farm/pasture leases, grazing permits, and land transfers that must be followed by the BIA, Land Department, and FBIC Tribal Council. Appendix A provides an initial outline of the steps in the various processes.
- The FBIC Tribal Council should provide business incentives (e.g., tax breaks, reduced fees, etc.) and support to tribal members with a business plan who are interested in starting a farming and ranching supply enterprise on the Reservation (e.g., feed stores, fencing contractor, agricultural supply stores, etc.).
- The Land Department, with the assistance from the Agriculture Department, should work with the FBIC Finance Department to determine an annual operating budget, which should be transparent and available to the community, for the Land Department to use for managing and improving tribal agricultural lands.
- The BIA, Land Department, and FBIC Tribal Council should work with USDA FSA to organize, through GIS data management, the leasing/permitting of allotments via unitized leases/permits to increase time efficiency and to reduce costs to the farmer/rancher.
- The BIA, Agriculture Department, and Land Department should set up a system to accommodate and respond to ranchers/farmers who stop by either office or call to inquire about the status of paperwork that has been submitted to either office. Appendix A provides an initial outline of the steps in the various processes, which include this system.
- The Buffalo Program Manager should work to share information about the buffalo program with the FBIC, including accomplishments, current state of the program, and plans for the future of the program. In addition, when major changes are proposed, such as buffalo pasture relocations or an increase to a buffalo herd, public meetings should be held to increase transparency of the program and encourage public involvement.

2.2.2 ENFORCEMENT GOAL

Goal: Uniformly and consistently enforce all federal and tribal rules, regulations, and ordinances

Some FBIC members expressed concerns regarding the lack of enforcement of federal and tribal rules, regulations, and ordinances. These FBIC members would like to see all established rules, regulations, and ordinances be followed by all members of the community, and they believe these things should be consistently and uniformly enforced. For instance, grazing permits require permittees to treat noxious weeds, but not all permittees adhere to this requirement. Additionally, fences are not being maintained across the Reservation, despite the requirement for fence maintenance in the Grazing Ordinance and Farm/Pasture Ordinance. Livestock trespass, disregard for crossing permits, disregard for the Hunting Ordinance, unpaid fees, and inattention to season of use restrictions are also issues FBIC members would like to see addressed.

OBJECTIVE: INCREASE THE ENFORCEMENT OF FARM/PASTURE LEASE AND GRAZING PERMIT STIPULATIONS BY REDUCING DELINQUENT ACTIONS BY 50% WITHIN 5 YEARS AND 100% WITHIN 10 YEARS.

Recommendations

- The BIA and Land Department should abide by the Grazing Ordinance and Farm/Pasture Ordinance and suspend permits/leases for range and farm/pasture units where the permittee fails to follow the ordinances and their permits/leases.
- If two violations of the Farm/Pasture or Grazing ordinances are cited by the BIA or the Land Department, then the matter should be submitted and reconciled in Tribal Court. The BIA and the Land Department should consider a consistent approach for leases that are paid late.
- The Land Department should work with the BIA and Tribal Finance Department to identify funding for the employment of additional range riders and tribal enforcement officers. Tribal enforcement officers should have training through Montana Law Enforcement Academy or an alternative state academy training program.
- The Land Department should work with the BIA to identify the contents that are required for a conservation plan (as required in the Grazing Ordinance and Farm/Pasture Ordinance). The BIA should assist with and enforce the requirements of the conservation plan, including their implementation.
- The FBIC Tribal Council should consider combining the Farm/Pasture Ordinance, Grazing Ordinance, and other ordinances/resolutions related to land management into an "FBIC Land Management Code" and incorporate the code into the "Laws of the Fort Belknap Indian Community." The FBIC Tribal Council should also consider developing a separate document as a "Fee Schedule," which could be renewed annually or every 5-10 years through FBIC resolution.
- The Land Department should coordinate with FBIC Fish and Game Department to increase enforcement of the Hunting Ordinance and provide information to hunters on the impacts that could occur if the ordinance is not followed.

2.2.3 AGRICULTURAL LAND MANAGEMENT GOAL

Goal: Implement farming and livestock grazing practices to protect, improve, and increase the utilization of agricultural lands

FBIC members and BIA and tribal employees expressed concerns about the ongoing degradation of trust land and the need to conserve the existing prairies. Community members shared suggestions for preserving the integrity of the land and protecting it against future degradation. For example, some people suggested that the BIA and the Land Department should increase their management and oversight of range units in an effort to prevent overgrazing and improve the range unit infrastructure in some locations. In addition, people noted that the range units would benefit

from rotational grazing, the installation and/or repair of fencing, and the installation and/or repair of stock tanks. Additionally, community members would like to see the improvement of farm/pasture lands through noxious weed and invasive species prevention and control, and the use of underutilized cropland and rangeland. Community members also recommended that the submarginal lands be assessed to determine their current conditions and to identify potential areas of improvement. Additionally, community members expressed the need for an updated rangeland inventory. Lastly, some community members believe successful ranches and farms within the Project Area should be used as examples when other farmers/ranchers plan future land management strategies.

Furthermore, community members continually expressed the need for increased noxious weed and invasive species prevention and control throughout the Reservation. Numerous community members believe that the creation of an official noxious weed program for the Reservation that would be responsible for providing valuable information and guidance on the treatment of noxious weeds and invasive species would be very helpful. Community members also expressed the need to proactively prepare for drought conditions, which could include the development of a drought management plan and/or a climate change adaptation plan. Finally, some FBIC members shared concerns about the degradation of surface water quality and riparian areas on the Reservation due to livestock grazing. However, other FBIC members indicated they would like to see repairs and improvements made to the Milk River irrigation projects, the dam at Lake 17, historical irrigation projects, and Weigand Reservoir so that these water sources could be made available to tribal members for agriculture operations. Other concerns that were expressed regarding the irrigation system and processes include inconsistencies with billing for operation and maintenance charges.

OBJECTIVE: INCREASE THE OVERALL AVAILABILITY, UTILIZATION, AND/OR YIELD OF FARM/PASTURE LANDS IN THE NEXT 5 YEARS BY 25%[2].

Recommendations

- The BIA, the Land Department, and the Agriculture Department should conduct a comprehensive assessment to identify idle and abandoned farm/pasture lands and then work with interested lessees (if possible) to improve those tracts (e.g., conduct noxious weed and invasive species treatments, repair/install irrigation systems, etc.). These assessments should be conducted every 2 years. Idle and abandoned tracts should then be made available for farm/pasture leasing, and if a lessee contributed to the improvement of the tract, the potential for a lower/negotiated rate for the lessee should be considered as a revision to the ordinance.
- The BIA, the Land Department, and the Agriculture Department should conduct a comprehensive assessment to identify current tracts leased under a farm/pasture lease that have lacked sustainable management (e.g., high

[2] As reported in the 2012 Census of Agriculture, American Indian Reservations, the Reservation produced approximately 1.3 million tons of grains, including barley, oats, and wheat (USDA 2014). The Reservation also produced approximately 33,898 metric tons of forage, including hay, haylage, grass silage, and green crop (USDA 2014). A 25% increase in yield would result in the production of approximately 1.6 million tons of grain and 42,000 tons of forage.

presence of noxious weeds and/or invasive species, not suitable for farming due to slope or soils, etc.). Those tracts that are not suitable for farming operations should be evaluated for their use as rangelands and transferred into a range unit, if applicable. The tracts determined to be suitable for farming operations should be improved (e.g., conduct noxious weed and invasive species treatments, repair/install irrigation systems, etc.), and made available for farm/pasture leasing. If a lessee contributed to the improvement of the tract, the potential for a lower/negotiated rate for the lessee should be considered as a revision to the ordinance.

- The USDA NRCS should develop a list of alternative crops that could be grown on the Reservation to serve as a guide to farmers interested in diversifying their crops. The USDA NRCS should distribute this list to interested farmers and work with the farmers to plan for the growth of those crops.
- A tribal construction company, with employees knowledgeable in repairing/maintaining irrigation systems, should be considered as a vehicle by which to accomplish most, if not all, of the agricultural improvements and repairs (e.g., irrigation systems).
- The Fort Belknap Planning Department should consider the development of a Land Use Plan to assist with Reservation-wide agricultural land management.

OBJECTIVE: INCREASE THE OVERALL AVAILABILITY, UTILIZATION, AND/OR FORAGE QUANTITY AND QUALITY OF RANGELANDS IN THE NEXT 5 YEARS BY 25%.

Recommendations

- The BIA, USDA NRCS, and Land Department, with the Agriculture Department, should coordinate and conduct an updated and comprehensive range inventory. This inventory would provide information to assist in the review of range unit stocking rates (i.e., potential increases or decreases) and developing management goals and strategies for individual range units or groups of range units that may enhance forage production, quality, and utilization. Appendix C provides additional information on the existing range inventory used and the need for an updated inventory.
- The USDA NRCS, Land Department, and the Agriculture Department should use the updated comprehensive range inventory to promote the best use of tribal range units and ensure that livestock grazing is occurring in a sustainable and economically beneficial way.
- The BIA should identify allotted tracts that are highly fractionated and the Tribes should continue to purchase those tracts whenever possible. The Tribes should also consider purchasing tracts of land that are mismanaged/unmanaged due to absentee landowners. Any land that is purchased by the Tribe should be assessed for its suitability as rangeland, and placed into a range unit, if appropriate, and announced to the community via a publicly available abstract. Similarly, recently purchased/acquired tribal land should be assessed for its suitability as rangeland, and placed into a range unit, if appropriate, and announced to the

community via a publicly available abstract. Lastly, submarginal lands not currently in a range unit should be assessed for their suitability to be used for grazing and made available to permittees via a grazing permit, if appropriate, and announced to the community. Specific recommendations are included in Appendix C.

- The BIA and Land Department should assess fencing conditions in range units and prioritize the range units with the worst fencing conditions for fence repair. The BIA, Land Department, and USDA NRCS should work with the permittees to repair those fences. Specific recommendations are included in Appendix C.
- The BIA, Land Department, USDA NRCS, and the Agriculture Department should conduct a comprehensive assessment to identify range units that could benefit from additional and/or different land management techniques to improve rangeland health, production, and utilization (e.g., improved pasture, rotational grazing/cross fencing, prairie dog [*Cynomys spp*.] management, etc.). Specific recommendations are included in Appendix C.
- The BIA, Land Department, USDA NRCS, and the Agriculture Department should work together to inform permittees and landowners about the options for improving rangeland health (e.g., host a workshop, provide recommendations, utilize Rancher's Stewardship Alliance, etc.) and work with the permittees/landowners on implementing these techniques.
- The BIA, Land Department, and the Agriculture Department should conduct a comprehensive assessment to identify range units lacking any water sources and those range units with limited water sources or water sources that are in need of repair. The BIA and Land Department should also work together to identify funding to repair and install water sources on range units (e.g., stock tanks, windmills, springs, etc.). Those range units lacking any water sources should be prioritized for the installation of water sources (e.g., gravity-fed springs, stock tanks, etc.), followed by those range units with water sources that need to be repaired (e.g., water from stock tanks is running indefinitely, floats are need for certain stock tanks, stock tanks are broken/leaking, etc.). In the end, all range units, even those that are landlocked, should have multiple water sources to encourage the distribution and the utilization of the entire range unit by livestock. Specific recommendations are included in Appendix D. Note that in Appendix D, the term, "rangelands", refers to lands in both range units and farm/pasture units used for grazing.
- The Fort Belknap Livestock Marketing Co-op and the Agriculture Department should evaluate existing and potential livestock marketing and sale opportunities within and outside of the Project Area (e.g., direct livestock buyers, co-ops, local feedlot, local branding, heifer replacement program, etc.). To the extent possible, keeping the sale and use of agricultural resources within the Project Area should be prioritized.
- The FBIC Buffalo Program should develop and implement a Buffalo Management Plan. The plan should include goals for both buffalo herds, explore marketing/sales options (including internet sales), require health protocols (including DNA testing), and include a budget for the Program.

- A tribal construction company, with employees knowledgeable in and experienced with agricultural improvements and repairs, should be considered as a vehicle by which to accomplish most, if not all, of the agricultural improvements and repairs (e.g., fencing, stock water sources, etc.). The FBIC Conservation District could also provide assistance with these repairs.
- The Fort Belknap Planning Department should consider the development of a Reservation-wide Land Use Plan to assist with agricultural land management.

OBJECTIVE: IMPLEMENT THE 2013 FBIC NOXIOUS WEED STRATEGIC PLAN WITHIN 3 YEARS.

Recommendations

- The BIA should work with the FBIC Financial Department to identify a funding source(s) that could be used to fund the implementation of the Noxious Weed Strategic Plan.
- The FBIC Tribal Council, FBIC Environmental Department, Land Department, and the Agriculture Department should work together to create a new position for a person or persons to act as the FBIC Noxious Weed Coordinator(s). The FBIC Noxious Weed Coordinator should develop an FBIC Noxious Weed Program to accomplish tasks outlined in the Noxious Weed Strategic Plan, including but not limited to assisting with and providing information on the prevention and control of noxious weeds in range units, farm/pasture lands, along ROWs, near homesites, and in Reservation communities; developing and distributing a fact sheet to the different Reservation communities that provides information on weed species and easy methods to prevent and control different species; and continuing the use of biological controls (including sheep) for noxious weed management.
- The FBIC Noxious Weed Coordinator should identify the locations and numbers of vehicle wash stations (for preventing the spread of noxious weeds) to be placed around the Reservation, and coordinate with the FBIC Road Department to ensure that they control noxious weeds in the ROW at the appropriate time of the season. The Noxious Weed Coordinator should consider vehicle wash points where U.S. Highway 2 enters the Reservation near Fort Belknap Agency, MT and where MT Route 66 (MT 66) enters the southern portion of the Reservation to wash vehicles/mobile equipment (particularly combines) coming onto the Reservation.
- The FBIC Noxious Weed Program should work to increase the use of biological controls and reduce the use of herbicide treatments within the Project Area, as available and feasible, while maintaining the effectiveness of noxious weed control and prevention measures.
- The FBIC Noxious Weed Program should work with Aaniiih Nakoda College to identify student interns who are interested in interning for the FBIC Noxious Weed Program to facilitate prevention and control of noxious weeds throughout the Reservation.

- The BIA should work with the Land Department and the Agriculture Department to assess all range units for cheatgrass and prioritize cheatgrass management. Note that cheatgrass was not identified during the previous rangeland inventory nor focused on in the Noxious Weed Strategic Plan, but it was observed as abundant in numerous range units during the 2017 site visits. Proactive measures to reduce current cover and/or minimize further spread should be prioritized; specific recommendations are included in Appendix C.
- The BIA and Land Department should provide assistance to farmers to treat noxious weeds prior to harvest and transport if noxious weeds are present in hay fields. If noxious weeds are present during the harvest season and treatments are not effective, BIA and the Land Department should require farmers to leave affected hay on the field.
- The FBIC Tribal Department and Land Department should utilize the Montana State Applicators Licensing Program so that farmers/ranchers can apply pesticides and herbicides on their leased/permitted land. In addition, the Montana State Applicators License would be acknowledged by the BIA as a license for the lessee/permittee to apply chemical herbicides, as needed, on their lease.

OBJECTIVE: MANAGE FOR IMPROVED WATER USE EFFICIENCY AND AGRICULTURAL PRODUCTIVITY WITHIN PRIORITY AREAS WITHIN 10 YEARS ON THE MILK RIVER AND HISTORICAL IRRIGATION PROJECTS, WITHIN 5 YEARS ON PRIORITY RANGE UNITS, AND WITHIN 3 YEARS ON LAKE 17.

Recommendations

- The Land Department and Agriculture Department should identify areas along the Milk River that could be irrigated, pending pump improvement. Specific recommendations are included in Appendix E.
- The BIA, Land Department, and the Agriculture Department should assist farmers with applying for funding for irrigation equipment (e.g., pivots, gated pipe, etc.). Specific recommendations are included in Appendix E.
- The BIA, the FBIC Environmental Department, the Land Department, Irrigation Department, and the Agriculture Department should work together to identify or complete the process for a funding source to use for the repair and improvement of the Lake 17 Dam. Once funding is received, existing plans for repair and improvement of Lake 17 Dam should be implemented.
- The use of reservoirs by tribal members for recreation should be prioritized above the use of the reservoirs by livestock, particularly Snake Butte and Strike reservoirs. Furthermore, in order to protect the water quality of the reservoirs and to deter algal blooms, water troughs should be used for livestock instead of allowing livestock to come in direct contact with reservoir waterbodies.

- The Climate Change Coordinator should work with the BIA and relevant tribal departments, such as the Agriculture Department, to develop and implement a climate change adaptation plan and/or a drought mitigation plan for the Reservation.
- The BIA, USDA NRCS, Land Department, and the Agriculture Department should evaluate the potential for use and rehabilitation of historical irrigation projects, as identified in Figure 1-5. If rehabilitation of the historical irrigation projects is feasible, the USDA NRCS and BIA should work with farmers to rehabilitate the irrigation systems and facilitate their use for adjacent farm/pasture lands.
- The BIA, USDA NRCS, and Land Department should evaluate the potential for use and rehabilitation of Weigand Reservoir. If possible, the Weigand Reservoir should be rehabilitated, and its use as a source of irrigation water for adjacent farm/pasture lands should be facilitated (if feasible).

OBJECTIVE: MANAGE FOR IMPROVED SURFACE WATER QUALITY WITHIN PRIORITY AREAS WITHIN RANGE UNITS WITHIN 5 YEARS.

Recommendations

- The FBIC Environmental Department, the Land Department, and the Agriculture Department should work together to conduct a comprehensive assessment of the health of reservoirs and riparian areas located within all of the range units. The assessment should identify and prioritize range units with water resources that are degraded due to livestock grazing. The installation of fences around those degraded areas and/or the installation of water improvements in those range units should be considered for the protection and improvement of surface water quality.

2.2.4 SENSITIVE SPECIES AND CULTURALLY SIGNIFICANT SPECIES GOAL

Goal: Honor and protect sensitive wildlife and plant species and culturally significant species (i.e., wildlife and plants) through responsible agricultural operations

Some FBIC members expressed concerns about the decreasing numbers of some wildlife populations throughout the Reservation, such as greater sage grouse. Their concerns were based on continued land disturbance and habitat fragmentation from farming and ranching activities combined with climate variability. Other community members expressed their desire to introduce black-footed ferrets (*Mustela nigripes*) on their lands as well.

OBJECTIVE: CONTINUE TO PROTECT AND FACILITATE THE GROWTH OF BLACK-FOOTED FERRET POPULATIONS CURRENTLY PRESENT ON THE RESERVATION, AND PLAN FOR THE REINTRODUCTION OF AN ADDITIONAL BLACK-FOOTED FERRET POPULATION AT ANOTHER SITE ON THE RESERVATION WITHIN 10 YEARS.

Recommendations

- The Land Department and FBIC Fish and Wildlife Department should conduct a public education campaign on the black-footed ferret, including its historical presence, the importance of prairie dogs, and the species' significance. The FBIC Fish and Wildlife Department should prohibit prairie dog shooting and poisoning actions in all prairie-dog colonies with known black-footed ferret populations (additional details provided in Section 4.7). However, the BIA, the FBIC Fish and Wildlife Department, the Land Department, and the Agriculture Department should work with and provide assistance to ranchers on controlling/managing prairie dog colonies, including those colonies with known black-footed ferret populations, per their permit-specific conservation plans.
- The FBIC Fish and Wildlife Department should work with the Land Department to identify additional sites for the potential reintroduction of additional black-footed ferrets. The reduction of grazing permit fees for range units located on tribally owned lands with black-footed ferrets should be considered.

OBJECTIVE: CONTINUE TO ENCOURAGE SAGE GROUSE POPULATIONS ON THE RESERVATION BY PROTECTING KNOWN SAGE GROUSE *(CENTROCERCUS UROPHASIANUS)* LEKS THROUGHOUT THE PROJECT AREA.

Recommendations

- The Land Department and FBIC Fish and Wildlife Department should work together to continue to protect known sage grouse leks throughout the Reservation. In addition, the FBIC Fish and Wildlife Department should perform a comprehensive assessment to map suitable habitat for the species and work with the Land Department to carefully consider ground disturbance activities in areas with known sage grouse habitat in order to reduce habitat fragmentation.
- The FBIC Fish and Wildlife Department should consider developing a public education campaign for further understanding of sage grouse and protection and conservation of the species.
- The Land Department, and the Agriculture Department should consider providing reduced rates to range units located on tribally owned lands that contain active leks if grazing is deferred until the breeding season ends (June).

- The Land Department, the Agriculture Department, and the FBIC Fish and Wildlife Department should consider applying for state and federal funding to protect and enhance the current sage grouse population. Specific recommendations are provided in Appendix C.
- The Land Department, the Agriculture Department, and the FBIC Fish and Wildlife Department should consider mapping and managing cheatgrass within suitable sage grouse habitat to reduce the risk of wildfire and the subsequent loss of suitable (i.e., sagebrush [*Artemisia* spp.]) habitat.

2.2.5 FARM/PASTURE LEASING AND GRAZING PERMITTING PROCESSES GOALS

Goal: Improve the farm/pasture leasing process and the grazing permitting process to facilitate the use of trust and tribal fee lands for agricultural activities by tribal members.

FBIC members and tribal and BIA employees expressed sentiment that the current farm/pasture leasing and grazing permitting processes could be improved to better meet lessees' and permittees' needs. Specifically, the limited duration of leases and permits presents several issues, such as the inability of lessees/permittees to seek funding opportunities. Similarly, the short lease durations discourage lessees/permittees to invest in the long-term management and fiscal strategies necessary to get the greatest return from the land and implement measures to promote sustainability of the resource (e.g., installation of irrigation infrastructure, crop rotation plans, fence improvements/repair, installation of cross fencing to facilitate rotation grazing, etc.). FBIC members provided some examples to improve the processes, including but not limited to the need for longer lease and permit durations; decreased leasing and permitting rates as an incentive for making farm/pasture unit and range unit improvements; further enabling the historical practice of aftermath grazing cropland so that the farmer/rancher can manage their cropland and utilize the trapped grass to benefit tribal members; and uniform and consistent farm/pasture unit and range unit appraisals. FBIC members also expressed different farm/pasture leasing rates and grazing rate preferences. Another suggestion was to allow non-members to lease with 1-year revocable permits only. Some members indicated that they preferred a fixed leasing/permitting rate so that they could anticipate and plan for future operations, but others believed leasing and permitting rates should be adjusted based on market values and changing conditions (i.e., drought). Lessees and permittees strongly indicated they would like the farm/pasture leasing process and grazing permit process to give preference to tribal members, including the ability of tribal members to match all bids. Some FBIC members expressed the need to retain the current right-to-do business fee levied on non-members, as the fee is a source of tribal income. Conversely, some tribal members felt this fee unjustly impacts those married to non-members. Overall, the FBIC would like to see changes to the Farm/Pasture Ordinance and the Grazing Ordinance with more focus on tribal members' priority in each process.

OBJECTIVE: ALLOW TRIBAL MEMBERS TO SIGN FARM/PASTURE LEASES AND GRAZING PERMITS THAT ARE MORE THAN 5 YEARS IN DURATION WITHIN 3 YEARS FOR SPECIAL CIRCUMSTANCES.

Recommendation

- The FBIC Tribal Council, in coordination with the Land Department and the Agriculture Department, should consider revising the Farm/Pasture Ordinance so that it facilitates extended farm/pasture lease durations for special circumstances, particularly if a tribal member is interested in obtaining USDA or other funding.
- The FBIC Tribal Council, in coordination with the Land Department and the Agriculture Department, should consider revising the Grazing Ordinance so that it allows extended grazing permit durations for special circumstances, particularly if a tribal member is interested in obtaining USDA or other funding.
- The FBIC Tribal Council should consider assisting the permittees and lessees with federal funding and possibly submitting federal funding proposals as the signatory.

OBJECTIVE: REVISE THE FARM/PASTURE LEASING PROCESS AND THE GRAZING PERMITTING PROCESS WITHIN 3 YEARS SO THAT THE PROCESSES ALWAYS PRIORITIZE THE USE OF TRUST AND TRIBAL FEE LANDS BY TRIBAL MEMBERS.

Recommendations

- The FBIC Tribal Council, in coordination with the Land Department and the Agriculture Department, should consider revising the Farm/Pasture Ordinance and the Grazing Ordinance per the recommendations in ARMP within 1 year.
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Farm/Pasture Ordinance and Grazing Ordinance to state that lessees and permittees should be subject to the enforcement procedures as dictated by the ordinances, including, but not limited to, cancellation of leases/permits and the potential for automatic denial of future leases/permits, if improvements to the land are not completed as specified in the lease/permit.
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Grazing Ordinance and Farm/Pasture Ordinance to require proof of payment and proof of an established operation and/or the ability of that permittee/lessee to ranch/farm the land before a permit or lease is approved.
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the ordinances to give preference to individual tribal members over corporations in all instances, and clarifying the definition of “Indian cattle association” in the Bylaws of the Fort Belknap Indian Community of the Fort Belknap Reservation.

- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Farm/Pasture Ordinance so that tribal members have the opportunity to match bids for farm/pasture leases in all situations; leasing preference is given to tribal members who have been leasing the land and who have made improvements to the farm/pasture unit; home base preference is given to tribal members seeking leases on land adjacent to their base of operations on the Reservation; non-member leases are restricted to 1-year revocable leases on tribal lands; priority in preference is given in the farm/pasture leasing process to a tribal member, if he/she can show a family connection to land (i.e., connection to the original allottee); and a maximum monetary limit is set for tribal members bidding on a farm/pasture lease in order to reduce competition from outside interests (i.e., non-tribal members).
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Grazing Ordinance to give permitting preference to tribal members who have been using the land for grazing and who have made improvements to the range unit; to give home base preference to tribal members seeking permits on land adjacent to their base of operations on the Reservation; to restrict non-member permits to 1-year revocable permits on tribal lands; to give preference in the permitting allocation process if a tribal member can show a family connection to land (i.e., connection to the original allottee); and to set a maximum monetary limit for grazing rates for tribal members who are bidding against outside interests (i.e., non-tribal members), to reduce competition and encourage the use of trust and tribal fee land by tribal members.
- The FBIC Tribal Council and Land Department should discuss the concern of tribal members married to non-tribal members who are required to pay the right-to-do business fee, while revising the ordinances.
- The FBIC Tribal Council should consider permanently waiving the right-to-do business fee for enrolled members in an effort to encourage long-term price stability for enrolled members.
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Grazing Ordinance and the Farm/Pasture Ordinance to better define the term “good standing”, and to allow current lessees or permittees that are enrolled members in good standing to renegotiate their existing lease/permit, without competition, one-on-one with the Land Department within 18 months before the lease/permit expires and special priority should be given to tribal members seeking or utilizing federal funding within 18 months before the lease/permit expires. The FBIC Tribal Council, Land Department, and Agriculture Departments should consider revising the Grazing Ordinance and Farm/Pasture Ordinance to further enable the historical practice of aftermath grazing cropland, while specifically addressing how aftermath grazing should be structured.

OBJECTIVE: ENCOURAGE SUSTAINABLE LAND STEWARDSHIP, WHILE INCREASING THE PRODUCTIVITY OF THE LAND, WITHIN 10 YEARS.

Recommendations

- The FBIC Tribal Council and Land Department should consider reducing Farm/Pasture leasing rates for tribal members who make improvements to the land they are leasing. If improvements included in the lease, permit, and/or federal program funding stipulations are not initiated and completed within a certain timeframe, the lessee/permittee should be subject to the enforcement procedures as dictated by the ordinances including, but not limited to, cancellation of leases/permits and the potential for automatic denial of future leases/permits. In addition, the FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Farm/Pasture Ordinance to adopt the requirement of following a USDA NRCS conservation plan (to replace the existing conservation requirements included in farm/pasture leases, while abiding by CFRs) for improved land management. In addition, the FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Farm/Pasture Ordinance to allow for crop rotation and residue management.
- The FBIC Tribal Council, Land Department, and the Agriculture Department should consider revising the Farm/Pasture Ordinance to more closely reflect the content of the Grazing Ordinance.
- The FBIC Tribal Council and Land Department should consider reducing grazing permit rates for tribal members who make improvements to range units. If improvements included in the lease, permit, and/or federal program funding stipulations are not initiated and completed within a certain timeframe, the lessee/permittee should be subject to the enforcement procedures as dictated by the ordinances including, but not limited to, cancellation of leases/permits and the potential for automatic denial of future leases/permits. In addition, the FBIC Tribal Council, Land Department, and Agriculture Department should consider revising the Grazing Ordinance to adopt the requirement of following a USDA NRCS conservation plan (to replace the existing conservation requirements currently included in grazing permits, while abiding by CFR) for improved land management.
- The BIA should replace the conservation plans currently included with farm/pasture leases and grazing permits with an USDA NRCS Conservation Plan prepared with assistance from USDA NRCS. The BIA should also consider reviewing and revising the farm/pasture lease and grazing permit stipulations that are currently included with the farm/pasture leases and grazing permits so that the stipulations include only requirements per the CFR.
- The USDA NRCS, the Land Department, Agriculture Department, and USDA FSA should work together to provide and share information with farmers and ranchers about available financial assistance during drought. Potential programs include the Livestock Forage Program, Noninsured Crop Disaster Assistance Program, and Pasture, Rangeland, and Forage insurance.

- The Land Department should consider the feasibility of offering and assisting with crop and livestock insurance for lessees; the development of a mentoring program that would allow established ranchers and agricultural operators to provide aspiring community members (with family members in good standing) with the skills and advice necessary to successfully ranch and farm (if feasible); and offering young or inexperienced farmers/ranchers (e.g., less than 5 years of experience) incentives to lease lands, such as setting aside a portion of allocated lands for young or inexperienced individuals.

OBJECTIVE: REVISE THE FARM/PASTURE UNIT APPRAISAL PROCESS WITHIN 7 YEARS SO THAT LEASING RATES MORE CLOSELY REFLECT ACTUAL FARM/PASTURE CONDITIONS.

Recommendations

- The BIA, Land Department, and the Agriculture Department should ensure that the farm/pasture unit appraisal process is consistent across every farm/pasture unit, and that the appraisals are conducted more frequently (when funding is available). Any desktop appraisals should be supported by real-time data and ground-truthing at least 50% of the time. Lease rates should be revised after each appraisal. The BIA, the Land Department, and the Agriculture Department should develop a fact sheet that explains the appraisal process, including how the leasing rates are set based on the results of the appraisal. This fact sheet should be distributed to all lessees who have leased land that is appraised and to any other interested persons.
- The FBIC Tribal Council and Land Department should consider revising the Farm/Pasture Ordinance to indicate that leasing rates would be reviewed if market prices drop significantly.

OBJECTIVE: REVISE THE GRAZING RATE DETERMINATION PROCESS WITHIN 10 YEARS SO THAT GRAZING RATES MORE CLOSELY REFLECT RANGE UNIT AND MARKET CONDITIONS.

Recommendations

- The Land Department, Agriculture Department, and FBIC Tribal Council should consider revising the Grazing Ordinance to indicate that if the land ownership of a range unit changes from allotted to tribal, the associated grazing rate would change as well.
- The BIA, Land Department, and the Agriculture Department should ensure that the rangeland appraisal process is consistent across every range unit, and that the appraisals are conducted more frequently. Desktop appraisals should be supported by real-time data and ground-truthed at least 50% of the time. Grazing rates should be revised after each appraisal. The BIA, the Land Department, and the Agriculture Department should develop a fact sheet that explains the appraisal process, including how the grazing rates are set based on the results of the appraisal. This fact sheet should be distributed to all permittees who are utilizing a range unit that was appraised and to any other interested persons. In addition to the 5-year appraisal schedule,

appraisals should also be conducted within 6 months following any catastrophic event (e.g., drought, fire, etc.). Note that this recommend management action would be implemented in accordance with the Fort Belknap Wildfire Management Plan (Fort Belknap Forestry and Fire Management 2017, *pending finalization*).

- The FBIC Tribal Council and Land Department should consider revising the Grazing Ordinance to indicate that grazing rates would be reviewed if market prices drop significantly.

2.2.6 CULTURAL RESOURCES GOAL

GOAL: Honor and protect cultural resources

Some FBIC members are concerned that land disturbing activities associated with agricultural activities are damaging and destroying cultural resources. For example, strip farming was blamed for the loss and destruction of numerous cultural resources over the years. In addition, the creation of fire lines during firefighting activities has resulted in inadvertent cultural resource discoveries, including the destruction of those resources. Conversely, some farmers and ranchers expressed concern about their farming and ranching activities being curtailed by THPO surveys.

OBJECTIVE: IMPLEMENT PROTECTIVE MEASURES FOR KNOWN CULTURAL RESOURCES IN 50% OF THE RANGE UNITS AND FARM/PASTURE UNITS WITHIN 10 YEARS.

Recommendations

- The THPO, the Land Department, and the Agriculture Department should identify range units and farm/pasture units with known cultural resources. Once cultural resources are identified, the Land Department, THPO, and BIA should mitigate the cultural resource through suggestions to the permittee/lessee. THPO will contact the permittee/lessee prior to entering a range unit or farm/pasture unit in an effort of common courtesy.
- The BIA, THPO, the Land Department, and the Agriculture Department should inform permittees and lessees on the importance of cultural resources, how to identify cultural resources, when to contact THPO for inadvertent discoveries, and share information on archaeological inventories conducted.

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3.0 NEPA

As stated in Section 1.0, implementation of the ARMP must undergo an environmental review; therefore, the following section provides the purpose and need along with the alternatives, in order for BIA to comply NEPA of 1969, as amended, and the regulations of the CEQ, 40 CFR parts 1500 through 1508.

3.1 PURPOSE AND NEED

The FBIC proposes to develop and manage current and future trust, tribal fee, and state (over which the Tribes have management jurisdiction) agricultural lands according to the FBIC ARMP contained in this PEA from 2018 through 2028, or until revised. Agricultural resources provide direct revenues to the FBIC, individual Indian landowners, and permittees/lessees. Additionally, the FBIC's ARMP promotes self-determination by providing for the management of the FBIC's agricultural lands and rangelands and related renewable resources in a manner consistent with identified tribal goals and priorities for conservation, multiple use, and sustained yields. The purpose of the project is to implement the FBIC's ARMP for the sustained and improved use of trust and tribal fee lands for agricultural purposes.

The need for this analysis arises from BIA's responsibilities under NEPA to review proposals for the use of Indian trust lands, including the lease of trust lands and the execution of agricultural land and rangeland management. The authority for the Secretary of Interior to lease trust lands is 25 U.S.C. 415. This authority is delegated from 209 DM 8, 230 DM 1, 3 Indian Affairs Manual 4 (Release No. 00-03), 10 Bureau of Indian Affairs Manual 11, as amended; and further delegations as needed to effectuate the reorganization embodied in DM Release dated April 21, 2003, for agency superintendents to approve leasing of trust lands. 25 CFR 162 provides the regulations on how to comply with this authority. Additionally, the AIARMA declares that the U.S. has a trust responsibility to protect, conserve, utilize, and manage Indian agricultural lands consistent with its fiduciary obligations. Therefore, a PEA is necessary to analyze the direct, indirect, and cumulative impacts of the proposed implementation on the FBIC ARMP in order for the BIA to issue a determination of effect in compliance with NEPA.

3.2 ALTERNATIVES

The Reservation is located in north central Montana, within Blaine and Phillips counties. The Reservation is bordered to the north by the Milk River and to the south by the Little Rocky Mountains, and encompasses approximately 623,000 acres. Additionally, the Tribes actively pursue expansion of their tribal ownership of lands located within and adjacent to the exterior boundaries of the Reservation. The submarginal lands are an example of this. In an effort to be as comprehensive as possible, and to accommodate any fee lands located within the exterior boundaries of the Reservation that could come into tribal ownership, all lands located within the exterior boundaries of the Reservation together with the submarginal lands, will be analyzed under this FBIC PEA, and shall be known together as the

"Project Area" (Figures 1-1 and 1-2, Table 1-1). Notably, this FBIC PEA will only apply to trust lands over which the BIA has jurisdiction (approximately 591,000 acres located within the Project Area).

3.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the BIA would not approve the implementation of the ARMP. FBIC trust lands would continue to be managed under the Farm or Pasture Lease and Range Permit Environmental Assessment (BIA 1996).

3.2.2 PROPOSED ACTION

Under the Proposed Action, the BIA would approve the implementation of the FBIC ARMP through 2028, or until the ARMP PEA is revised. The FBIC tribal departments and BIA would manage agricultural lands and rangelands in accordance with the processes identified herein and all relevant statutes, regulations, policies, executive orders, and the laws of the FBIC. This alternative would allow for an expedited review by the BIA of individual leasing and permitting actions for trust lands by means of the Onsite NEPA Checklist that would be tiered from this PEA (example checklist provided in Appendix F). Each individual permit and lease would be reviewed using the Onsite NEPA Checklist to determine whether potential environmental impacts associated with the leasing and permitting actions have been addressed and whether site specific information falls within the parameters of the programmatic impacts that are analyzed in the PEA.

Under Proposed Action, the implementation of the FBIC ARMP would result in the completion and/or progress towards the holistic goals, objectives, and recommendations identified in Section 2.0 of this FBIC ARMP/PEA. Each goal listed in Section 2.0 has objectives developed specifically for the FBIC ARMP timeline (i.e., 2018 through 2028). For example, under the Proposed Action, a noxious weed program should be funded and established within the first few years to facilitate the implementation of the Noxious Weed Strategic Plan. The Farm/Pasture Ordinance and the Grazing Ordinance may be considered for revision based upon the FBIC ARMP (per decision by the FBIC Tribal Council) to improve the flexibility and transparency in the farm/pasture leasing and grazing permitting processes and to enable tribal members to better plan for and to continue to develop their agricultural operations.

In addition, under the Proposed Action, the availability, utilization, and quality of rangeland forage would increase through the implementation of specific objectives and recommendations, including but not limited to, an updated comprehensive range inventory; the exploration and consideration of opportunities for enhanced livestock marketing and sale prospects; and construction and repair of stock water improvements. Similarly, the availability, utilization, and yield of farm/pasture lands is expected to increase through the implementation of the Proposed Action. For example, recommendations specific to farm/pasture lands, include but are not limited to, conducting an assessment and subsequent management of idle, abandoned, and/or mismanaged farm/pasture lands; the use of alternate crops; and the

utilization of historical irrigation projects. Additionally, agricultural water would be managed more sustainably through an increase in water quality and quantity expected in various range units expected from 2018 through 2022, and through improvements to multiple irrigation projects, including the Milk River Irrigation Project through 2028. The FBIC Environmental Protection Department is also developing Tribal Water Quality Standards, which will further assist with the management of the community's agricultural water resources.

Communication and information sharing between the FBIC Tribal Council, FBIC tribal departments, the BIA, and FBIC would improve within 5 years, becoming more consistent and transparent. The appraisal process for determining grazing permit and farm/pasture lease rates would also be improved, would become more consistent, and would more closely reflect actual farm/pasture and range unit conditions in addition to market conditions within 7 years. Enforcement of lease and permit stipulations is also expected to be improved through 2021, including increased consistency through 2028.

Finally, under the Proposed Action, the increased agricultural management actions proposed through 2021 would facilitate the continued protection and respect for cultural resources, sensitive species, and culturally significant species. Specifically, protective measures for cultural resources would be more consistently implemented during agricultural operations and disturbance and destruction of cultural resources would be prevented. Additionally, black-footed ferrets and sage grouse populations would continue to be protected and developed on the Reservation.

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4.0 RESOURCE DESCRIPTIONS AND IMPACTS OF MANAGEMENT ALTERNATIVES

4.1 AIR QUALITY

4.1.1 CURRENT CONDITIONS

Air quality standards are set by the United State Environmental Protection Agency (USEPA) as the primary enforcer of the Clean Air Act (CAA) that was originally passed in 1955 as the Air Pollution Control Act. In accordance with U.S.C. Title 42, Chapter 85, §7601(d)(2)(B), the USEPA is given authority to treat tribes as states for purposes of developing, administering, and enforcing air quality regulations within reservation boundaries, irrespective of land ownership. The Tribal Authority Rule implements the provisions of Section 301(d) of the CAA authorizing eligible tribes to implement their own tribal air programs. If a tribe is eligible per the criteria, the rule provides that the tribe will be treated in the same manner as states for virtually all CAA programs.

In 2000, the FBIC assessed air quality conditions with the goal of continuing to maintain a clean airshed. The Project Area is rural in nature and air quality in the Project Area is not located in a non-attainment area (USEPA 2016a). In conjunction with the CAA Special Project, an air emissions inventory of the Reservation was also completed in 2000. The air emissions inventory included the transfer stations (gas pipeline) just west of the Reservation, potential impacts from Canada, and a 1-year saturation (i.e., particulate matter 10 micrometers or less in diameter [PM_{10}] and particulate matter 2.5 micrometers or less in diameter [$PM_{2.5}$]) study to investigate the concentration of PM_{10} on the southern and the northern ends of the Reservation. As a result of the CAA Special Project and the air emissions inventory, the FBIC Environmental Protection Department indicated the PM air quality on the Reservation should be designated as unclassifiable (FBIC n.d.a; Doney 2008).

Other than the 2000 air emissions inventory, comprehensive air quality monitoring has not been conducted within the Project Area or any of the surrounding counties. Concentrations of total suspended particulates (dust) could occur occasionally during springtime due primarily to wind erosion of tilled land. Additionally, local traffic also likely produces road dust during periods of dry weather. Other emission sources affecting air quality in the area likely include agricultural equipment and trains. Sparse human development in the area has likely resulted in a dispersal of the number of emission sources, which subsequently have a minimal effect on air quality.

4.1.2 IMPACTS OF MANAGEMENT ALTERNATIVES

4.1.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, air pollution associated with continued agricultural production activities would include continued and increased PM from erosion due to tilled lands, areas of overgrazing, and/or dry weather.

Additionally, minor exhaust and dust emissions from agricultural equipment and vehicles would continue to occur. However, due to the dispersed nature of the ongoing agricultural activities, the rural location of the Project Area, and the existing air quality in the area, the potential impacts to air quality from PM would likely be negligible. In addition, the seasonal nature of the agricultural activities would render any negligible impacts to air quality short-term.

4.1.2.2 PROPOSED ACTION

Under the Proposed Action, impacts to air quality would be similar to those discussed under the No Action Alternative. However, the implementation of the recommended agricultural management actions (e.g., conversion of idle and/or abandoned farm/pasture land to active farm/pasture land, the use of additional farm equipment/vehicles for repairing livestock water sources and/or fencing, etc.) would likely increase the total amount of exhaust and dust emissions in and around the Project Area, including total PM. Nevertheless, these potential impacts are expected to be short-term and negligible due to the dispersed nature of the recommended management actions and the limited amount of total emissions expected to result from the implementation of the recommended management actions. In addition, implementation of the recommended management actions is also expected to result in long-term beneficial, although negligible, impacts to air quality. For example, under the Proposed Action, erosion is expected to decrease, which would result in less PM.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to air quality have been addressed in the FBIC ARMP/PEA.

4.2 SOILS

4.2.1 CURRENT CONDITIONS

Soils are made up of horizons, or layers, which develop through geomorphic processes that operate on the underlying geological materials in the area. The primary soil forming factors include climate, organisms, topography, parent material, and time (Birkeland 1999). Topography in the Project Area is a significant factor in relation to the location and type of the soil. Topography includes the shape and slope of the landscape, the direction the slope faces (aspect), and the effects of a high water table (Birkeland 1999). Topography in the northern portion of the Project Area generally consists of glacial plains and alluvial river valley lands, which give way to rolling grasslands, river breaks, and eventually the Little Rocky Mountains that are found in the southern portion of the Project Area. Elevations in the Project Area range from approximately 2,300 feet to 5,000 feet (Klauk 2017). Project Area soils are variably located on glaciated uplands, strong sloping uplands, in glacial till on glaciated uplands, and on fans and terraces in valleys. The health of the soil in the Project Area is critical for agricultural activities, and farm/pasture lease rates and AUMs for range units are generally partly determined by soil classification and health. Prime farmlands are also an important consideration for agricultural development.

4.2.1.1 SOIL SERIES AND RESOURCES

Soil series were developed by the USDA NRCS as part of a soil classification system for the U.S. However, due to the scale at which soil series occur, it is impractical to map them. Therefore, soil series are grouped into soil map units based on similarities. There are 175 soil map units within the Project Area. The approximate acreage and percentages of the soil map units that encompass greater than 1% of the Project Area (i.e., 26 soil map units) are provided in Table 4-1 and shown on Figure 4-1. Table 4-1 also shows the different soils series names associated with each soil map unit. These soil series are further discussed in the text below.

TABLE 4-1. SOIL MAP UNITS AND THEIR ASSOCIATED ACREAGE WITHIN THE PROJECT AREA

Unit	Map Unit Soil Name	Acres	Percentage of Project Area	Soil Series
200	Farland-Cherry silt loams, 2 to 8 percent slopes	73,814	11	Farland
317	Phillips-Elloam complex, 0 to 4 percent slopes	54,853	8	Phillips
109	Phillips loam, 0 to 4 percent slopes	8,948	1	
63	Phillips-Elloam complex, 4 to 8 percent slopes	5,934	1	
218	Telstad loam, 0 to 4 percent slopes	32,141	5	Telstad
157	Telstad-Joplin loams, 2 to 8 percent slopes	17,445	3	
46	Telstad loam, 2 to 8 percent slopes	4,385	1	
255	Thoeny-Elloam complex, 0 to 4 percent slopes	42,931	6	Thoeny
48	Thoeny-Kevin-Elloam complex, 4 to 8 percent slopes	3,852	1	
230	Zahill-Vida clay loams, 15 to 35 percent slopes	19,907	3	Zahill
99	Zahill clay loam, 25 to 45 percent slopes	12,762	2	
59	Cabba-Cambert-Cherry silt loams, 8 to 15 percent slopes	19,361	3	Cabba
30	Cabba-Cambert silt loams, 15 to 45 percent slopes	7,523	1	
232	Nishon clay loam, 0 to 2 percent slopes	18,959	3	Nishon
27	Vanda-Nobe clays, 0 to 2 percent slopes	10,062	2	Vanda
52	Vanda clay, 0 to 2 percent slopes	4,040	1	
141	Dooley sandy loam, 0 to 4 percent slopes	12,384	2	Dooley
116	Dimmick silty clay	11,510	2	Dimmick
18	Whitecow association, steep	9,872	1	Whitecow
31	Whitecow-Warneke gravelly loams, 25 to 60 percent slopes	4,568	1	
47	Havrelon loam, 0 to 2 percent slopes	10,858	2	Havrelon
58	Martinsdale clay loam, 0 to 4 percent slopes	9,190	1	Martinsdale
28	Martinsdale loam, 1 to 8 percent slopes	5,255	1	
28	Turner-Beaverton complex, 8 to 15 percent slopes	9,250	1	Turner
97	Evanston loam, 2 to 8 percent slopes	8,993	1	Evanston
28	Harlem silty clay loam, protected, 0 to 2 percent slopes	7,653	1	Harlem

Source: USDA NRCS 2014
Note: Percentages and acreages are approximate due to rounding and geospatial outputs.

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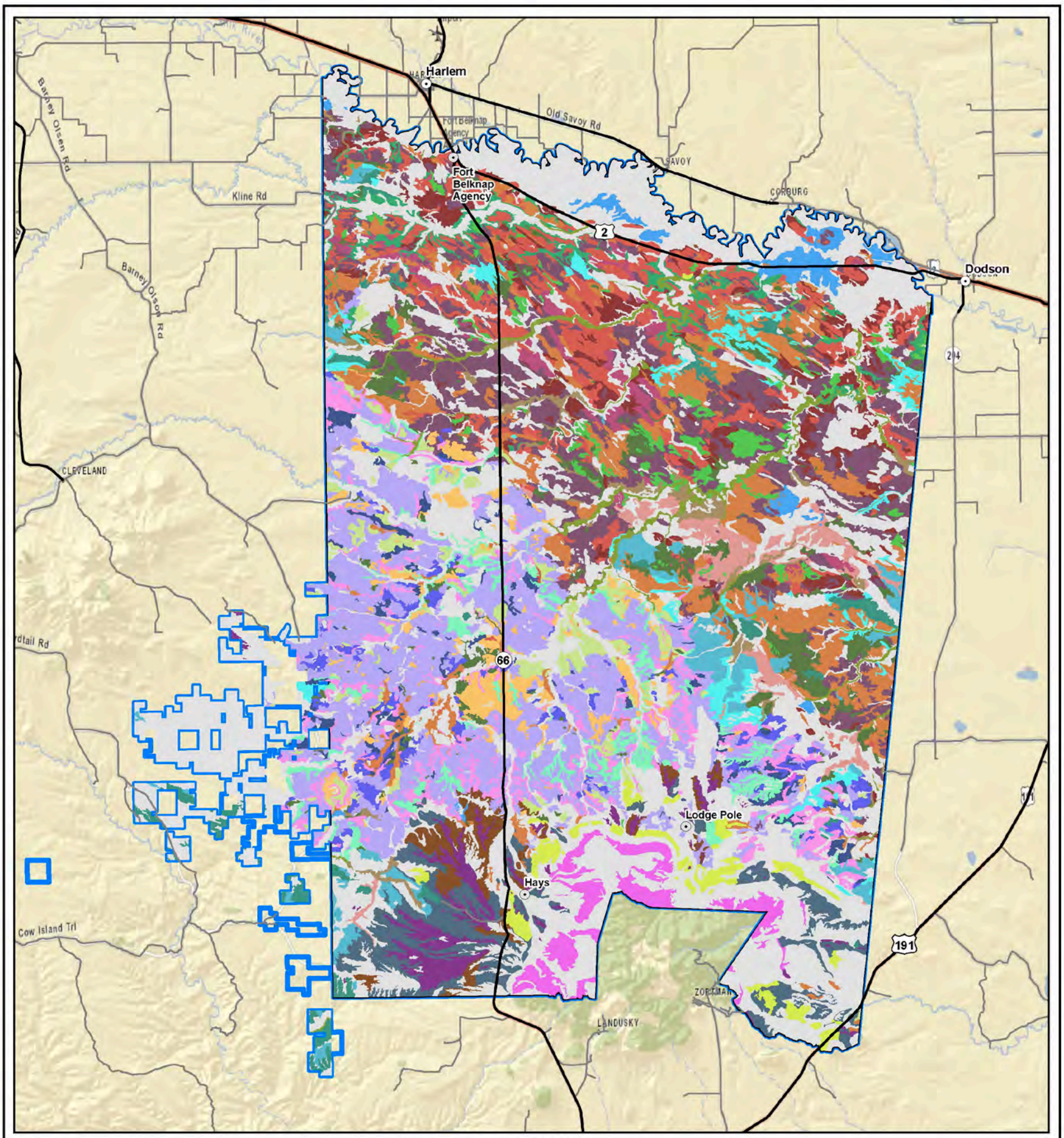
FIGURE 4-1. SOILS IN THE PROJECT AREA



EXPLANATION

- ASSINNIBOINE FINE SANDY LOAM, 0 TO 4 PERCENT SLOPES
- BARKOF-NORBERT CLAYS, 8 TO 20 PERCENT SLOPES
- BARKOF-WINDHAM ASSOCIATION, MODERATELY STEEP
- BEARPAW CLAY LOAM, 0 TO 4 PERCENT SLOPES
- BEARPAW-ELLOAM CLAY LOAMS, 0 TO 4 PERCENT SLOPES
- BEARPAW-ELLOAM CLAY LOAMS, 4 TO 8 PERCENT SLOPES
- BEARPAW-VIDA CLAY LOAMS, 4 TO 8 PERCENT SLOPES
- BOWDOIN CLAY
- CABBA-WINDHAM ASSOCIATION,
- CABBART-HILLON ASSOCIATION,
- CREED-GERDRUM COMPLEX, 0 TO 4 PERCENT SLOPES
- ELLOAM CLAY LOAM, 0 TO 4 PERCENT SLOPES
- HAVRE, HANLY, AND GLENDIVE SOILS, CHANNELED
- LISAM-DILTS CLAYS, 8 TO 35 PERCENT SLOPES
- LISAM-DILTS-ROCK OUTCROP, SHALE COMPLEX, 25 TO 60 PERCENT SLOPES
- LISAM-HILLON ASSOCIATION,
- MARTINSDALE CLAY LOAM, 0 TO 4 PERCENT SLOPES
- OTHER
- PHILLIPS LOAM, 0 TO 4 PERCENT SLOPES
- PHILLIPS-ELLOAM COMPLEX, 0 TO 4 PERCENT SLOPES
- TELSTAD LOAM, 0 TO 4 PERCENT SLOPES
- TELSTAD-JOPLIN LOAMS, 2 TO 8 PERCENT SLOPES
- THOENY-ELLOAM COMPLEX, 0 TO 4 PERCENT SLOPES
- VANDA-NOBE CLAYS, 0 TO 2 PERCENT SLOPES
- VIDA-ZAHILL CLAY LOAMS, 8 TO 15 PERCENT SLOPES
- WHITECOW ASSOCIATION,
- ZAHILL CLAY LOAM, 25 TO 45 PERCENT SLOPES
- ZAHILL-VIDA CLAY LOAMS, 15 TO 35 PERCENT SLOPES
- FORT BELKNAP INDIAN RESERVATION
- PROJECT AREA

Source: USDA NRCS 2014; BIA 2014a; FBIC 2017a

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
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(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-1

SOILS IN THE PROJECT AREA

**FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA**

Drawn By: BR	Checked By: JM	Scale: 1 " = 5 Miles	Date: 1/3/18	File: Fig4-1_FtBelknap_Soils.mxd

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The three soil series that comprise 30% of the Project Area (i.e., Farland, Phillips, and Telstad) are very deep, well-drained soils with moderately slow to slow permeability. The Farland soil series is a product of stratified alluvium, which was formed by sediments deposited by running bodies of water (USDA NRCS 1998). The Phillips and Telstad soil series are a product of till parent material, which formed from a direct deposit of glacial sediments. When cultivated, Farland soil is suitable for growing small grains, such as flax, corn, and hay. Irrigated Farland soils have the potential to yield alfalfa, beans, corn, and sugar beets (USDA NRCS 1998). Phillips and Telstad soil series are suitable for rangeland use and dryland farming, such as small grains (e.g., wheat, rye, barley, etc.). Generally, these soils are subject to long, cold winters; and, can experience 90-130 day period of frost-free conditions (USDA NRCS 1998).

4.2.2 IMPACTS OF MANAGEMENT ALTERNATIVES

4.2.2.1 NO ACTION ALTERNATIVE

Continuous and persistent soil disturbance resulting from actions such as the use of agricultural equipment and/or the overuse of an area by livestock would continue to cause rutting and soil compaction under the No Action Alternative. Soil rutting and compaction would generally occur following precipitation events.

Generally, overgrazing by livestock would result in an increase in the amount of bare ground within the Project Area. In turn, this can cause an increase in runoff, less water permeating into the soil, and an increase in wind and water erosion. These impacts would likely result in a less productive range unit, one that is less resistant to drought and noxious weeds, produces decreased forage quality and quantity, and eventually requires a decreased stocking rate (USDA NRCS 2016).

4.2.2.2 PROPOSED ACTION

Potential impacts to soils under the Proposed Action are expected to be similar to those impacts described under the No Action Alternative; however, some impacts may be more widespread and other impacts may be less adverse. In general, overall impacts to soils would be long-term and beneficial. Adverse impacts currently occurring under the No Action Alternative are expected to be minimized through the implementation of the ARMP. For example, the soil quality and stability would be improved through the implementation of the recommended agricultural management actions, such as the use of rotational grazing practices and the installation of cross-fencing. In addition, the implementation of crop rotation practices and improvements made to drainages would also improve soil health on croplands and farm/pasture lands. Lastly, repaired and properly functioning irrigation systems could also reduce soil erosion.

In addition to the long-term and beneficial impacts described above, there would be some temporarily adverse impacts. For example, the repair and construction of agricultural improvements (i.e., fencing and water sources) could result in temporary soil disturbance and/or slight soil compaction. However, such impacts would be temporary and negligible to

minor, particularly if repair and construction activities are performed on dry ground, in order to avoid rutting from equipment.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to soils have been addressed in the FBIC ARMP/PEA.

4.3 WATER RESOURCES

4.3.1 CURRENT CONDITIONS

4.3.1.1 SURFACE WATER

The Reservation is located within the Milk River Valley, and is bordered to the north by the Milk River and to the south by the Little Rocky Mountains (Figure 1-5). Generally, the Milk River Valley consists primarily of irrigated agricultural lands surrounded by low bluffs that rise to glaciated plains (Goodwin and Longknife 2013). The Milk River, which eventually drains into the Missouri River Basin (FBIC 2013), is supplied by four principle tributaries (Goodwin and Longknife 2013): Three Mile Creek, White Bear Creek, Peoples Creek, and Beaver Creek. Peoples Creek accounts for the majority of the drainage in the Project Area (Alverson 1965) and includes the following perennial and intermittent streams, all of which are located in the Project Area: Duck Creek, South Fork of Peoples Creek, Little Peoples Creek, Jim Brown Creek, Lodge Pole Creek, Lone Tree Coulee, and Mud Creek. Beaver Creek Basin (located in the eastern portion of the Project Area) includes the Big Warm Creek and the Little Warm Creek (FBIC 2013). Surface water resources in the submarginal lands also include Rattlesnake Creek, Suction Creek, and Little Suction Creek.

In addition to the rivers and creeks listed above, surface water resources in the Project Area also include several major lakes and reservoirs. The major surface water bodies in the Project Area include Snake Butte Reservoir (5 acres), Bigby Lake (145 acres), Lake 17 (415 acres), and Weigand Reservoir (1,000 acres) (FBIC 2013). Strike Reservoir, which is a public recreation area, is also within the Project Area (FBIC 2017c). Numerous other water impoundments for livestock, irrigation, wildlife habitat, and recreational purposes are also present within the Project Area (Goodwin and Longknife 2013). Surface water sources available for agricultural operations are also shown on Figure 1-5 and described above in Section 1.0 and the appendices.

Surface water entering the Reservation may be transported or diverted for use on trust lands for various irrigation or non-irrigation uses, provided that it is within the usage limits and boundaries established in the Water Rights Compact (State of Montana 2015a). The FBIC negotiated their water rights claims with the U.S. government, which were adopted by the Montana state legislature and ratified in 2001 in the *Water Rights Compact Entered Into By the State of Montana, the Fort Belknap Indian Community of the Fort Belknap Reservation, and the United States of America*. The

Water Rights Compact quantifies specific amounts of water that can be used for different purposes (i.e., domestic, agricultural, and for emergency uses). Note that the Water Rights Compact is not effective until it is approved by the FBIC, the State of Montana, and Congress. The Water Rights Compact was introduced in Congress in 2013, but is still pending approval (Congressional Research Service 2016).

Under the compact, the FBIC is entitled to up to 645 cubic feet per second (cfs) of water from the Milk River Basin for irrigation and non-irrigation uses. In addition, some of that water may be stored for future use and/or used for small impoundments meant for stock water use. The maximum capacity of each impoundment must be less than l5 acre-feet, and the total amount of water impounded in each impoundment must be less than 30 acre-feet per year (afy). The FBIC is also entitled to all of the water in Peoples Creek, after upstream water rights are met. Furthermore, the FBIC is entitled to use the water from Beaver Creek to irrigate up to 2,421 acres and for small impoundments for stock watering. Additionally, the FBIC may divert up to 1,135 afy for irrigation from the Missouri River Basin, in addition to the diversion of up to 1,290 afy from the Missouri River Basin to the Peoples Creek Basin.

Surface water usage on the Reservation is classified as either water used for irrigation purposes or non-irrigation purposes. Water used for irrigation purposes is limited to those uses identified in the compact (State of Montana 2015a), including farmland crop growing and pasture management from March 1 through October 31 of each year (FBIC 2013). Water used for non-irrigation purposes include water used for livestock (i.e., stock water), domestic, commercial, municipal, cultural, industrial, and recreational uses, and supporting fish and wildlife populations.

Water quality assessments are conducted by the FBIC Environmental Department and the USEPA, per the Clean Water Act (CWA) and the Draft FBIC Tribal Water Quality Standards, which parallel the Montana Water Quality Standards (FBIC n.d.b). In general, surface waters within the Reservation tend to have a high mineral content and are designated as alkaline waters with high concentrations of calcium and magnesium (USEPA 2016b). This designation is due to the surrounding geological features of glacial till and limestone bedrocks (Alverson 1965).

Surface water quality can be affected by point source pollution and nonpoint source pollution adjacent to and in the Project Area. Specifically, upstream nonpoint source pollution, such as stormwater runoff and agricultural runoff, may influence surface water quality (Massachusetts Institute of Technology 2012). Additionally, the operation of the former Zortman and Landusky gold mines adjacent to the south side of the Project Area (Indian Law Resource Center 2016a) have historically contaminated surface water and groundwater resources with high levels of cyanide and acid rock drainage (Indian Law Resource Center 2016b). The mines are no longer operational; however, it is suggested that the surface and groundwater of the Reservation continues to be threatened by the contaminated water leaving the mine sites (Indian Law Resource Center 2016a), and water treatment is required.

Drought, flooding, and increased land development may also affect the water quality in the Project Area. The Project Area is located in a semi-arid region where the annual rainfall averages 12 to 13 inches per year (further discussed in Section 4.4) (USDA 2016a). Heavy rainfall and flooding during 2011 (i.e., a 500-year flood event), caused extensive damage to streams, stream banks, homes, and infrastructure (e.g., roads, bridges, septic systems) in Hays, Lodgepole, Beaver Creek, Fort Belknap Agency, Dodson, and throughout the Project Area. The 500-year flood event also caused devastating damage to the Zortman and Landusky mine reclamation sites, as well as to the towns of Zortman and Landusky. Following the 2011 flood, restoration and mitigation was performed in Little Peoples Creek, Mission Canyon, and White Cow drainage (with funding from USDA NRCS) (FBIC 2017c). Additionally, heavy rainfall during the spring of 2012 resulted in damage to communities and agricultural operations along the Milk River Valley, including the Project Area (FBIC n.d.b). In addition, water quality may also be affected by decreased water availability in the coming years. For example, water rights along the Milk River and upstream of the Reservation are stretched to capacity with more demands expected for the future from both U.S. and Canadian off-reservation developments (Fredericks et al. 2013).

Additional concerns surrounding surface water quality and quantity include several terrestrial noxious weeds that have demonstrated impacts on surface water and groundwater resources and hydrology. For example, both Russian olive and saltcedar (*Tamarix ramosissima*) can change local hydrology. Russian olive often outcompetes native species of trees and bushes, and the species is preferentially avoided by beavers, which can increase the pressure of beavers on native tree and bush species (Forest Invasive Plants Resource Center 2016). In addition, both Russian olive and saltcedar have higher evapotranspiration rates compared to native species. These higher evapotranspiration rates can result in altered riparian and wetland water volumes and consequently decreased groundwater quantities due to a reduction in water infiltration and more evapotranspiration (Forest Invasive Plants Resource Center 2016; Montana Weed Control Association 2010a). Saltcedar also creates saline crusts and can impact the local water chemistry. Additionally, the dense roots of saltcedar can slow down river flows increasing the amount of sediment deposition within channels (Montana Weed Control Association 2010a).

4.3.1.2 GROUNDWATER

Potential groundwater sources and groundwater quality on the Reservation have been characterized by the U.S. Geological Survey (USGS) and Douglas C. Alverson (1965). Upper deposits of alluvium, glacial, and terrace rocks on the Reservation have shown small to moderate quantities of fair to good quality groundwater at rates that are sufficient to support domestic and livestock uses (Alverson 1965). The deeper aquifers under the Reservation consist of the Bearpaw Shale, Claggett Shale, Eagle Sandstone, Warm Creek Shale, Mowery Shale, and Thermopolis Shale, which yield none to small quantities of poor to fair quality water. The Judith River Formation, along the northwest flank of the Little Rocky Mountains on the Reservation, yields moderate to large quantities of poor to good water from many locations with some under artesian pressure (Alverson 1965). Deep aquifers within the Madison group and Ellis group

may supply small to large quantities of good water (Alverson 1965), but it is unknown as to whether there are any water wells within those aquifers at this time.

The overall occurrence of groundwater in the Project Area is based on the pore spaces or openings, fissures, fractures, and caverns that are present in less porous rock (Alverson 1965) and recharged by various surface water sources. The surface water recharge rates to groundwater in the Project Area likely follow seasonal fluctuations. For example, the groundwater wells within the Milk River Valley show water level rises near the end of June and early July, which is likely due to recharge from irrigation efforts (Alverson 1965). Additional research conducted by the USGS and the BIA on the southwestern portion of the Reservation revealed that groundwater wells within the Virgelle Sandstone Member (base of the Eagle Sandstone) also experience a seasonal fluctuation with the highest water levels recorded during the spring and summer (Slagle and Christensen 1993).

Groundwater quality within the area is generally composed of fair to good quality slightly alkaline water (Alverson 1965). Additional analysis administered through the FBIC Environmental Department with a source water protection grant found that contaminants from identified sources have had little effect on the groundwater; however, continued monitoring was recommended (FBIC n.d.a). As mentioned previously, the former Zortman and Landusky mines have been identified as a potential contaminant source to groundwater with groundwater in the area showing impacts from acid rock drainage (Indian Law Resource Center 2016a and 2016b). Other nonpoint pollution sources may have the potential to impact groundwater such as wastewater and agricultural runoff (FBIC n.d.a); however, those impacts have not been identified or quantified at this time.

4.3.1.3 WETLANDS

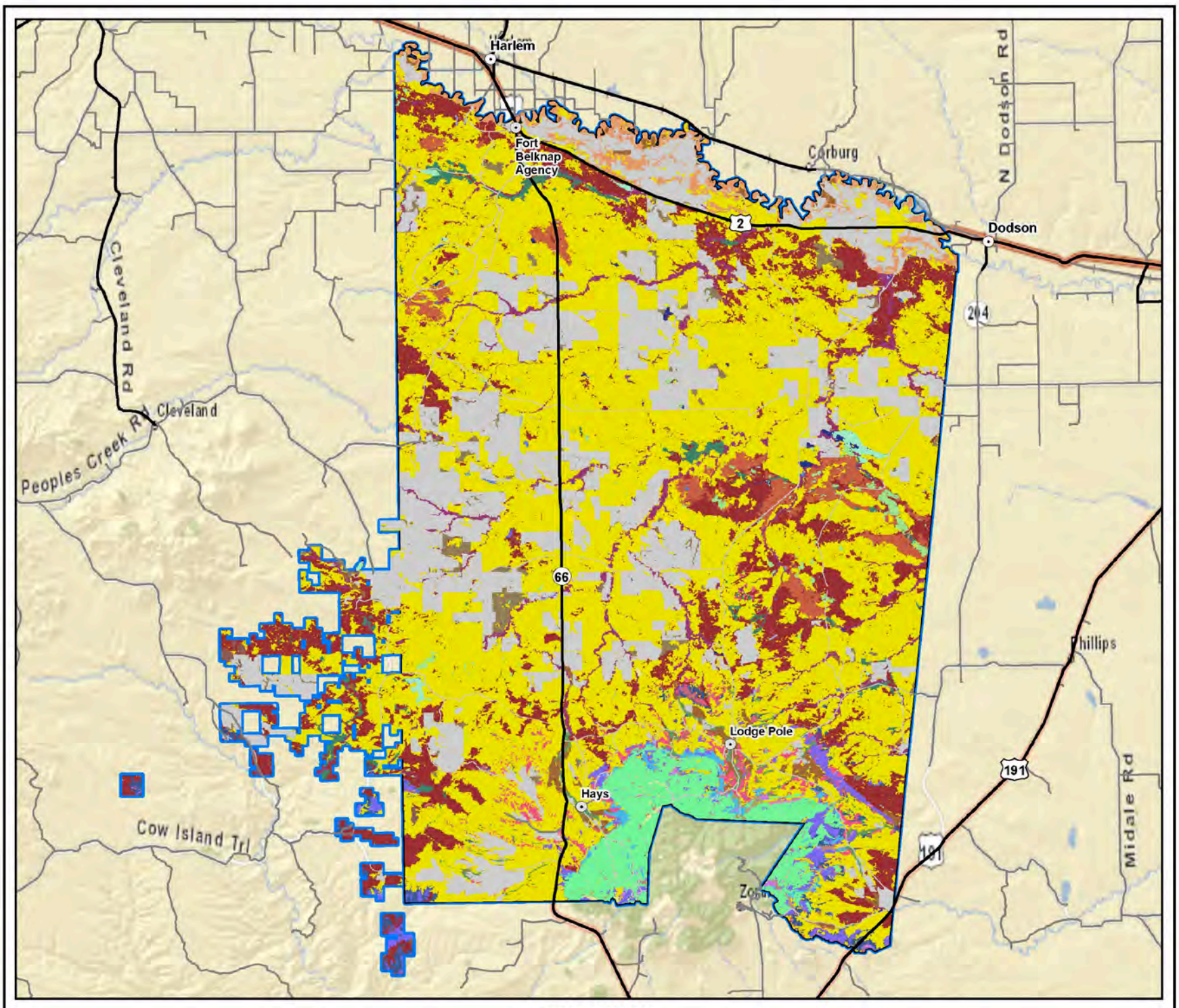
According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory database, wetland resources in the Project Area consist of the following wetland types (shown on Figure 1-5) freshwater (or palustrine) emergent wetlands, freshwater forested/shrub wetlands, freshwater ponds, lake (lacustrine), riverine, and other (USFWS 2016). Freshwater (palustrine) wetlands include all non-tidal wetlands dominated by trees, shrubs, persistent emergent vegetation, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity, due to ocean-derived salts, is below 0.5 parts per trillion. The emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens; the vegetation is present for most of the growing season in most years. The forested wetlands are characterized by woody vegetation that is 6 meters in height or greater. The freshwater ponds include wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6 to 7 centimeters), and a vegetative cover less than 30%. The lakes (lacustrine) habitat include wetlands and deepwater habitats in a topographic depression or a dammed river channel. This habitat typically lack trees, shrubs, persistent emergent vegetation, emergent mosses or lichens with 30% or greater areal coverage; and total area of at least 20 acres.

The *other* category may include farmed wetlands, saline seeps, and other miscellaneous wetlands (Cowardin et al. 1979).

Wetland resources based on MTNHP vegetation mapping are shown on Figure 4-2 and include emergent marshes, Great Plains closed depressional wetlands, and Great Plains saline depression wetlands (MTNHP 2016). The emergent marsh wetland type occurs throughout arid and semi-arid regions and is often found in depressions surrounded by upland mixed prairie, shrub steppe, or steppe vegetation. Water alkalinity chemistry tends to be highly variable with distinctive soils and potential organic matter buildup (Montana Field Guide [MFG] 2010a). The Great Plains closed depressional wetland type occurs in basins that are completely isolated from both the regional groundwater system and inter-wetland surface drainage system. This wetland type relies entirely on precipitation to form and maintain water; water becomes trapped at the surface due to an impermeable soil layer. These wetlands tend to experience irregular hydro-periods where water is occasionally present and can restrict the vegetative communities (MFG 2010b). The Great Plains saline depression wetland type is similar to the other wetland types; however, the system has increased soil salinity causing brackish water quality. The salinity levels are contributed from evaporation and the accumulation of dissolved minerals, often from regional groundwater discharges. Plant species that are salt tolerant are present in these wetlands; though, wet years can result in diluted salt concentrations allowing other species to establish (MFG 2010c).

The current status of wetland habitat (freshwater emergent wetlands and forested/shrub wetlands) in the Project Area includes approximately 8,636 acres of varying levels of quality (Figure 1-5 [USFWS 2016]). Wetlands in the Peoples Watershed (located throughout the majority of the Reservation) have been identified as being impacted from mining activities (FBIC n.d.b). However, other wetlands on the Reservation have been completely restored (Ducks Unlimited 2016). The FBIC Environmental Department had a Wetland Management Program, which included administrative, programmatic, legal, and a regulatory framework that allowed for wetlands in the Project Area to be assessed, monitored, controlled, and protected as a community resource (FBIC n.d.b). Lake 17 Wetland is also protected under a cooperative agreement, under the USDA NRCS Wetlands Reserve Program (WRP), which serves to preserve, protect, and enhance wetland ecosystems throughout the nation. In 2013, Lake 17 was enrolled into a 30-year WRP contract with the USDA NRCS, with the intent to restore the wetland to its original, undisturbed conditions, and prevent future degradation, primarily from livestock use (USDA NRCS 2013). Restoration of Lake 17, as outlined by the USDA NRCS, includes the implementation of fencing to exclude livestock, and the management of both upland and wetland habitats.

FIGURE 4-2. VEGETATION IN THE PROJECT AREA



EXPLANATION

- ASPEN FOREST AND WOODLAND
- ASPEN AND MIXED CONIFER
- BIG SAGEBRUSH STEPPE
- COMMERCIAL/INDUSTRIAL
- OTHER
- EMERGENT MARSH
- GREASEWOOD FLAT
- GREAT PLAINS BADLANDS
- GREAT PLAINS CLIFF AND
- GREAT PLAINS CLOSED DEPRESSIONAL WETLAND
- GREAT PLAINS FLOODPLAIN
- GREAT PLAINS MIXEDGRASS PRAIRIE
- GREAT PLAINS OPEN FRESHWATER DEPRESSION WETLAND
- GREAT PLAINS PONDEROSA PINE WOODLAND AND SAVANNA
- GREAT PLAINS RIPARIAN
- GREAT PLAINS SALINE DEPRESSION WETLAND
- GREAT PLAINS SAND PRAIRIE
- GREAT PLAINS SHRUBLAND
- GREAT PLAINS WOODED DRAW AND RAVINE
- INTRODUCED RIPARIAN AND WETLAND VEGETATION
- INTRODUCED UPLAND VEGETATION - ANNUAL AND BIENNIAL FORBLAND
- MAT SALTBUSH SHRUBLAND
- OPEN WATER
- PASTURE/HAY
- ROCKY MOUNTAIN CLIFF, CANYON AND MASSIVE BEDROCK
- ROCKY MOUNTAIN DRY-MESIC MONTANE MIXED CONIFER FOREST
- ROCKY MOUNTAIN FOOTHILL LIMBER PINE - JUNIPER WOODLAND
- ROCKY MOUNTAIN FOOTHILL WOODLAND-STEPPE TRANSITION
- ROCKY MOUNTAIN LODGEPOLE PINE FOREST
- ROCKY MOUNTAIN LOWER MONTANE, FOOTHILL, AND VALLEY GRASSLAND
- ROCKY MOUNTAIN LOWER MONTANE-FOOTHILL RIPARIAN WOODLAND AND SHRUBLAND
- ROCKY MOUNTAIN MONTANE-FOOTHILL DECIDUOUS SHRUBLAND
- ROCKY MOUNTAIN PONDEROSA PINE WOODLAND AND SAVANNA
- ROCKY MOUNTAIN POOR SITE LODGEPOLE PINE FOREST
- ROCKY MOUNTAIN SUBALPINE-MONTANE RIPARIAN SHRUBLAND
- FORT BELKNAP INDIAN RESERVATION
- PROJECT AREA

N

0 6 Miles

Source: MTNHP 2013; BIA 2014a; FBIC 2017a

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4-2

VEGETATION IN THE PROJECT AREA

FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA

Drawn By: BR	Checked By: JM	Scale: 1 " = 6 Miles	Date: 1/8/18	File: Fig4-2_FtBelknap_Veg.mxd

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4.3.2 IMPACTS OF MANAGEMENT ALTERNATIVES

4.3.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, existing conditions would continue as described in Section 4.3.1, including the adverse and long-term impacts to water resources from ongoing agricultural activities. Potential impacts to surface water quality from livestock would continue to be a potential concern under this alternative. Overgrazing and the utilization of surface water sources by livestock as a water source can lead to degraded riparian areas, altered stream flows, and decreased surface water quality.

For example, current conditions allow livestock to access water resources, during which they can decrease water quality through influxes of nitrogen and phosphorus from waste, alterations in watershed hydrology, changes to stream channel morphology, soil compaction and erosion, and riparian vegetation destruction (Agouridis et al. 2005). Additionally, the inefficient use of irrigation systems could result in decreased water quantity for agricultural operations in and around the Project Area.

4.3.2.2 PROPOSED ACTION

Similar to the No Action Alternative, existing conditions would continue, including the adverse impacts to water resources that are occurring in and around the Project Area; however, under the Proposed Action, these impacts are expected to lessen as more of the recommended agricultural management actions are implemented. For example, the construction of additional agriculture improvements (e.g., additional range water such as springs, wells, and troughs) for livestock could result in long-term beneficial impacts to surface water resources within the Project Area, since the presence of additional water developments would preclude livestock from gathering at one location indefinitely. If livestock were to move from different water sources placed within a range unit, there would be less erosion and contamination along surface waterways. The construction of fences to exclude livestock from some aquatic resources would reduce the negative impacts identified under the No Action Alternative. Similarly, the repair and installation of irrigation facilities would reduce the inefficient use of water in farm/pasture areas that utilize irrigation.

Most of the water used by grazing livestock would be from surface water sources; if additional livestock concentrate at watering sources, then they could potentially further damage adjacent vegetation, and thereby contribute to stream bank erosion and siltation, which could further affect surface water quality and reduce riparian habitat quality. Under this alternative, irrigation improvements would occur which could adversely impact the existing adjacent wetlands through loss of water flows. These long-term minor impacts would be dispersed over the entire Reservation; however, under this alternative, some priority riparian areas and wetlands would be protected, as noted in the recommendations.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to water resources have been addressed in the FBIC ARMP/PEA.

4.4 CLIMATE AND CLIMATE CHANGE

4.4.1 CURRENT CONDITIONS

4.4.1.1 CLIMATE

The climate of the Project Area is typical of the Great Plains region. Major snowstorms and ice are typical during the winter months, and the warmer months (typically March through October) have heat waves with thunderstorms. The coldest annual average temperatures in the Great Plains region are typically 30 degrees Fahrenheit (^{0}F) or less and these low temperatures are normally found in the higher mountain areas of Wyoming and Montana and along the northern border with Canada, close to the Project Area (National Oceanic and Atmospheric Administration [NOAA] 2013). Annual rainfall averages 12 to 13 inches per year (USDA 2016a); detailed representative climate data for the Project Area are presented in Table 4-2 (Western Regional Climate Center [WRCC] 2011 and 2015).

TABLE 4-2. REPRESENTATIVE CLIMATE DATE IN THE VICINITY OF THE PROJECT AREA

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Zortman, Montana													
Average Max. Temperature (^{0}F)	31.9	34.6	42.5	52.2	62.2	70.8	80	79.3	68.4	55.4	42.4	33.5	54.4
Average Min. Temperature (^{0}F)	10	12.4	20.2	29	37.7	45.7	51.5	50.2	40.9	30.9	20.8	12.3	30.1
Average Total Precipitation (in.)	0.88	0.52	0.88	1.66	3.33	3.98	2.04	1.76	1.65	0.99	0.56	0.78	19.03
Average Total Snow Fall (in.)	6.2	5.1	6.2	1.7	0.5	0	0	0	0	0.6	3	6.1	29.6
Average Snow Depth (in.)	4	4	2	0	0	0	0	0	0	0	1	2	1
Harlem, Montana													
Average Max. Temperature (F)	26	31.9	42.8	59.4	69.9	77.3	86.5	84.9	73.2	61.2	42.6	31.3	57.2
Average Min. Temperature (F)	1.8	6.4	17.1	29.4	39.5	47.8	52.8	50.3	40.2	30.2	16.4	6.8	28.2
Average Total Precipitation (inches)	0.5	0.41	0.51	0.86	1.73	2.58	1.6	1.06	1.11	0.63	0.52	0.44	11.95
Average Total Snow Fall (inches)	6.3	5.4	4.9	1.4	0	0	0	0	0.1	0.9	4	6.3	29.3
Average Snow Depth (inches)	5	5	2	0	0	0	0	0	0	0	1	2	1

Source: WRCC 2011 and 2015
Note: Harlem, Montana is located adjacent to the northern boundary of the Project Area, and Zortman, Montana is located adjacent to the southern boundary of the Project Area.

The Northern Plains have recently been in the midst of a drought, which resulted in the Tribes declaring disaster emergencies in June 2017. In response, reports from the Northern Plains included many accounts of extensive crop damage, livestock water holes drying up, and cattle losing weight due to poor or nonexistent grazing land (NOAA 2017). The market prices for all wheat varieties were predicted to be so low that only yields which met or exceeded the 30-year average would be profitable, and farmers with less successful yields would have to rely on crop insurance or alternative income (Great Falls Tribune 2017). In July of 2017, Montana's Governor declared drought disaster areas in 28 counties and five Indian Reservations, including the Project Area (Havre Daily News 2017).

4.4.1.2 CLIMATE CHANGE

Climate variability refers to the way climate fluctuates above or below long-term average values during the year. Climate variability is caused by volcanic eruptions, sunspots, and El Nino and El Nina events (Dinse n.d.). Climate change refers to any systematic change in the long-term statistics of climate elements (such as temperature, pressure, or winds) sustained over several decades or longer (American Meteorological Society [AMS] 2012). The AMS also indicates climate change may be due to natural external forcings (e.g., changes in solar emission or slow changes in the earth's orbital elements), natural internal processes of the climate system, or anthropogenic forcing. The climate system can be influenced by changes in the concentration of various greenhouse gases (GHGs) in the atmosphere that affect the earth's absorption of radiation (AMS 2012).

The United Nations Framework Convention on Climate Change (UNFCCC) defined climate change as …*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods* (UNFCCC 2009). In its most recent report (Fifth Assessment Report), the Intergovernmental Panel on Climate Change (IPCC) stated that human interference with the climate system is occurring. IPCC further stated that climate change involves complex interactions and changing likelihoods of diverse impacts, and changes in climate have caused impacts on natural and human systems on all continents and across the oceans (Field et al. 2014).

Future climate change projections for the Great Plains include more violent storms and more frequent flooding (NOAA 2013). Declines in water quality have been associated with a higher incidence of flooding (U.S. Global Change Research Program 2014). In addition to changes in precipitation patterns, climate change in the Great Plains is expected to be manifested through annual increases in temperature. Summers will likely become warmer and winters will likely become milder, as compared to current conditions of mild summers and cold winters. There is some variability in predictions for changes to total annual precipitation; however, most of the Dakotas and Montana are expected to experience moderate increases in annual precipitation (U.S. Global Change Research Program 2014; NOAA 2013).

4.4.1.3 GREENHOUSE GAS EMISSIONS

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor. Because CO_2 is the reference gas for climate change, measures of non-CO_2 GHGs are converted into CO_2 equivalent (CO_2e) values based on their potential to absorb heat in the atmosphere. GHGs occur naturally because of volcanoes, forest fires, and biological processes (such as breathing), and they are also produced by burning fossil fuels in power plants and automobiles and from industrial and agricultural processes, waste management, and land use changes.

Nationally and historically, CO_2 emissions from fossil fuel combustion represented the largest source of total weighted GHG emissions from all emissions. Within the U.S. and U.S. territories, fossil fuel combustion from electricity generation, transportation, and industrial, residential, and commercial uses accounted for 94% of CO_2 emissions (approximately 5,277 million metric tons) in 2011. The remaining 6% came from non-energy use of fuels and from other manufacturing and production sources (USEPA 2013). Similar to the U.S., CO_2 emissions in the Project Area are likely the result of transportation, residential, and commercial uses.

Emissions from ruminant livestock grazing are also a large source of methane worldwide. Globally, livestock grazing produces approximately 80 million metric tons of methane emissions per year (Pew Center on Global Climate Change 2009). In the U.S., ruminant livestock emit about 23% of the U.S. methane emissions from human related activities (or anthropogenic sources) (U.S. Department of State 2014). Methane emissions from cattle grazing have not been quantified for Blaine or Phillips counties.

4.4.2 IMPACTS OF MANAGEMENT ALTERNATIVES

In 2016, the CEQ provided the Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Review (CEQ 2016). In that guidance, CEQ provided a reference point of 25,000 metric tons of direct CO2e emissions to agencies as a useful indicator for agencies' action-specific evaluation of GHG emissions and disclosure of that analysis in their NEPA documents. CEQ did not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, as that term is used by NEPA, but noted that it serves as a minimum standard for reporting emissions under the CAA. It is important to note that this guidance was rescinded in 2017 per 82 Federal Register 16576; however, the reference point of 25,000 metric tons of direct CO2e emissions will be used in this analysis when discussing and analyzing potential GHG emissions under the Proposed Action and No Action Alternative due to the lack of any other established GHG emission reference points for NEPA analyses. In addition, the guidance noted that in a NEPA analysis, climate change issues arise in relation to the consideration of: (1) the GHG emissions effects of a proposed action and alternative actions; and (2) the relationship of climate change effects to a proposed action or alternatives, including the relationship to proposal design, environmental impacts, and mitigation and adaptation measures.

4.4.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, negligible to minimal impacts to climate change and variability are anticipated. Livestock, specifically cattle, contributions to global CO_2e emissions account for approximately 9% of the total GHG emissions from anthropogenic sources (Ripple et al. 2014). Emissions are anticipated to increase in the next 50 to 100 years, as approximately 25 million domestic ruminants, including cattle, are introduced globally each year, resulting in a growing domestic ruminant population (Ripple et al. 2014). In consideration of the total amount of CO_2e

emissions from livestock located within the Project Area compared to the 9% contribution that cattle have on climate change worldwide, it is clear that the impact of livestock within the Project Area on total CO_2e emissions would be negligible to minimal. Impacts from emissions from agriculture equipment and vehicles could also occur, however, farmers and ranchers are contributing to GHG emissions in the Project Area through dispersed use of vehicles, farm equipment, and animal husbandry. In general, the seasonal use of such equipment and the low number of farmers and ranchers working in such a large Project Area would also result in negligible amounts of GHG emissions and thus negligible impacts to climate change.

4.4.2.2 PROPOSED ACTION

Under the Proposed Action, impacts to climate change would be similar to those discussed under the No Action Alternative. However, if there is an increase in the amount of land used for farming or ranching activities or increase in livestock numbers, there could be a slight increase in the total amount of GHG emissions (i.e., CO_2, CH_4, and N_2O) under the Proposed Action. Regardless of such changes, it is expected that GHG emissions generated under the Proposed Action would continue to be negligible and limited due to the dispersed, minimal, and temporary nature of the emissions.

As noted in CEQ (2016), impacts from changing climate to the Proposed Action should also be considered in a NEPA environmental review. When reviewing future climate conditions anticipated in the Great Plains, the conditions could affect the ongoing farming and ranching activities due to more violent storms, more frequent flooding, through annual increases in temperature, and changes to total annual precipitation (increased and reduced) (U.S. Global Change Research Program 2014; NOAA 2013). For example, an increase in water availability from winter and spring precipitation could provide benefits to agricultural resource productivity if the precipitation occurs during the early growing season. However, in the case of croplands, this benefit could be offset if fields are too wet to plant. Additionally, rising temperatures could lengthen the growing seasons, possibly allowing for a second annual crop in some places and years, and/or an increase in the total length of time livestock can utilize the range units. Alternatively, if warmer winters occur, pests and invasive weeds could potentially survive the warmer winters, and winter crops and forage that emerge earlier are susceptible to spring freezes (U.S. Global Change Research Program 2014). Additionally, if drought continues (as described above) additional impacts to agricultural resources would occur.

Nonetheless, the implementation of the recommended management actions in the ARMP would allow FBIC farmers and ranchers to better plan for and adapt to climate changes and climate variability. Examples of these recommended management actions are listed below:

- Water used for agricultural operations would be utilized more efficiently after implementation of the Milk River Irrigation Rehabilitation Plan, stock water recommendations, and historical irrigation recommendations, and thus the overall water quantity impacts agricultural operations can have would be reduced.

- Development of a climate change adaptation plan and/or a drought mitigation plan would assist the FBIC with planning for and adapting to climate changes and climate variability.
- The implementation of the Fort Belknap Noxious Weed Strategic Plan and development of a noxious weed program would reduce the impacts that the changing climate and climate variability may have within the Project Area (i.e., an increase in noxious and invasive weeds).

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to and from climate change have been addressed in the FBIC ARMP/PEA.

4.5 VEGETATION, NOXIOUS WEEDS, AND INVASIVE SPECIES

The Project Area is located within the Northwestern Glaciated Plains ecoregion. The Northwestern Glaciated Plains is considered a transitional ecoregion because it is located between the more level and humid Northern Glaciated Plains and the more irregular and drier Northwestern Great Plains. In Montana, this ecoregion has been further divided into additional ecoregions that separate areas of different terrain, land use, surficial deposits, soils, potential natural vegetation, and/or climate. The Northwestern Glaciated Plains within the Project Area includes the ecoregions of Glaciated Dark Brown Prairies and Foothill Grasslands. Predominant land use in the Northwestern Glaciated Plains ecoregion is cattle ranching and farming (Woods et al. 2002).

4.5.1 VEGETATION

There are 42 types of ecological systems within the Project Area (MTNHP 2013); each ecological system is shown in Figure 4-2. Additionally, the approximate acreage and percentages of the ecological systems that encompass at least 1,000 acres of the Project Area are provided in Table 4-3. Of the 42 types of ecological systems, 5 systems make up the majority (86%) of the Project Area, ranging from 3% to 50% (MTNHP 2013). The five major systems are indicated by bold text in Table 4-3 and further described below.

TABLE 4-3. ECOLOGICAL COMMUNITIES IN THE PROJECT AREA

Ecological Community	Approximate Acreage	Approximate Percentage (%) of the Project Area
Great Plains Mixedgrass Prairie	320,320	48
Cultivated Crops	117,254	18
Big Sagebrush Steppe	87,962	13
Great Plains Riparian	20,356	3
Rocky Mountain Lodgepole Pine Forest	19,506	3
Mat Saltbush Shrubland	11,635	2
Introduced Upland Vegetation - Annual and Biennial Forbland	10,478	2
Great Plains Floodplain	9,022	1
Great Plains Shrubland	8,916	1
Great Plains Ponderosa Pine Woodland and Savanna	7,604	1
Greasewood Flat	6,974	1
Rocky Mountain Foothill Woodland-Steppe Transition	5,506	1
Other Roads	5,500	1
Pasture/Hay	4,870	1
Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland	3,644	1
Great Plains Saline Depression Wetland	3,447	1
Rocky Mountain Montane-Foothill Deciduous Shrubland	2,882	<1
Open Water	2,447	<1
Rocky Mountain Foothill Limber Pine - Juniper Woodland	1,989	<1
Emergent Marsh	1,666	<1
Great Plains Sand Prairie	1,493	<1
Rocky Mountain Subalpine-Montane Riparian Shrubland	1,146	<1
Great Plains Wooded Draw and Ravine	1,055	<1

Source: MTNHP 2013
Note: Percentages and acreages are approximate due to rounding and geospatial outputs.
Bold = Ecological systems comprising a majority of the Project Area.

The dominant ecological system in the Project Area is the Great Plains Mixedgrass Prairie, which comprises approximately 320,320 acres (MTNHP 2013). This system covers much of the eastern two-thirds of Montana and is interspersed with wetland/riparian areas and sand prairies. This system is characterized by high herbaceous canopy cover, with western wheatgrass (*Pascopyrum smithii*) as the dominant species. Other common species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). The primary ecological drivers of this system include fire and grazing; however, drought can also impact it by favoring shortgrass species over mid-height grasses, resulting in shifts in relative cover by these two general grass types. When mixedgrass prairie is intensely grazed, cool season exotic species such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and field brome increase in cover, thereby reducing both native species cover and potentially diversity (MFG 2010d). Moderate grazing tends to increase cover and abundance of forb species.

Another dominant vegetation type in the Project Area is Cultivated Crops, which comprises approximately 117,254 acres (MTNHP 2013). This system includes areas that are used for the production of crops on an annual cycle, such as alfalfa, hay, small grains, seed crops, and vegetables. Agricultural plant cover is variable depending on season and type of farming, and may be dry-farmed or irrigated (MFG n.d.).

Another dominant ecological system in the Project Area is the Big Sagebrush Steppe which comprises approximately 87,962 acres (MTNHP 2013). This widespread ecological system occurs throughout much of central Montana and the western fringe of the Great Plains. Overall shrub cover can range from 10% to 25%, but this system is always co-dominated by perennial grasses and forbs with greater than 25% cover. The majority of this system (50-90%) is dominated by two species - Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) and western wheatgrass (*Pascopyrum smithii*). When this system is disturbed, field brome and cheatgrass (*Bromus tectorum*) can invade and increase in cover. Periodic fire (the natural fire regime) results in a patchy mosaic of shrubs across the landscape; however, fire suppression and/or heavy grazing may result in an increase in shrub cover (MFG 2010e).

Another dominant ecological system in the Project Area is Great Plains Riparian, which comprises approximately 20,356 acres (MTNHP 2013). This system is associated with perennial to intermittent or ephemeral streams throughout the northwestern Great Plains and in Montana, and it occurs along smaller tributaries of the Yellowstone and Missouri rivers, as well as along tributaries to the large floodplain rivers that feed them (e.g., the Milk, Marias, Musselshell, Powder, Clark's Fork Yellowstone, and Tongue rivers, etc.). This system is found on alluvial soils in various settings, including confined, deep cut ravines to wide, braided streambeds. The key process influencing this system is flooding, which creates suitable sites for seed dispersal and seedling establishment, and controls vegetation succession. Riparian forests, shrublands, tallgrass wet meadows, and gravel/sand flats are various communities that are included in this system. The dominant species include narrowleaf cottonwood (*Populus angustifolia*) and Plains cottonwood (*P. deltoides*); in wetter systems, the understory is typically willow (*Salix* spp.) and redosier dogwood (*Cornus*

stolonifera). Western wheatgrass dominates the grasses, and the dominant forb is American licorice (*Glycyrrhiza lepidota*). The understory may be dominated by big sagebrush (*Artemisia tridentata*) or silver sagebrush (*Artemisia cana*) in areas where the channel is incised. Like floodplain systems, riparian systems are often exposed to overgrazing and/or converted for agricultural use and can be heavily degraded without native woody vegetation and periodic recruitment and regrowth of these species. Under these conditions, saltcedar and Russian olive (*Eleagnus angustifolia*) can invade and replace the native species. Groundwater depletion and lack of fire have also resulted in species changes (MFG 2010f).

Another dominant ecological system in the Project Area is the Rocky Mountain Lodgepole Pine Forest, which comprises approximately 19,506 acres (MTNHP 2013). This forested system is widespread from the Montana Rocky Mountains and east into island ranges of north-central Montana and the Bighorn and Beartooth ranges of south-central Montana. This system is dominated by lodgepole pine (*Pinus contorta*), which is a species that relies on fire. After fires in lodgepole pine stands, this species will rapidly re-colonize and develop into dense, even-aged stands. This system in Montana is found at elevations ranging from 3,200-9,000 feet and occurs on flats and slopes of all degrees and aspect, as well as valley bottoms (MFG 2010g). This ecological system, along with others in the Project Area, can contain species that can cause abortion in cows. Lodgepole pine, along with ponderosa pine (*Pinus ponderosa*) and common juniper (*Juniperus communis*), can contain isocupressic acid, which can cause abortions when grazed by cattle. Generally, cattle graze pine needles during storms with increased snow, wind, cold, changes in feed, or hunger; induced abortions generally occur in late fall to early spring, during the last trimester of pregnancy. Incidences of abortion vary, ranging from only a few to 100% of the cows involved. Ways to prevent this occurrence includes: (1) keep pregnant cows away from pine trees and fallen needles or slash piles, especially during the third trimester, and (2) provide supplemental feed when the weather is cold and/or snow covers dormant forage (USDA 2016b).

4.5.1.1 CULTURALLY SIGNIFICANT PLANTS

The most commonly utilized culturally significant plant species within the Project Area were identified with assistance from the THPO during the development the Noxious Weed Strategic Plan and associated PEA. These plants may be culturally significant because of their use as food, as ceremonial artifacts, and/or in medicines. The culturally significant plants are known to occur throughout the Project Area in various types of ecological systems. Examples of such species include:

- Kinnikinnick (*Arctostaphylos uva-ursi*)
- Yarrow (*Achillea millefolium*)
- Chokecherry (*Prunus virginiana*)
- Silver sage (*Artemisia cana*)
- Buffaloberry (*Shepherdia canadensis*)

Additional information on the culturally significant plants is included in Appendix G.

4.5.2 NOXIOUS WEEDS AND INVASIVE SPECIES

A weed is defined *as any plant that interferes with management objectives for a given area of land (or body of water) at a given point in time*. Over the past 150 years, the rate of introduction and spread of noxious weeds has increased dramatically, due to increases in human activities, trade, and commerce (Montana Weed Control Association 2016a). A weed attains a "noxious" status by rule as described in the Montana County Weed Control Act. Currently, there are 32 weeds on the Montana statewide noxious weed list that infest about 7.6 million acres statewide. Note that the FBIC does not maintain an official noxious weed list; therefore, the Montana statewide noxious weed list is used for this section. Management of noxious weeds often occurs after the noxious weeds have already become prolific in an area, and can be difficult to remove without the use of integrated management (i.e., combining various controls methods) (Fuller and Mangold 2017). Operators are encouraged to manage noxious weeds on their land at first sighting, because growth can lead to economic and ecological consequences. For instance, noxious weeds exhibit slow to moderate growth during initial introduction to a new environment, but continue to expand until naturally-induced or anthropogenic limitations are presented (Research Group LLC 2014). Nationwide, invasive weeds are responsible for an estimated $34 billion in damages, each year (Fuller and Mangold 2017). Specifically, the direct impact invasive species have on the livestock industry has been estimated to approximately $120 million every year (Community Attributes Inc. 2017).

The following section provides descriptions of noxious weed species that are likely or known to occur within the Project Area. Figure 4-3 provides the locations of known infestations of noxious weed species in the Project Area, along with biological controls conducted on the Reservation by INCA.

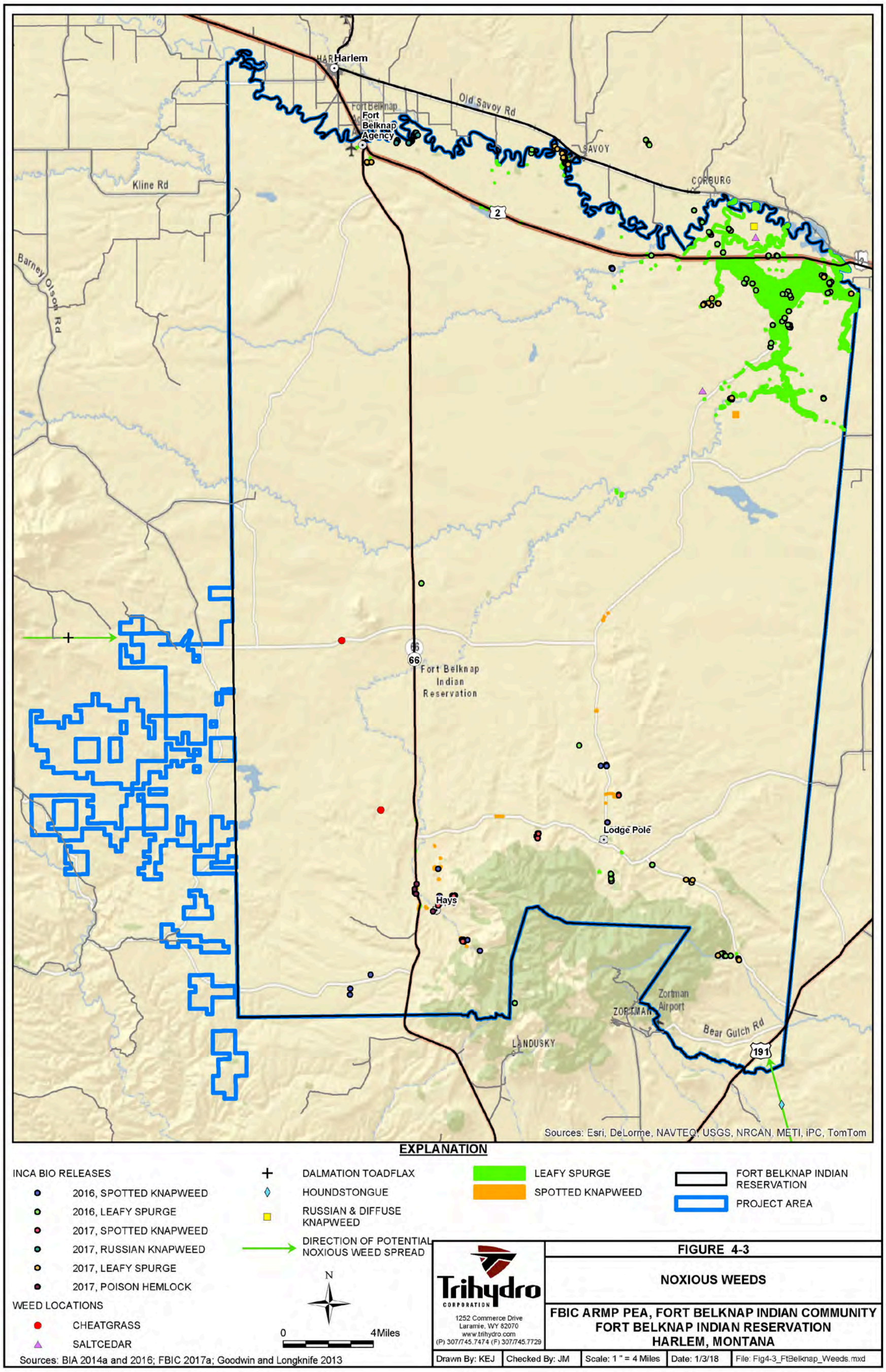
4.5.2.1 AQUATIC NOXIOUS WEEDS

Aquatic noxious weeds are generally aquatic invasive species (AIS) that invade an aquatic ecosystem beyond their natural or historic range (USFWS 2015a). The presence of an AIS may harm native ecosystems or commercial, agricultural, or recreational activities. These species are often intentionally or unintentionally introduced, with their effects on an ecosystem ranging from very little to devastating (USFWS 2015a). Three aquatic noxious weeds, including curly-leaf pondweed (*Potamogeton crispus*), flowering rush (*Butomus umbellatus L.*), and Eurasian water milfoil (*Myriophyllum spicatum*), are currently listed on Montana's noxious weed list. Additionally, hydrilla (*Hydrilla verticillata*) is considered a regulated plant, which is not Montana listed noxious weeds, but it still has the potential to result in significant negative impacts (Montana Weed Control Association 2016b). The State of Montana mandates that regulated plants are not to be intentionally distributed or sold, unless it is a contaminant in agricultural produce (Montana Weed Control Association 2016b). There are also two terrestrial noxious weeds that are closely associated

with aquatic ecosystems: purple loosestrife (*Lythrum salicaria*) and yellowflag iris (*Iris pseudocorus*) (Montana Weed Control Association 2016b).

There are no mapped aquatic noxious weeds infestations in the Project Area, but zebra mussel (*Dreissena polymorpha*) and quagga mussel (*Dreissena bugensis*) have been identified in waterbodies surrounding the Project Area, such as the York's Island Fishing Access Site (approximately 160 miles southwest of the Reservation) and in the Tiber Reservoir (approximately 100 miles west of the Reservation) (BIA 2017c). AIS are a potential concern for the area due to their effects on native aquatic ecosystems. The disruption of native aquatic ecosystems may cause economic, recreational, ecological, and human health impacts (Montana Fish, Wildlife and Parks [MFWP] 2016a). A strategic plan for the early detection and rapid response to the dreissenid mussel in Montana (i.e., the Montana Invasive Mussel Coordination Strategic Plan for the Early Detection Rapid Response) is currently being developed and would assist with the prevention of AIS spread into the Project Area.

FIGURE 4-3. NOXIOUS WEEDS



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4.5.2.2 CANADA THISTLE

Canada thistle is commonly found in abandoned fields, gravel pits, pastures, ROWs, roadsides, railroad embankments, and agricultural fields. Additionally, it can be found in areas with fluctuating water elevations, such as a stream bank, irrigation ditch, or canal (Montana Weed Control Association 2016c). Canada thistle decreases forage and livestock production on rangelands and reduces aesthetics in recreation areas. Additionally, it invades areas impacted by disturbance (including restoration efforts) and may produce toxins that inhibit growth of other plants. Hiking and horse-back trails are major invasion pathways for Canada thistle. This species often establishes after fire, disking, and herbicide treatments that have reduced the cover of other plants (BIA 2014b).

There are no mapped Canada thistle infestations on the Reservation, but the species is a potential concern due to its large root network allowing it to be an aggressive competitor. The long root system allows the plant to outcompete nearby desirable species for soil nutrients and moisture. Additionally, the height of the flowering stalk can shade the ground below, limiting the production of other plants. Canada thistle may also be a problem on certain croplands because it can serve as a host for undesirable insects and pathogens (Montana Weed Control Association 2010b).

4.5.2.3 CHEATGRASS

Cheatgrass is a regulated plant and not a state-listed noxious weed; however, it has the potential to alter the ecosystems it invades and can completely replace native vegetation and alter fire regimes. It easily invades heavily grazed rangeland, roadsides, burned areas, and disturbed sites. If a fire occurs, cheatgrass may outcompete the native vegetation, which often results in erosion, and water resource damage concerns (Montana Weed Control Association 2016d).

Cheatgrass infestations have been mapped west of MT 66 and the species is a known concern in the Project Area, since it can alter native plant communities and can easily outcompete more desirable native grasses. In addition, cheatgrass forms highly flammable and densely growing stands due to the fine texture of the plant structure. This increase in fire fuel availability can result in hotter and faster fires and an increase in the frequency of fire (Montana Weed Control Association 2010c). Although cheatgrass can provide good quality forage for livestock grazing in the spring and winter, it is often unpalatable to livestock in the mid- to late- growing season due to the sharp seed structures and pointed awns in a mature plant (USDA NRCS 2008). The mature seeds may also cause health problems for livestock such as tissue damage to eyes, skin, mouth, and ears and may cause damage to intestines when ingested (USDA NRCS 2008). Appendix C provides additional information on cheatgrass within the Project Area.

4.5.2.4 DALMATIAN TOADFLAX

Dalmatian toadflax (*Linaria dalmatica*) grows best in full sun on dry sites with well-drained soils. It is typically found along disturbed sites such as roadsides, clear cuts, ROWs, fences, cultivated fields, pastures, and rangelands. Dalmatian toadflax infestations have been mapped west of the Project Area, and the species is a potential concern because it can displace native vegetation and degrade habitat. The loss of the native vegetation may also result in increased soil erosion, sediment yield, and surface runoff (Montana Weed Control Association 2010d).

4.5.2.5 HOUNDSTONGUE

Houndstongue (*Cynoglossum officinale*) is found in well drained and relatively sandy soils. It is also found in shady areas and can be located under the canopy of forests and wetter grasslands. It is often found in pastures and meadows, along roadsides, and disturbed sites (Montana Weed Control Association 2016e). Houndstongue infestations have been mapped just southeast of the Project Area, and the species is a potential concern in the Project Area because it can displace the native vegetation and cause problems to grazing lands when established (Montana Weed Control Association 2010e). Additionally, the species is not palatable to grazing animals; however, if consumed in large quantities it can kill an animal. Houndstongue contains an alkaloid chemical, which can cause liver damage in horses and cattle, but not sheep (Montana Weed Control Association 2010e).

4.5.2.6 KNAPWEED (DIFFUSE, RUSSIAN, AND SPOTTED)

Knapweed species potentially occurring in the Project Area include diffuse, Russian, and spotted. Diffuse knapweed can be found along roadsides, pastures, croplands, clear-cuts, irrigation ditches, river banks, and other disturbed habitats (Montana Weed Control Association 2016f), but is not generally found on irrigated lands (Montana Weed Control Association 2016f). Russian knapweed is a perennial plant that differs from both the diffuse and spotted knapweeds because of its extensive root system and tendency to reproduce by rhizomes. However, Russian knapweed can produce up to 1,200 seeds annually (Montana Weed Control Association 2016g). Spotted knapweed can produce approximately 140,000 seeds by each individual plant with multiple blooming rosettes. This knapweed is highly adaptable and can be found in other areas such as wet or well-drained gravel soils (Montana Weed Control Association 2016h).

There are numerous mapped infestations of spotted knapweed in the southern portion of the Project Area and around the communities of Hays and Lodgepole. Russian and diffuse knapweed have also been mapped in the Project Area. All three knapweed species are a potential concern in the Project Area due to their competitive nature. Knapweed species can form monospecific stands, which can completely alter the structure and function of the ecosystem. This can reduce the productivity of rangeland by displacing forage species for livestock and wildlife. They can also quickly invade disturbed and undisturbed grasslands, shrubland, and riparian areas, with the exception of Russian knapweed, which does not readily establish in healthy ecosystems and typically invades disturbed areas (Colorado Weed Management Association [CWMA] 2016c). Both spotted and Russian knapweeds produce chemicals to inhibit nearby

plant growth (CWMA 2016b and 2016c). Additionally, Russian knapweed is poisonous to horses when consumed (CWMA 2016b).

4.5.2.7 LEAFY SPURGE

Leafy spurge is often found along waterways and irrigation ditches, in addition to within draws and sagebrush stands (Montana Weed Control Association 2016i). Leafy spurge infestations have been mapped in the eastern and southern portions of the Project Area, and the species is a potential concern in the Project Area due to its aggressive nature and its ability to out-compete more desirable plants. The milky sap produced from the stem is poisonous to humans, horses, and cattle (Montana Weed Control Association 2010f), but sheep are not adversely affected and sheep grazing has therefore been shown to reduce leafy spurge communities (Montana Weed Control Association 2016i). Livestock and wildlife avoid areas of concentrated leafy spurge; and wildlife-grazing patterns have likely been altered by the presence of leafy spurge in historic grazing locations (Montana Weed Control Association 2010f). Currently, leafy spurge has a large economic effect on western states (including Montana, North and South Dakota, and Wyoming), due to the costs associated with control, reduced crop and grassland production, and reduced land values due to infestations (Montana Weed Control Association 2010f).

4.5.2.8 RUSSIAN OLIVE

Russian olive is found in riparian areas, lakeshores, old fields, roadsides, forest edges, and sandy floodplains. It is tolerant of dry to moist soils, low nutrients, high salinity, shade, and extreme heat and cold (Forest Invasive Plants Resource Center 2016). Its prolific and rapid growth rate enables the Russian olive to outcompete native plants for water, light, and nutrients, eventually displacing them (Forest Invasive Plants Resource Center 2016). There are no mapped Russian olive infestations in the Project Area, but the species is a potential concern because of its potential to establish along several watersheds within Montana.

4.5.2.9 SALTCEDAR

Saltcedar is found along streams, waterways, bottom lands, banks, and drainages. The species can be found on moist rangelands, pastures, and other areas where the seeds can establish in saturated soils (Montana Weed Control Association 2016k). A saltcedar infestation has been mapped in the northeast portion of the Project Area. This species is a potential concern because of its rapid growth rate and ability to colonize within and subsequently alter riparian communities (Montana Weed Control Association 2010a). Additionally, the species excludes native vegetation by releasing salts above and below ground, rendering soils in the immediate area inhospitable for native species. The other main concern with saltcedar is the species' large consumption of water, which can deplete groundwater, dry up springs and marshes, and reduce water availability in riparian areas (Montana Weed Control Association 2010a). The species' dense roots may slow down river flow because of decreased water availability, which can increase sediment deposition along river banks. Further, this deposition can widen riparian zones, which may further cause a reduction in streamflow or rechanneling and adversely impact existing wetland habitat (Montana Weed Control Association 2010a).

4.5.2.10 CLUBMOSS

Clubmoss, also known as spikemoss, is considered problematic on degraded rangelands, due to its mat-forming properties and extensive, shallow root system, which quickly absorb most of the precipitation and limits moisture available for other species. Clubmoss often establishes a dominant presence in rangelands that have been heavily grazed, and it reduces diversity overall potential livestock forage. This species is known to be problematic in Montana, and federal funding has facilitated the trial of mechanical and biological treatments to control established populations (Kilian et al. n.d.) Clubmoss is not palatable for livestock or wild game in the state of Montana, and contains poor nutritional value (Crane 1990). Average clubmoss cover ranges from 6% to 50% throughout the range units in the Project Area. Increases in percent of clubmoss cover are associated with decreased annual production of forage (see Appendix C for more information).

4.5.3 IMPACTS

4.5.3.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to vegetation resources, including culturally significant plants, are expected to be major and long term. The goals and objectives outlined in the Noxious Weed Strategic Plan and associated PEA have not yet been implemented. Under the No Action Alternative, noxious weeds would continue their establishment throughout the Project Area, competing with and potentially excluding desirable species (including culturally significant species). The impact of noxious weeds on ecological and biological communities is well documented and also descried in the Noxious Weed Strategic Plan (MFWP 2008). Within the State on Montana, noxious weeds are estimated to reduce livestock production by a factor of approximately $0.40 per acre (Fuller and Mangold 2017). Most range units on the Reservation encompass 2,000 to 4,000 acres, suggesting that the average range unit may lose an estimated $800 to $1,600 in livestock production each year. Under the No Action Alternative, this estimate may increase, as the Noxious Weed Strategic Plan may not be implemented under the current conditions and without the creation of a Noxious Weed Strategic program.

Potential impacts to vegetation resources under the No Action Alternative would be adverse and minor to moderate. For example, trampling of vegetation and soil compaction (resulting from livestock grazing) could lead to reduced infiltration and water availability for vegetation. In addition, the seasonal use of farm equipment could result in soil compaction, and overgrazing, which could decrease the density of some vegetation communities, increase soil temperature, and decrease the amount of water available for the vegetation could also occur.

4.5.3.2 PROPOSED ACTION

Selection of the Proposed Action would result in long-term beneficial impacts to desirable vegetation resources, including culturally significant plants, due to the implementation of increased rangeland health management and implementation of the Noxious Weed Strategic Plan and program. These actions are expected to result in the reduction and eventual elimination of noxious weeds and the re-establishment of native vegetation. At a minimum,

implementation of the recommended management actions would constrain further spread and control existing noxious weed populations.

Conversely, there may be some-short term and minor adverse impacts to vegetation during the implementation of the recommended management actions. For example, the installation and repair of agricultural improvements (e.g., fences, stock water impoundments, etc.) could result in destruction and/or damage to vegetation communities located in and/or around where the installation/repair of the agricultural improvements are taking place. In addition, some methods for noxious weed control are non-specific to a particular noxious weed and may therefore result in temporary adverse impacts to other plant species in the immediate area.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to vegetation have been addressed in the FBIC ARMP/PEA.

4.6 WILDLIFE AND FISHERIES

4.6.1 EXISTING ENVIRONMENT

4.6.1.1 WILDLIFE

The discussions in this section on common wildlife and fisheries resources that may occur in the vicinity of the Project Area are drawn largely from species sightings at the Dodson Creek Wildlife Management Area (located approximately 1.5 miles east of the Project Area) and from the MTNHP, which provides information on the location of Montana's species and habitats (MFWP 2016b).

4.6.1.1.1 COMMON MAMMALS

Large carnivores and omnivores expected to occur frequently in the Project Area include coyote (*Canis latrans*), red fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), American badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and weasels (*Mustela* spp.). Black bear (*Ursus americanus*) are also becoming more prevalent in the Project Area (FBIC 2017b). Medium-size omnivores and herbivores that could occur in the Project Area include mountain cottontail (*Sylvilagus nutalli*), white-tailed jackrabbit (*Lepus townsedii*), and northern pocket gopher (*Thomomys talpoides*) (MFWP 2016b). Known occurrences of small mammals within the vicinity of the Project Area include the deer mouse (*Peromyscus maniculatus*), northern grasshopper mouse (*Onychomys leucogaster*), mink (*Mustela vison*), western jumping mouse (*Zapus princeps*), Richardson's ground squirrel (*Urocitellus richardsonii*), prairie vole (*Microtus ochrogaster*), meadow vole (*Microtus pennsylvanicus*), long-tailed vole (*Microtus longicaudus*), and masked shrew (*Sorex cinereus*). Bat species identified within the vicinity of the Project Area include the following: the silver-haired bat (*Lasionycteris noctivagans*) and the little brown myotis (*Myotis lucifugus*), a species of concern within the state of Montana, which is discussed in Section 4.6 in more detail (MFWP 2016b).

4.6.1.1.2 BIG GAME AND UPLAND GAME SPECIES

The primary big game species in and around the Project Area include elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), moose (*Alces alces*), pronghorn antelope (*Antilocapra americana*), and mountain lion (*Puma concolor*) (MTNHP 2016; MFWP 2016b). Moose and black bear are not permitted for hunting on the Reservation. Upland game species present and hunted in the Project Area include ring-necked pheasant (*Phasianus colchicus*), gray partridge (*Perdix perdix*), wild turkey (*Meleagris gallopavo*), and sharp-tailed grouse (*Tympannuchus phasianellus*) (Fort Belknap Fish and Wildlife Department 2002). Section 4.13, Recreation, provides information on hunting in the Project Area.

4.6.1.1.3 REPTILES AND AMPHIBIANS

Reptile and amphibian species could occur in the wetland habitats within the Project Area. The most common species known to occur in the vicinity of the Project Area include the common gartersnake (*Thamnophis sirtalis*), north American racer (*Coluber constrictor*), and the painted turtle (*Chrysemys picta)* (MFWP 2016b). Additional observations have also been recorded for the boreal chorus frog (*Pseudacris maculata*), northern leopard frog (*Lithobates pipiens*), the Woodhouse's toad (*Anaxyrus woodhousii*), the plains gartersnake (*Thamnophis radix*), the plains hog-nosed snake (*Heterodon nasicus*), and the western tiger salamander (*Ambystoma mavortium*) (MTNHP 2016).

4.6.1.2 FISHERIES

Surface water features within and adjacent to the Project Area that may support fisheries include freshwater ponds, reservoirs, and perennial streams (e.g., Weigand Reservoir, Seventeen-mile Reservoir, etc.) (MTNHP 2016). Fish species observed in the Seventeen-mile Reservoir (located near the southwestern boundary of the Project Area) include golden shiner (*Notemigonus crysoleucas*), longnose Dace (*Rhinichthys cataractae*), brook trout (*Salvelinus fontinalis*), bluegill (*Lepomis macrochirus*), and largemouth bass (*Micropterus salmoides*). In addition, the USFWS has a stocking program for the Reservation, wherein the USFWS annually stocks rainbow trout (*Onchorynchus mykiss*) in the Snake Butte Reservoir on the Reservation (BIA 2017c)

4.6.2 IMPACTS

4.6.2.1 NO ACTION ALTERNATIVE

Generally, under the No Action Alternative, most wildlife including common mammals, big game species, upland game species, and reptiles and amphibians would continue to coexist with livestock. Big game species may benefit from this alternative, as a lack of fencing allows for uninterrupted migration through wildlife corridors, and reduces potentially fatal obstacles, such as barbed wire fencing. While this alternative may benefit terrestrial species that rely on natural landscapes, fisheries would still be subject to habitat degradation. For example, current conditions allow livestock to access areas where they may reduce water quality through increased sedimentation from bank erosion, and generate influxes of nitrogen and phosphorous from waste. Additionally, if range units are overgrazed, the reduction in

forage and habitat may limit wildlife populations within the Project Area, and the fish, reptiles, and amphibians within the Project Area could be impacted by degradation of their habitat if fertilizers/herbicides used on adjacent fields act as non-point source pollution to a surface water body. These impacts are expected to be long-term, although minor.

4.6.2.2 PROPOSED ACTION

Under the Proposed Action, impacts to wildlife within the Project Area may be both negative and beneficial. Increases in land used for agricultural operations could reduce habitat and forage for some terrestrial species. This impact is expect to be minor and long term. Aquatic habitat would improve under the Proposed Action due to reduced sedimentation from improved rangeland quality and limited cattle access to critical water resources. Additionally, the construction and repair of livestock water sources could benefit wildlife through increased water availability. Overall, implementation of the Proposed Action would ultimately result in long-term beneficial impacts to wildlife and fisheries in the Project Area.

It is anticipated that the adverse impacts to wildlife discussed under the No Action Alternative could be more widespread if the amount of land used for ranching and/or farming is increased and if additional fences are constructed. However, implementation of the recommended management actions under this alternative would minimize and reverse the degradation to rangelands that is currently occurring from things such as overgrazing and noxious weed establishment and spread. In addition, one of the recommended management actions includes increased communication between farmers and ranchers and the FBIC Fish and Wildlife Department to ensure that wildlife are considered before the construction of fences, water improvements, etc., which is expected to reduce some of the potential adverse impacts.

Each individual permit, lease, or associated improvement would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether or not potential environmental impacts to wildlife and fisheries have been addressed in the ARMP/PEA.

4.7 SENSITIVE SPECIES

This section describes sensitive wildlife and fisheries species expected to occur in the Project Area, including threatened and endangered, candidate, state-sensitive species, and migratory birds and eagles.

4.7.1 EXISTING ENVIRONMENT

4.7.1.1 WILDLIFE

The discussions in this section on sensitive wildlife and fisheries resources that may occur in the vicinity of the Project Area are drawn largely from the MTNHP, which provides information regarding recorded observations of sensitive species (MTNHP 2016 and 2017).

4.7.1.2 PROTECTED SPECIES

4.7.1.2.1 THREATENED AND ENDANGERED SPECIES

Section 102 of the ESA, enforced by the USFWS, establishes measures for the protection of federally listed threatened and endangered plant and animal species. Endangered species are species that are in danger of extinction throughout all or a significant portion of their range. Threatened species are species that are likely to become endangered within the foreseeable future. While candidate species receive no protection under the ESA, it is within the spirit of the ESA to consider these species as having significant value and worth protecting, as they may become listed in the future. Only one federally listed species may be present within the Project Area (Table 4-4).

TABLE 4-4. FEDERALLY LISTED AND CANDIDATE SPECIES IN THE PROJECT AREA

Common Name	Scientific Name	Status	Range in Montana
Black-footed Ferret	*Mustela nigripes*	Endangered, nonessential, experimental	Prairie dog complexes; Eastern Montana

Source: USFWS 2017

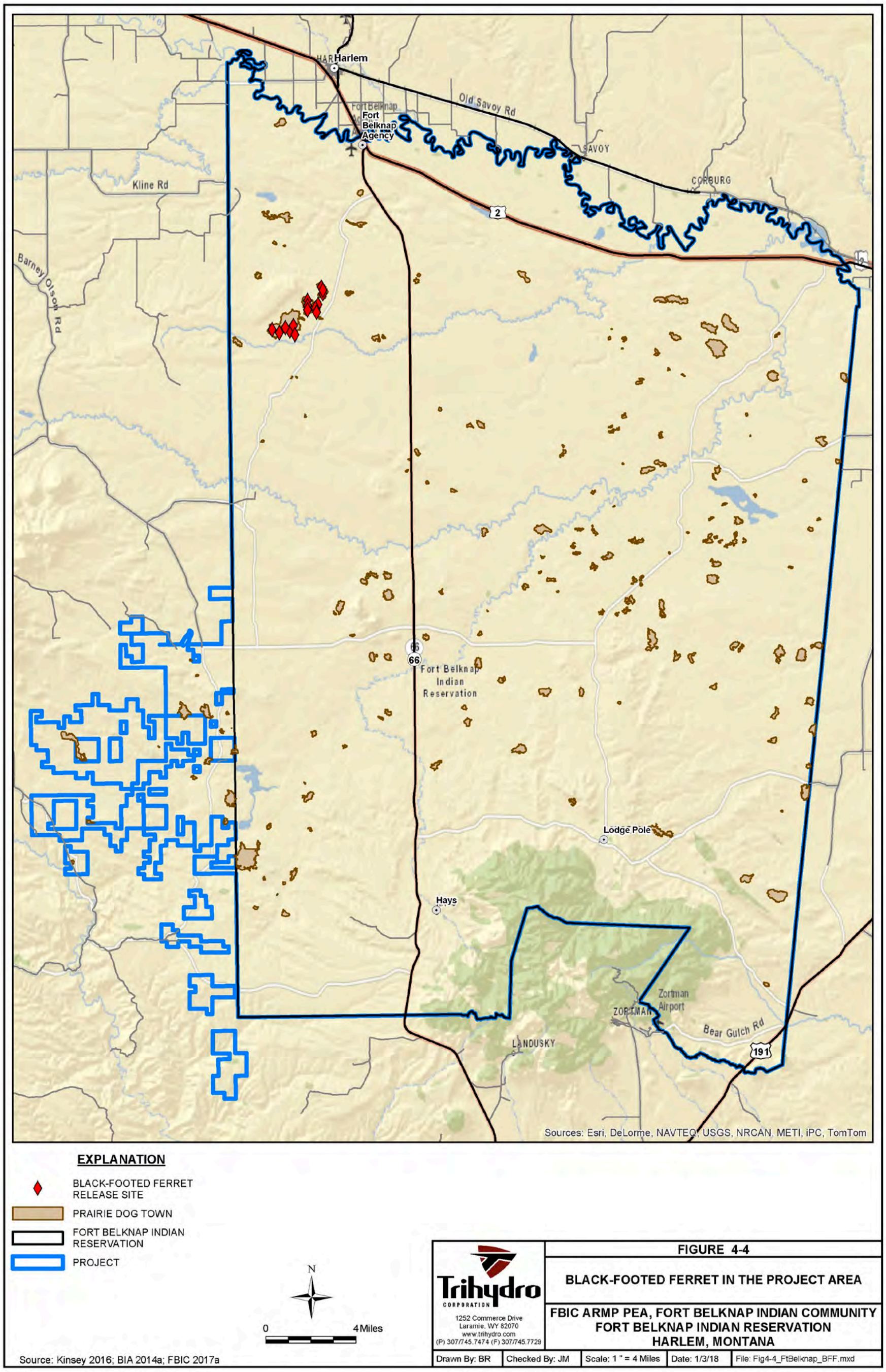
Black-footed Ferret

The black-footed ferret is listed as endangered, nonessential experimental population under the ESA. The black-footed ferret is a slender, medium-sized member of the weasel family with black feet, a black-tipped tail, and a distinctive black face mask. Historically, the range of this species extended throughout western North America's prairie grasslands and coincided with the range of the black-tailed prairie dog (*Cynomys ludovicianus*), Gunnison's prairie dog (*C. gunnisoni*), and the white-tailed prairie dog (*C. leucurus*) (USFWS 2015b). Prairie dogs are the primary prey of the black-footed ferret, and prairie dog complexes provide habitat for the species. Black-footed ferret habitat is limited to grasslands containing large prairie dog complexes, of which the black-footed ferret uses the burrows for shelter and dens (USFWS 2015b).

The USFWS black-footed ferret program has annually released ferrets into the wild at a number of different reintroduction sites across the West (USFWS 2015b). Black-footed ferrets were reintroduced into the wild on the Reservation for the third consecutive year in 2015 (World Wildlife Fund 2016). The recent reintroduction sites are shown on Figure 4-4 and are located in the northwest corner of the Reservation.

Threats to the black-footed ferret include habitat loss and related declines in prey and disease. Further, the conversion of native grasslands to agricultural land, fatal non-native diseases (i.e., plague), along with widespread prairie dog eradication programs, have reduced ferret populations to less than 2% of their original range (USFWS 2015b).

FIGURE 4-4. BLACK FOOTED FERRET IN THE PROJECT AREA



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4.7.1.2.1 STATE SPECIES OF CONCERN

Although the State of Montana does not have any regulatory authority within the Project Area, there are species identified by the State of Montana as being "sensitive" that could potentially occur within the Project Area. Recent occurrence information for the State of Montana "state species of concern" was obtained by means of a search of the MTNHP database (MTNHP 2016) and from MTNHP via Mr. Dennis Longknife (MTNHP 2017). State-sensitive species queried and identified by the MTNHP database include 31 Montana species of concern (Appendix H) potentially occurring near the Project Area (MTNHP 2017). One sensitive species, the greater sage grouse, is further discussed below due to its previous status as a candidate species for federal listing.

Greater Sage Grouse

The greater sage grouse was previously a candidate species for federal listing, but it was determined that the primary threats to populations had been reduced by conservation efforts implemented by federal, state, and private land owners. As a result, it was determined to be not warranted for listing in September 2015 (MTNHP and MFWP 2016). The greater sage grouse is North America's largest grouse. The greater sage grouse uses different food sources during different life stages; chicks primarily consume insects while juveniles and adults primarily eat sagebrush and forbs depending on the season. Sagebrush is the preferred habitat of the species (State of Montana 2015b). Male sage grouse gather together to perform courtship displays on areas called leks (USFWS 2010); lek activity extends from March to May. Note that an active lek is defined as a lek with two or more males lekking on site followed by evidence of lekking within 10 years of that observation (State of Montana 2015b). Nests are located 0.2 to 6.5 miles from the lek (MTNHP and MFWP 2016). Sixteen leks have been identified throughout the Project Area; these leks are documented in Figure 4-5. Additionally, one of the Core Areas identified in the state Executive Order No. 12-2015 (State of Montana 2015b) overlaps some of the Project Area (Figure 4-5); five leks are located within the Core Area. Core Areas are those areas designated as prime nesting and breeding habitat for greater sage grouse. Core Areas have stipulations which limit activities that may threaten resident populations.

Primary threats to the greater sage grouse include cultivation of grazing lands, urban development, improper grazing, and the presence of non-native plants. Secondary threats include mesic area loss and degradation, conifer expansion, and fence collisions (USDA 2016c).

The Montana Greater Sage grouse Habitat Conservation Program was established in September 2014 by state executive order to provide regulatory protections for the species and establish a mechanism for voluntary habitat conservation actions. A second state executive order was issued in September 2015 with an effective date of January 1, 2016, that clarified aspects of the Montana Greater Sage grouse Habitat Conservation Program compliance by state agencies (MFWP 2016, State of Montana 2015b). The BIA acknowledges, but does not adopt, the Montana State Executive Orders concerning sage grouse conservation on state and private lands. The lek and core area habitat designations may be utilized for management purposes, but the Tribes are not obligated to adhere to the state executive orders on federal Indian trust lands. However, the Tribes currently manage sage grouse on the Reservation with various mitigation measures (e.g., fence markers, monitoring, etc.).

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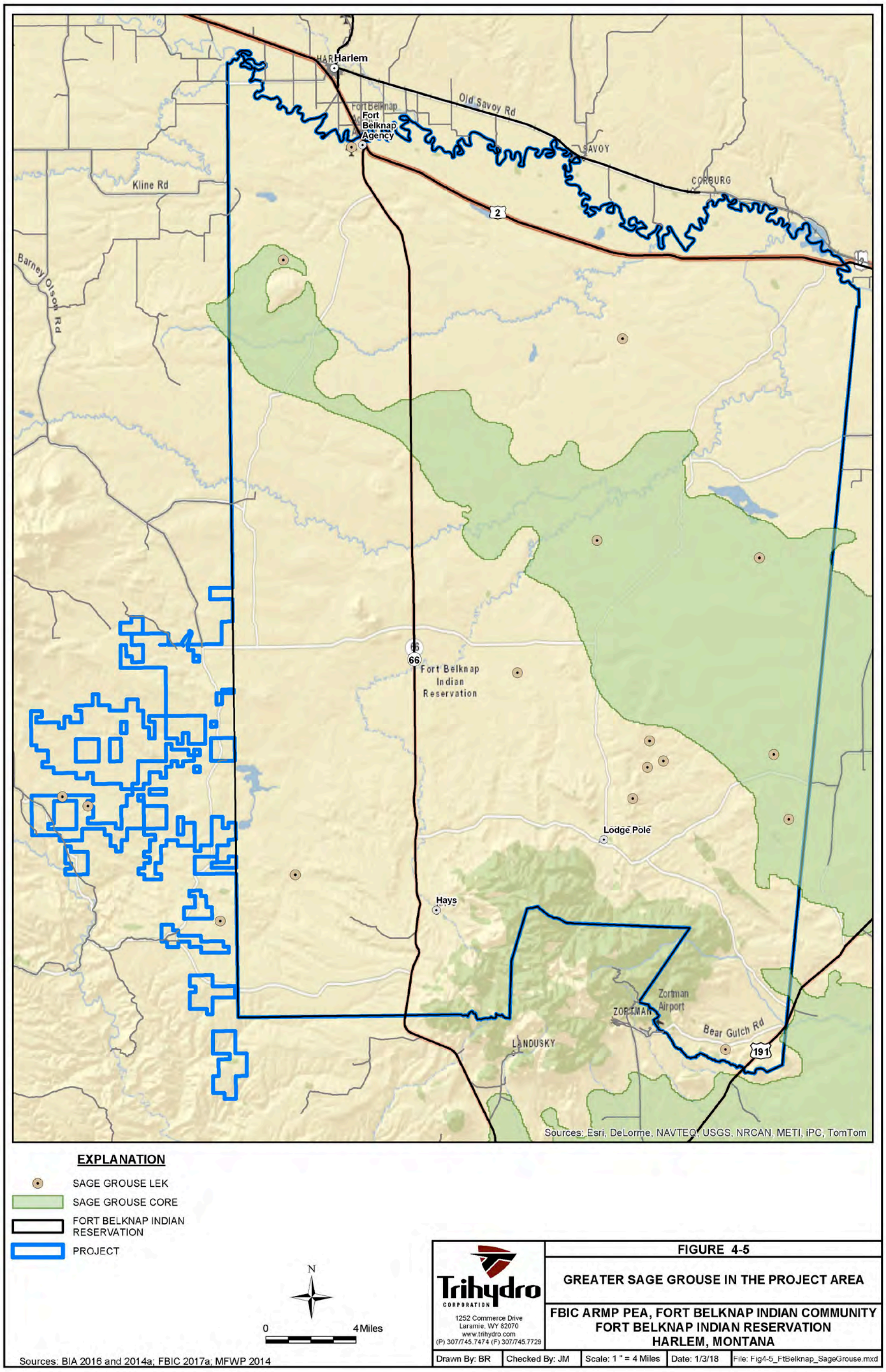
FIGURE 4-5. SAGE GROUSE IN THE PROJECT AREA



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4.7.1.2.2 MIGRATORY BIRDS, RAPTORS, AND EAGLES

Migratory birds are protected by the Migratory Bird Treaty Act of 1918 (MBTA) (USFWS 2013). The MBTA was developed in the early 20th century in response to the precipitous decline in populations of many bird species from over harvest for commercial operations. Under the MBTA, taking, killing, or possessing migratory birds is unlawful. Unless permitted by regulations, the MBTA provides that is it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg or product, manufactured or not.

The combination of grasslands, shrublands, and badlands, together with the ponds and riparian wetlands prevalent throughout the region, results in a relatively high diversity of bird species in the vicinity of the Project Area. Many of the bird species that occur in the Project Area are Neotropical Atlantic and Gulf Coastal migrants that spend the summer nesting season in Montana. Most migratory birds nest in Montana between April 15 and July 15 (BLM 2012).

Large numbers of waterfowl and shorebirds are drawn to this Montana region, particularly during the breeding season, given the proximity of the nearby Snake Butte Reservoir, Bigby Lake, Lake 17, Weigand Reservoir, and the Milk River and the associated emergent marsh and riparian wetland habitats within the Project Area. For example, some common waterfowl and shorebirds that have occurred within the vicinity of the Project Area include Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), pied-billed grebe (*Podilymbus podi*), California gull (*Larus californicus*), solitary sandpiper (*Tringa solitaria*), willet (*Tringa semipalmata*), greater yellowlegs (*Tringa melanoleuca*), killdeer (*Charadrius vociferus*), and black tern (*Chlidonias niger*) (MFWP 2016b).

Birds of prey are also common in the Project Area, given the diversity of cover types and the abundance of small mammal prey. Such species that have been identified within the vicinity of the Project Area include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and western screech-owl (*Megascops kennicottii*) (MFWP 2016b).

Under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d) the taking, killing, possession or commerce of bald and golden eagles (including their eggs, nests, or parts) is prohibited unless allowed by permit. Golden eagles (*Aquila chrysaetos*) and bald eagles (*Haliaeetus leucocephalus*) have been observed in the Project Area (observations in 2015) (MTNHP 2016 and 2017).

4.7.2 IMPACTS

4.7.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, adverse impacts to eagles and migratory birds are not anticipated. The overall undeveloped and rural nature of the Project Area coupled with the mobility of these species, which would allow them

to easily move from less desirable habitat to more desirable areas, if necessary, would decrease the potential for negative impacts to these species.

This alternative could result in minor adverse impacts to the black-footed ferret and the greater sage grouse. Overgrazing in range units and the cultivation of farmlands may degrade or diminish shrub and grasslands that currently provide or could provide suitable habitat for these species. However, adverse impacts to sensitive species are anticipated to be minor under this alternative, as the FBIC Fish and Wildlife Department recognizes the need to protect sensitive wildlife within the Project Area. For instance, the FBIC Fish and Wildlife Department has taken steps to protect sage grouse by implementing hunting restrictions and monitoring lek activity. Additionally, the FBIC Fish and Wildlife Department has participated in efforts to reintroduce black-footed ferrets to the Project Area. Conservation efforts for sensitive species are expected to continue under either alternative.

4.7.2.2 PROPOSED ACTION

Similar to the No Action Alternative, there would be no adverse impacts to eagles and migratory birds under to Proposed Action. The Proposed Action is expected to result in increased sustainable water use and improved surface water quality and riparian habitat health, all of which may increase seasonal resting and nesting utilization by migratory birds in the Project Area. Potential impacts to the black-footed ferret and the greater sage grouse include loss of habitat due to conversion of native shrub and grasslands for agriculture operations. Additionally, increased fencing could segment shrub habitat suitable for sage grouse, and/or fences may also result in increased, potentially fatal, sage grouse/fence collisions. However, recommended management actions, such as the development of a plan to protect and enhance sensitive wildlife habitat and/or known sensitive species populations; and protection of black-footed ferret populations would ultimately prevent the degradation of habitat potentially suitable for black-footed ferrets and greater sage grouse. Conservation efforts identified under the No Action Alternative are anticipated to continue under this alternative.

Ultimately, the Proposed Action would have **No Effect** to the black-footed ferret.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to sensitive species have been addressed in the FBIC ARMP/PEA.

4.8 CULTURAL RESOURCES

Cultural resources on tribal lands are protected by many laws, regulations, and agreements. Section 106 of the National Historic Preservation Act of 1966 requires that a federal agency take into account the effect that any federal, federally assisted, or federally licensed undertaking may have on any district, site, building, structure, or object that is included in the National Register of Historic Places (NRHP) before any federal funds are spent or federal licenses are issued. In

addition, the area of potential effect from any federal undertaking must also be evaluated for cultural and religious significance to Native Americans. Sacred sites and practices may be identified by a tribe or an authoritative individual (Executive Order 13007), and may be eligible for protection under the American Indian Religious Freedom Act of 1978. In addition, the Cultural Property Code of the Fort Belknap Indian Community provides for the protection of cultural resources in the Project Area.

Cultural resources are remnants of past human activity that, as a general rule, are greater than 50 years of age. They can include sites, objects, or practices of archaeological, historical, cultural, and religious significance. Cultural resources also include traditional cultural properties (TCPs). A TCP is a place defined by its historical association with the beliefs, customs, and/or practices of an existing community and its continuing, contemporary importance in maintaining that community's cultural identity.

The eligibility of a cultural resource for the NRHP is dependent upon the resource's association with important events or people in history, distinctive construction or artistic characteristics, and either a record of yielding or a potential to yield information important in prehistory or history. TCPs are generally considered eligible for nomination to the NRHP if they are associated with cultural practices or beliefs of a living community that are: (a) rooted in the community's history and (b) important in maintaining the continuing cultural identity of the community (Parker and King 1990). Properties considered eligible for listing are treated as though they were listed on the NRHP, even when no formal nomination has been filed. Culturally significant locations, which may not be considered eligible for nomination to the NRHP, may still be protected under the American Indian Religious Freedom Act. In addition, human remains, funerary objects, and objects of cultural patrimony are afforded special protections under the Native American Graves Protection and Repatriation Act.

Whatever the nature of the cultural resource addressed by a particular statute or tradition, federal consultation is required. The FBIC has designated a THPO by tribal council resolution, whose office and functions are similar to the Montana State Historic Preservation Officer. For example, THPO requires cultural surveys be completed prior to surface disturbance on any previously unbroken ground and/or when any surface disturbance will be deeper than the plow zone (i.e., 24 inches). Therefore, the BIA consults and corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the Project Area.

4.8.1 CURRENT CONDITIONS

Known cultural resources in the Project Area include historic battle sites, burial sites, fasting areas, and specific plant species. The majority of the cultural resource sites typically occur on hilltops, rock outcrops, and knolls. TCPs are known to exist on Project Area. The THPO has information regarding some TCPs as a result of cultural resource investigations, but a systematic inventory of TCPs has not been completed (Black Wolf 2016).

4.8.2 IMPACTS OF MANAGEMENT ALTERNATIVES

4.8.2.1 NO ACTION ALTERNATIVE

Cultural resources of various types, as described in Section 4.8.1, may be subject to adverse impacts from ground-disturbing activities, including construction of roads and fences; from establishment and use of two-track vehicle paths; and from changes in land use that result in removal of historic structures or tillage of previously undisturbed ground surface and subsurface. Grazing may also result in adverse impacts, particularly if vegetation is over-grazed to the extent that soil erosion occurs, and if animal use patterns result in establishment of incised trails through cultural resources. Grazing may also result in dislocation of stones in stone features, usually in conditions of over-grazing where sod ground cover is degraded. Adverse impacts to TCPs may occur as a result of any activity that removes a location or natural resource from continued traditional uses or impedes such uses, including impedance of access through fencing, increasing public access to areas used for traditional spiritual purposes, or the removal of certain plants through grazing, tillage, or application of herbicides. Depending on the potential damage or loss of a cultural resource, long-term adverse impacts could be negligible to major. However, the overall impacts to cultural resources under the No Action Alternative are unknown since the location of all cultural resources in the Project Area have not been documented. If a cultural resource was inadvertently discovered during routine agricultural or ranching activities, the resource would be evaluated for eligibility for the NRHP, and the potential for the proposed agricultural activity to affect eligible properties would be assessed. Additionally, the Cultural Property Code of the Fort Belknap Indian Community would be adhered to and cultural surveys would be completed prior to surface disturbance on any previously unbroken ground and/or when any surface disturbance would be deeper than the plow zone (i.e., 24 inches).

4.8.3 PROPOSED ACTION

Under the Proposed Action, impacts to cultural resources are expected to be similar to those under the No Action Alternative, and the Cultural Property Code of the Fort Belknap Indian Community would be adhered to as would the requirement to perform a cultural survey prior to surface disturbance on any previously unbroken ground and/or when any surface disturbance would be deeper than the plow zone (i.e., 24 inches). Additionally, per the recommended management actions, there would be an increased potential for both adverse and beneficial impacts to cultural resources to occur. For example, if undocumented cultural resources are disturbed or destroyed during the conversion of idle land to cropland, impacts would be major and long-term. Conversely, the discovery of cultural resources resulting from increased human presence in areas where the land had been idle, would a long-term beneficial impact. The cultural resource would be evaluated for eligibility for the NRHP, and the potential for the proposed agricultural activity to affect eligible properties would be assessed.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to cultural resources have been addressed in the FBIC ARMP/PEA.

4.9 SOCIOECONOMICS

The population (3,025) on the Reservation comprises less than 1% of Montana's total population (1,006,370) and approximately 4% of the state's American Indian and Alaska Native population (U.S. Census Bureau 2016). There are an estimated 7,000 enrolled tribal members, half of whom live on the Reservation (State of Montana Governor's Office et al. 2013).

Over the 2010-2014 period, the Tribes had a civilian labor force of 1,095, with an approximately 21% unemployment rate (U.S. Census Bureau 2016). The principal employers on the Reservation include the tribal government, Indian Health Service, the BIA, and the Aaniiih Nakoda College. Tribal enterprises include the Little Rockies Meat Packing Plant and Native American economic development corporation Island Mountain Development Group. In addition, the Tribes maintain an insurance company (i.e., the Fort Belknap Insurance Company), which provides unemployment and workers' compensation programs for the tribal government (State of Montana Governor's Office et al. 2013).

Jobs in educational services, health care, and social assistance account for the largest share of those employed on the Reservation (32%), followed by public administration (18%), and agriculture, forestry, fishing and hunting, and mining (10%) (U.S. Census Bureau 2016). Table 4-5 provides a breakdown of employment by industry for the Reservation.

TABLE 4-5. EMPLOYMENT BY INDUSTRY ON THE RESERVATION

Industry	Approximate Percentage (%) of Population Employed in Each Industry[1]
Agriculture, forestry, fishing and hunting, and mining	10
Construction	9
Manufacturing	2
Wholesale Trade	0
Retail Trade	6
Transportation, warehousing, and utilities	4
Information	0
Finance and insurance, real estate, and rental and leasing	7
Professional, scientific, management, and administrative and waste management services	5
Educational services, health care, and social assistance	32
Arts, entertainment, recreation, accommodation, and food services	7
Other services, except public administration	3
Public administration	18

Source: U.S. Census Bureau 2016
[1] Percent of population 16 years and older

Although the agriculture, forestry, fishing and hunting, and mining industry only accounts for approximately 10% of employment on the Reservation, land in farms encompass approximately 85% of all trust land on the Reservation and approximately 89% of total land on the Reservation. Additionally, as of 2007, 224 farms were located on the Reservation, and 175 of these farms were operated by American Indians (State of Montana et al. 2013). The most common livestock on the Reservation include cattle, sheep, and horses. In 2007, there were approximately

23,136 cows and calves on the Reservation, half of which were ranched by American Indians (State of Montana et al. 2013). Similarly, 1,731 horses were recorded on the Reservation in 2007, and 1,341 were owned by American Indians. A total of 3,282 sheep and lambs were recorded on the Reservation in 2007, with an undisclosed proportion belonging to American Indians (State of Montana et al. 2013).

The market value of agricultural products produced on the Reservation in 2012 was $25,157,000; more than half of which came from farms operated by an American Indian or Alaska Native (USDA 2014). However it is important to note that approximately $10 million worth of the agricultural products produced on the Reservation are sold outside of the Reservation each year (Archambault 2017).

The overall amount of agricultural lands on the Reservation has been decreasing; however, the amount of income from the sale of agricultural products has been increasing. Between 2007 and 2012, the amount of Reservation acreage in farms decreased by approximately 5%; however, the market value of agricultural products increased by approximately 35%. More notably, the market value of agricultural products produced on farms owned by American Indians or Alaska Natives on the Reservation increased by more than 93% (USDA 2009 and 2014). Additionally, the amount of acres in farms owned by an American Indian or Alaska Native increased by approximately 11% between 2007 and 2012.

4.9.1 IMPACTS

4.9.1.1 NO ACTION ALTERNATIVE

Socioeconomic resources and conditions would generally remain the same under the No Action Alternative. Unemployment and poverty rates are expected to stay the same since additional employment opportunities and increased agricultural revenues are not expected under the No Action Alternative. The FBIC members who earn money from the lease and/or permitting of their land would continue to earn relatively the same amount; no increases to farm/pasture leases or grazing permit fees are expected on allotted lands. In addition, agricultural revenues earned by farmers and ranchers is expected to stay relatively the same based on crop and livestock markets. However, the increased establishment and spread of noxious weeds could result in reduced crop yields and stocking rates and increased agricultural operating costs, which would negatively impact agricultural revenues. Impacts under the No Action Alternative are expected to be adverse and long-term, but negligible.

4.9.1.2 PROPOSED ACTION

There would be positive long-term socioeconomic impacts to FBIC members under the Proposed Action. The more efficient, organized, and transparent leasing and permitting processes between the FBIC Tribal Council, BIA, and the FBIC would bring in more money to the FBIC, farmers, and ranchers in the form of leasing and permitting fees and agricultural revenue. Implementation of the recommended management actions would likely increase the amount of available jobs on the Reservation, because of the need for agricultural improvements (e.g., fencing, irrigation, and stock

water improvements) and the opportunity for new farmers/ranchers to lease or permit land in the Project Area. The increase in available jobs would be a major beneficial impact. The expanded and improved agricultural improvements, farm/pasture units, and range units would increase the economic base for FBIC members who depend on the land for income. Improvements in irrigation systems can also have important indirect economic effects as noted in ECONorthwest (2008). In addition, the implementation of the recommended management actions would be essential for continuing the economic returns on the land used for agricultural operations by ensuring proper and sustainable management of the land is exercised.

Additionally, as noted in the Noxious Weed Strategic Plan PEA, impacts to socioeconomic conditions and resources from additional noxious weed management would be long-term and positive, particularly if a noxious weed program is developed and implemented. The reduction and/or elimination of noxious weeds could result in higher crop yields and increased forage. This increase in income from the sale of agricultural products would be long-term and would be expected to increase as additional noxious weeds are controlled and/or eliminated. It is also possible that the additional agricultural income could result in an increase in the crop yields and amount and size of farms in the Project Area, which could lead to an increase in employment opportunities.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential impacts to socioeconomic resources have been addressed in the FBIC ARMP/PEA.

4.10 ENVIRONMENTAL JUSTICE

Environmental Justice is defined by the USEPA as …*The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people including racial, ethnic, or socioeconomic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies* (USEPA 1998).

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, tasks …*each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high adverse human health and environmental effects of its programs, policies, and activities on minority populations and low income populations*. The memorandum accompanying Executive Order 12898 states that each federal agency shall analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority populations, low-income populations, and Indian tribes when such analysis is required by NEPA (CEQ 1997).

The following section uses U.S. Census Bureau information to determine whether the population residing in the Project Area constitutes an environmental justice population, and whether the alternatives considered in this PEA may result in disproportionately high and adverse human health or environmental effects on an environmental justice population. Note the U.S. Census Bureau's definitions of "low-income" and "minority" are used in this analysis for the purposes of identifying potential environmental justice populations.

4.10.1 CURRENT CONDITIONS

Between 2010 and 2014, approximately 95% of the FBIC residents identified as American Indian or Alaskan Native. In comparison, populations of those who identify as American Indian and Alaska Native ranged between 6 and 49% of all residents in the two counties partially located on the Reservation and the State of Montana. Table 4-6 summarizes minority population characteristics for the Reservation, Blaine County, Phillips County, and the State of Montana.

TABLE 4-6. MINORITY POPULATION CHARACTERISTICS OF THE RESERVATION AND SURROUNDING AREA

Location	Total Population	American Indian or Alaska Native Population	Approximate Percentage American Indian or Alaska Native (%)
Reservation	3,025	2,880	95
Blaine County	6,576	3,240	49
Phillips County	4,194	397	9
Montana	1,006,370	65,110	6

Source: U.S. Census Bureau 2016
Note: Blaine and Phillips counties contain portions of the Reservation, which, in some cases, increase their share of American Indian and Native Alaskan populations substantially. Blaine County contains almost the entire Reservation; because of this, demographic and economic characteristics of Blaine County closely reflect those of the Reservation.

With respect to low-income populations, the incidence of poverty on the Reservation is higher than the counties located partially within the Reservation and the state as a whole. Table 4-7 illustrates the per capita income and poverty rates for the Reservation, the two counties located partially within the Reservation, and the State of Montana. Over the 2010-2014 period, the average per capita income for the FBIC ($11,055) was approximately 57% lower than the per capita income for the State of Montana ($25,997) and approximately 37% lower than the per capita income for Blaine County ($17,529). Further, the proportion of residents on the Reservation living below the poverty line was over two times as high as those living in poverty statewide.

TABLE 4-7. AVERAGE INCOME AND POVERTY RATES (2010-2014)

Location	Per Capita Income	Poverty Rate[1]
Reservation	$11,055	37.9%
Blaine County	$17,529	28.0%
Phillips County	$22,450	13.8%
Montana	$25,997	15.3%

Source: U.S. Census Bureau 2016
[1]Percentage of people whose income in the past 12 months was below the poverty level

Based on the presence of the Tribes, the high incidence (approximately 95%) of minorities (i.e., American Indian/Alaskan Native), and the presence of a low-income population (approximately 38% living below the poverty line) living on the Reservation, the population constitutes an environmental justice population. Per the requirements of Executive Order 12898, analysis of the disproportionate impacts of the proposed project is required, and is included below.

4.10.2 IMPACTS OF MANAGEMENT ALTERNATIVES

This section examines whether any adverse environmental, human health, or other effects identified in conjunction with the alternatives would be disproportionately high and adverse with regard to their incidence on minority or low-income communities on the Reservation. In general, the environmental, health and safety, and other effects of past, ongoing, and future agricultural activities are undifferentiated for residents of the Reservation and residents in the surrounding areas.

4.10.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, FBIC members would continue to practice agricultural practices throughout the Project Area. These actions would be similar to the agricultural activities taking place in the counties surrounding the Project Area. In addition, under the No Action Alternative, the agricultural operations are not expected to cause adverse human health impacts or significantly affect the environment. Therefore, the intermittent agricultural activities are not expected to cause disproportionally high and adverse impacts to the environmental justice population living in the Project Area.

4.10.2.2 PROPOSED ACTION

Under the Proposed Action, the increase in management of agricultural lands would not result in disproportionately high and adverse impacts to the environmental justice population, as agriculture is a prominent industry both in the Project Area and in that region of Montana. In addition, under the Proposed Action, poverty rates could be slightly reduced. This would be a long-term beneficial impact, even if it is negligible.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to environmental justice populations have been addressed in the FBIC ARMP/PEA.

4.11 GEOLOGY AND PALEONTOLOGY

4.11.1 EXISTING ENVIRONMENT

4.11.1.1 GEOLOGY

A majority of the Project Area is located on the northern Great Plains in Blaine County, with the exception of a southeastern irregular narrow strip positioned in Phillips County on the margins of the Little Rocky Mountains. During the Tertiary Period, an uplift created the Little Rocky Mountains, which are the dominant structural features of the southern portion of the Project Area (Alverson 1965). The Little Rocky Mountains are a series of igneous intrusions that have created abundant structural domes (i.e., Twin Buttes, Wild Horse Butte, and Snake Butte). The northern part of the Project Area is mainly a gentle dip, although a major thrust fault trends northwest to southeast (U.S. Department of Energy [USDOE] n.d.).

Exposed sedimentary, igneous, and metamorphic rocks range from Precambrian to Recent occurrence in the Project Area. Precambrian metamorphics, Paleozoic carbonates, and Jurassic and Cretaceous sandstones comprise the regional geologic sections of the Project Area (USDOE n.d.). The Paleozoic rocks are primarily deposited dolomites and limestones. The Jurassic and Cretaceous sandstone rocks differ from continental to marine sandstones, and shales. Cambrian rocks, Quaternary alluvium deposits, Cretaceous Bearpaw shale, and Judith River Formation sandstones and siltstones also overlay most of the Project Area. The southeast and east central portions of the Project Area are dominated by Bearpaw shale outcrops, whereas in the southwest portion of the Project Area, the Judith River Formation prevails. The oldest rocks exposed are metamorphosed sedimentary and igneous rocks, comprised primarily of Biotite schist and gneiss (USDOE n.d.).

4.11.1.2 PALEONTOLOGY

As noted above, the geologic formations underlying the Project Area overlap the central portion of the Upper Cretaceous (Claggett Formation). This formation is fossiliferous and is known to contain abundant and varied marine fauna, such as shells (Clapp et al. 1921). Additionally, the Telegraph Creek Formation through Belle Fourche Shale (central portion of the Reservation), is characterized by creamy-weathering calcareous shale of Greenhorn Formation overlying thin, platy, locally fossiliferous sandstones (Bergantino 2001).

In the southern portion of the Project Area, underlying the upper Jurassic sandstones, undivided sedimentary rocks are composed of an upper few feet of carbonaceous shale with abundant plant remains. This layer is underlain by a lower gray marine shale containing a large fossiliferous pebble layer and a gray limestone and locally highly fossiliferous layer, dominated by marine fauna such as mollusk species (e.g., *Gryphea* spp. and *Belemnites* spp.) (Porter and Wilde 2001). There are no known paleontological sites located in the Project Area.

4.11.2 IMPACTS

4.11.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, current agricultural activities would continue, and there would be no impacts to geological resources. Potential direct impacts to paleontological resources could include damage or destruction of fossils by livestock or from other agricultural practices. If a paleontological property was inadvertently discovered during routine agricultural activities, the resource would be evaluated for eligibility for the NRHP, and the potential for the proposed project to affect eligible properties would be assessed. If potential adverse impacts are recognized, the proposed project may be altered to avoid or lessen impacts to eligible properties, and/or the impacts may be mitigated to preserve the scientific and cultural values of the affected property to the extent possible and reasonable. Potential impacts could be negligible to major depending on the damage/destruction of the paleontological resource.

4.11.2.2 PROPOSED ACTION

The potential for impacts under Proposed Action are similar to that of the No Action Alternative. No impacts to geological resources are expected under the Proposed Action. Additionally, inadvertent damage to or destruction of a paleontological resources could result in negligible to major long-term damage to paleontological resources. However, no known paleontological resources are known to exist in the Project Area.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to paleontology have been addressed in the FBIC ARMP/PEA.

4.12 ROADS AND TRAFFIC

4.12.1 CURRENT CONDITIONS

The Project Area is a rural area with small communities scattered throughout the Reservation. These communities, as well as dispersed homesites are connected by paved (blacktop) and unpaved (gravel, or unimproved dirt) roadways. State and U.S. highways are the primary travel arteries in the Project Area. As shown on Figure 4-6, MT 66 intersects the Fort Belknap Agency community and traverses the Project Area from north to south. U.S. Highway 2 likewise intersects the town of Fort Belknap Agency, but runs east to west along the northern extent of the Project Area. Lodgepole Road (Route 8 and 11) and Beaver Creek Road (Route 15) provide additional access to various parts of the Reservation. Hays Road and Hays Cut-Across Road (Route 1 and 3) provide access to Hays and Mission Canyon and between Hays and Lodgepole. U.S. Highway 191 intersects the southwestern corner of the Project Area for approximately 3 miles. There are also many local roads providing access to areas not directly served by the highways and routes.

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FIGURE 4-6. ROADS IN THE PROJECT AREA

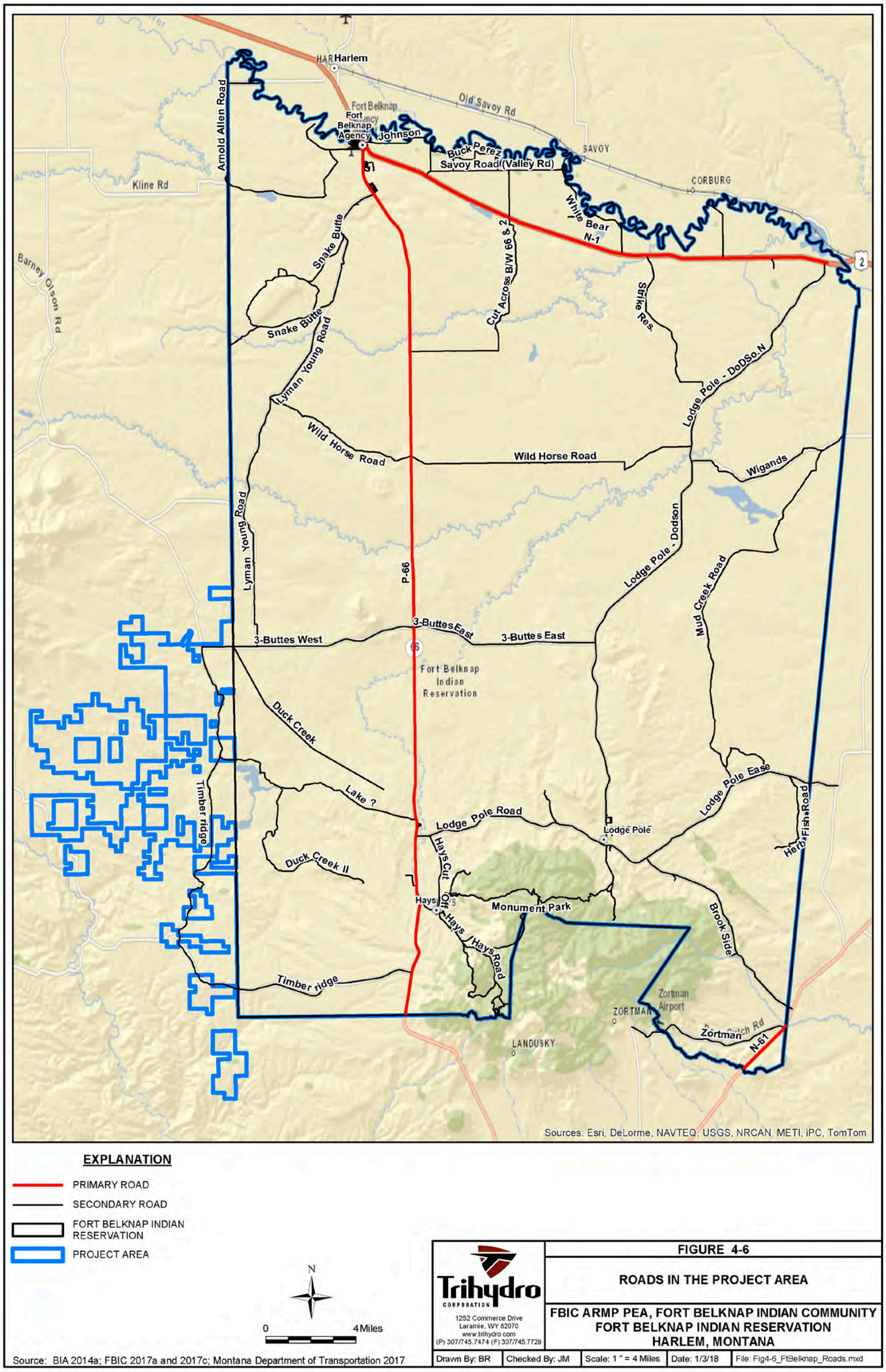

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Table 4-8 provides the average annual daily traffic (AADT) counts for the major roadways that cross the Reservation.

TABLE 4-8. AADT ALONG MONTANA ROADWAYS

Location	2012 AADT	2013 AADT	2014 AADT	2015 AADT	2016 AADT	5-Year Average AADT
MT 66 (4 mi N of Phillips Co Line)	500(A)	440(A)	390(A)	460(A)	400(A)	438
MT 66 (N of Lodgepole Rd)	980(A)	990(A)	900(A)	970(A)	1196(A)	1007
MT 66 (14 mi S of US 2)	870(A)	730(A)	750(A)	830(A)	931(A)	822
MT 66 (1 mi S of US 2)	900(A)	910(A)	870(A)	940(A)	1058(A)	936
US 2 (SE of MT 66)	1620(A)	1520(A)	1580(A)	1460(A)	1598(A)	1556
US 2 (11 mi E of MT 66)	1350(A)	1340(A)	1410(A)	1210(A)	1290(A)	1320
US 2 (3.5 mi W of S-204 in Dodson)	1180(A)	1210(A)	1330(A)	1190(A)	1139(A)	1210

Source: Montana Department of Transportation 2017
Acronyms: A – Actual

U.S. Highway 2 is the most travelled roadway within the Project Area. Traffic volume is greatest near the community of Fort Belknap Agency and it decreases to the east. The greatest volume of traffic along MT 66 within the Project Area occurs just north of the intersection with Lodgepole Road (Route 11). Traffic counts within the Project Area are generally low in comparison to AADT counts for other regions of the state (Montana Department of Transportation 2017).

4.12.2 IMPACTS OF MANAGEMENT ALTERNATIVES

4.12.2.1 NO ACTION ALTERNATIVE

Agricultural practices currently have a low impact on roads and traffic volumes within the Project Area. Transportation of livestock and crops within the Project Area negligibly increases traffic in spring and fall when livestock are moved between rangelands, and when crops are planted and harvested. Under the No Action Alternative, agricultural equipment and vehicles would continue to increase wear and tear on roads and minimally add to traffic volumes over time. Current use of roadways by agricultural trucks is expected to result in negligible adverse impacts to road conditions over the long-term. Under the No Action Alternative, no additional impacts on roadway infrastructure or traffic volumes in the Project Area are expected as a result of the continuation of current agricultural activities.

4.12.2.2 PROPOSED ACTION

Under the Proposed Action, impacts to the existing road network and traffic volumes in the Project Area would be similar to the impacts discussed under the No Action Alternative. However, under the Proposed Action, recommended management actions aimed at increasing farm/pasture land yields in the next 5 years are expected to result in a minor increase in vehicle traffic, which would also result in adverse impacts to roadway infrastructure throughout the Project Area. Truck traffic is expected to slightly increase during spring planting and fall harvesting seasons as well as during

transportation of livestock between rangelands. While vehicle traffic is expected to slightly increase within implementation of the ARMP, adverse impacts to roadways would be long-term and minor.

Improvements to and increased utilization of idle and/or abandoned farm/pasture land may also result in the construction of some small access roads for farm machinery access. This potential impact is unquantifiable and is likely negligible. Increased truck traffic related to increased agricultural and ranching activities would also result in an increased potential for the spread of noxious weeds; however, implementation of the recommended management actions aimed at noxious weed reduction is expected to minimize this impact if vehicle wash stations are constructed.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to roads and traffic have been addressed in the FBIC ARMP/PEA.

4.13 RECREATION

4.13.1 EXISTING ENVIRONMENT

Recreational activities in the Project Area consist of outdoor activities and cultural community events. Outdoor activities include hunting and fishing, camping, hiking, horseback riding, and boating. Hunting in the Project Area is managed by the FBIC Fish and Wildlife Department. Both tribal and non-tribal members may hunt in the Project Area with the proper licensing. A species license is required along with a tribal conservation license; however, a tribal conservation license also allows for the hunting of coyotes or varmints without the requirement for additional permits. Wildlife currently hunted in the Project Area include prairie dogs, upland game birds, and big game. Upland game birds include sharp-tailed grouse, Hungarian partridge (also known as the grey partridge), ring-necked pheasant, and wild turkey. Big game includes antelope, mule deer, moose, bighorn sheep (*Ovis canadensis*), white-tailed deer, and mountain lion. Buffalo hunting permits are also available (Fort Belknap Fish and Wildlife Department 2002). Hunting is permitted on all tribal trust and fee lands; however, if that land is leased under a farm/pasture lease, the hunter must obtain permission from the lessee before hunting on that land. Hunters do not have to obtain permission to hunt on tribal trust or tribal fee land that is permitted under a grazing permit; however, the FBIC Fish and Wildlife Department highly encourages hunters to alert permittees to their presence as a common courtesy.

In addition to hunting, both tribal and non-tribal members may fish in lakes, reservoirs, and rivers in the Project Area. Species of fish that may be encountered include rainbow trout and brook trout in the Peoples Creek drainage. Other species such as brown trout (*Salmo trutta*), largemouth bass, bluegill, walleye (*Sander vitreus*), sauger (*Sander canadensis*), pike (*Esox sp.)*, yellow perch (*Perca flavescens*), whitefish (*Prosopium williamsoni*), and channel catfish (*Ictalurus punctatus*) may be encountered in the Milk River drainage (Havre Daily News 2015).

4.13.2 IMPACTS

The effects to recreation would be considered adverse if they hinder recreational opportunities in the Project Area or if they reduce the appeal of the natural landscape. Potential impacts to recreation from the alternatives are discussed below.

4.13.2.1 NO ACTION ALTERNATIVE

The No Action Alternative may result in beneficial and adverse impacts to recreational fishing areas. For example, the lack of fencing infrastructure associated with this alternative would maintain the natural, aesthetic appeal of the Project Area's landscapes. However, poor water quality resulting from increased sedimentation and other pollutants associated with livestock use may result in decreased fish populations, which may limit recreational fishing opportunities within the Project Area. Additionally, overgrazed rangelands and deteriorating banks from livestock activity may result in decreased aesthetic appeal to natural landscapes within the Project Area.

4.13.2.2 PROPOSED ACTION

Impacts to recreation under the Proposed Action would vary depending on the extent and location of agricultural improvements. The recreational experience may be impacted by the seasonal presence of agricultural equipment, related truck traffic, and livestock relocations between range units. However, the impacts would be minor and short-term in nature and dispersed throughout the Project Area.

New agricultural, rangelands, and fencing infrastructure could impact hunters, off-roaders, and hikers, if previously undisturbed or previously abandoned land is leased or permitted. This also has the potential to disturb game species' habitat and recreational trails. Disturbance and activity in an otherwise undeveloped area would potentially affect the number and distribution of game species, which could impact the quality of the hunting experience. However, the fall harvest of hay, alfalfa seed, and corn generally concludes prior to the beginning of hunting season.

Positive impacts from agricultural improvements could also occur. A positive impact to the recreational experience for hunters would be the construction of new roads, which could provide access to new areas for hunting, hiking, and wildlife viewing. Additionally, increased water drainages could be utilized by wildlife, which could benefit hunters and wildlife viewers. Increased soil health from decreased noxious weed infestations, agricultural improvements, and improved rangeland health would lead to improved forage quality and quantity. This would positively impact wildlife and potentially increase wildlife populations within the Project Area, which would be a beneficial impact to the overall recreation experience. Similarly, improved water quality from protected riparian areas would beneficially affect all aquatic species and may ultimately benefit fishers.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to recreation have been addressed in the FBIC ARMP/PEA.

4.14 NOISE

Noise is the intrusion of a new sound inconsistent with and above the background level of an existing landscape. The following section addresses potential noise issues within the Project Area associated with the alternatives.

4.13.3 EXISTING ENVIRONMENT

The Project Area is predominately rural with associated low levels of ambient noise. The primary sources of ambient noise in the Project Area include vehicular traffic, agricultural activities, and natural sounds such as flowing water, wind through vegetation, wildlife, and domesticated animals. In some areas, sounds associated with small urban areas may be heard.

4.13.4 IMPACTS

4.13.4.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to noise levels in the Project Area would not be impacted. Intermittent noise, in the form of seasonal agricultural and recreational equipment, would continue to occur.

4.13.4.2 PROPOSED ACTION

Under the Proposed Action, increased ambient noise may occur in the form of equipment used for agricultural improvements associated with implementation of the recommended management actions. For example, noise may result from the restoration and construction of irrigation head gates, construction of additional livestock fencing, and additional farming equipment. These impacts are anticipated to be short-term and negligible.

Each individual permit and lease would be reviewed using an onsite NEPA checklist (example provided in Appendix F) to determine whether potential environmental impacts to noise have been addressed in the FBIC ARMP/PEA.

5.0 CUMULATIVE IMPACTS

NEPA and CEQ regulations require the consideration of the cumulative impacts of a proposed action. Cumulative impacts are defined in the CEQ regulations as the impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (CEQ regulations 40 CFR Part 1508.7). The cumulative impacts analysis area varies by resource. It may be restricted to a specific area of the Project Area (for recreation) or an entire watershed (for water resources); each resource is discussed below.

5.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

Past, present, and reasonably foreseeable actions must be considered in determining whether there are potential cumulative impacts. Past actions are actions that occurred in the past that may warrant consideration in determining whether there are potential cumulative impacts. Present actions are actions that are occurring in the same general period as the Proposed Action and the No Action Alternative. Reasonably foreseeable actions are actions that may affect the projected impacts of the Proposed Action and the No Action Alternative.

Past, present, and reasonably foreseeable actions that should be considered in the cumulative impacts assessment include past, present, and continued agricultural operations in and around the Project Area, such as livestock grazing and cultivation of crops. There are no other known major projects in the Project Area or vicinity that can be evaluated in conjunction with this project for cumulative effects.

5.2 AIR QUALITY

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on air quality from other past, present, and reasonably foreseeable activities in and around the Project Area. Cumulative impacts from the No Action Alternative and Proposed Action would be long-term, adverse, and negligible. Air quality would continue to be adversely affected from air emissions resulting from agriculture equipment and vehicle use; however, due to the intermittent and dispersed nature of the agricultural operations taking place throughout the Project Area, air quality in and around the Project Area is not expected to be noticeably impacted nor changed.

5.3 SOILS

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on soils from other past, present, and reasonably foreseeable activities in the Project Area. Under the No Action Alternative, cumulative impacts to soils would include continued erosion, compaction, and disturbance resulting from natural forces (e.g., rain, wind, etc.) and from agricultural operations. These cumulative impacts would be long-term, but negligible.

Under the Proposed Action, cumulative impacts to soils would be the same as the cumulative impacts described under the No Action Alternative, but not as adverse since soil health is expected to improve. Cumulative impacts to soils under the Proposed Action are expected to be long-term and negligible, most of which could be beneficial while others could be adverse.

5.4 WATER RESOURCES

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on water resources from other past, present, and reasonably foreseeable activities in the Project Area. Under the No Action Alternative, cumulative impacts to water resources could include decreased water quality and quantity. The potential for and severity of these impacts would vary depending on the location of specific agricultural operations. These adverse cumulative impacts are expected to be long-term, and negligible to minor. Under the Proposed Action, cumulative impacts to water resources could include (but are not limited to) the same impacts described under the No Action Alternative; however, the impacts are not expected to be as adverse. Cumulative impacts to water resources under the Proposed Action are expected to be long-term and negligible, most of which could be beneficial while others could be adverse.

5.5 CLIMATE AND CLIMATE CHANGE

The No Action Alternative and the Proposed Action would incrementally and cumulatively add to the impacts of climate change from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts could include (but are not limited to) negligible increases in CH_4 emissions from livestock and CO_2 emissions from the use of agricultural equipment and vehicles, all of which would increase total GHG emissions. Nonetheless, these cumulative impacts are expected to be negligible and temporary due to the seasonal use of agricultural equipment and vehicles and the dispersed and minimal nature of the emissions. Cumulatively, climate change impacts to the Proposed Action and No Action Alternative could cause more adverse conditions for agricultural operations.

5.6 VEGETATION, NOXIOUS WEEDS, AND INVASIVE SPECIES

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on vegetation from other past, present, and reasonably foreseeable activities in the Project Area. Under the No Action Alternative, cumulative impacts to vegetation could include (but are not limited to) vegetation disturbance and loss, and the spread and/or introduction of noxious weeds. These impacts would be long-term, adverse, and could be negligible to major depending on the distribution and spread of the noxious weeds. Cumulative impacts under the Proposed Action would be similar; however, the introduction and spread of noxious weeds is expected to be minimal and the health of vegetation is expected to improve due to improved soil health. Therefore, cumulative impacts under the Proposed Action are expected to be long-term, but could vary from negligible to minor and adverse to negligible to minor and beneficial.

5.7 WILDLIFE AND FISHERIES

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on wildlife and fisheries from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts under the No Action Alternative to wildlife and fisheries could include (but are not limited to) disturbance, loss, and/or degradation of habitats, and/or direct disturbance to and/or loss of wildlife and fisheries species. These cumulative impacts are expected to be minor and limited due to the dispersed nature of the ongoing agricultural operations and the overall rural setting of the area (i.e., the loss of one area of wildlife habitat/fisheries would not prelude wildlife/fish from finding other sufficient habitat). Cumulative impacts under the Proposed Action would be similar to those under the No Action Alternative; however, cumulative impacts could also be long-term and beneficial. For example, the quality of some wildlife habitats and fisheries may be improved due to an increase in water quality and quantity and improved vegetation health and abundance.

5.8 SENSITIVE SPECIES

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on sensitive species from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts under the No Action Alternative to sensitive species could include (but are not limited to) disturbance, loss, and/or degradation of habitats, and/or direct disturbance to and/or loss of certain sensitive species. These cumulative impacts are expected to be minor, negligible, and limited due to the proactive measures taken by the FBIC Fish and Wildlife Department to protect sensitive species in the Project Area. Cumulative impacts under the Proposed Action would be similar to those under the No Action Alternative. In addition, cumulative impacts under the Proposed Action could also be long-term and beneficial. For example, the quality and quantity of black-footed ferret and sage grouse habitats are expected to be improved. Additionally, under the Proposed Action, the habitat for those species may be protected through the use of buffers and/or avoidance measures. Cumulative impacts to eagles and migratory birds are not anticipated.

5.9 CULTURAL RESOURCES

The No Action Alternative and Proposed Action have the potential to incrementally and cumulatively add to the impacts on cultural resources from other past, present, and reasonably foreseeable activities in the Project Area. Under both the No Action Alternative and the Proposed Action, adverse cumulative impacts could include damage to or loss of cultural resources. However, the inadvertent discovery of cultural resources from agricultural operations could result in a positive cumulative impact due to the generation of information about the location and nature of cultural resources in the Project Area. Overall, cumulative impacts are expected to be long-term and negligible, with the potential to be either adverse or beneficial.

5.10 SOCIOECONOMICS

The No Action Alternative would not incrementally and cumulatively add to the impacts on the socioeconomic environment from other past, present, and reasonably foreseeable activities in the Project Area. Poverty levels and employment opportunities are expected to stay the same, and there would be no changes to the status quo. However, the Proposed Action would incrementally and cumulatively add to the impacts on the socioeconomic environment from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts would be expected to be long-term and beneficial, although negligible to minor, because of the expected increase in agricultural-related revenues and increased employment opportunities.

5.11 ENVIRONMENTAL JUSTICE

The No Action Alternative and the Proposed Action are not expected to impact environmental justice populations; therefore, no cumulative impacts would occur.

5.12 GEOLOGY AND PALEONTOLOGY

As discussed in Section 4.11, the No Action Alternative and the Proposed Action are not expected to impact geological resources; thus, there would be no cumulative impacts. Conversely, the No Action Alternative and Proposed Action could incrementally and cumulatively add to the impacts on paleontological resources from other past, present, and reasonably foreseeable activities in the Project Area.. Cumulative impacts would be long-term and adverse if paleontological resources have been or are disturbed or destroyed. Alternatively, cumulative impacts could be long-term and beneficial if the discovery of a paleontological resource could result in a positive impact in new information is generated about the location and nature of paleontological resources in the Project Area. Nevertheless, it is important to note that no known paleontological resources exist in the Project Area.

5.13 ROADS AND TRAFFIC

The No Action Alternative and Proposed Action would incrementally and cumulatively add to the impacts on roads and traffic from other past, present, and reasonably foreseeable activities in and around the Project Area. Cumulative impacts to roads and traffic from these actions could include (but are not limited to) slight increases in traffic (both seasonal and year-round) throughout the Project Area and reduced road conditions. These cumulative impacts are expected to be negligible due to their seasonal nature and the overall rural character and low traffic counts in and around the Project Area. However, cumulative impacts could be adverse, minor, and temporary if the increases in traffic cause substantial localized impacts to already heavily utilized roads and routes used throughout the Reservation (i.e., U.S. Highway 2).

5.14 RECREATION

The No Action Alternative and the Proposed Action would incrementally and cumulatively add to the impacts on recreation from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts to recreation under the No Action Alternative could include (but are not limited to) displacement of wildlife, displacement of hunters and fishers, if any areas previously utilized by hunters/fishers become restricted due to agricultural operations, and/or increased access to recreational sites. These impacts are expected to be long-term, adverse, and negligible due to the rural nature of the Project Area and the abundance of other recreation areas that could be used. Additionally, the increased access to recreation sites could also be viewed as a long-term, beneficial impact. Cumulative impacts under the Proposed Action are expected to be similar to those under the No Action Alternative. In addition, the Proposed Action is also expected to result in some long-term beneficial impacts such as improved surface water quality, which would benefit fishers and swimmers. These beneficial impacts would be negligible to minor.

5.15 NOISE

The No Action Alternative and Proposed Action would incrementally and cumulatively add to impacts associated with noise from other past, present, and reasonably foreseeable activities in the Project Area. Cumulative impacts to noise from these actions (e.g., use of agricultural equipment and vehicles, livestock sounds, etc.) could include slight increases in ambient noise in areas of the Project Area near ongoing agricultural operations. This noise could cause localized negative impacts if located near houses, businesses, or other locations where people congregate. Overall, due to the rural nature of the Project Area, the number of receptors who may be bothered by the noise would be minimal; cumulative impacts would be negligible.

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6.0 CONSULTATION AND COORDINATION

The CEQ Regulations under NEPA require that the lead agency (i.e., BIA) of the NEPA process involve the public in the preparation of a PEA. The *public* includes federal agencies, state agencies, local agencies, landowners, and other interested parties. The scoping and consultation details were provided in Section 1.3 and summarized below.

The first public involvement opportunity was at the beginning of the project during the request for comments per the NOI. Additional public involvement opportunities included four public scoping meetings/community meetings in each community on the Reservation. Continued direction and input from the FBIC Advisory Group (bi-weekly or weekly depending on the point in the ARMP/NEPA process) along with meetings and site visits with FBIC members. Another four community meetings and the availability of the draft ARMP/PEA to provide input also provided another opportunity for public comment, particularly an opportunity to review the draft ARMP/PEA. Finally, the BIA will request public comments for the final PEA during the 30-day public appeal/comment period (assuming a FONSI).

During the process of preparing the PEA, no effect to threatened and endangered species was identified; therefore, BIA did not consult with the USFWS.

6.1 PREPARERS OF THE PEA

An interdisciplinary team of natural resource specialists employed by Trihydro assisted with the preparation of this PEA under supervision of the BIA. The team of preparers for this PEA are provided in Table 6-1.

TABLE 6-1. PREPARERS OF THIS PEA

NAME	ROLE/SECTIONS PREPARED
Juli Anna McNutt	Project Manager
Kara Mulvihill	Deputy Project Manager
Jana White	Quality Assurance
Juli Anna McNutt, Jana White, Kara Mulvihill, Todd Hanlin	Site Visits and Meetings
Jana White, Sam Joseph, Todd Hanlin, Derrick Thompson, Ryan Athey, Alan Sisel	Section 1.0, Section 2.0, Appendices
Juli Anna McNutt, Kara Mulvihill	Section 1.0, Section 2.0, Section 3.0, Section 4.0, Section 5.0, Section 6.0, Appendices
Juli Anna McNutt, Kara Mulvihill, Danielle Tavis, Sam Joseph, Erik Schmude	Section 4.0
Brian Robeson, Kyle Jordan	GIS Mapping

6.2 TECHNICAL ASSISTANCE AND REVIEW OF PEA

Members from the BIA Rocky Mountain Regional Office, BIA Fort Belknap Agency, FBIC, USDA NRCS, and the Fort Belknap Reservation Extension Service who provided technical input on, a member of the FBIC Advisory Group, and/or performed reviews of the PEA are listed in Table 6-2.

TABLE 6-2. INDIVIDUALS WHO PROVIDED TECHNICAL ASSISTANCE AND/OR REVIEW OF THIS PEA

NAME	AFFILIATION
Allan Hanley	unaffiliated
Alvin "Jim" Kennedy	Tribal Council
Andrew Werk Jr.	Tribal Council, President
Blake Stiffarm	USDA NRCS
Bronc SpeakThunder	FBIC Buffalo Program
Brandi King	Tribal Council
Carl Healy Sr.	FBIC Transportation
Craig Adams	FBIC Irrigation Department
Curtis Horn	Tribal Council
Daniel Longfox	Tribal Land Department
Dave Kirkaldie	Rancher
Dennis Longknife	Climate Change Coordinator
Dominic Messerly	Tribal Council
Donovan Archambault Sr.	Tribal Council
Elliott LaMere	BIA - Fort Belknap Agency
Gerald "Manny" Healy	Tribal Council, Vice-President
George Horse Capture, Jr.	Tribal Council, Vice-President
Gerald Hockhalter	BIA - Fort Belknap Agency
Gerald (Bud) Walsh	FBIC Rancher
Harold "Jiggs" Main	FBIC Fish and Wildlife; FBIC White Clay Society
Ina Nez Perce	FBIC Environmental Dept.
Jayme Lamebull	Tribal Land Department
Jay Smith	FBIC Rancher
Jeffrey Stiffarm	Tribal Council
Jerry Lankford	FBIC Farmer
Joey Kill Eagle	FBIC Conservation District
John Allen	FBIC Buffalo Chasers Society
John Hawley	Tribal Council
John St. Pierre	BIA - Fort Belknap Agency
Kristal Hawley-Fox	FBIC Irrigation
Kyle Bigby	Council Member
Lorraine Brien	BIA - Fort Belknap Agency
Lynn Cliff Jr.	Tribal Council
Mark Azure	Tribal Council, President
Martha King	BIA - Fort Belknap Agency
Michael Black Wolf	THPO
Miranda Skoyen	USDA FSA
Mike McCabe	FBIC Rancher
Nathaniel "Nate" Mount	Tribal Council
Peggy Doney	Tribal Land Department
Phillip Shortman	Tribal Council
Robert Bearcub	Tribal Council
Roc Becenti	INCA
Rochelle LaMere	BIA - Fort Belknap Agency
Ryan Lankford	FBIC Farmer
Shaun Holcomb	USDA NRCS
Sheila Walsh	FBIC Rancher
Steve Fox Jr.	Tribal Council
Tracy Harshman	USDA FSA
Warren Morin	Tribal Council

Note that a tribal council election was held in November 2017, and new tribal council members were elected, including a new president and vice president.

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APPENDIX A

FARM/PASTURE LEASING AND GRAZING PERMITTING PROCESSES

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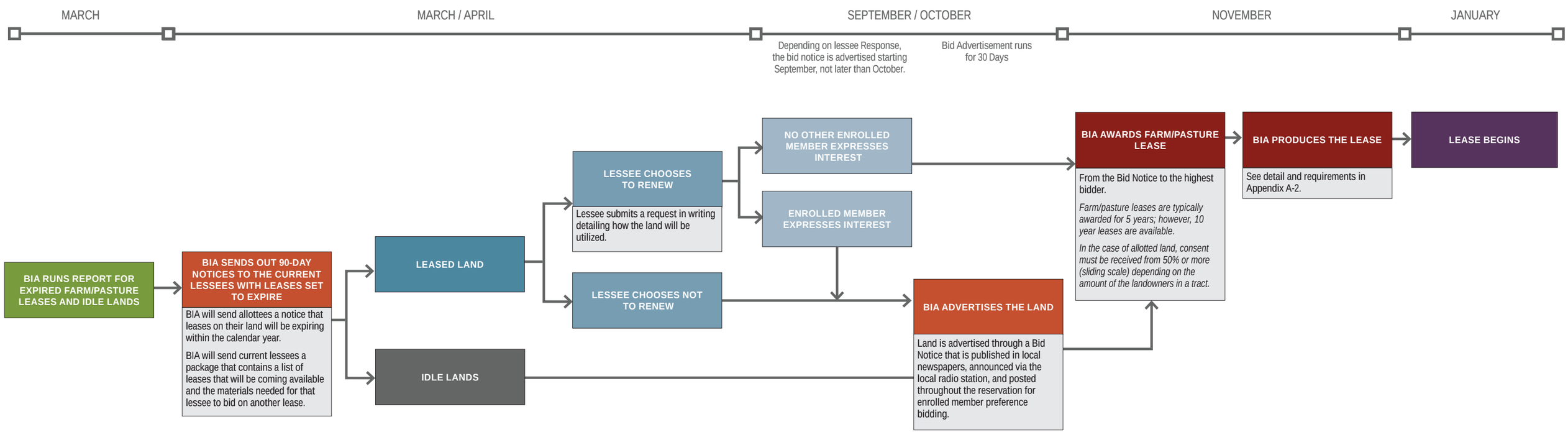
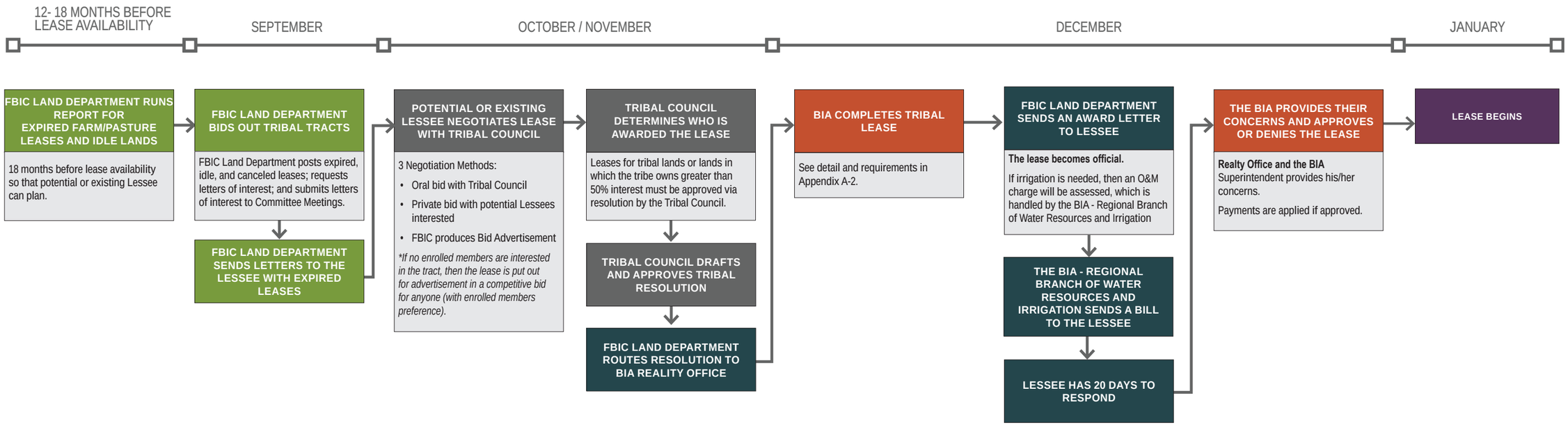
Appendix A-1

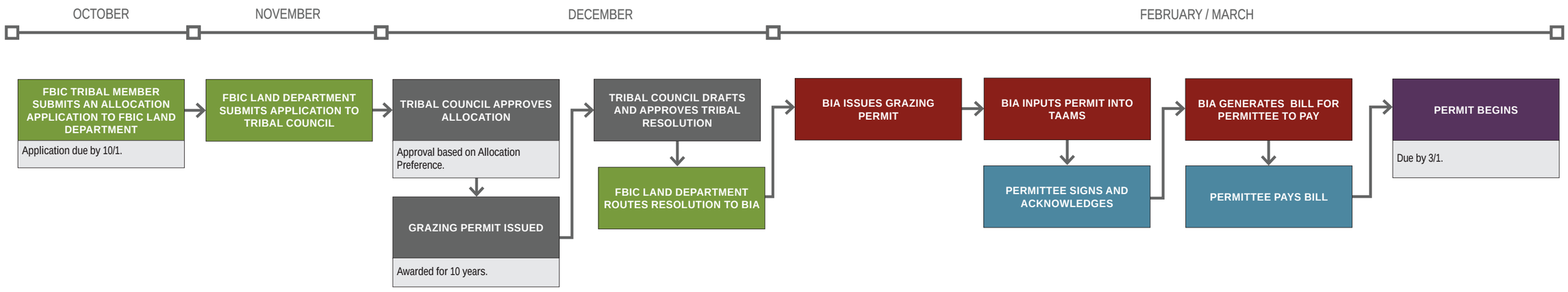
Farm/Pasture Lease Process – Allotted Lands



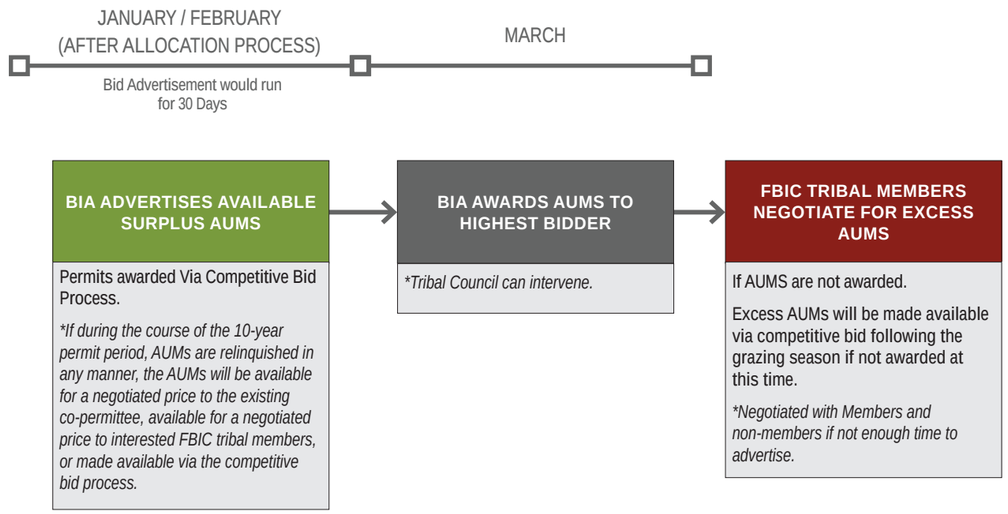
Farm/Pasture Lease Process – Tribal Lands



Grazing Permit Process – Allocations



Grazing Permit Process – Surplus AUMs



Acronyms:
TAAMS – Trust Asset and Accounting Management System
AUM – Animal Unit Month

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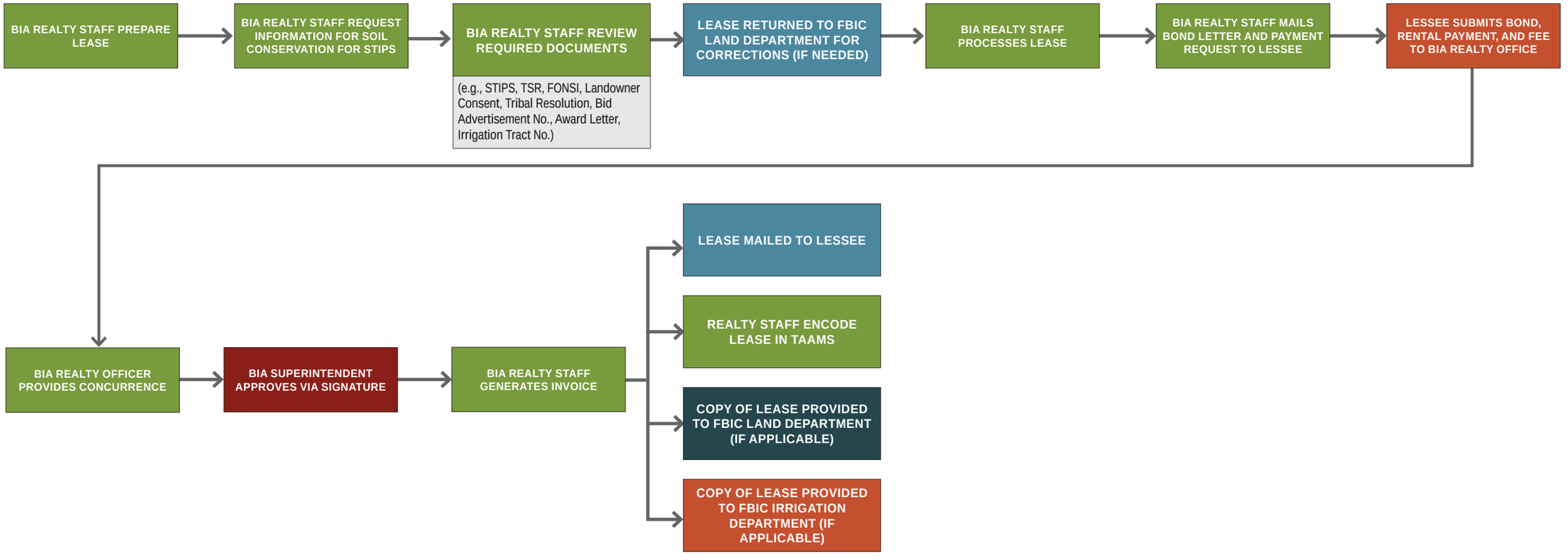
Appendix A-2

BIA Farm/Pasture Lease Development Process



Acronyms:
STIPS – Stipulations
TSR – Title Status Report
FONSI – Finding of No Significant Impact
TAAMS – Trust Asset and Accounting Management System
No. – Number

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APPENDIX B

RANGE AND FARM/PASTURE UNIT DETAILS

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APPENDIX B. RANGE AND FARM/PASTURE UNIT DETAILS

Range Unit and Farm/Pasture Unit Numbers	Total Approximate Acreage	Average Annual Production (lbs/acre)	Average Cattle Forage Production (lbs/acre)	Average Stocking Rage (AUM/acre)	Average Clubmoss Cover (%)	Average Similarity Index (%)	Located in the Submarginal Lands?	Current Range Unit[1]
0	8,468	NA	NA	NA	NA	NA	No	No
1	4,858	587.72	397.86	0.14	28.56	31.02	No	Yes
2	13,658	501.51	318.46	0.11	26.17	26.18	No	No
3	9,795	538.37	377.67	0.14	32.53	29.08	No	Yes
4	3,037	628.22	423.7	0.16	38.04	31.39	No	Yes
5	10,191	824.88	549.39	0.21	29.92	38.53	No	Yes
7	7,247	737.72	469.75	0.17	31.7	32.67	No	Yes
8	13,923	597.53	410.7	0.15	31.65	32.06	No	Yes
9	8,974	675.61	422.04	0.16	31.83	32.42	No	Yes
11	15,533	729.88	491.08	0.18	29.22	37.86	No	Yes
13	6,386	717.75	466.94	0.17	28.41	34.03	No	Yes
14	6,500	665.38	448.32	0.17	21.05	32.25	No	Yes
15	35,360	675.07	437.54	0.16	24.68	31.25	No	Yes
16	5,011	582.86	386.01	0.14	27.7	30.87	No	Yes
17	3,844	603.72	411.89	0.15	30.26	31.57	No	Yes
18	7,640	678.81	492.96	0.18	31.21	31.85	No	Yes
19	6,724	563.47	451.01	0.14	33.79	29.37	No	Yes
20	2,184	702.83	488.56	0.18	36.12	32.88	No	Yes
22	7,529	534.1	370.93	0.13	22.69	33.28	No	Yes
23	2,096	626.81	429.14	0.16	38.97	29.61	No	Yes
24	2,119	773.74	532.24	0.2	24.49	37.51	No	Yes
25	2,948	964.05	612.64	0.22	31.99	44.28	No	Yes
30	8,808	593.6	397.94	0.14	30.65	30.16	No	Yes
32	2,226	769.83	492.61	0.18	22.07	35.54	No	Yes
33	2,928	592.69	371.77	0.13	33.77	27.92	No	Yes
35	5,363	563.04	369.99	0.13	34.56	27.57	No	Yes
39	2,083	700.14	481.38	0.18	31.03	33.45	No	Yes
40	4,179	650.13	425.79	0.16	24.13	32.13	No	Yes
41	2,493	700.31	490.19	0.18	28.4	33.98	No	Yes
42	827	670.73	452.18	0.16	20.55	33.55	No	Yes
48	3,496	556.08	393.53	0.14	41.43	29.14	No	Yes
54	3,628	933.98	621.97	0.23	23.93	42.85	No	Yes
56	8,795	780.65	591.46	0.22	36.21	40.02	No	Yes
59	7,028	589.99	399.24	0.15	31.76	31.57	No	Yes
60	1,873	663.08	441.18	0.16	24.87	32.92	No	Yes
63	5,448	677.88	445.07	0.16	28.56	31.03	No	Yes
64	3,573	688.6	485.54	0.18	34.71	30.73	No	Yes
65	1,475	726.27	508.2	0.19	30.53	31.43	No	Yes
66	3,627	611.68	370.85	0.13	21.96	29.7	No	Yes
69	2,537	683.31	440.5	0.16	22.69	33.12	No	Yes
72	6,059	654.44	446.12	0.16	37.14	32.34	No	Yes
73	5,850	714.99	461.32	0.17	23.54	32.17	No	Yes
75	8,323	553.39	377.85	0.14	30.53	29.95	No	Yes
77	5,281	600.05	421.21	0.15	37.45	29.37	No	Yes
78	3,965	671.22	516.29	0.19	49.91	31.34	No	Yes
82	2,071	684.53	490.88	0.19	42.55	34.65	No	Yes
83	3,240	460.98	320.96	0.12	25.68	26.11	No	Yes
103	1,997	688.8	491.77	0.18	25.97	37.2	No	Yes
104	2,934	599.7	388.79	0.14	25.25	30.77	No	Yes
201	1,659	922.45	598.92	0.22	31.71	42.47	No	No
202	1,110	1122.54	643.93	0.24	17.32	40.46	No	No
203	407	928.22	522	0.2	16.22	35.11	No	No
204	478	790.53	542.06	0.2	23.06	40.47	No	No
205	324	770.47	514.6	0.18	25.33	38.93	No	No
206	1,519	1048.1	621.48	0.23	20.73	40.83	No	No
207	479	810.12	583.76	0.22	26.65	43.12	No	No
209	155	NA	NA	NA	NA	NA	No	No
210	637	710.19	418.43	0.15	13.52	30.33	No	No
251	638	NA	NA	NA	NA	NA	No	No
252	643	871.74	614.21	0.22	21.95	44.47	No	No

APPENDIX B. RANGE AND FARM/PASTURE UNIT DETAILS

Range Unit and Farm/Pasture Unit Numbers	Total Approximate Acreage	Average Annual Production (lbs/acre)	Average Cattle Forage Production (lbs/acre)	Average Stocking Rage (AUM/acre)	Average Clubmoss Cover (%)	Average Similarity Index (%)	Located in the Submarginal Lands?	Current Range Unit[1]
253	27,803	NA	NA	NA	NA	NA	No	No
255	346	961.55	473.27	0.18	10.91	33.91	No	No
312	653	814.11	550.63	0.2	27.74	38.95	Yes	No
321	228	758	540	0.2	26	40	Yes	No
365	1	NA	NA	NA	NA	NA	Yes	No
367	838	671.67	387	0.14	14.5	31.72	Yes	No
381	219	520	445	0.15	29	36	Yes	No
401	240	1247	625	0.22	15	40	Yes	No
402	104	816	474	0.17	24	35	Yes	No
411	12	NA	NA	NA	NA	NA	Yes	No
431	370	677	482	0.18	23	33	Yes	No
432	8	NA	NA	NA	NA	NA	No	No
433	283	666	405	0.14	23	33	Yes	No
441	2,637	517.66	370.27	0.13	20.01	27.52	Yes	No
451	60	NA	NA	NA	NA	NA	Yes	No
461	812	610.83	464.06	0.17	28.44	25.17	Yes	No
471	163	977	587	0.21	21	37	Yes	No
472	2,229	728.57	395.37	0.13	24.29	27.2	Yes	No
473	759	710.37	472.8	0.17	30.27	34.03	Yes	No
474	6	NA	NA	NA	NA	NA	No	No
475	235	792	454.5	0.16	12.5	33	No	No
476	349	662.05	502.74	0.19	26.53	29.05	Yes	No
477	1,125	569.81	401.58	0.15	19.47	28.53	Yes	No
479	397	733	491	0.17	36	37	Yes	No
480	415	720.61	392.44	0.14	28.22	27.83	No	No
481	548	528.52	352.62	0.12	16.43	30.24	Yes	No
482	1,632	964.17	574.25	0.21	21.83	39.54	Yes	No
491	1,335	623.44	437.58	0.16	22.69	30.36	Yes	No
492	2,742	647.89	474.53	0.17	33.38	28.64	Yes	No
501	1,953	729.92	537.32	0.19	34.68	37.72	Yes	No
977	41	758	540	0.2	26	40	Yes	No
978	340	958	552	0.2	18	40	Yes	No
979	15	649	482	0.17	26	36	Yes	No
980	84	567	379	0.13	19.25	32	Yes	No
981	600	483.86	324.43	0.11	16.29	27.43	Yes	No
982	647	1168	586	0.22	9	42	Yes	No
983	183	639	370	0.13	9	33	Yes	No
984	325	567.92	352.67	0.13	14.42	31.67	Yes	No
985	170	501	345	0.12	15	34	Yes	No
986	228	677	440	0.16	14	37	Yes	No
987	40	NA	NA	NA	NA	NA	Yes	No
988	337	677	337	0.11	12	31	Yes	No
989	991	479.41	318.52	0.11	15.75	29.66	Yes	No
990	636	488.7	311.3	0.11	15.65	29	Yes	No
991	2,066	608.55	406.46	0.14	25.5	33.05	Yes	No
992	25	NA	NA	NA	NA	NA	Yes	No
993	39	NA	NA	NA	NA	NA	Yes	No
994	64	NA	NA	NA	NA	NA	Yes	No
995	1,293	651.59	467.07	0.17	26.8	30.02	Yes	No
996	316	793	522	0.19	29	34	Yes	No
997	137	1867	854	0.31	7	48	Yes	No
998	402	1185.07	648.7	0.23	23.19	41.11	Yes	No
999	320	728	599	0.22	6	21	Yes	No

[1]Current range unit reflects 2017 data while the remaining data in this table reflect 2006 conditions.

Acronyms:

AUM - animal unit month

lbs - pounds

NA - no data available; these range units were only used to calculate total and average acreage

% - percent

References:

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APPENDIX C

RANGELAND IMPROVEMENT RECOMMENDATIONS

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APPENDIX C. RANGELAND IMPROVEMENT RECOMMENDATIONS

1.0 INTRODUCTION

The Fort Belknap Indian Community (FBIC) Tribal Council determined that an agricultural resource management plan (ARMP) was needed for the Fort Belknap Indian Reservation (Reservation). The Reservation, which is home to the FBIC (i.e., members of the Gros Ventre and Assiniboine Tribes [Tribes]), is predominately rural and agricultural activities are the prevailing land use.

As part of the ARMP development process, the Tribes determined that a focused assessment of the rangelands within the Reservation boundary and the submarginals was warranted to ultimately identify ways to sustain and enhance range unit health and forage utilization, amount, and quality. This assessment consisted of a review and synthesis of the 2006 Rangeland Inventory Report and its component data (which includes range units and farm/pasture land), followed by a three-day site visit. During the site visit, the FBIC ARMP Senior Rangeland Ecologist 1) met with range management staff from United States (U.S.) Bureau of Indian Affairs (BIA), FBIC, and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) to discuss general range unit conditions and issues and 2) visited range and farm/pasture units selected by staff for the purpose of evaluating existing conditions and observing significant issues to assist with developing recommendations for improved range health. In combination with data contained within the 2006 Rangeland Inventory Report, the on-the-ground information gathered during the site visit was used to generate recommendations for targeted efforts to sustain and/or improve range unit condition in the future, with the greater goal of being aligned with objectives collaboratively established in the ARMP. It is important to note that the site visit occurred toward the latter part of the permitted grazing period (late August 2017) and during a summer characterized by significantly below average precipitation. As such, observations made during the site visit and the issues identified by range management staff should be viewed within this context.

At present, the most comprehensive and quantitative inventory of FBIC range units and farm/pasture land is contained within the 2006 NRCS Rangeland Inventory, which contains data that were collected in 2004 through 2006 (NRCS et al. 2006). Stocking rates (i.e., animal unit months [AUMs]) that were established within these reports, which were generated more than 10 years ago, are currently being used for the permitting of individual range units and farm/pasture leases. In discussing the inventories with FBIC representatives, 2004-2006 were considered to be below average in forage production. Annual precipitation on the Reservation ranges from 10-14 inches per year, and approximately 11 and 10 inches were received in 2004 and 2005, respectively. Note that in this appendix, the term, “rangelands”, refers to lands in both range units and farm/pasture units used for grazing.

Together, the inventory reports, on-the-ground observations, and input received from representatives from the BIA and FBIC represent the best available and most useful information for identifying the current condition of

rangelands and general measures to enhance them. Measures to enhance the condition of rangelands are described in the sections that follow and are focused on:

- Forage production
- Noxious weed/invasive species management
- Range management strategies
- Reliable and well-distributed water resources
- Adaptive management

These measures are consistent with working towards the objective of increasing the overall availability, utilization, and/or forage quantity and quality that was identified within Section 2.2 of the ARMP.

2.0 FBIC RANGELANDS AND REVIEW OF 2006 RANGELAND INVENTORY

2.1 OVERVIEW AND INVENTORY OBJECTIVES

FBIC rangelands and farm/pasture lands, which account for approximately 359,980 acres of land in the Project Area, were consolidated to form units of land for the management and administration of cultivating and grazing under a permit or lease (NRCS et al. 2006; BIA 2017). Note that the rangeland data includes information from the rangeland inventory (encompassing range units and farm/pasture lands) that was conducted in 2005-2006 (NRCS et al. 2006) or from rangeland unit data files from 2014 (BIA 2014). Additionally, the range unit spatial layer providing these data and information is the best available data provided to Trihydro Corporation for the purposes of this plan; however, some representatives have noted that it is not current. Currently, 47 range units exist in the Project Area (BIA 2017).

The 2006 Rangeland Inventory is the most recent rangeland and farm/pasture land inventory for the FBIC (BIA 2017). The primary objectives of the inventory were to 1) assess the production and stocking capacity of management units based on available forage and levels of grazing, 2) evaluate the ecological condition of the rangeland, and 3) identify areas of noxious weeds. These objectives were achieved through on-the-ground data collection and the review of high resolution aerial photography and satellite imagery within a geographical information system.

2.1.1 INVENTORY RESULTS AND INTERPRETATION

The inventory provides data for rangeland production, plant community composition, clubmoss (*Selaginella densa*) cover, and similarity to the Historic Climax Plant Community (HCPC) (Similarity Index, or SI). A summary of these data by individual rangeland and farm/pasture land unit is included in Appendix B of the ARMP, and general trends for rangeland characteristics are described in Section 1.4.1. During the inventory of

individual range units and farm/pasture units (hereon "units" or "rangelands"), a Rangeland Ecological Health assessment was also completed according to the methodology and procedures outlined within Pellant et al. (2005). Rangeland Health Assessments are tools for evaluating soil/site stability, hydrologic function, and biotic integrity at the ecological site level. Because they are completed at individual sampling locations, they are useful in assessing how ecological processes onsite are functioning (in reference to expected conditions within the general region), in addition to identifying areas that may warrant a follow-up assessment to identify issues and potential recommendations for addressing it before they become progressively worse. The Rangeland Ecological Health Assessment results have been compiled in Table C-1 for units within both the Reservation boundary and the submarginals. Based on a review of the data for each unit and the management units as a whole, the following conclusions can be made:

- Production estimates for individual units, which are based on field data, are considerably below HCPC average annual production estimates from Ecological Site Descriptions.
- The SI for all range units is below 50 percent (%), with most units having an SI in the 30-40% range (Table 1).
- Clubmoss cover exceeds 20% in the majority of units, and exceeds 40% in some units (Appendix B).
- Whereas range condition estimates for soil stability and hydrology indicate conditions that do not strongly deviate from reference conditions, the biotic integrity index indicates stronger deviation from reference conditions (Table C-1).
- Rangeland condition (as calculated according to Lacey and Taylor 2005) for units 8, 13, 14, 15, 19, 40, 56, and 461 ranges from fair to excellent (Table C-2). These units were selected for a range condition assessment because they were visited during the site visit and specifically targeted by range management staff for assessment and previously recognized issues.

Project Area units are characterized primarily as the following two general ecological communities: Great Plains Mixedgrass Prairie and Big Sagebrush Steppe. These two different community types contain a diversity of plant species, with grazing, fire history, and climate (interannual variability in precipitation) strongly influencing the composition and subsequently productivity of the vegetation at any given time. Research consistently shows that precipitation is the principal factor influencing productivity on ecological sites in the Northern Great Plains (Heitschmidt et al. 2005). Grazing can have both a positive and negative influence on annual productivity, with precipitation and plant community structure interacting with these effects.
The HCPC for Great Plains Mixedgrass Prairie, and the different ecologic sites within it, is the basis for evaluating the current plant community structure and annual productivity. The HCPC can be interpreted as the potential for an ecological site and the plant community and production value that is characteristic of the conditions under which it may have evolved. Departures from the HCPC can be brought about by management actions, drought, a change in the nature fire regime, or the colonization and spread of invasive

species and/or noxious weeds (NRCS 2005). The HCPC for the majority of the ecological sites within the Project Area is characterized by tall and medium height cool season perennial grasses (such as bluebunch wheatgrass [*Pseudoroegneria spicata*], green needlegrass [*Nassella viridula*], western wheatgrass [*Pascopyrum smithii*], thickspike wheatgrass [*Elymus lanceolatus*], and needle and thread grass [*Hesperostipa comata*]), about 10% perennial forbs (including dotted gayfeather [*Liatris punctata*], scurfpeas [*Psoralidium* spp.], prairie clovers [*Dalea* spp.], and American vetch [*Vicia americana*]), about 5% native shrubs (including winterfat [*Krascheninnikovia lanata*]) and limited bareground. Production for this HCPC can be as high as 1,600 pounds per acre. Notably, club moss is a minimal part of this ecological system. It is important to note that this plant community type, while covering a large portion of the Project Area, is intermixed with other plant community types that are found in areas with different topography and soils. As such, it should be considered as reflective of the potential for this area, as opposed to the plant community that is expected to be found throughout. Note, the rangelands condition assessments in Table C-2 similarly indicate deviations from the expected plant community composition within the general area of the Project Area. Deviations from the HCPC are often, but not always, associated with deviations in annual forage production.

Ecological Health Assessment data were also reviewed to identify previously documented deviations from expected conditions for soil/site stability, hydrology, and biotic integrity. Units with higher counts in the Moderate to Extreme (ME) and Extreme (E) categories as opposed to the None to Slight (NS) to Moderate (MOD) categories reflect assessments of significant departure from local reference conditions because one or more of the following issues that are important to the biotic integrity and subsequently sustainability of an area: susceptibility to erosion, soil loss or degradation, soil compaction, litter amount, plant community structure, annual production, invasive plants, and/or the absence of apparent reproduction in the existing plant community.

2.2 ISSUES OBSERVED AND IDENTIFIED

Because it was limited in time and scope, the site visit was intended to verify data/conditions from the 2006 Rangeland Inventory and gather information from range staff that are on-the-ground daily and therefore make observations throughout the large area and, in some cases, across more than one year. Below are key observations that were made during the site visit:

- The dominant plant species observed within the units visited were similar to dominant species reported within the 2016 Rangeland Inventory Reports, within the exception of cheatgrass (*Bromus tectorum*) (further discussed below). Units 8, 13, 14, 15, 19, 40, 56, 72, 461, and 492 were visited and briefly surveyed for the composition of the plant community. The vehicular tour of the site allowed for a visual review of the following additional units: 3, 9, 18, 22, 30, 32, 41, 42, 64, 70, 77, 78, 82, 312, 321, 433, 979, 980, 982, 985, 986, amongst others.

- Cheatgrass is considerably more abundant within Project Area units than suggested by the results of the 2016 Rangeland inventories. It is very likely that this species has significantly increased in abundance since 2004-2006, which is similar to regional trends for this species.
- Stubble height (ocular estimates) in some of the submarginal units was consistently less than 2 inches and bareground was greater than 20%, suggesting heavy grazing pressure in the areas visited. Recommended minimum stubble heights range from 2-6 inches, depending on species.
- Grazing pressure and utilization varies across individual range units with water sources as attractants. As a result, some areas that are far from a water source experience minimal to low intensity grazing while others experience much more intense grazing. This observation was confirmed by FBIC and BIA range personnel as a common issue across range units.
- Units have minimal to no cross fencing for managing the locations and time within those locations that cattle spend within the range unit during the permitted time period (May 15-November 15).
- While quantitative assessments of club moss cover were not made within units during the site visits, estimates of 20-30% for most range that were made in the 2016 Rangeland Inventories appear to be consistent with current conditions.
- Prairie dog towns are present on some units and stocking rates may need to be adjusted to reflect the reduction in forage available to cattle in these range units in both the short- and longer- term.
- Plant community composition and forage production varies considerably between and within range units. During normal years, the HCPC indicates that total annual production averages 1,600 pounds per acre, which is significantly greater than that documented in the 2006 Rangeland Inventory reports.

In conclusion, the 2006 Rangeland Inventory Reports and the site visit were used to identify issues, observe general trends in plant community structure, learn more about the grazing approach applied within most range units, and to derive recommendations that should be considered in developing a plan to sustain the productivity of tribal rangelands and potentially increase forage production in the future.

2.3 NEED FOR A CURRENT RANGE UNIT INVENTORY

The 2006 Rangeland Inventory Reports provide valuable information for the plant community composition and annual forage production within range units at a single point in time more than 10 years ago. However, there is a strong need to complete a new inventory that more accurately reflects existing vegetation communities, forage production, noxious weed and invasive species cover and distribution throughout the Project Area, and current rangeland health and condition. Forage production of Great Plains grasslands varies considerably between years, with production in wet years nearly doubling the production in dry years. As such, stocking rates that are based on a snapshot in time may underestimate or overestimate the true potential

of the system in an average year. Single point in time measurements are also not useful in identifying the relative range in forage production that might be expected for range units. An updated inventory would also allow for a comparison between data collected 10-20 years apart, which may be helpful in identifying changes in species composition, production, and other range condition/health parameters. Recognizing that limited funds may exist to complete a comprehensive inventory, a targeted plan could be developed so that similar and adequate data are collected to effectively inform the development of stocking rates for grazing permits. A comprehensive mapping of cheatgrass would also be valuable in determining the management approach for this species.

3.0 RANGE AND FARM/PASTURE UNIT IMPROVEMENTS

The improvements and/or enhancements described below are focused on increasing overall forage production and utilization through management and/or infrastructure. As indicated above, current production is less than the estimated potential production of this ecological system, although the relative magnitude is unclear. Within the ARMP, a 20% increase in forage production has been established as a goal for the future. A climate change adaptation plan and/or a drought mitigation plan are recommended so that specific approaches can be followed during and after drought. Additionally, the Fort Belknap Fire Management Plan (Fort Belknap Forestry and Fire Management 2017, *pending finalization)* should be implemented for long-term management of rangelands, as well as in response to wildfire, so that measures can be implemented to avoid potential adverse impacts from these natural and periodic disturbances.

3.1 WATER RESOURCE DEVELOPMENT

Cattle require water sources that can be utilized throughout the growing season. Depending on range unit size, numerous and spatially distributed water resources are needed. During the site visit, range management staff indicated that many water resources were in various states of disrepair and/or usability, depending on the specific nature of the water resource. Appendix D provides a thorough review of water resources and provides recommendations for repair, enhancement, and development of water sources to ensure that adequate water is available for cattle within all range units.

An assessment of water resources, in terms of persistence and reliability during drought, should also be included in the climate change adaptation plan and/or a drought mitigation plan described above.

3.2 LIVESTOCK GRAZING MANAGEMENT CONSIDERATIONS AND RECOMMENDATIONS

The Grazing Ordinance permits grazing from May 15 through November 15 and gives the permittee the authority to manage livestock use of the unit within the AUMs set for the unit. Based on discussions with FBIC and BIA grazing management staff, the majority of range units receive season-long grazing. Below are a list of management considerations (in coordination with recommendations in the ARMP, Section 2.0) for range units that could be instituted to potentially enhance overall forage utilization, quality, and quantity:

- Subdividing range units into pastures through permanent cross-fencing. While many range units could benefit from additional fencing to better manage herd spatial and temporal use of forage within the range unit, prioritizing the largest pastures might serve as a first step in this process. **There are currently nine range units that are greater than 8,000 acres in size and these should be prioritized for subdividing with cross-fencing. These range units include 3, 5, 8, 9, 11, 15, 30, 56, and 75. Figure C-1 identifies range units in the Project Area that should be prioritized for cross-fencing, as well as locations that are currently not classified as range units, but may suitably serve as range units in the future.**
- Development of specific grazing management plans that shift range unit forage use from season long grazing of entire range units to seasonal grazing. **Permittees should work with NRCS range biologists or technicians to learn about how to incorporate rotational grazing into their management plans (Undersander et al. 2002) and to develop an NRCS Conservation Plan.**
- **Development of specific grazing management plans and intense active management/enforcement at the submarginal rangelands** since observations suggested heavy grazing pressure occurring in the areas visited (Figure C-1).
- **Encouraging adaptive management by educating permittees on how to evaluate rangelands and to make decisions that promote sustainability of the resource** (e.g., when to move cattle to another area of the pasture, etc.). Educational programs, provided by the Montana State University Extension Service, Ranchers Stewardship Alliance, and/or the NRCS, may be helpful in providing permittees with formal and informal ways to assess range units throughout the growing season and manage their livestock in response to the conditions that they observe.
- **Consider monitoring the health of the rangelands periodically.** Monitoring stations could be identified and visited frequently as a way to track and record changes in forage production, forage utilization, plant community structure, and other important rangeland health metrics over time. Permanent monitoring stations could be established and assessed annually as well as throughout the grazing period in a single year. The resulting data could assist in identifying trends over time, providing valuable information for adaptive management within a year or between years, or in response to a change in grazing management

(e.g., developing a new water source, treating noxious weed infestations, and/or in pastures sub-divided through cross-fencing).

3.3 LIVESTOCK GRAZING AND WILDLIFE MANAGEMENT CONSIDERATIONS

Declines in greater sage grouse (*Centrocercus urophasianus*) populations throughout the Western U.S. are largely the result of habitat loss and degradation of sagebrush (*Artemisia spp*.) steppe ecosystems. Improper livestock grazing has been proposed as a contributing factor to habitat degradation because overgrazing can result in limited concealment cover during female nesting periods. Consequently, finding ways to successfully manage livestock and manage for high quality habitat for sage grouse is essential.

Recent research suggests that grazing, particularly rotational grazing, is highly compatible with healthy sage grouse populations (Sage Grouse Initiative 2017). The locations of sage grouse leks within the Project Area have been previously documented**. Sagebrush steppe plant communities within the Project Area could be targeted for developing and introducing rotational grazing plans. Some units that should be considered for implementing rotational grazing to benefit sage grouse and to promote ARMP rangeland grazing objectives include 0, 2, 5, 9, 14, 15, 35, 40, 59, 63, 66, 72, 73, 204, and 205**.

3.4 MANAGING TO REDUCE CLUBMOSS

Clubmoss cover varies between individual range units, with the majority of range units being characterized as having greater than 25% cover by clubmoss. Because clubmoss is not a forage species and occupies space that might otherwise be occupied by forage grasses, high cover by club moss represents a significant departure from the potential production on a range unit and subsequently an economic loss that is experienced directly by the permittee or indirectly by the Tribes (with a reduced stocking rate for a given range unit and subsequently a lower perception of the unit's forage potential, which results in a lower bid). In addition, some research suggests that clubmoss increases in response to heavy and/or overgrazing of a pasture, and may therefore increase over time (NRCS 2005).

Regardless of the factors that have resulted in the current cover and abundance of club moss, the primary ways to reduce clubmoss cover include chemical, mechanical, and/or physical (grazing pressure, intense hood action) measures. The most effective chemicals for reducing clubmoss and increasing yield of desirable species include the application of ammate and atrazine during the spring (Crane 1990). Other chemicals that reduce clubmoss cover, but may target desirable species as well, include monuron, paraquat, and bromacil (Crane 1990). Some mechanical controls have been documented to reduce clubmoss cover during long-term (e.g., 10 years), integrated management, such as manuring, disking, and harrowing, coupled with seeding desirable species (Crane 1990). Manure may promote the growth of taller vegetation to outcompete clubmoss; and, disking and harrowing may disrupt the clubmoss roots, which can be extremely drought tolerant when

undisturbed (Crane 1990). Because clubmoss does not compete well with other species, seeding desirable species after disking and harrowing may further reduce clubmoss cover. Mechanical treatments may be difficult in areas that contain high concentrations of rocks at or immediately below the soil surface. Recent research (Killian et al. 2009) suggests that hoof action, through short duration heavy grazing, may be more effective than other control measures and also more economically efficient (especially in remote areas where the use of equipment might be infeasible), provided livestock can be managed to effectively break up clubmoss cover. However, this would likely require intense active management with additional water sources and fence (i.e., temporary and/or permanent) to be successful and not adversely impact rangeland health from overgrazing. Additional control measures include prescribed burns, which have been observed to effectively reduce or eliminate clubmoss cover (Crane 1990). If prescribed fire is to be used to reduce clubmoss, burns should be conducted during years of average or above-average precipitation to minimize adverse effects on desirable grasses and forbs. Clubmoss does not have a high fire tolerance, and the successful reduction of this species relies predominantly on the ability of desirable species to reestablish following a burn. Prescribed burns in Montana often occur during late fall or early spring, when desirable species are dormant (Wakimoto et al. 2005). **Units 48, 78, and 82 currently have greater than 40% clubmoss cover and should be prioritized for immediate clubmoss reduction/control.**

3.5 NOXIOUS WEED MANAGEMENT

Noxious weeds and invasive species were observed within rangelands during the site visit and are known to be present on thousands of acres throughout the Project Area. Documented known infestations are shown on Figure C-2, and descriptions of known problematic noxious weeds and/or invasive species are provided within Section 4.5 of the ARMP. Species that were either observed during the site visit and/or are known to be present and problematic within Project Area rangelands include the following:

- Canada Thistle (*Cirsium arvense*)
- Cheatgrass
- Field Brome (*Bromus arvensis*)
- Dalmatian Toadflax (*Linaria dalmatica*)
- Knapweed (Diffuse [*Centaurea diffusa*], Russian [*Acroptilon repens*], and Spotted [*Centaurea stoebe*])
- Kochia (*Bassia scoparia*)
- Leafy Spurge (*Euphorbia esula*)

These species effectively displace desirable forage species within rangelands, and as such, reduce the overall forage available to livestock. The negative impacts from noxious weeds and invasive species are fully

described in the 2013 FBIC Noxious Weed Strategic Plan and associated 2016 Noxious Weed Management PEA.

The Noxious Weed Strategic Plan should be aggressively implemented to begin to reduce current coverage within the Project Area and prevent further spread. Known infestations of Canada Thistle, Dalmatian Toadflax, Knapweed, and Leafy Spurge should be prioritized for treatment to effectively prevent further spread.

During the site visit, cheatgrass and field brome were observed in many of the rangeland units, although with varying abundances. **Because cheatgrass and field brome can spread rapidly and pose a wildfire risk (if abundant in sufficient densities), a specific plan for treating and managing these species is recommended and should be prioritized. During the site visit, cheatgrass and field brome were observed to be abundant within Units 14, 15, 19, 30, 40, and 56; however, a more thorough inventory and mapping effort is needed in order to specifically prioritize units. Sagebrush is typically killed during wildfire. As such, cheatgrass and field brome cover within sage grouse habitat should be mapped and actively managed to reduce wildfire risk, especially in the areas around known leks.**

The most effective techniques for managing cheatgrass and field brome are aligned with their lifecycle, which differs from other rangeland species and consists of fall/winter germination, early spring growth, and early summer seed production, drying and senescence. The Noxious Weed Strategic Plan should be used to determine whether chemical herbicide, biological control, and/or grazing management should be implemented in sites in which these species are abundant. In addition, intense inventory and mapping of these species is also recommended.

3.6 ALTERNATIVE APPROACHES TO CURRENT CONSERVATION RESERVE PROGRAM (CRP) LANDS

At present, approximately 13,361 acres within the Project Area are enrolled in the CRP and are managed through spatial or temporal rotational grazing, with 30% annual use. In other words, a unit may be grazed during 30% of the growing season or 30% of the unit may be utilized. CRP Lands within the Reservation are also sometimes hayed. **CRP Lands that were previously planted with crested wheatgrass (*Agropyron cristatum*) should be evaluated as potential locations for interseeding with other forage species that might enhance seasonal and/or annual forage that is available to livestock.** It is important to note that interseeding an existing pasture requires planning and the setting of specific goals and objectives regarding the needs of livestock and subsequent plans to manage pasture through rotational and seasonal grazing (Holzworth et al. 2003). While there are numerous species that should be considered by ranchers desiring to interseed pastures, three grass species that have been seeded into CRP Lands and other rangelands in the general region

are Russian wildrye (*Psathyrostachys juncea*), green needlegrass, and pubescent wheatgrass (*Thinopyrum intermedium*). These species are also considered common introduced species within the Project Area precipitation range (Holzworth et al. 2003). Pasture can also be improved through the seeding of legumes, including milkvetches (e.g., Cicer milkvetch [*Astragalus cicer*]).

4.0 IMPLEMENTATION AND PRIORITIES

The primary purpose of this rangeland unit improvement plan was to highlight some of the strategies and approaches that could be implemented to enhance forage utilization, production, and quality in the future. While data suggest that range unit quality within the Project Area is fair to excellent (depending on location), there are numerous issues that were shared by BIA and/or FBIC with members of the ARMP team and/or recognized by ARMP professional staff in reviewing previously collected data or during site visits. In addition, enhancing overall rangeland health and production is an objective established within the ARMP. Bolded text above indicates the priorities for improved rangeland health and production.

Many of the recommendations provided within this appendix require specific and targeted actions and significant monetary allocations and commitments to pursue and implement them. Once priorities are established, there are numerous federal programs and foundations that can provide financial assistance, provided that objectives are aligned with program goals and specific grant opportunities. The NRCS Sage Grouse Initiative provides education and financial assistance to support range management strategies that are mutually beneficial to sage grouse conservation and livestock grazing. In addition, the NRCS Environmental Quality Incentives Program (i.e., EQIP) can also be used for developing grazing management plans, managing and treating noxious weeds and/or invasive species, amongst other things. Both programs can be used for the development, rehabilitation, and/or improvement of rangeland water resources, especially if they will also be of benefit to sage grouse. Sage grouse habitat protection and conservation and successful livestock management operations are objectives for the Tribes, and as such, grant programs under the National Fish and Wildlife Foundation might also prove to be of assistance in pursuing action items under these objectives. In conclusion, once priorities for enhancing range quality have been established, specific funding opportunities to wholly support and/or provide additional funding can be pursued.

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TABLE C-1. ATTRIBUTES OF RANGELAND HEALTH

Range or Farm/Pasture Unit	Transect	Soil/Site Stability					Hydrologic Function					Biotic Integrity				
		NS	SM	MOD	ME	E	NS	SM	MOD	ME	E	NS	SM	MOD	ME	E
1	**190A**	9	0	0	0	0	9	1	0	0	1	3	1	0	4	1
1	**191A**	7	1	1	0	0	7	1	2	0	1	4	1	1	1	2
1	**1A**	5	3	1	0	0	6	3	2	0	0	4	2	3	0	0
1	**231A**	9	0	0	0	0	10	0	1	0	0	5	2	2	0	0
2	**18A**	5	3	1	0	0	6	2	1	2	0	2	2	1	3	1
2	**19A**	6	1	2	0	0	7	1	1	2	0	3	1	1	3	1
2	**25A**	2	3	1	3	0	2	3	1	4	1	1	2	0	4	2
2	**26A**	3	1	2	3	0	4	1	2	2	2	2	1	2	2	2
2	**28A**	9	0	0	0	0	9	1	0	1	0	4	1	1	2	1
2	**30A**	6	1	1	1	0	7	0	1	2	1	2	1	0	3	3
2	**32A**	7	1	0	1	0	7	1	0	1	2	1	2	1	3	2
2	**38A**	2	3	2	1	1	3	2	2	1	3	0	0	3	1	5
2	**42A**	3	4	0	2	0	4	3	0	2	2	0	2	1	3	3
3	**196A**	7	0	2	0	0	8	2	3	0	0	2	2	5	0	0
3	**201A**	8	1	0	0	0	9	2	0	0	0	5	2	1	1	0
3	**2A**	4	0	3	1	1	4	0	3	1	3	2	0	3	2	2
4	**16A**	9	0	0	0	0	8	1	0	2	0	4	1	1	2	1
4	**21A**	2	4	3	0	0	2	5	4	0	0	2	4	3	0	0
4	**22A**	8	0	0	1	0	8	0	0	3	0	3	0	2	4	0
5	**123A**	5	4	0	0	0	5	5	1	0	0	2	3	3	1	0
5	**127A**	6	2	1	0	0	6	2	1	2	0	1	2	2	3	1
5	**133A**	5	1	0	3	0	6	1	0	3	1	1	0	1	5	2
5	**141A**	5	2	0	2	0	5	2	0	3	1	0	2	1	3	3
5	**148A**	5	0	3	1	0	5	0	3	1	2	0	2	2	1	4
5	**149A**	6	0	1	2	0	6	0	1	3	1	0	1	3	3	2
5	**152A**	6	1	2	0	0	6	1	3	1	0	0	2	4	2	1
5	**154A**	9	0	0	0	0	9	0	0	0	2	4	0	0	0	5
7	**46A**	8	1	0	0	0	9	1	0	1	0	5	1	3	0	0
7	**53A**	9	0	0	0	0	10	0	0	1	0	6	0	3	0	0
7	**60A**	9	0	0	0	0	9	1	0	1	0	4	1	3	1	0
8	**242A**	8	1	0	0	0	8	2	1	0	0	3	3	2	1	0
8	**58A**	9	0	0	0	0	9	2	0	0	0	5	4	0	0	0
8	**63A**	8	1	0	0	0	7	3	0	0	1	4	0	0	3	2
8	**66A**	8	0	1	0	0	9	0	1	1	0	4	1	2	2	0
8	**68A**	9	0	0	0	0	9	1	1	0	0	6	0	1	1	1
8	**69A**	9	0	0	0	0	9	0	1	0	1	4	0	2	2	1
8	**71A**	3	3	3	0	0	4	4	3	0	0	2	5	2	0	0
8	**76A**	7	2	0	0	0	7	4	0	0	0	7	2	0	0	0
9	**243A**	8	1	0	0	0	10	1	0	0	0	5	2	1	1	0
9	**243E**	3	0	0	0	6	2	0	1	0	8	1	0	0	3	5
9	**50A**	8	1	0	0	0	8	1	1	1	0	3	1	3	1	1
9	**56A**	9	0	0	0	0	11	0	0	0	0	5	0	1	0	3
9	**59A**	8	0	0	1	0	8	0	1	2	0	4	2	1	1	1
9	**74A**	9	0	0	0	0	8	1	0	2	0	4	0	1	3	1
11	**259A**	2	2	3	2	0	2	1	5	3	0	2	2	4	1	0
11	**277A**	8	1	0	0	0	8	2	1	0	0	5	2	1	1	0
11	**278A**	9	0	0	0	0	9	2	0	0	0	4	3	1	1	0
11	**279A**	3	2	3	1	0	2	2	4	2	1	3	2	1	2	1
11	**280A**	8	1	0	0	0	8	2	1	0	0	3	3	2	1	0
13	**205A**	9	0	0	0	0	11	0	0	0	0	7	1	1	0	0
13	**84A**	5	2	2	0	0	5	2	4	0	0	2	2	5	0	0
13	**93A**	7	2	0	0	0	7	3	1	0	0	4	3	2	0	0
13	**96A**	8	1	0	0	0	8	2	1	0	0	4	1	4	0	0
13	**89A**	4	5	0	0	0	3	7	0	1	0	2	4	3	0	0
14	**78A**	8	0	1	0	0	8	0	2	1	0	3	0	4	2	0
14	**79A**	4	5	0	0	0	3	7	1	0	0	4	4	1	0	0
14	**83A**	5	4	0	0	0	5	4	1	1	0	4	0	2	1	2
14	**88A**	4	4	1	0	0	3	5	1	2	0	1	3	0	3	2
15	**223A**	7	2	0	0	0	8	3	0	0	0	7	2	0	0	0
15	**224A**	3	0	0	6	0	2	1	0	8	0	1	2	1	4	1
15	**225A**	6	2	1	0	0	6	4	1	0	0	6	1	0	2	0
15	**246A**	3	1	0	5	0	2	1	2	6	0	1	0	3	5	0
15	**247A**	9	0	0	0	0	11	0	0	0	0	7	2	0	0	0
15	**281A**	2	1	0	4	2	2	1	1	5	2	4	0	2	2	1

TABLE C-1. ATTRIBUTES OF RANGELAND HEALTH

Range or Farm/Pasture Unit	Transect	Soil/Site Stability					Hydrologic Function					Biotic Integrity				
		NS	SM	MOD	ME	E	NS	SM	MOD	ME	E	NS	SM	MOD	ME	E
15	**282A**	9	0	0	0	0	10	1	0	0	0	5	2	1	1	0
15	**283A**	5	4	0	0	0	5	6	0	0	0	4	3	1	1	0
15	**285A**	3	0	0	2	4	2	0	1	4	4	1	0	3	5	0
15	**286A**	8	1	0	0	0	11	0	0	0	0	6	1	1	0	1
16	**16-1A**	3	4	2	0	0	4	3	3	0	1	0	2	3	2	2
16	**16-2A**	3	4	1	1	0	5	5	1	0	0	3	2	4	0	0
16	**202A**	9	0	0	0	0	10	0	1	0	0	5	0	4	0	0
16	**232A**	9	0	0	0	0	10	1	0	0	0	6	2	1	0	0
17	**4A**	9	0	0	0	0	9	0	1	1	0	4	0	1	4	0
17	**5A**	6	2	1	0	0	7	2	0	2	0	2	1	2	2	2
17	**7A**	8	0	1	0	0	8	0	2	1	0	3	1	2	2	1
17	**8A**	7	1	0	1	0	8	1	1	0	1	4	0	1	2	2
18	**248A**	9	0	0	0	0	10	1	0	0	0	6	3	0	0	0
18	**250A**	5	3	1	0	0	4	4	2	1	0	4	0	5	0	0
18	**262A**	9	0	0	0	0	10	1	0	0	0	6	3	0	0	0
18	**263A**	4	5	0	0	0	4	6	1	0	0	2	3	3	1	0
18	**264A**	5	4	0	0	0	5	4	1	1	0	4	1	3	1	0
19	**203A**	6	3	0	0	0	6	5	0	0	0	7	2	0	0	0
19	**3A**	5	1	2	0	1	6	1	2	0	2	2	1	1	2	3
20	**129A**	9	0	0	0	0	9	0	2	0	0	3	0	5	1	0
20	**130A**	7	2	0	0	0	7	2	1	1	0	2	1	3	3	0
22	**11A**	3	1	5	0	0	3	3	5	0	0	3	4	2	0	0
22	**17A**	1	5	3	0	0	1	6	4	0	0	2	5	2	0	0
22	**235A**	4	4	1	0	0	5	4	1	1	0	8	1	0	0	0
22	**236A**	5	3	1	0	0	5	5	1	0	0	6	1	2	0	0
22	**23A**	6	2	1	0	0	7	3	1	0	0	3	2	3	1	0
22	**24A**	4	3	0	2	0	3	5	1	2	0	1	4	4	0	0
23	**114A**	6	2	0	0	1	6	2	0	0	3	3	3	1	0	2
23	**115A**	7	2	0	0	0	7	2	1	1	0	4	0	0	4	1
24	**111A**	7	1	0	1	0	8	1	1	1	0	5	0	3	1	0
25	**144A**	7	2	0	0	0	9	2	0	0	0	2	3	0	0	2
25	**147A**	7	0	2	0	0	7	0	2	0	2	1	0	2	2	4
25	**157A**	9	0	0	0	0	9	1	1	0	0	4	1	2	0	2
30	**237A**	9	0	0	0	0	11	0	0	0	0	7	0	2	0	0
30	**34A**	0	4	0	5	0	0	4	0	6	1	0	1	1	4	3
30	**37A**	2	3	4	0	0	2	4	5	0	0	2	3	4	0	0
30	**51A**	0	3	5	1	0	0	3	5	1	2	1	1	2	4	1
30	**55A**	0	2	2	5	0	0	2	2	7	0	0	2	1	6	0
32	**269A**	5	4	0	0	0	5	5	1	0	0	3	3	1	2	0
32	**270A**	8	1	0	0	0	8	2	1	0	0	3	3	2	1	0
33	**241A**	9	0	0	0	0	10	1	0	0	0	5	4	0	0	0
33	**265A**	9	0	0	0	0	10	1	0	0	0	5	4	0	0	0
35	**61A**	8	1	0	0	0	7	3	0	0	1	5	0	2	1	1
35	**67A**	3	6	0	0	0	3	6	1	1	0	4	0	4	1	0
39	**119A**	8	1	0	0	0	8	3	0	0	0	4	2	1	2	0
39	**121A**	5	3	1	0	0	5	3	3	0	0	2	2	4	1	0
40	**40-1A**	3	2	2	2	0	3	3	3	2	0	2	3	4	0	0
40	**40-2A**	6	3	0	0	0	5	6	0	0	0	5	3	1	0	0
40	**40-4A**	8	1	0	0	0	7	3	0	1	0	4	1	1	3	0
41	**91A**	9	0	0	0	0	9	1	1	0	0	4	1	3	1	0
41	**92A**	8	1	0	0	0	8	2	1	0	0	4	1	3	1	0
42	**97A**	4	5	0	0	0	3	5	1	1	1	0	4	1	4	0
48	**43A**	3	3	3	0	0	4	3	4	0	0	2	2	2	1	2
48	**47A**	4	2	2	1	0	4	1	4	1	1	1	0	2	1	5
48	**52A**	9	0	0	0	0	9	1	1	0	0	3	4	1	1	0
54	**164A**	9	0	0	0	0	9	0	2	0	0	3	3	3	0	0
54	**165A**	8	1	0	0	0	8	2	1	0	0	3	2	2	2	0
56	**207A**	8	0	0	0	1	9	0	1	0	1	2	1	5	0	1
56	**274A**	6	3	0	0	0	8	3	0	0	0	6	2	1	0	0
56	**275A**	8	0	0	1	0	9	0	1	1	0	4	1	3	1	0
56	**276A**	6	2	1	0	0	8	2	1	0	0	5	2	2	0	0
59	**54A**	9	0	0	0	0	10	1	0	0	0	4	4	1	0	0
59	**57A**	9	0	0	0	0	9	2	0	0	0	4	4	1	0	0
59	**65A**	9	0	0	0	0	9	1	1	0	0	3	1	5	0	0

TABLE C-1. ATTRIBUTES OF RANGELAND HEALTH

Range or Farm/Pasture Unit	Transect	Soil/Site Stability					Hydrologic Function					Biotic Integrity				
		NS	SM	MOD	ME	E	NS	SM	MOD	ME	E	NS	SM	MOD	ME	E
59	**70A**	7	2	0	0	0	8	3	0	0	0	5	4	0	0	0
60	**15A**	8	1	0	0	0	8	1	1	1	0	2	2	1	4	0
63	**49A**	6	2	0	1	0	7	3	0	1	0	3	3	3	0	0
64	**138A**	7	2	0	0	0	6	3	0	2	0	3	1	1	4	0
64	**146A**	6	3	0	0	0	7	3	1	0	0	3	3	1	2	0
64	**206A**	8	0	1	0	0	8	2	1	0	0	6	1	2	0	0
65	**120A**	6	2	1	0	0	6	2	2	1	0	5	1	1	2	0
65	**126A**	8	1	0	0	0	8	1	1	1	0	3	0	1	1	4
66	**72A**	6	3	0	0	0	6	3	2	0	0	2	4	1	0	2
66	**73A**	8	1	0	0	0	9	1	0	1	0	4	1	1	3	0
69	**62-1A**	9	0	0	0	0	9	2	0	0	0	3	2	4	0	0
69	**62A**	7	2	0	0	0	7	3	1	0	0	2	2	3	2	0
72	**62A**	7	2	0	0	0	7	3	1	0	0	2	2	3	2	0
72	**41A**	7	2	0	0	0	7	3	0	1	0	2	3	0	4	0
72	**45A**	8	1	0	0	0	8	2	0	1	0	2	2	1	3	1
72	**48A**	3	2	2	2	0	3	3	3	2	0	3	3	3	0	0
73	**125A**	6	2	1	0	0	7	2	2	0	0	2	2	5	0	0
73	**134A**	5	2	1	1	0	5	1	3	1	1	2	1	4	1	1
73	**136A**	6	1	2	0	0	8	1	2	0	0	3	4	2	0	0
73	**139A**	7	1	1	0	0	7	2	2	0	0	3	3	3	0	0
73	**143A**	8	0	0	1	0	8	0	2	1	0	3	1	3	2	0
75	**27A**	2	0	4	3	0	3	1	4	2	1	1	1	3	1	3
75	**29A**	2	2	5	0	0	2	2	6	1	0	0	0	3	2	4
75	**36A**	6	3	0	0	0	6	4	0	1	0	3	2	0	4	0
75	**39A**	9	0	0	0	0	9	0	2	0	0	3	2	2	2	0
75	**40A**	8	1	0	0	0	8	1	1	1	0	2	1	3	2	1
77	**20-1A**	9	0	0	0	0	9	1	1	0	0	3	3	1	2	0
77	**204A**	9	0	0	0	0	11	0	0	0	0	6	2	0	0	1
77	**20A**	9	0	0	0	0	10	0	0	1	0	4	0	2	3	0
78	**261A**	9	0	0	0	0	9	1	1	0	0	5	1	1	1	1
78	**272A**	9	0	0	0	0	9	2	0	0	0	4	1	2	2	0
82	**230A**	9	0	0	0	0	10	1	0	0	0	6	2	1	0	0
82	**44A**	9	0	0	0	0	9	1	0	1	0	3	2	0	4	0
82	**82A**	8	1	0	0	0	8	3	0	0	0	4	2	0	3	0
82	**82C**	8	0	1	0	0	9	0	2	0	0	3	0	4	0	2
83	**31A**	1	4	2	1	1	1	4	4	2	0	0	3	4	1	1
83	**33A**	3	0	4	2	0	3	0	6	1	1	0	0	5	2	2
103	**12A**	0	2	4	3	0	0	3	5	3	0	1	1	4	3	0
103	**9A**	7	1	0	1	0	7	1	2	1	0	3	1	4	1	0
104	**6A**	8	0	0	1	0	9	0	1	1	0	3	1	2	1	2
Submarginal Units																
‡312	**260A**	9	0	0	0	0	10	1	0	0	0	5	1	1	2	0
‡367	**375A**	3	5	1	0	0	4	4	2	1	0	4	2	3	0	0
‡401	**106A**	9	0	0	0	0	9	0	0	1	1	3	1	1	2	2
‡401	**113A**	9	0	0	0	0	9	1	1	0	0	6	1	2	0	0
‡402	**117A**	4	3	2	0	0	3	4	3	0	1	2	4	1	1	1
‡403	**219A**	4	4	1	0	0	4	4	3	0	0	3	2	4	0	0
‡404	**105A**	9	0	0	0	0	9	0	1	1	0	4	0	2	3	0
433	**215A**	5	3	1	0	0	5	3	3	0	0	2	2	2	1	2
433	**374A**	8	1	0	0	0	8	3	0	0	0	8	1	0	0	0
441	**216A**	3	0	3	3	0	3	0	4	4	0	2	2	1	3	0
441	**216X**	3	0	1	1	4	2	0	1	1	7	1	1	0	0	7
‡477	**217A**	4	2	3	0	0	3	5	3	0	0	5	4	0	0	0
‡480	**256A**	8	0	1	0	0	8	1	2	0	0	4	1	3	1	0
481	**257A**	7	2	0	0	0	8	3	0	0	0	6	3	0	0	0
482	**267A**	8	1	0	0	0	10	1	0	0	0	8	1	0	0	0
482	**268A**	4	3	2	0	0	3	5	3	0	0	4	4	1	0	0
492	**255A**	5	1	3	0	0	5	2	4	0	0	6	2	1	0	0
492	**273A**	3	0	0	0	6	2	0	0	0	9	1	0	0	0	8
‡984	**211A**	9	0	0	0	0	11	0	0	0	0	6	0	2	1	0
‡995	**379A**	5	4	0	0	0	5	4	1	1	0	4	1	3	1	0

‡Data collected from the single, listed Unit, but represents multiple Units.

NS - None to Slight, SM - Slight to Moderate, MOD - Moderate, ME - Moderate to Extreme, E - Extreme

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TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
19	203A	Needle and thread	Increaser	307	40	25	25
19	203A	Needleleaf sedge	Increaser	153	20	5	5
19	203A	Prairie sandreed	Decreaser	127	17	10	10
19	203A	Prairie junegrass	Increaser	115	15	5	5
19	203A	Fringed Sagewort	Increaser	17	2	10	2
19	203A	Cudweed sagewort	Increaser	17	2	10	2
19	203A	Chickweed	Invader	11	1	0	0
19	203A	Blue grama	Increaser	8	1	5	1
19	203A	Dotted gayfeather	Decreaser	3	0	10	0
19	203A	Scurfpea	Increaser	2	0	10	0
19	203A	Woolly plaintain	Invader	2	0	0	0
19	203A	Sandberg bluegrass	Increaser	2	0	5	0
		Total = Good		764	100	95	**50**
40	40-2A	Western wheatgrass	Increaser	478	67	50	50
40	40-2A	Green needlegrass	Decreaser	108	15	55	15
40	40-2A	Twin arnica	Increaser	30	4	5	4
40	40-2A	Scarlet globemallow	Increaser	25	4	5	4
40	40-2A	Needleleaf sedge	Increaser	21	0	15	0
40	40-2A	Blue grama	Increaser	19	3	5	3
40	40-2A	Sandberg bluegrass	Increaser	16	2	5	2
40	40-2A	Prairie junegrass	Increaser	5	1	5	1
40	40-2A	American vetch	Decreaser	3	0	5	0
40	40-2A	Silver sagebrush	Increaser	3	0	5	0
40	40-2A	Fringed sagewort	Increaser	2	0	5	0
		Total = Excellent		710	100	160	**79**
40	40-4A	Western wheatgrass	Increaser	100	25	40	25
40	40-4A	Plains reedgrass	Increaser	64	16	15	15
40	40-4A	Silver sagebrush	Increaser	59	15	5	5
40	40-4A	Blue grama	Increaser	55	14	5	5
40	40-4A	Woolly plantain	Invader	37	9	5	5
40	40-4A	Thickspike wheatgrass	Increaser	36	9	40	9
40	40-4A	Sandberg bluegrass	Increaser	17	4	5	4
40	40-4A	Needle and	Increaser	10	2	20	2
40	40-4A	Prairie junegrass	Increaser	10	2	5	2
40	40-4A	Needleleaf sedge	Increaser	9	5	15	2
40	40-4A	Scurfpea	Increaser	7	2	5	2
40	40-4A	Hedgehog spp	Increaser	1	0	10	0
		Total = Excellent		405	100	170	**76**
8	242A	Needle and thread	Increaser	130	22	20	20
8	242A	Hoods phlox	Increaser	90	15	5	5
8	242A	Fringed sagewort	Increaser	60	10	5	5
8	242A	Daisy fleabane	Increaser	53	9	5	5
8	242A	Threadleaf sedge	Increaser	46	8	5	5
8	242A	Blue grama	Increaser	37	6	5	5
8	242A	Western wheatgrass	Increaser	32	5	40	5
8	242A	Unknown forb	Increaser	32	5	5	5
8	242A	Prairie junegrass	Increaser	19	3	5	3
8	242A	Pussytoes	Increaser	19	3	5	3
8	242A	American vetch	Decreaser	15	3	15	3
8	242A	Broom snakeweed	Increaser	13	2	5	2
8	242A	Plains reedgrass	Increaser	11	2	15	2
8	242A	Locoweed spp	Increaser	10	2	5	2
8	242A	Goldenweed	Increaser	8	1	5	1
8	242A	Needleleaf sedge	Increaser	6	1	5	1
8	242A	Goldenrod spp	Increaser	6	1	5	1
		Total = Good		587	100	155	73

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
8	58A	Western wheatgrass	Increaser	547	61	40	40
8	58A	Woolly plantain	Invader	115	13	5	5
8	58A	Needle and	Increaser	62	7	20	7
8	58A	Needleleaf sedge	Increaser	50	6	5	5
8	58A	Blue grama	Increaser	46	5	5	5
8	58A	Plains reedgrass	Increaser	14	2	15	2
8	58A	Sandberg bluegrass	Increaser	14	2	5	2
8	58A	Prairie junegrass	Increaser	14	2	5	2
8	58A	Silver sagebrush	Increaser	13	1	5	1
8	58A	Japanese brome	Invader	7	1	NA	NA
8	58A	Western yarrow	Increaser	6	1	5	1
8	58A	Unknown forb	Increaser	4	0	5	0
8	58A	Fringed sagewort	Increaser	4	0	5	0
8	58A	Dandelion	Invader	3	0	NA	NA
8	58A	Mint	Increaser	1	0	5	0
Total = Good				900	NA	125	70
8	63A	Blue grama	Increaser	190	46	5	5
8	63A	Silver sagebrush	Increaser	78	19	5	5
8	63A	Scarlet globemallow	Increaser	44	11	5	5
8	63A	Fringed sagewort	Increaser	24	6	5	5
8	63A	Plains reedgrass	Increaser	22	5	15	5
8	63A	Sandberg bluegrass	Increaser	14	3	15	3
8	63A	Prairie junegrass	Increaser	13	3	5	3
8	63A	Hoods phlox	Increaser	11	3	5	3
8	63A	Scurfpea	Increaser	8	2	5	2
8	63A	Needle and	Increaser	8	2	20	2
8	63A	Needleleaf sedge	Increaser	5	1	15	1
Total = Fair				417	100	100	39
14	78A	Silver sagebrush	Increaser	140	27	5	5
14	78A	Threadleaf sedge	Increaser	106	20	5	5
14	78A	Needle and	Increaser	102	19	20	19
14	78A	Western wheatgrass	Increaser	53	10	40	10
14	78A	Blue grama	Increaser	47	9	5	5
14	78A	Prairie junegrass	Increaser	16	3	5	3
14	78A	Fringed sagewort	Increaser	14	3	5	3
14	78A	Needleleaf sedge	Increaser	11	2	5	2
14	78A	Plains reedgrass	Increaser	11	2	15	2
14	78A	Rush skeletonweed	Increaser	10	2	5	2
14	78A	Hoods phlox	Increaser	7	1	5	1
14	78A	Dotted gayfeather	Decreaser	4	1	15	1
14	78A	Locoweed spp	Increaser	2	0	5	0
14	78A	Beardtongue	Increaser	2	0	5	0
14	78A	Woolly plantain	Invader	1	0	NA	NA
14	78A	Dandelion	Invader	1	0	NA	NA
Total = Good				527	100	140	58
14	83A	Silver sagebrush	Increaser	237	55	5	5
14	83A	Blue grama	Increaser	72	17	5	5
14	83A	Needle and	Increaser	36	8	20	8
14	83A	Sandberg bluegrass	Increaser	32	7	5	5
14	83A	Needleleaf sedge	Increaser	16	4	5	4
14	83A	Scarlet globemallow	Increaser	14	3	5	3
14	83A	Woolly plantain	Invader	12	3	NA	NA
14	83A	Sixweeks fescue	Invader	4	1	NA	NA
14	83A	Western wheatgrass	Increaser	4	1	40	1
14	83A	Prairie junegrass	Increaser	1	0	5	0
14	83A	Mint	Increaser	1	0	5	0
14	83A	Fringed sagewort	Increaser	1	0	5	0
Total = Fair				430	100	100	31

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
14	88A	Western wheatgrass	Increaser	43	18	40	18
14	88A	Fringed sagewort	Increaser	40	16	5	5
14	88A	Woolly plantain	Invader	34	14	NA	NA
14	88A	Blue grama	Increaser	31	13	5	5
14	88A	Sandberg bluegrass	Increaser	21	9	5	5
14	88A	Prairie junegrass	Increaser	19	8	5	5
14	88A	Needleleaf sedge	Increaser	13	5	5	5
14	88A	Scarlet globemallow	Increaser	12	5	5	5
14	88A	Plains reedgrass	Increaser	11	5	15	5
14	88A	Knotweed	Invader	4	2	NA	NA
14	88A	Curlycup gumweed	Increaser	4	2	5	2
14	88A	Annual Forbs	Increaser	4	2	5	2
14	88A	Hoods phlox	Increaser	3	1	5	1
14	88A	Mint	Increaser	3	1	5	1
14	88A	Locoweed spp	Increaser	1	0	5	0
14	88A	American vetch	Decreaser	1	0	15	0
		Total = Good		244	100	125	59
15	224A	Western wheatgrass	Increaser	423	68	50	50
15	224A	Sandberg bluegrass	Increaser	68	11	5	5
15	224A	Fringed sagewort	Increaser	47	8	5	5
15	224A	Scarlet globemallow	Increaser	39	6	5	5
15	224A	American vetch	Decreaser	31	5	15	5
15	224A	Broom snakeweed	Increaser	12	2	5	2
		Total = Good		620	100	85	72
15	225A	Snowberrry	Increaser	250	36	10	10
15	225A	Silver sagebrush	Increaser	214	31	5	5
15	225A	Needle and	Increaser	107	15	0	0
15	225A	Fringed sagewort	Increaser	64	9	10	9
15	225A	Nebraska sedge	Decreaser	64	9	10	9
		Total = Fair		699	100	35	33
15	246A	Fringed sagewort	Increaser	256	35	5	5
15	246A	Western wheatgrass	Increaser	169	23	40	23
15	246A	Woolly plantain	Invader	113	15	5	5
15	246A	Prairie junegrass	Increaser	48	6	5	5
15	246A	Scarlet globemallow	Increaser	35	5	5	5
15	246A	Threadleaf sedge	Increaser	31	4	5	4
15	246A	Needle and thread	Increaser	29	4	20	4
15	246A	Blue grama	Increaser	24	3	5	3
15	246A	Sandberg bluegrass	Increaser	23	3	5	3
15	246A	American vetch	Decreaser	13	2	15	2
		Total = Good		741	100	110	59
15	247A	Thickspike wheatgrass	Increaser	648	46	50	46
15	247A	Western wheatgrass	Increaser	387	28	50	28
15	247A	Silver sagebrush	Increaser	218	16	5	5
15	247A	Green needlegrass	Decreaser	62	4	55	4
15	247A	Sandberg bluegrass	Increaser	28	2	5	2
15	247A	Needle and thread	Increaser	22	2	0	0
15	247A	Blue grama	Increaser	22	2	5	2
15	247A	American vetch	Decreaser	14	1	15	1
15	247A	Scarlet globemallow	Increaser	3	0	5	0
15	247A	Threadleaf sedge	Increaser	1	0	0	0
		Total = Excellent		1405	100	190	88

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
15	282A	Green needlegrass	Decreaser	121	26	40	26
15	282A	Thickspike wheatgrass	Increaser	103	22	40	22
15	282A	Blue grama	Increaser	62	13	5	5
15	282A	Prairie junegrass	Increaser	55	12	5	5
15	282A	Sandberg bluegrass	Increaser	32	7	5	5
15	282A	Dandelion	Invader	24	5	5	5
15	282A	Western wheatgrass	Increaser	17	4	40	4
15	282A	Bastard toadflax	Increaser	14	3	5	3
15	282A	Scurfpea	Increaser	13	3	5	3
15	282A	Fringed sagewort	Increaser	10	2	5	2
15	282A	Threadleaf sedge	Increaser	8	2	5	2
15	282A	Scarlet globemallow	Increaser	6	1	5	1
15	282A	Thistle species	Invader	4	1	NA	NA
15	282A	American vetch	Decreaser	2	0	15	0
15	282A	Prairie sandreed	Decreaser	2	0	0	0
		Total = Excellent		473	100	180	83
15	283A	Needle and thread	Increaser	307	31	20	20
15	283A	Fringed sagewort	Increaser	204	20	5	5
15	283A	Prairie junegrass	Increaser	182	18	5	5
15	283A	Silver sagebrush	Increaser	171	17	5	5
15	283A	Threadleaf sedge	Increaser	52	5	5	5
15	283A	Sandberg bluegrass	Increaser	30	3	5	3
15	283A	Western wheatgrass	Increaser	23	2	40	2
15	283A	Scarlet globemallow	Increaser	10	1	5	1
15	283A	Blue grama	Increaser	8	1	5	1
15	283A	American vetch	Decreaser	4	0	15	0
15	283A	Dandelion	Invader	4	0	NA	NA
15	283A	Scurfpea	Increaser	2	0	5	0
		Total = Fair		997	100	115	47
15	285A	Pricklypear spp	Increaser	640	54	10	10
15	285A	Blue grama	Increaser	129	11	5	5
15	285A	Sandberg bluegrass	Increaser	116	10	5	5
15	285A	Needle and thread	Increaser	92	8	25	8
15	285A	Fringed sagewort	Increaser	53	4	10	4
15	285A	Prairie junegrass	Increaser	50	4	5	4
15	285A	Woolly plantain	Invader	46	4	10	4
15	285A	Cheatgrass BRTE	Invader	16	1	NA	NA
15	285A	Curlycup Gumweed	Increaser	13	1	10	1
15	285A	Scurfpea	Increaser	12	1	10	1
15	285A	American vetch	Decreaser	12	1	10	1
15	285A	Cryptantha spp	Increaser	8	1	10	1
		Total = Fair		1187	100	110	44
15	286A	Western wheatgrass	Increaser	292	24	40	24
15	286A	Needle and thread	Increaser	210	17	20	17
15	286A	Silver sagebrush	Increaser	141	12	5	5
15	286A	Salsify	Invader	88	7	NA	NA
15	286A	Goldenrod spp	Increaser	78	6	5	5
15	286A	Blue grama	Increaser	64	5	5	5
15	286A	Wallflower	Invader	57	5	NA	NA
15	286A	Scarlet globemallow	Increaser	50	4	5	4
15	286A	Scurfpea	Increaser	49	4	5	4
15	286A	Broom snakeweed	Increaser	42	3	5	3
15	286A	Prairie junegrass	Increaser	28	2	5	2
15	286A	Western yarrow	Increaser	27	2	5	2
15	286A	Fringed sagewort	Increaser	25	2	5	2
15	286A	Slender wheatgrass	Decreaser	22	2	0	0
15	286A	Threadleaf sedge	Increaser	16	1	5	1
15	286A	Sandberg bluegrass	Increaser	15	1	5	1
15	286A	Sunflower spp	Decreaser	10	1	15	1
15	286A	American vetch	Decreaser	7	1	15	1
15	286A	Indian paintbrush	Increaser	3	0	5	0
		Total = Excellent		1224	100	150	77

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
13	205A	Western wheatgrass	Increaser	454	52	40	40
13	205A	Prairie junegrass	Increaser	177	20	5	5
13	205A	Oppositeleaf Bahia	Increaser	61	7	5	5
13	205A	Scarlet globemallow	Increaser	50	6	5	5
13	205A	Blue grama	Increaser	31	4	5	4
13	205A	Broom snakeweed	Increaser	22	3	5	3
13	205A	Winterfat	Decreaser	22	3	5	3
13	205A	Sedge spp	Increaser	13	1	5	1
13	205A	Fringed sagewort	Increaser	11	1	5	1
13	205A	Red threeawn	Increaser	10	1	15	1
13	205A	Green needlegrass	Decreaser	10	1	40	1
13	205A	Sandberg bluegrass	Increaser	7	1	5	1
13	205A	Unknown forb	Increaser	5	1	5	1
13	205A	Hoods phlox	Increaser	4	0	5	0
		Total = Good		877	100	150	71
13	84A	Silver sagebrush	Increaser	1,204	67	5	5
13	84A	Western wheatgrass	Increaser	266	15	50	15
13	84A	Blue grama	Increaser	180	10	5	5
13	84A	Scarlet globemallow	Increaser	49	3	5	3
13	84A	Green needlegrass	Decreaser	29	2	55	2
13	84A	Needle and thread	Increaser	26	1	0	0
13	84A	Needleleaf sedge	Increaser	22	1	0	0
13	84A	Sandberg bluegrass	Increaser	7	0	5	0
13	84A	Red threeawn	Increaser	4	0	15	0
13	84A	Unknown forb	Increaser	4	0	5	0
13	84A	Woods rose	Increaser	1	0	10	0
		Total = Fair		1,792	100	155	30
13	96A	Blue grama	Increaser	168	31	5	5
13	96A	Western wheatgrass	Increaser	108	20	40	20
13	96A	Needle and thread	Increaser	91	17	20	17
13	96A	Scarlet globemallow	Increaser	64	12	5	5
13	96A	Woolly plantain	Invader	29	5	5	5
13	96A	Plains reedgrass	Increaser	24	4	15	4
13	96A	Sandberg bluegrass	Increaser	17	3	5	3
13	96A	Needleleaf sedge	Increaser	12	2	5	2
13	96A	Threadleaf sedge	Increaser	7	1	5	1
13	96A	Prairie junegrass	Increaser	5	1	5	1
13	96A	Hoods phlox	Increaser	4	1	5	1
13	96A	Unknown forb	Increaser	2	0	5	0
13	96A	Mint	Increaser	2	0	5	0
13	96A	Trumpet	Increaser	1	0	5	0
13	96A	Fringed sagewort	Increaser	1	0	5	0
		Total = Good		535	100	135	64
13	99A	Cudweed sagewort	Increaser	211	20	5	5
13	99A	Western wheatgrass	Increaser	202	19	40	19
13	99A	Sandberg bluegrass	Increaser	114	11	5	5
13	99A	Needle and thread	Increaser	111	11	20	11
13	99A	Blue grama	Increaser	97	9	5	5
13	99A	Woolly plantain	Invader	89	8	NA	NA
13	99A	Scarlet globemallow	Increaser	78	7	5	5
13	99A	Mint	Increaser	72	7	5	5
13	99A	Needleleaf sedge	Increaser	22	2	5	2
13	99A	Green needlegrass	Decreaser	14	1	40	1
13	99A	Unknown forb	Increaser	13	1	5	1
13	99A	Plains reedgrass	Increaser	11	1	15	1
13	99A	Prairie junegrass	Increaser	7	1	5	1
13	99A	Wavyleaf thistle	Invader	5	0	NA	NA
13	99A	Stoneseed LITHO	Increaser	5	0	5	0
13	99A	Milkvetch spp	Increaser	2	0	5	0
13	99A	Mustard BRASS2	Invader	2	0	NA	NA
		Total = Good		1055	100	165	61

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
56	207A	Plains reedgrass	Increaser	395	38	15	15
56	207A	Western wheatgrass	Increaser	276	26	40	26
56	207A	Needle and thread	Increaser	99	9	20	9
56	207A	Threadleaf sedge	Increaser	78	7	5	5
56	207A	Prairie junegrass	Increaser	68	6	5	5
56	207A	American vetch	Decreaser	52	5	15	5
56	207A	Fringed sagewort	Increaser	37	4	5	4
56	207A	Blue grama	Increaser	15	1	5	1
56	207A	Sedge spp	Increaser	12	1	5	1
56	207A	Rush skeletonweed	Increaser	8	1	5	1
56	207A	Hoods phlox	Increaser	8	1	5	1
56	207A	Prairiesmoke	Increaser	1	0	5	0
56	207A	Purple coneflower	Decreaser	1	0	15	0
56	207A	Pussytoes	Increaser	1	0	5	0
56	207A	Pricklypear spp	Increaser	1	0	10	0
		Total = Good		1052	100	160	73
56	274A	Bluebunch wheatgrass	Decreaser	262	24	25	24
56	274A	Needle and thread	Increaser	211	19	25	19
56	274A	Threadleaf sedge	Increaser	139	13	5	5
56	274A	Little bluestem	Decreaser	126	12	30	12
56	274A	Woods rose	Increaser	87	8	10	8
56	274A	Plains reedgrass	Increaser	71	7	10	7
56	274A	Salsify	Invader	59	5	NA	NA
56	274A	Green needlegrass	Decreaser	44	4	30	4
56	274A	Scurfpea	Increaser	32	3	10	3
56	274A	Western wheatgrass	Increaser	22	2	10	2
56	274A	Plains muhly	Decreaser	14	1	10	1
56	274A	Unknown forb	Increaser	11	1	10	1
56	274A	Blue grama	Increaser	7	1	5	1
56	274A	Fringed sagewort	Increaser	5	0	10	0
56	274A	Bastard toadflax	Increaser	2	0	10	0
		Total = Excellent		1092	100	200	87
56	275A	Needle and thread	Increaser	173	26	0	0
56	275A	Western wheatgrass	Increaser	142	21	50	21
56	275A	Blue grama	Increaser	82	12	5	5
56	275A	Plains reedgrass	Increaser	67	10	15	10
56	275A	American vetch	Decreaser	58	9	15	9
56	275A	Dotted gayfeather	Decreaser	38	6	15	6
56	275A	Green needlegrass	Decreaser	29	4	55	4
56	275A	Fringed sagewort	Increaser	22	3	5	3
56	275A	Prairie junegrass	Increaser	19	3	5	3
56	275A	Purple prairieclover	Decreaser	14	2	15	2
56	275A	Woods rose	Increaser	10	1	10	1
56	275A	Needleleaf sedge	Increaser	10	1	0	0
56	275A	Scarlet globemallow	Increaser	8	1	5	1
56	275A	Pussytoes	Increaser	5	1	5	1
		Total = Good		677	100	200	66
56	276A	Threadleaf sedge	Increaser	330	29	10	10
56	276A	Bluebunch wheatgrass	Decreaser	292	25	25	25
56	276A	Needle and thread	Increaser	187	16	25	16
56	276A	Hairy goldenaster	Increaser	60	5	10	5
56	276A	Wild pea	Increaser	53	5	10	5
56	276A	Three leaved	Increaser	51	4	10	4
56	276A	Two-grooved milkvetch	Increaser	51	4	10	4
56	276A	Yucca	Increaser	42	4	10	4
56	276A	Woods rose	Increaser	31	3	10	3
56	276A	Scurfpea	Increaser	10	1	10	1
56	276A	Little bluestem	Decreaser	9	1	30	1
56	276A	Prairie junegrass	Increaser	7	1	5	1
56	276A	Hoods phlox	Increaser	7	1	10	1
56	276A	Fringed sagewort	Increaser	7	1	10	1
56	276A	Purple prairieclover	Decreaser	5	0	10	0
56	276A	Dotted gayfeather	Decreaser	5	0	10	0
56	276A	Prairiesmoke	Increaser	2	0	10	0
		Total = Excellent		1149	100	215	81

TABLE C-2. RANGE OR FARM/PASTURE UNIT CONDITION

Range or Farm/Pasture Unit	Transect	Species Common Name	Grazing Response	Dry Weight (lbs/acre)	*Value (%)	**Allowable Value	Lesser value (total of the lesser values = the condition of the range unit [%])
461	379A	Blue grama	Increaser	412	72	5	5
461	379A	Winterfat	Decreaser	49	9	15	9
461	379A	Prairie junegrass	Increaser	35	6	5	5
461	379A	Scarlet globemallow	Increaser	18	3	5	3
461	379A	Needle and thread	Increaser	17	3	20	3
461	379A	Fringed sagewort	Increaser	13	2	5	2
461	379A	Locoweed spp	Increaser	12	2	5	2
461	379A	Western wheatgrass	Increaser	8	1	40	1
461	379A	Needleleaf sedge	Increaser	6	1	5	1
461	379A	Goldenrod spp	Increaser	2	0	5	0
461	379A	Milkvetch spp	Increaser	2	0	5	0
461	379A	Pricklypear spp	Increaser	1	0	10	0
Total = Fair				575	100	125	31

Unit values were calculated for transects containing soil types that are recognized by the Montana Guide to Range, Condition and Initial Stocking Rates (Lacey and Taylor 2005).

NA= Not applicable, as invader species are not used in the calculation of rangeland condition

*Dry weights and Values were derived from the 2006 Range Inventory Report (NRCS et al. 2006).

**Allowable Values were derived from the Montana Guide to Range, Condition and Initial Stocking Rates (Lacey and Taylor 2005).

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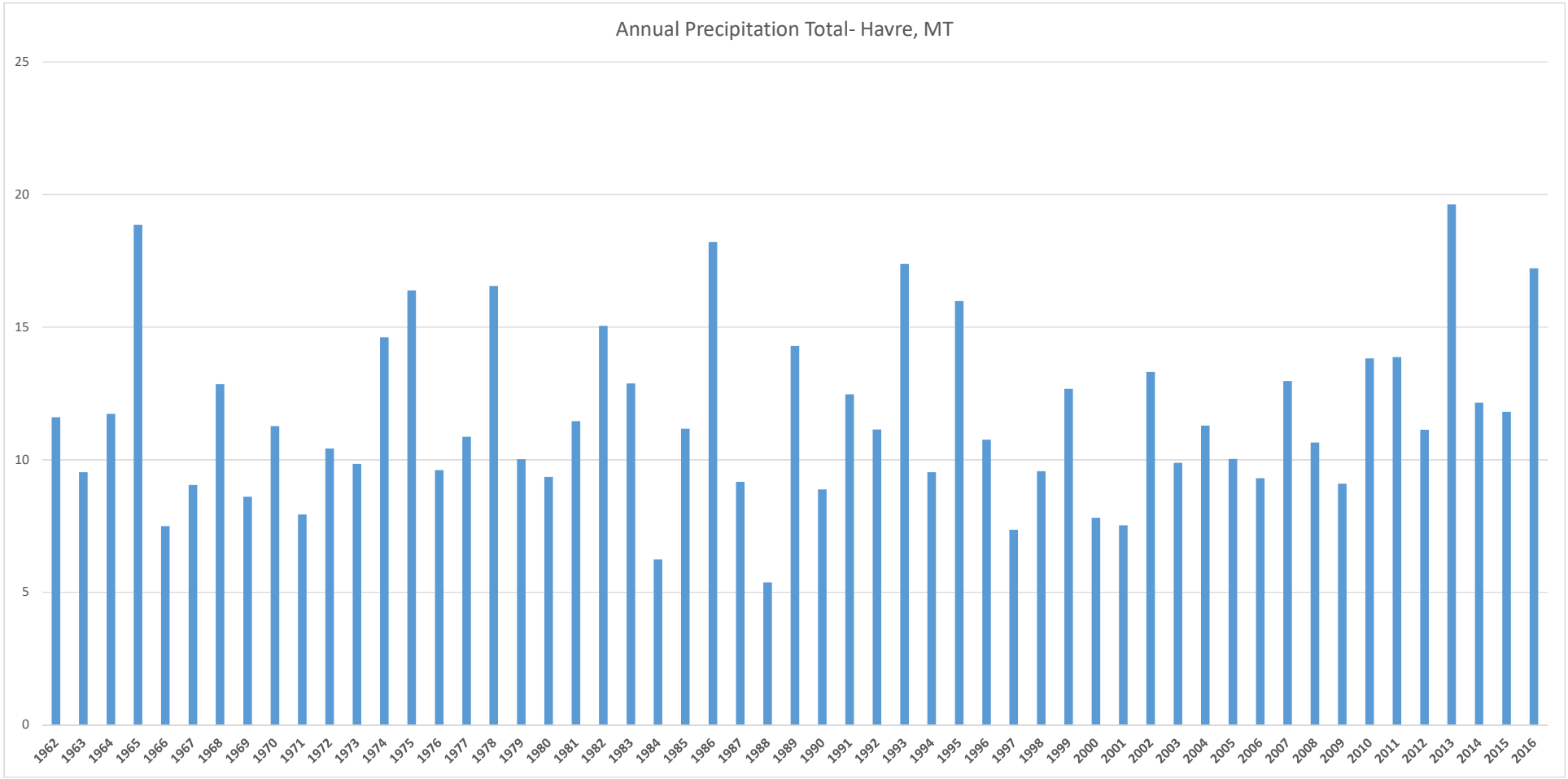
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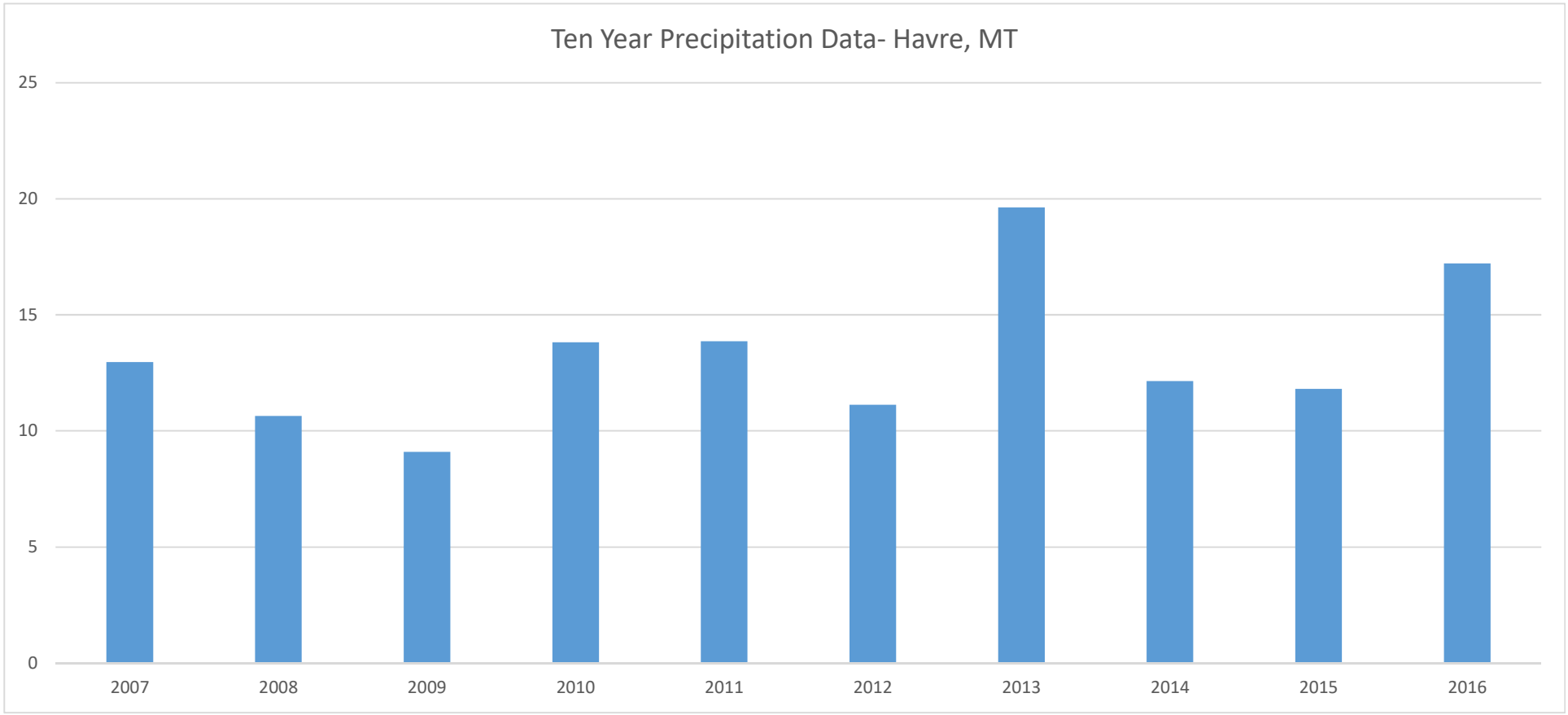
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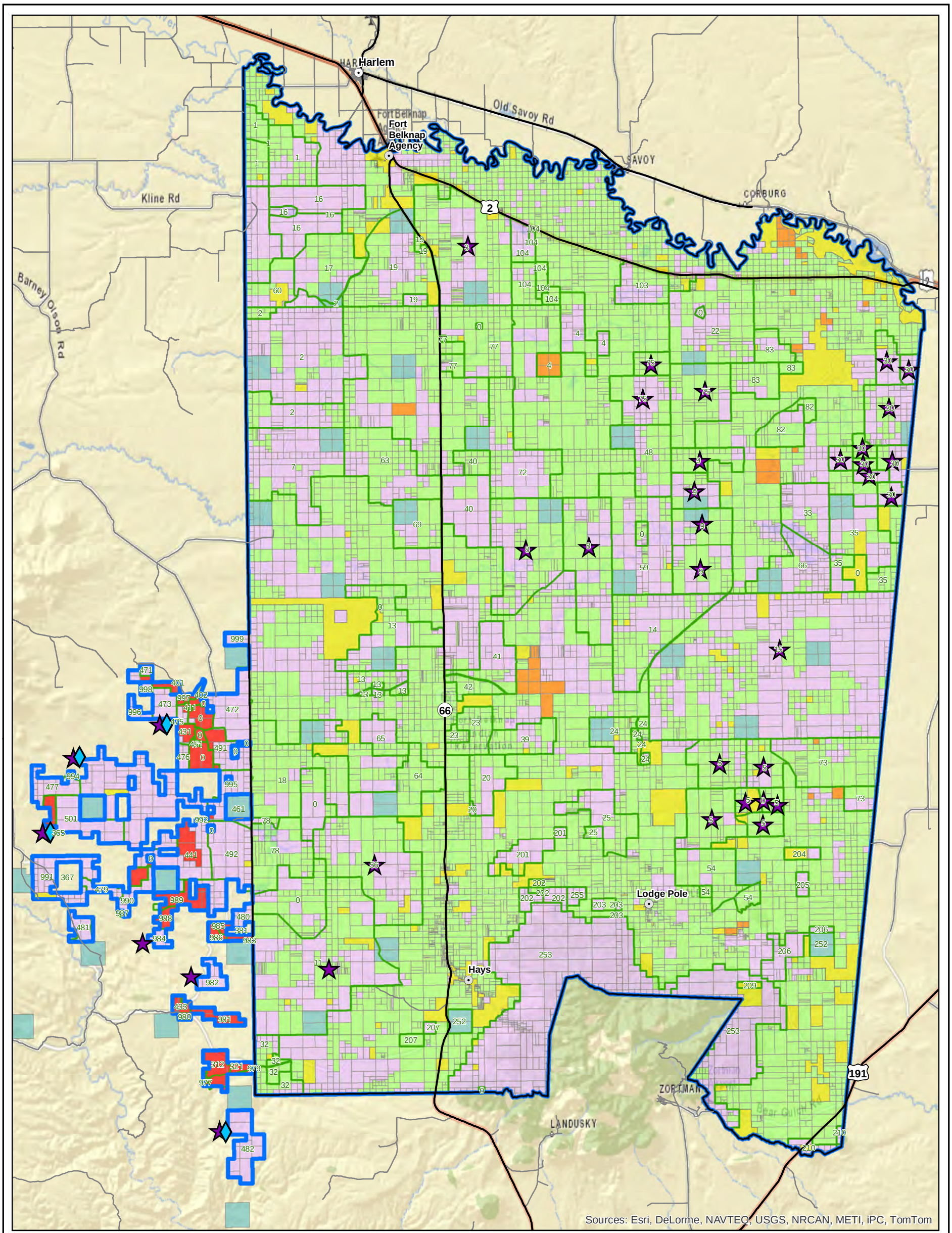

EXPLANATION

- GENERAL PRIORITY FENCING AREA
- POTENTIAL RANGE UNIT
- FORT BELKNAP INDIAN RESERVATION
- PROJECT AREA
- RANGE UNIT

SURFACE OWNERSHIP

- ALLOTTED
- TRIBAL TRUST
- STATE SCHOOL SECTION
- U.S. DEPARTMENT OF THE INTERIOR
- TRIBAL FEE
- NO DATA

N

0 4 Miles

Source: BIA 2014; Montana Department of Revenue 2017; FBIC 2017

Trihydro CORPORATION
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Laramie, WY 82070
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FIGURE C-1

PRIORITY AREAS

**FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA**

Drawn By: KEJ	Checked By: JM	Scale: 1 " = 4 Miles	Date: 1/4/18	File: FigC-1_FtBelknap_PriorityArea.mxd

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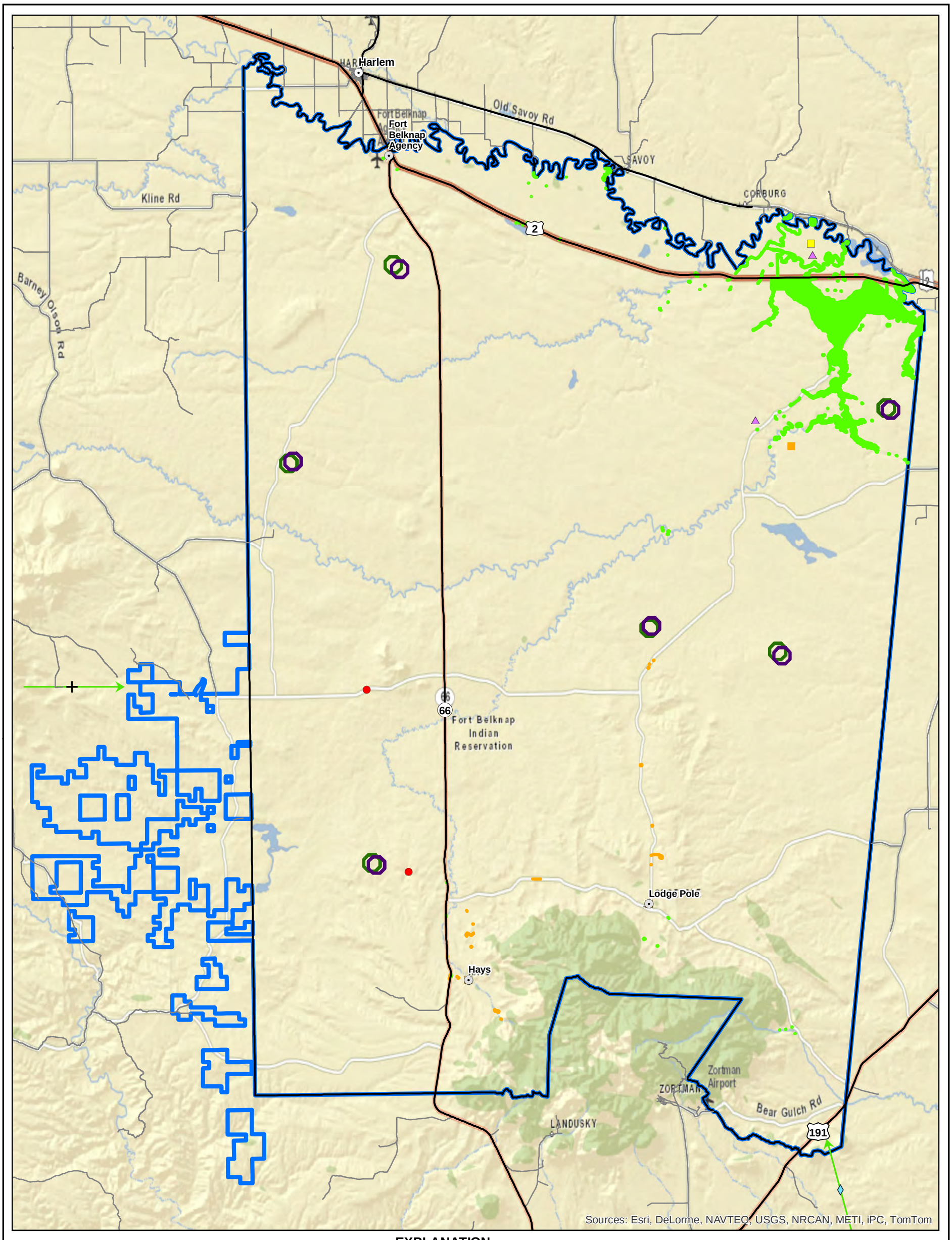

EXPLANATION

2017 FIELD SURVEY

- CHEATGRASS
- FIELD BROME

WEED LOCATIONS

- CHEATGRASS
- SALTCEDAR

- DALMATION TOADFLAX
- HOUNDSTONGUE
- RUSSIAN & DIFFUSE KNAPWEED
- DIRECTION OF POTENTIAL NOXIOUS WEED SPREAD
- LEAFY SPURGE
- SPOTTED KNAPWEED
- FORT BELKNAP INDIAN RESERVATION
- PROJECT AREA

N

0 4 Miles

Sources: BIA 2014 and 2016; Goodwin and Longknife 2013; FBIC 2017; Trihydro 2017

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FIGURE C-2

2017 FIELD SURVEY NOXIOUS WEEDS

FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA

Drawn By: KEJ	Checked By: JM	Scale: 1 " = 4 Miles	Date: 1/4/18	File: FigC-2_FtBelknap_2017Weeds.mxd

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APPENDIX D

RANGELAND WATER SOURCES RECOMMENDATIONS

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APPENDIX D. RANGELAND WATER SOURCES RECOMMENDATIONS

1.0 PURPOSE

The Fort Belknap Indian Community (FBIC) Tribal Council determined that an agricultural resource management plan (ARMP) was needed for the Fort Belknap Indian Reservation (FBIR). Furthermore, the FBIC Tribal Council requested that the ARMP include a Rangeland Water Rehabilitation Plan providing guidance in addressing the overwhelming task of rehabilitating and developing the Reservation's rangeland stock watering infrastructure.

1.1 PROJECT AREA

The Project Area is illustrated in Figures 1-1 and 1-2 in the ARMP and encompasses 660,317 acres. Within the total Project Area, FBIC rangelands and farm/pasture lands account for approximately 359,980 acres of land. These lands were consolidated to form range units and farm/pasture units for the management and administration of cultivating and grazing under a permit or lease (United States [U.S.] Bureau of Indian Affairs [BIA] 2014). Currently, 47 range units exist in the Project Area (BIA 2017). Note that in this appendix, the term, "rangelands", refers to lands in both range units and farm/pasture units used for grazing.

2.0 EXISTING CONDITIONS

2.1 WATER RESOURCES

2.1.1 SURFACE WATER

The FBIR is located within the Milk River Valley, and is bordered to the north by the Milk River and to the South by the Little Rocky Mountains (Figure D2-1). Generally, the Milk River Valley consists of primarily irrigated agricultural lands surrounded by low bluffs that rise to glaciated plains (Goodwin and Longknife 2013). The Milk River, which eventually drains into the Missouri River Basin (FBIC 2013), is supplied by four principle tributaries (Goodwin and Longknife 2013), including: Three Mile Creek, White Bear Creek, Peoples Creek, and Beaver Creek. Peoples Creek accounts for the majority of the drainage (Alverson 1965) and includes the following perennial and intermittent streams: Duck Creek, South Fork of Peoples Creek, Little Peoples Creek, Jim Brown Creek, Lodge Pole Creek, Lone Tree Coulee, and Mud Creek. Beaver Creek Basin (located in the eastern portion of the Project Area) includes the Big Warm Creek and the Little Warm Creek (FBIC 2013). Surface water resources in the submarginal lands also include Rattlesnake Creek, Suction Creek, and Little Suction Creek.

Additionally, surface water resources include several major lakes and reservoirs. These major lakes and reservoirs include Snake Butte Reservoir (5 acres), Bigby Lake (145 acres), Lake 17 (415 acres), and Weigand Reservoir (1,000 acres) (FBIC 2013). Numerous water impoundments for livestock, irrigation, wildlife habitat, and recreational purposes are also present within the FBIR (Goodwin and Longknife 2013). Surface water sources are also shown on Figure D2-1.

2.1.2 GROUNDWATER

Existing stock watering wells throughout the Project Area are illustrated in Figure D2-1. Alluvium, glacial, and terrace deposits occur throughout the FBIC and often yield sufficient water for stock watering. Alluvial deposits are located along the Milk River and tributary creeks. These deposits are typically less than 30-feet thick and likely yield small (5-10 gallons per minute [gpm]) water quantities. Glacial outwash deposits are located along the Milk River and throughout the central plains of the FBIR. These deposits are typically less than 25-feet thick, although may be thicker in some areas. Yields from the glacial deposits may exceed yields from the alluvial deposits. An irrigation well drilled into the glacial outwash near the Milk River is completed to 30-feet and yields 40 gpm. Terrace deposits are located mostly west of the Little Rocky Mountains and north of Lodgepole. These deposits are typically less than 50-feet thick, and composed of pebbles and cobbles with minor amounts of sand. Terrace deposits that exist north of the Little Rocky Mountains have been reworked by glaciation. Water yield from terrace deposits is limited where sufficient saturated thickness exists. Seeps and springs may occur at the contact of underlying shale and overlying terrace deposits (Alverson 1965).

Members of the Cretaceous-age Montana Group include, from youngest to oldest, the Bearpaw Shale, Judith River, Claggett Shale, and Eagle Sandstone. Overall, the Bearpaw and Claggett shales are aquitards and do not yield sufficient water quantities for stock watering. The Bearpaw Shale is 600- to 700-feet thick and outcrops across much of the FBIR's eastern and northern portions. The underlying Judith River Formation is the most important aquifer in the area and outcrops across much of the FBIR's western portion. This formation is approximately 100-feet thick and may yield water quantities up to 75 gpm (potentially artesian). Where the Bearpaw Shale overlies the Judith River, depth to water-bearing zones in the Judith River may be up to 700 feet. In some areas, the Judith River may be overlain by thin (up to 50 feet) alluvial and glacial deposits. The lower member (Virgelle Sandstone) of the Eagle Sandstone may also yield sufficient water for stock watering. Across most of the FBIR, this formation is buried by up to 1,100-feet of sediments, but exists in outcrop around the Little Rocky Mountains. In these areas, the Eagle Sandstone may produce water under artesian conditions up to 1 gpm. Groundwater quality within the area is generally composed of fair to good quality, slightly alkaline water (Alverson 1965).

Other potential groundwater sources on the FBIR include lower Cretaceous Kootenai, the Jurassic Rierdon Formation, Mississippian Madison Group (Mission Canyon and Lodgepole Limestones), and older Devonian, Ordovician, and Cambrian age rocks. These formations are exposed in outcrop around the Little Rocky Mountains where they may be able to yield water. In other areas of the FBIR, these formations are located at depths that are not cost effective (Alverson 1965).

2.1.3 SPRINGS AND SEEPS

Springs and seeps are located throughout much of the FBIR as shown on Figure D2-1. Springs and seeps occur where the contact between underlying impermeable shale and overlying permeable materials (gravel and sand) meet at the ground surface. Groundwater sits on the impermeable surface and surfaces where it meets the ground surface. Surfacing can occur along slopes or where stratigraphic layers are dipping, groundwater is pushed up to the surface. These types of springs, if protected and maintained can provide sufficient water for stock watering purposes.

On the FBIR, springs and seeps occur where coarse-grained terrace deposits are overlying the Bearpaw Shale. In areas where this contact is exposed at the surface, springs and seeps may occur. These areas include the southwestern portion of the FBIR and areas north of the Little Rocky Mountains. Due to volcanic intrusion in the core of the Little Rocky Mountains, the stratigraphic layers dip radially around the mountains. Similar types of springs also occur near the Twin Buttes in the west-central portion of the Reservation near range units 69 and 13.

APPENDIX D. RANGELAND WATER SOURCES RECOMMENDATIONS

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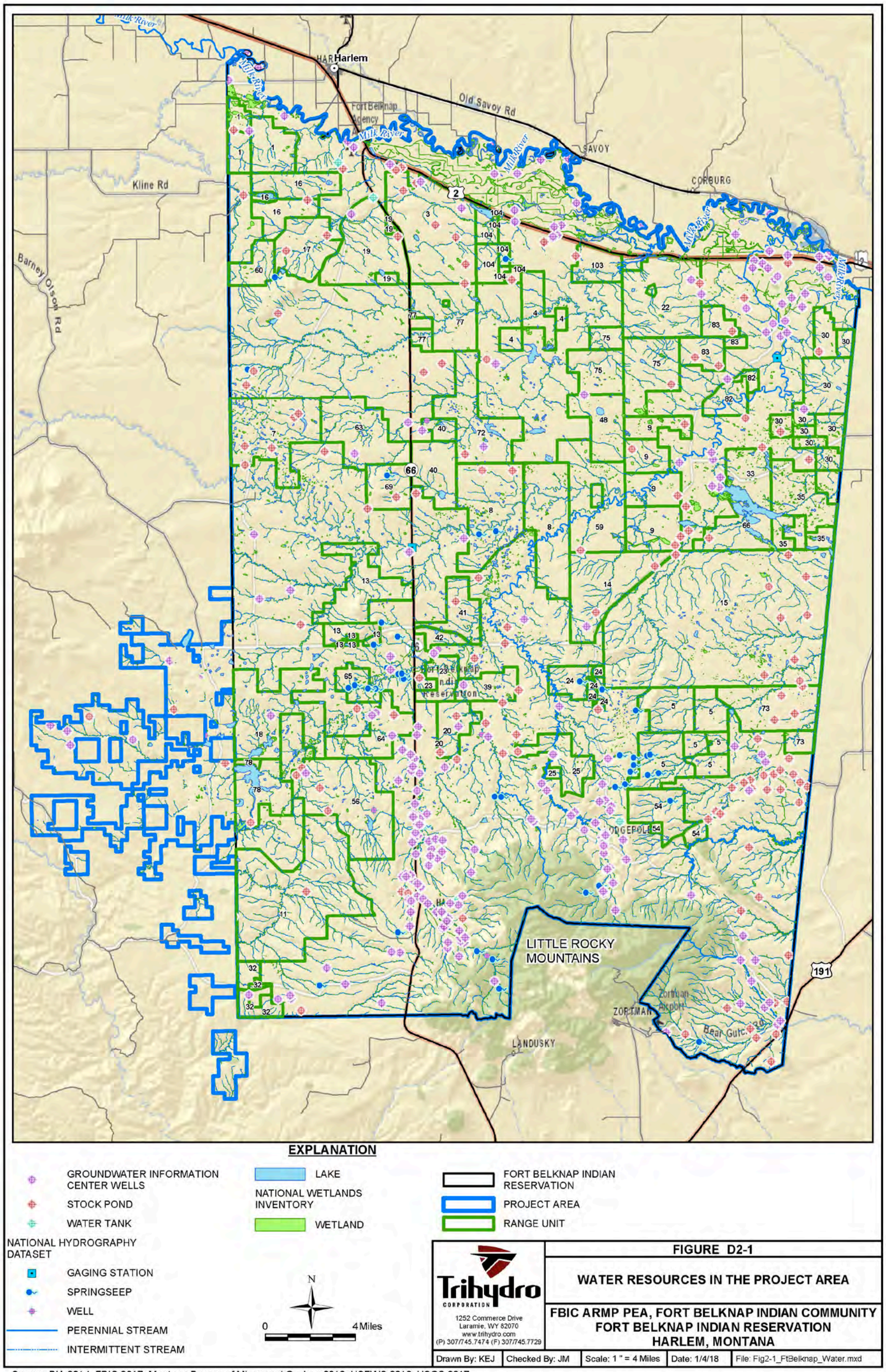
FIGURE D2-1. WATER RESOURCES IN THE PROJECT AREA



Source: BIA 2014; FBIC 2017; Montana Bureau of Mines and Geology 2013; USFWS 2016; USGS 2017

APPENDIX D. RANGELAND WATER SOURCES RECOMMENDATIONS

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2.2 EXISTING FACILITIES

An inventory of the agricultural surface water sources, such as springs, water wells, water tanks, stock ponds, etc., on the FBIR as shown on Figure D2-1 and is summarized in Attachment D-1 and D-2. Attachment D-3 provides photos of some of the existing range water infrastructure.

There are 47 range units on the FBIR spanning approximately 450 square miles of land (BIA 2017). Total grazing capacity is about 54,000 animal unit months (AUMs) (FBIC 1988). As shown in Attachment D-1 summary tables, stock water is provided to the 47 range units by 28 wells, 32 springs, and 77 stock ponds. Additionally, a few units are fed by access to perennial stream flows. Ephemeral channels throughout the range units provide extremely limited water supplies, generally limited to a month or so in the early spring.

Trihydro Corporation (Trihydro) personnel spent significant time on the FBIR during August 2017, meeting with FBIC members and FBIC tribal departments, as well as BIA and Natural Resources Conservation Service (NRCS) personnel and conducting site visits at various range unit locations throughout the Project Arae. This work provided a basis of understanding regarding the condition of range unit watering facilities. Conclusions drawn from these meetings and range unit inspection tours are as follows:

- No working windmills were observed; and only one observed and recently rehabilitated well pump (i.e., solar pump), was operational. Additionally, all observed stock dams were breached, presumably due to overtopping as all inspected stock dams lacked overflow or spillway components. Only ponds/pits were observed to provide stock water, and these were drying up quickly in the late summer.
- Many grazing units have poor livestock distribution, which causes overgrazing in some areas and under-grazing in others. Additional range water improvements are desperately needed to improve livestock distribution.
- Existing water supplies for reservation livestock operations are inadequate for full use of the range resource and for proper livestock distribution.
- If livestock water supplies for the rangelands were rehabilitated, there would be much improved forage use. However, rangeland production under current conditions is less than its potential. Stock watering facilities must be developed to realize the reservation potential for forage production.
- In terms of reliability and drought resiliency, wells are generally preferred over spring and stock ponds both of which can dry up in dry years.
- Reliance upon individual lessees to maintain the water supply infrastructure within each grazing unit has not been successful. Trihydro proposes that this responsibility be undertaken by the FBIC Land Department. The cost for this effort would be derived from increased grazing assessments as the value of the grazing lease should increase if it included adequate and sufficient water infrastructure.

3.0 RANGELAND IMPROVEMENT PLAN

Based on the input obtained from FBIC, BIA, and NRCS personnel and a field review of range water conditions and facilities, the following developmental items are recommended as part of a comprehensive rangeland water improvement plan.

3.1 HIGH PRIORITY

Project 1) Phase I Stock Well Rehabilitation

Project Description

Eight wells were identified as having the highest priority in terms of repair. These include wells in range units 9, 13, 22, 43, 72, and 77, and two wells in the Snake Butte Buffalo Pasture. In each case, a well exists with casing above the ground. Down-hole conditions, however, have not been verified. Trihydro recommends installation of a standard windmill and concrete watering trough.

Project Costs

Cost for this would be approximately $64,000 as summarized below.

Windmill ($5,000 each, installed)	= $5,000	
Water Trough ($2,000 each, installed)	= $2,000	
Contingency (per installation)	= $1,000	
Total (per Windmill)	= $8,000	(x 8 = $64,000)

Project Implementation

We recommend that the FBIC submit for a Tribal-based NRCS Environmental Quality Incentives Program (EQIP) financial assistance application to fund the construction of this Phase I Stock Well Rehabilitation Project.

Project 2) Rangeland Investment Incentive Program

Project Description

Current land use regulations require the lessee to maintain water resources infrastructure on the range units. This system is not working effectively for a variety of reasons including access to capital, length of lease term, etc. There is a need for additional incentives and/or subsidies to better facilitate lessee investment. We strongly recommend that additional financial resources be set aside to stimulate lessee investment. This could be through the use of a cost-match, or reasonable grant/loan mechanism(s) to support individual EQIP funding applications, including application development assistance.

Project Costs

Cost for this could be variable as FBIC financial resources allow. We estimate that a minimum $20,000 annual investment be stimulated to begin a meaningful restoration of the rangeland water infrastructure.

Project Implementation

We recommend that the FBIC develop a financial stimulus for rangeland infrastructure development.

Project 3) – Sage Grouse Water Development

Project Description

Water supply development is one of the most significant improvement elements in terms of supporting sage grouse habitat and can provide important benefits to livestock as well. Large areas of potentially suitable sage grouse habitat development exist throughout the FBIC rangelands. Additionally, significant federal funding is currently available to support sage grouse habitat development. The NRCS Sage Grouse Initiative, for example, provides education and financial assistance to support range management strategies that are mutually beneficial to sage grouse conservation and livestock grazing. Additionally, grant programs under the National Fish and Wildlife Foundation aid in developing sage grouse water supplies in concert with successful livestock management operations. These and other programs should be used for the development, rehabilitation, and/or improvement of rangeland water resources, to the benefit of sage grouse and livestock grazing. Trihydro recommends that the FBIC Fish and Wildlife Department and FBIC Land Department coordinate to initiate a broad range of collaborative projects aimed at improving sage grouse habitat and rangeland water supplies (additional information provided in Appendix C).

Project Implementation

Inter-agency coordination between the FBIC Fish and Wildlife Department and the FBIC Land Department would be important to an effective joint sage grouse habitat and rangeland water supply improvement program. Cost-sharing issues would need to be resolved, but there is ample opportunity for “win-win” situations to result in terms of advancing each departments’ goals and objectives.

Project 4) Stock Well Rehabilitation Phase II

Project Description

Fifteen wells were identified as having a high priority in terms of repair. These include wells in range units 4, 14, 15, 18, 20, 73, 54, 47, 48, and 103, as well as two wells in the submarginal areas. In each case, a well exists with casing above the ground. Down-hole conditions, however, have not been verified. We recommend installation of a standard wind-mill and concrete watering trough.

Project Costs

Cost for this would be approximately $120,000 as summarized in the following table.

Windmill ($5,000 each, installed)	= $5,000	
Water Trough ($2,000 each, installed)	= $2,000	
Contingency (per installation)	= $1,000	
Total (per Windmill)	= $8,000	(x 15 = $120,000)

Project Implementation

Trihydro recommends that the FBIC submit as an organizational-basis for financial assistance through the NRCS EQIP program to fund the construction of this Phase II Stock Well Rehabilitation Project. State funding options should also be examined.

Project 4) Lake 17 Project

Project Description

The Lake 17 Wetland Enhancement Project allows for the re-establishment of the historical Lake 17. Most recently this project has been completely designed though the efforts of the NRCS. Environmental reviews have also been completed and the project appears "shovel-ready" for construction. By establishing Lake 17 and supporting streamflows in downstream Duck and Peoples Creek basins this project will provide livestock watering throughout the downstream range units.

Project Costs

Costs for this were estimated at $1.2 million in 2013 (NRCS 2013). Using the Construction Cost Index (CCI) to increase to present day costs, results in an anticipated project cost of $1.4 million in 2017 dollars.

Project Implementation

Originally, construction of Lake 17 was envisioned as an NRCS EQIP funded project. The project was planned for two phases to allow for two separate applications due to single contract payment limitations, resulting in an overall cost share of approximately 76%. Another option would be to use Water Infrastructure Improvements for the Nation (WIIN) Act funds, once these become available.

3.2 MEDIUM PRIORITY

Project 1) Stock Reservoir Rehabilitation Phases I and II

Project Description

Twenty-six high priority stock reservoirs have been identified as having a high priority in terms of repair. These include stock reservoirs in range units 5, 11, 13, 14, 15 (x3), 19 (x2), 20, 22, 23, 30 (x3), 40 (x2), 54 (x2), 56 (x2), 60, 63, 72, 73, and 77. In each case, a small dike exists, however, absence of a proper spillway has caused the reservoir to be breached. Existing typical dike heights are below ten feet and breach widths vary between 10 and 20 feet.

Project Costs

The cost for this would be approximately $247,000 as summarized in the following table.

Earthwork – Breach Repair	= $2,500	
Earthwork – Sediment Removal	= $3,500	
Overflow Spillway Culvert	= $2,500	
Contingency	= $1,000	
Total (per Stock Reservoir)	= $9,500	(x 26 = $247,000)

Project Implementation

Trihydro recommends the FBIC submit as an organizational-basis for NRCS EQIP funding assistance to fund the construction of this Phase I and II Stock Reservoir Rehabilitation Project. NRCS funding may be problematic, however, due to design requirements, which if cannot be resolved with NRCS may necessitate using other state and federal funding sources.

Project 2) Drought Management Plan

Project Description

Currently, the rangelands throughout the FBIC are being ravaged by extreme drought conditions. The effective management of rangelands based on drought and drought contingency planning would be a strong improvement and was identified by staff as having important impacts and benefits. We therefore recommend that a rangeland drought management plan be developed to guide land use managers in forecasting, identifying, and managing drought.

Project Costs:

A cost range to develop a drought management plan is estimated at $30,000 to $50,0000; depending upon scope and detail provided in the plan.

Project Implementation

Drought contingency planning is funded through a variety of potential sources including BIA, Bureau of Reclamation, and Federal Emergency Management Agency to name a few. We recommend that the FBIC Land Department work to identify funding sources and develop the requisite grant application(s).

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APPENDIX D. RANGELAND WATER SOURCES RECOMMENDATIONS

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ATTACHMENT D-1. RANGE UNIT WATER RESOURCES INVENTORY

Range Unit and Farm/Pasture Unit Number	Current Range Unit[1]	Area (acres)	Wells	Springs	Surface Water - Perennial (miles)	Surface Water - Intermittent (miles)	Stock Ponds
0	No	8,468	0	0	0.31	36.99	1
1	Yes	4,858	1	0	-	19.45	1
2	No	13,658	0	2	-	62.96	3
3	Yes	9,795	2	0	-	30.15	6
4	Yes	3,037	0	0	-	8.09	0
5	Yes	10,191	0	5	-	50.05	0
7	Yes	7,247	0	0	-	24.49	5
8	Yes	13,923	0	2	3.98	46.45	2
9	Yes	8,974	0	1	4.92	19.41	5
11	Yes	15,533	0	0	-	86.53	1
13	Yes	6,386	0	3	-	29.75	0
14	Yes	6,500	1	1	-	31.60	3
15	Yes	35,360	0	0	-	142.33	10
16	Yes	5,011	0	0	-	18.89	1
17	Yes	3,844	0	0	0.05	18.82	2
18	Yes	7,640	1	0	-	28.72	0
19	Yes	6,724	2	0	-	21.31	1
20	Yes	2,184	1	1	-	11.01	3
22	Yes	7,529	2	0	-	30.73	1
23	Yes	2,096	1	0	-	10.35	1
24	Yes	2,119	0	3	2.51	11.85	1
25	Yes	2,948	1	0	4.06	15.19	1
30	Yes	8,808	1	0	-	34.09	2
32	Yes	2,226	2	1	-	7.66	0
33	Yes	2,928	0	0	-	1.78	1
35	Yes	5,363	0	0	-	8.96	0
39	Yes	2,083	1	0	-	9.57	2
40	Yes	4,179	1	0	-	13.89	0
41	Yes	2,493	0	0	-	12.80	1
42	Yes	827	1	0	-	3.34	0
48	Yes	3,496	1	0	-	5.25	0
54	Yes	3,628	0	2	1.28	15.71	1
56	Yes	8,795	1	0	-	41.13	4
59	Yes	7,028	0	1	5.22	21.79	1
60	Yes	1,873	0	2	0.03	9.11	0
63	Yes	5,448	1	0	-	23.20	0
64	Yes	3,573	4	0	-	13.42	1
65	Yes	1,475	0	4	-	8.85	0
66	Yes	3,627	0	0	-	9.80	1
69	Yes	2,537	0	3	-	8.85	2
72	Yes	6,059	1	0	-	17.45	1
73	Yes	5,850	0	0	-	13.98	4
75	Yes	8,323	1	0	-	31.56	1
77	Yes	5,281	0	0	-	19.43	1
78	Yes	3,965	0	0	-	6.97	1
82	Yes	2,071	1	0	3.31	8.81	1
83	Yes	3,240	0	0	-	11.65	3
103	Yes	1,997	0	0	0.68	8.46	1
104	Yes	2,934	0	1	-	11.66	1
201	No	1,659	0	4	1.21	5.23	0
202	No	1,110	0	2	-	5.88	0
203	No	407	0	0	-	2.14	0
204	No	478	1	0	-	1.47	3
205	No	324	0	0	1.24	0.90	0
206	No	1,519	0	1	-	9.08	0
207	No	479	2	0	-	1.95	0
209	No	155	0	0	-	0.94	0
210	No	637	0	0	-	2.49	1

ATTACHMENT D-1. RANGE UNIT WATER RESOURCES INVENTORY

Range Unit and Farm/Pasture Unit Number	Current Range Unit[1]	Area (acres)	Wells	Springs	Surface Water - Perennial (miles)	Surface Water - Intermittent (miles)	Stock Ponds
251	No	638			-	1.95	
252	No	643	0	0	-	3.28	
253	No	27,803	5	5	3.03	112.77	1
255	No	346	2	0	0.66	0.35	0
312	No	653	0	0	-	1.28	0
321	No	228	0	0	-	0.48	0
365	No	1	0	0	-	-	0
367	No	838	0	0	-	0.76	0
381	No	219	0	0	-	0.90	0
401	No	240	0	0	1.58	0.48	0
402	No	104	0	0	-	0.20	0
411	No	12	0	0	-	0.45	0
431	No	370	0	0	-	2.24	0
432	No	8	0	0	-	-	0
433	No	283	0	0	-	0.08	0
441	No	2,637	0	0	-	9.97	0
451	No	60	0	0	-	0.55	0
461	No	812	0	0	-	0.14	0
471	No	163	0	1	-	0.88	0
472	No	2,229	0	0	-	1.65	0
473	No	759	0	0	-	2.90	0
474	No	6	0	0	-	0.16	0
475	No	235	1	0	-	0.80	0
476	No	349	0	0	-	2.31	1
477	No	1,125	2	0	-	3.24	0
479	No	397	0	0	-	0.38	0
480	No	415	1	0	-	1.22	0
481	No	548	0	0	0.19	0.51	0
482	No	1,632	0	0	-	12.09	0
491	No	1,335	0	0	-	3.29	0
492	No	2,742	0	0	-	7.67	1
501	No	1,953	1	0	-	5.31	0
977	No	41	0	0	-	-	0
978	No	340	0	0	-	2.74	0
979	No	15	0	0	-	-	0
980	No	84	0	0	-	-	0
981	No	600	0	0	-	4.06	0
982	No	647	0	0	-	3.13	0
983	No	183	0	0	-	1.92	0
984	No	325	0	0	-	2.41	0
985	No	170	0	0	-	1.37	0
986	No	228	0	0	-	1.44	0
987	No	40	0	0	-	-	0
988	No	337	0	0	-	3.15	0
989	No	991	0	0	-	9.23	0
990	No	636	0	0	-	3.70	0
991	No	2,066	0	0	-	2.91	0
992	No	25	0	0	-	-	0
993	No	39	0	0	-	0.33	0
994	No	64	0	0	-	-	0
995	No	1,293	0	0	0.11	1.77	0
996	No	316	0	0	-	2.25	0
997	No	137	0	0	-	0.89	0
998	No	402	0	0	1.70	0.32	0
999	No	320	0	0	-	-	0

[1]Areas not currently designated as range units are farm/pasture units.

Note, range unit 43 and 47 are not located in this table, as they have received new range unit numbers (data unavailable). The change in the range unit numbers may have resulted from the merger of these units with adjacent units.

ATTACHMENT D-2. STOCK WATER WELLS

Well Name	Latitude	Longitude	Township	Range	Section	Quarter Section	Total Depth (feet)	Static Water Level (feet)	Yield (gpm)	Completion Date	Well Use	Range Unit
Helgerson Ray	48.171768	-108.547309	28N	25E	19	A	114	68	6	8/1/1984	Stock water	14
Fort Belknap Tribal Land * McGuire East Well	48.116813	-108.851622	27N	22E	11	ABB	580	78	30	5/9/1999	Stock water	18
Campbell Bud	48.108694	-108.67159	27N	24E	7	DAADCD	420	128	50	6/21/1993	Stock water	20
McCracken Virginia	48.393841	-108.442401	31N	25E	35	DCC	43	33	10	8/23/1977	Stock water	22
Bureau of Indian Affairs * Nordlund Donita * Well #3	48.309599	-108.335165	30N	26E	34	DCBBBC	325	120	27	4/11/1994	Stock water	30
Louie Gilbert Ranch *Jay Smith	48.320821	-108.546791	30N	24E	25	DCDDDD	512	166	24	6/23/2001	Stock water	48
Getten Patty C.K.	48.288135	-108.644296	29N	24E	8	B	420	110	80	9/3/2007	Stock water	72

gpm - gallons per minute

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ATTACHMENT D3. PHOTOGRAPHS

	Well and blown over windmill
	Abandoned well and stock watering trough
	Stock water pit. Note deep mud around ponds edge.

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APPENDIX E

IRRIGATION REHABILITATION PLAN

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1.0 INTRODUCTION

1.1 PURPOSE

The Fort Belknap Indian Community (FBIC) Tribal Council determined that an agricultural resource management plan (ARMP) was needed for the Fort Belknap Indian Reservation (Reservation). Furthermore, the FBIC requested that the ARMP include a Milk River Irrigation Rehabilitation Plan providing guidance in addressing the overwhelming task of rehabilitating and developing the Milk River irrigation infrastructure.

1.2 PROJECT AREA

The Project Area and associated cropland is illustrated in Figures 1-1 and 1-4 in the ARMP. As shown on the figures, the Milk River is located on the northern portion of the Project Area. The Fort Belknap Irrigation Project (FBIP) was originally authorized for construction in 1895, but full construction was never completed. The current FBIP operates under the Gros Ventre and Assiniboine Tribes' (Tribes') original *Winters vs. United States (207 U.S. 564, year 1908)* water right for 10,425 acres of "presently irrigated" lands served from the irrigation system's canals and laterals. Approximately 9,900 acres are currently assessed annual fees by the local United States (U.S.) Bureau of Indian Affairs (BIA) office. The majority (92 %) of the FBIP assessed acreage is Indian-owned land, and the rest is privately owned by non-Tribal entities (Natural Resources Consulting Engineers, Inc [NRCE] 2016).

1.3 WATER RIGHTS

The FBIC negotiated their water rights claims with the U.S. government with the 2001 ratification of the *Water Rights Compact Entered Into By the State of Montana, the Fort Belknap Indian Community of the Fort Belknap Reservation, and the United States of America*. The compact quantifies specific amounts of water that can be used for different purposes (i.e., domestic, agricultural, and for emergency uses). The compact is not effective until it is approved by the FBIC, the State of Montana, and Congress. The compact was introduced in Congress in 2013, but is still pending approval (Congressional Research Service 2016).

Under the compact, the FBIC is entitled to up to 645 cubic feet per second (cfs) of water from the Milk River Basin for irrigation and non-irrigation uses. In addition, some of that water may be stored for future use and/or used for small impoundments meant for stock water use. The maximum capacity of each impoundment must be less than l5 acre-feet, and the total amount of water impounded in each impoundment must be less than 30 acre-feet per year (afy). The FBIC is also entitled to all of the water in Peoples Creek, after upstream water rights are met. Furthermore, the FBIC is entitled to use the water from Beaver Creek to irrigate up to 2,421 acres and for small impoundments for stock watering. Additionally, the FBIC may divert up to 1,135 afy for irrigation from the Missouri River Basin, in addition to the diversion of up to 1,290 afy from the Missouri River Basin to the Peoples Creek Basin.

Additionally, the FBIC have drafted legislation, and they are currently negotiating a settlement for damage claims related to water rights. Included in the draft legislation is a FBIC Comprehensive Water Development Plan. The settlement legislation includes the following four accounts and amounts (in 2011 dollars):

1. FBIC Tribal Land & Water, Rehabilitation, Modernization, and Expansion Account: $240,140,000;
2. FBIC Water Resources and Water Rights Administration, Operation, and Maintenance Account: $61,300,000;
3. FBIC Tribal Economic Development Account: $135,290,000; and,
4. FBIC Water and Wastewater Rehabilitation and Expansion Account: $123,280,000.

The total of the four accounts in the draft bill is $560,010,000. In addition to these, the draft legislation refers to the 2001 Compact between the State of Montana and the Tribes for a total of $5,000,000 to build Peoples Creek Reservoir. Finally, the legislation includes $21,000,000 from the Federal Government to the State of Montana for the Montana Mitigation Fund, which is associated with the projects included for the proposed settlement accounts as stated above (NRCE 2016). It should be noted that tribal water right settlements of this nature and magnitude often take decades to resolve.

2.0 EXISTING CONDITIONS

2.1 PREVIOUS REPORTS

The condition of the FBIP has been extensively documented in several recent reports:

1. HKM Engineering (HKM). 2016. Engineering Evaluation and Condition Assessment Ft. Belknap Irrigation Project - Final Report
2. NRCE 2016. Fort Belknap Indian Community Comprehensive Water Development Plan
3. General Accounting Office (GAO) Report 06-314, 2006

In the first listed report, HKM completed extensive field evaluations of key structures and facilities of the Ft. Belknap Irrigation Project (Project) as part of its investigations. The purpose of the evaluations was to assess the condition and to document the type and extent of deficiencies of canals and structures throughout the entire project. Remediation cost summaries and priority rankings, as well as remediation reports for individual canals and structures, were developed. Total system rehabilitation costs (in 2016 dollars) of approximately $9.0 million were identified. Recommended rehabilitation measures are illustrated in Figure E-1 and a breakdown of the anticipated costs are summarized below.

Rehabilitation of Structures – Key Canals and Laterals	$1.5 million
Rehabilitation of Structures – Minor/Remaining Laterals	$1.9 million
Canals – Bank Instability	$0.2 million
Canals Improvements – Cleaning/Reshaping	$1.8 million
Canals Improvements – Overtopping	$0.1 million
Canals Improvements – Lining	$3.5 million
Total	$9.0 million (HKM 2016)

Funding and implementation of this plan were not addressed, although it is stated that the cost estimates and priorities developed are intended to be used to guide rehabilitation efforts, which suggests an incremental implementation approach was anticipated.

The NRCE Plan (NRCE 2016) provides for a significantly more extensive rehabilitation and expansion of the FBIP. Under this plan the irrigated area would be approximately doubled to a gross of 29,815 acres. Major findings of this effort are summarized below.

- Most of the infrastructure making up the FBIP is over 100 years old, and generally exists in a dilapidated and technologically outdated state. Much of the original project infrastructure needs repairs (maintenance) or major reconstruction (rehabilitation) for the project to function efficiently and effectively. The deteriorated condition of the FBIP has likely led to a decline in the quality of irrigation water management in recent years.
- The currently dilapidated condition and non-optimal management of the FBIP is exacerbated by its location adjacent to the Milk River. The FBIP is characterized by nearly level field slopes and generally very clayey soils. Many of the project areas have become waterlogged, swampy, and overgrown with nonagricultural vegetation in recent years.
- Many of the lands authorized as part of the FBIP are not currently farmed or assessed. Additionally, other potentially productive lands exist to the east that could be added to the FBIP.
- If the FBIP facilities are upgraded and expanded, then lands in the eastern portion of the Milk River Valley, contained within the Ereaux Unit and the Dodson Dam area, could be irrigated by the Tribes as part of the FBIP.

The comprehensive plan developed for the NRCE effort included not only complete rehabilitation and modernization of the existing FBIP but significant expansion into additional adjoining areas. Major plan components are shown on Figure E-2 and include the following:

1. Construction of a new Lower Highline Canal that would extend from just east of Fort Belknap Agency to the existing Three Mile Reservoir.

2. Construction of a new Upper Highline Canal extending from a diversion on Three Mile Creek to Peoples Creek in the Ereaux Unit.
3. Additional storage in a new off-stream reservoir, Fort Belknap Reservoir, located on Three Mile Creek and having a capacity of 58,800 acre-feet.
4. Conveyance and distribution pipelines served from the two Highline canals.
5. On-farm sub-surface drainage systems.
6. Expansion of irrigated acreage to lands in the eastern portion of the Milk River Valley, contained within the Ereaux Unit and the Dodson Dam area.

Under this plan the expanded FBIP would service a gross area of 29,815 acres, with a total of 26,890 net irrigated acres, which include the existing FBIP, Ereaux Unit, Dodson withdrawn area, and other adjacent lands in Basin 40J of the Milk River Valley. Of these lands, it is proposed that 22,330 acres would be gravity irrigated, and 4,560 acres would be sprinkler irrigated. The total estimated costs for the FBIP rehabilitation, modernization, and expansion project under this plan is approximately $202 million.

In addition to these two studies, the 2006 GAO report estimated total deferred maintenance costs at the FBIP to be approximately $17.5 million (GAO 06-314). In current dollars (2017) this would be approximately $23.1 million. The report by the GAO listed the following problems regarding the FBIP:

- Fees and appropriations are insufficient to cover project maintenance needs
- Vegetation impairs water flow in open channels
- There is canal bank erosion caused by cattle crossings
- Deteriorated and leaking irrigation structures reduce operational flexibility
- Additional equipment is needed to perform maintenance
- Deferred maintenance aggravates problems associated with difficult soils
- Relatively low crop productivity
- Many of the authorized lands are not currently farmed or assessed

2.2 OTHER IRRIGATION PROJECTS

In addition to the FBIP, there are several historical and currently abandoned irrigation projects on the Reservation. Trihydro Corporation (Trihydro) was requested to examine two of the largest and more significant of these, the Ereaux and the Little People Creek or Hays projects. As originally constructed, the Ereaux project consisted of 4,307 acres of irrigated lands, and the Little Peoples Creek project served 1,193 acres of agricultural land (NRCE 2016).

These historic projects were turned over to the water users for operation and maintenance in the 1960s. Irrigation on the tributaries was always a partial water delivery service because there are little or no storage facilities available for the systems. Thus, typically, irrigation would start as early as possible in the spring to take advantage of spring runoff and would continue until the natural flows dry up, typically in June or July, depending on the year and the location of the lands. Over the years, the systems became increasingly dilapidated until they were eventually abandoned.

Because these irrigated lands were an important source of hay and pasture for the local economy, re-establishment of the Ereaux and Little People Creek projects, as well as others, is an important objective of the NRCE comprehensive water development plan for the Reservation. The rehabilitation plan includes supplemental groundwater wells, new diversion structures, cleaning and realignment of canals, replacing canals with pipes where the seepage losses are highest, and using gated pipe as the on-farm water application method.

2.3 SUMMARY OF PROBLEMS

In addition to reviewing previous reports, Trihydro personnel spent significant time on the Reservation, meeting with FBIC members and FBIC tribal departments, and conducted site visits throughout the FBIP area developing an understanding of the irrigation facilities condition and operational issues. This direct inspection of the facilities allowed Trihydro personnel to confirm previous investigators conclusions regarding the generally dilapidated condition of the irrigation facilities. Conclusions drawn from these meetings and inspection tours are as follows:

- The majority of the irrigation infrastructure is very old and is in very poor condition. Much of the original project irrigation infrastructure needs complete reconstruction or major rehabilitation for the project to function efficiently and effectively.
- Flow measurement needs to be implemented at or near the diversion dam and at critical locations throughout the FBIP to provide for the efficient management and operation of the system.
- In many areas, insufficient capacity exists in the canal and lateral systems. Extensive ditch cleaning needs were observed.
- Several old abandoned pumping stations were investigated. All need replacement to re-establish pumping capabilities.
- In a number of locations, it was observed that canal seepage has caused adjacent lands to become waterlogged and alkaline. Piping or lining of the canal through these areas is needed.
- There are predominantly tight clay soil characteristics and currently inadequate and ineffective drainage facilities on the project lands, many of the fields tend to be inundated with standing water, which has resulted in many areas becoming waterlogged, swampy, and overgrown with nonagricultural vegetation.
- At one location in the lower section (below Whitebear Reservoir) the canal alignment is located near an actively eroding bend of the Milk River, putting the canal at significant and impending risk of failure.

- Many of the project lands have never been properly leveled. Reportedly, this is because FBIC lands were declared ineligible for Natural Resources Conservation Service (NRCS) financial assistance for leveling in the past. As a result, FBIC fields are noticeably less efficiently irrigated than those in the surrounding non-tribal areas.
- Flood irrigation is by far the most common application method throughout the FBIP. In contrast, significant portions of nearby, non-tribal farm lands are irrigated by means of sprinklers (pivot or wheel-line) or slotted pipe. Modernization is a significant need of the FBIP.
- In general, our assessment, while not nearly as comprehensive as previous investigations, nevertheless confirms that the rehabilitation needs of the FBIC are indeed severe.
- Reliance upon individual lessees to maintain and improve the irrigated lands on the Reservation has not been successful. Trihydro proposes that some of this responsibility be undertaken by the FBIC Irrigation Department. Some or all of the cost for this effort could be derived from increased irrigation land assessments as the value of the grazing lease should increase, if it included adequate and sufficient water infrastructure.

3.0 MILK RIVER IRRIGATION IMPROVEMENT PLAN

As discussed, a number of improvement and rehabilitation plans exist for the FBIP. These plans all highlight the extensive needs of the project placing total costs from nearly $10 million to over $200 million. Needless to say, implementation of any of these plans will require a significant financial input from state and/or federal entities. The purpose of the plan described below however, is to provide a more modest and realistic approach to begin to address the significant rehabilitation needs of the FBIP.

Based on the input obtained from FBIC tribal department, BIA, and NRCS personnel, and a field review of range water conditions and facilities, the following developmental items are recommended as part of a comprehensive irrigation water improvement plan. The restoration of idle irrigated croplands to productive service was also considered of the highest priority in the development of this plan.

3.1 HIGH PRIORITY

Project 1) Irrigation Investment Incentive Program

Project Description

Current land use regulations require the lessee to fund irrigation application and land improvements such as slotted pipe, sprinklers, leveling, drains, etc. This system is not working effectively for a variety of reasons, including access to capital and insufficient length of lease term. We recommend that additional incentives and/or subsidies are needed to better facilitate lessee investment. We strongly recommend that additional financial resources be set aside to stimulate lessee investment. This could be through the use of a cost-match, or reasonable grant/loan components to

support individual NRCS Environmental Quality Incentives Program (EQIP) grant applications including application development assistance.

Project Costs

Cost for this could be variable as FBIC financial resources allow. Trihydro recommends that a minimum of $30,000 annual investment be stimulated to begin a meaningful improvement of the irrigation systems.

Project Implementation

We recommend that the FBIC develop a financial stimulus for irrigation infrastructure investment.

Project 2) Milk River Diversion Dam Rehabilitation

Project Description

The gates on the existing Milk River Diversion Dam are in very poor condition and need to be replaced. The stop-log slot gates on the north end of the diversion dam represent a danger to dam operators and should be replaced with a gate that could be automatically operated from the south side (and where all the other gates and actuators are located). Additionally, no flow measurement exists at the diversion dam for canal flows. Until a flume can be constructed, we recommend that a rated-section and staff-gage be installed and calibrated. These improvements are illustrated on Figure E-3.

Project Costs

Cost for this would be approximately $65,000 as summarized below.

New air or hydraulic activated Sluice Gate	
(north end of dam)	= $14,000
Radial Sluice Gate Repair	= $ 4,000
Slide Gates ($7,500 each, installed, x4)	= $30,000
Establish Rated Section/Flow Measurement	= $ 3,000
Stair/Railing Access Improvements	= $ 4,000
Unlisted Items & Contingency	= $10,000
Total	= $65,000

Project Implementation

Trihydro recommends that the FBIC submit a tribal-based NRCS EQIP funding assistance application to fund construction. Other state and federal grant funding opportunities exist and should be explored as well.

Project 3) Whitebear Diversion Dam Rehabilitation

Project Description

The Whitebear Headworks structure controls releases from Whitebear Reservoir to the canal feeding the lower portions of the FBIP. This structure is in extreme disrepair and needs complete replacement.

Project Costs

Cost for re-construction of the Whitebear headworks has been recently estimated at approximately $110,000 (HKM 2016).

Project Implementation

We recommend that the FBIC submit as an organizational-basis for an EQIP NRCS funding assistance to fund the construction of this rehabilitation project. Other applicable state and federal grant funding programs exist and should be explored as well.

Project 4) Threemile Pump Station

Project Description

The Threemile Pump Station provides necessary water for irrigation to many users within the FBIP. The Threemile Pump Station feeds water into Threemile Reservoir, an existing 140-acre reservoir with approximately 500 acre-feet of storage capacity that feeds approximately 1,400 acres downstream of the reservoir that depend on this water for crop irrigation. The existing pump station was constructed in approximately 1949 and consists of the following:

- An inlet canal from Main Canal A to a steel inlet
- 3-foot diameter steel intake
- 5-foot diameter steel sump
- Small pump house
- A 14-inch steel discharge line
- A single 60-horse power vertical turbine pump and electrical switchgear

The existing pump station is old, inefficient and has recently become no longer operational due to age and disrepair. The Threemile Pump Station is the primary source of water supply to Threemile Reservoir, which is the source of supply for Main Canal B that feeds approximately 1,400 acres directly, and provides an additional source of supply to lower Main Canal A late in the irrigation season when flows in the Milk River cannot cover the entire demand of the irrigation project.

Project Costs

Cost for this were estimated at $140,000 (Higley, pers. comm. 2017).

Project Implementation

State grants have been identified by irrigation department staff that would partially fund design and construction for these improvements. If the existing state funding application is successful, project design and construction starting in the Fall of 2019 is anticipated.

Project 5) Pump Station Replacement (x2)

Project Description

Two historical pumping stations feeding major laterals located near the upper end of the Main Canal need to be re-established and re-constructed. The existing structures are no longer operational due to an extreme state of disrepair, rendering a total of approximately 400 acres of previously irrigated project lands currently unserviceable.

Project Costs

Cost for these improvements were recently estimated at $55,000 in the HKM report (HKM 2016). In addition to this, approximately $20,000 of ditch cleaning will be needed for a total estimated project cost of $75,000.

Project Implementation

State and federal funding assistance programs exist that could partially fund design and construction for these improvements. NRCS EQIP may also constitute a source for funding assistance.

3.2 MEDIUM PRIORITY

Due to the extremely poor condition of most of the FBIP facilities, some efforts are best approached on an annualized and continuous basis. These recommended efforts are described below.

Project 1) Ditch Cleaning and Capacity Enhancement

Significant portions of the FBIP canals need cleaning of both sediments and vegetation to re-establish conveyance capacity and better allow the efficient provision of irrigation waters to project lands. Due to the extensive length of canals impacted, this effort might be best addressed using a progressive approach over the course of several years. Total costs for this effort were recently estimated at approximately $2.0 million (HKM 2016).

Project 2) Flow Measurement

No flow measurement currently exists in the FBIP. We recommend that flow measurement facilities (flumes and/or weirs) be installed at key locations throughout the project area to provide the efficient and fair distribution of irrigation waters. Costs for these improvements could be highly variable depending upon the number and sizes of flumes. A flow monitoring program consisting of a 15-20 discreet flumes or weirs with a range of sizes and capacities ranging from over 125 cfs to 25 cfs, could likely be installed for about $40,000 and would not be an unreasonable way to implement flow measurement throughout the project lands.

Project 3) Canal Structures and Lining

As previously discussed, there are several areas where excessive canal seepage can be observed and has given rise to swampy and unproductive areas adjacent to the canal. An effort to line the canals in these areas will be significant and might best be accomplished in an incremental approach over the course of a number of years. HKM (2016) estimated this effort at approximately $3.5 million.

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APPENDIX E. IRRIGATION REHABILITATION PLAN

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ATTACHMENT E1. PHOTOGRAPHS

	Milk River Diversion Dam. Note – stoplog gate at far end of dam and dangerous access conditions due to turbulent flow downstream.
	Sluice Gate at Milk River Diversion Dam Note – need to repair gate cables

ATTACHMENT E1. PHOTOGRAPHS

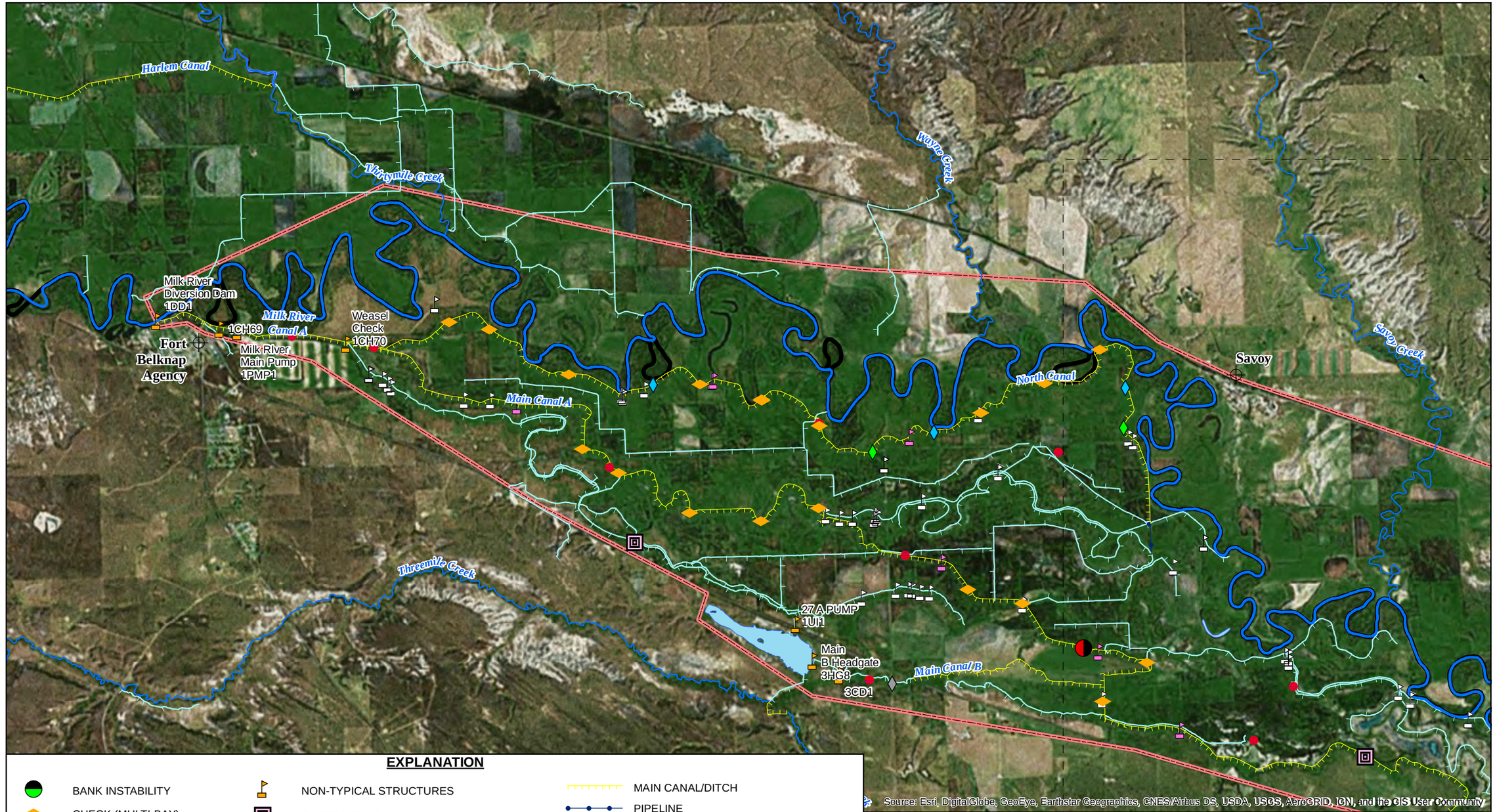
	Old, abandoned lateral pumping station.
	27A Pumping Station Out of operation and in need of rehabilitation
	Whitebear Headgate Structure Note – dilapidated and dangerous condition. In need of replacement

ATTACHMENT E1. PHOTOGRAPHS

	Whitebear Headgate Structure Note – dilapidated and dangerous condition. In need of replacement
	Whitebear Diversion Dam Structure. Note – in good shape; only minor crack repair required.
	Typical Canal Bifurcation Structure Note – dilapidated condition.

ATTACHMENT E1. PHOTOGRAPHS

	New Canal Check Structure



EXPLANATION

- BANK INSTABILITY
- CHECK (MULTI-BAY)
- CHECK (TYPE A)
- CHECK (TYPE B)
- CHECK (TYPE C)
- CHECK/CROSS
- CLEANING/RESHAPING
- NON-TYPICAL STRUCTURES
- OVERTOPPING
- REPRESENTATIVE LATERAL STRUCTURES
- SEEPAGE AREA LINING
- TURNOUT
- MILK RIVER
- STREAM
- MAIN CANAL/DITCH
- PIPELINE
- LATERAL OR SUBLATERAL CANAL/DITCH
- WATERBODIES
- PROJECT BOUNDARY
- PAGE BREAKS
- FORT BELKNAP RESERVATION BOUNDARY

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FIGURE E-1a

EXISTING IRRIGATION CONDITIONS

**FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA**

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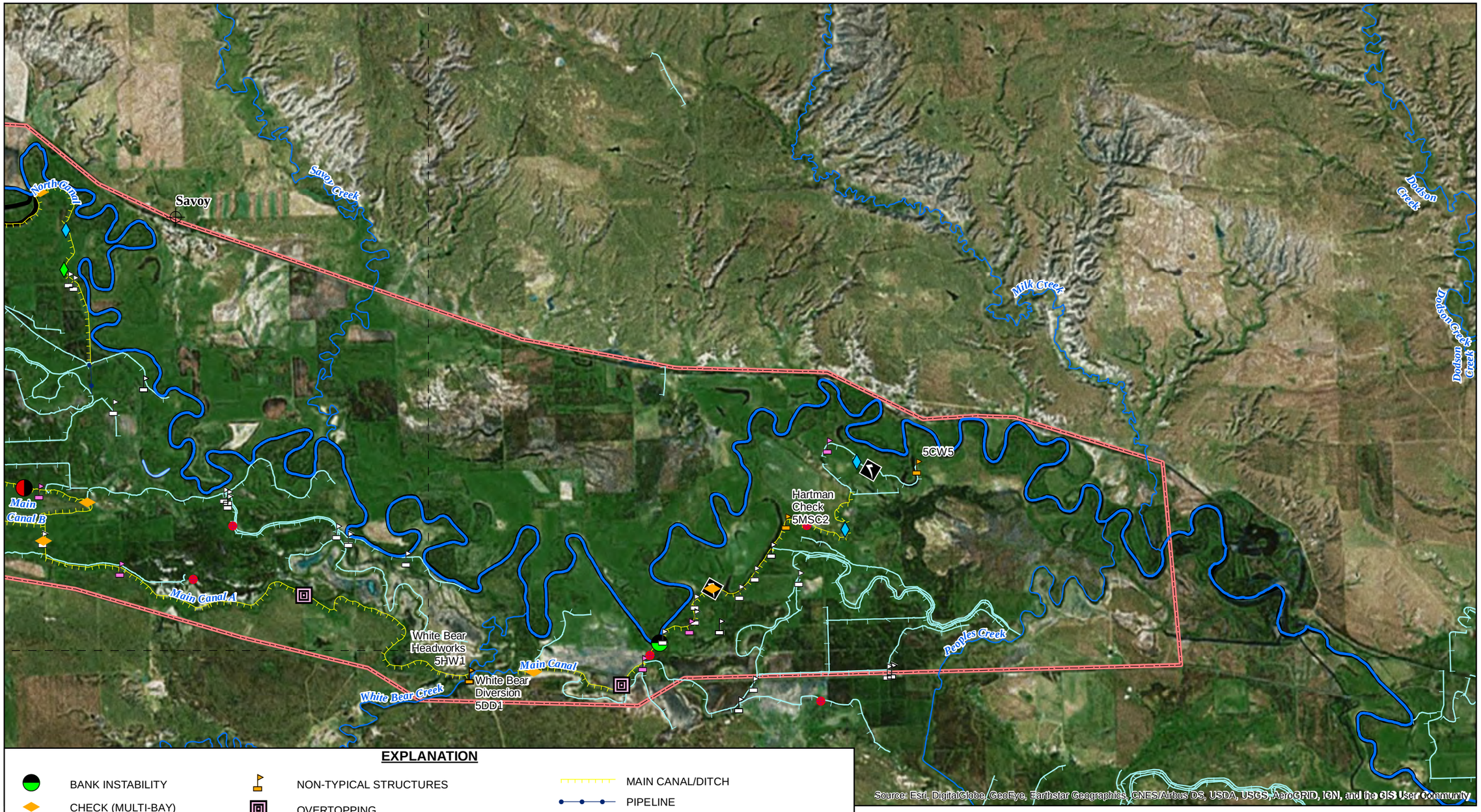

EXPLANATION

- BANK INSTABILITY
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- CHECK (TYPE A)
- CHECK (TYPE B)
- CHECK (TYPE C)
- CHECK/CROSS
- CLEANING/RESHAPING
- NON-TYPICAL STRUCTURES
- OVERTOPPING
- REPRESENTATIVE LATERAL STRUCTURES
- SEEPAGE AREA LINING
- TURNOUT
- MILK RIVER
- STREAM
- MAIN CANAL/DITCH
- PIPELINE
- LATERAL OR SUBLATERAL CANAL/DITCH
- WATERBODIES
- PROJECT BOUNDARY
- PAGE BREAKS
- FORT BELKNAP RESERVATION BOUNDARY

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FIGURE E-1b

EXISTING IRRIGATION CONDITIONS

FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA

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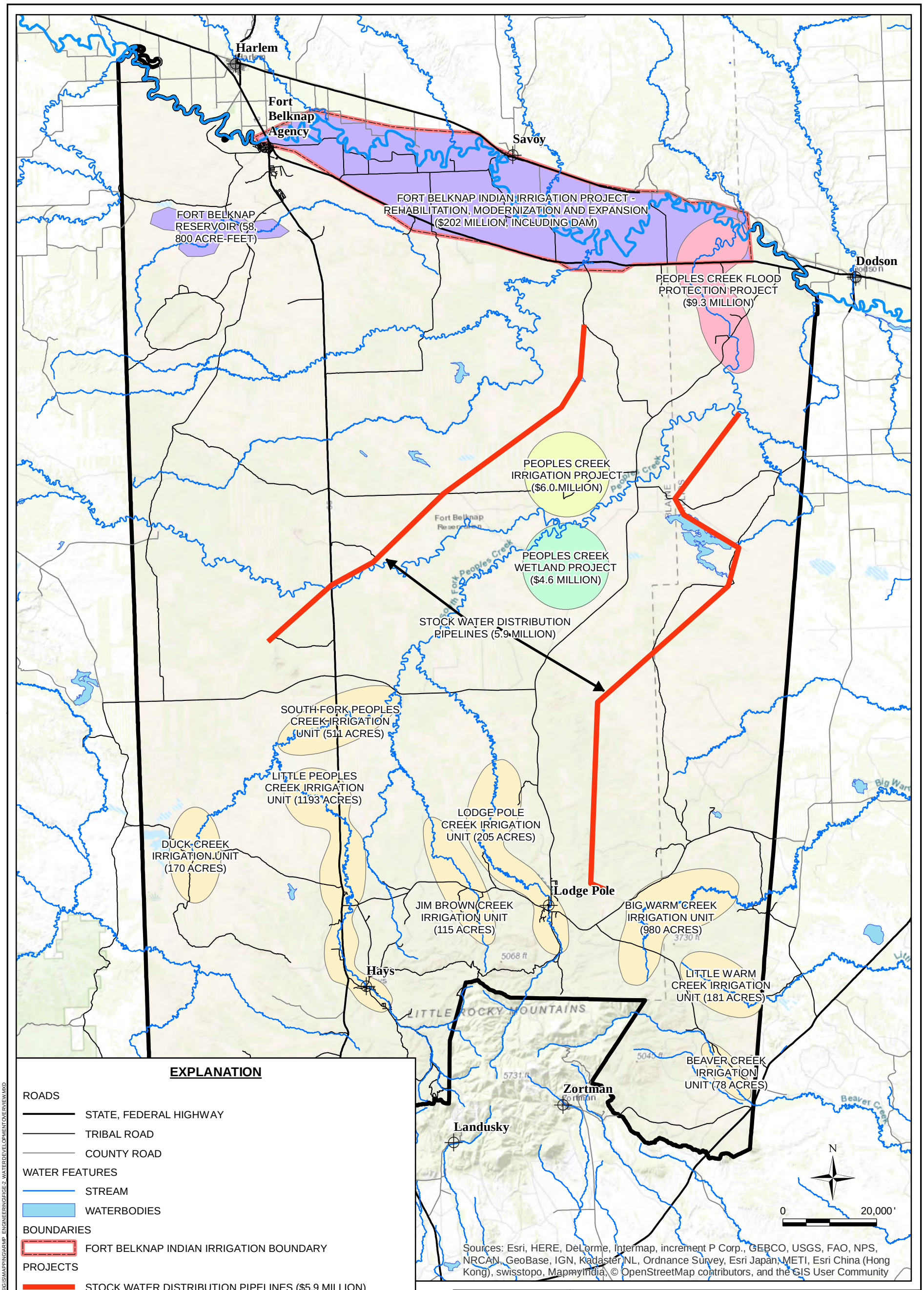

EXPLANATION

ROADS
- STATE, FEDERAL HIGHWAY
- TRIBAL ROAD
- COUNTY ROAD

WATER FEATURES
- STREAM
- WATERBODIES

BOUNDARIES
- FORT BELKNAP INDIAN IRRIGATION BOUNDARY

PROJECTS
- STOCK WATER DISTRIBUTION PIPELINES ($5.9 MILLION)
- SOUTHERN IRRIGATION PROJECTS ($4.4 MILLION)
- FORT BELKNAP INDIAN IRRIGATION PROJECT ($202 MILLION)
- PEOPLES CREEK FLOOD PROTECTION PROJECT ($9.3 MILLION)
- PEOPLES CREEK IRRIGATION PROJECT ($6.0 MILLION)
- PEOPLES CREEK WETLAND PROJECT ($4.6 MILLION)
- FORT BELKNAP RESERVATION BOUNDARY

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FIGURE E-2

WATER DEVELOPMENT OVERVIEW

FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA

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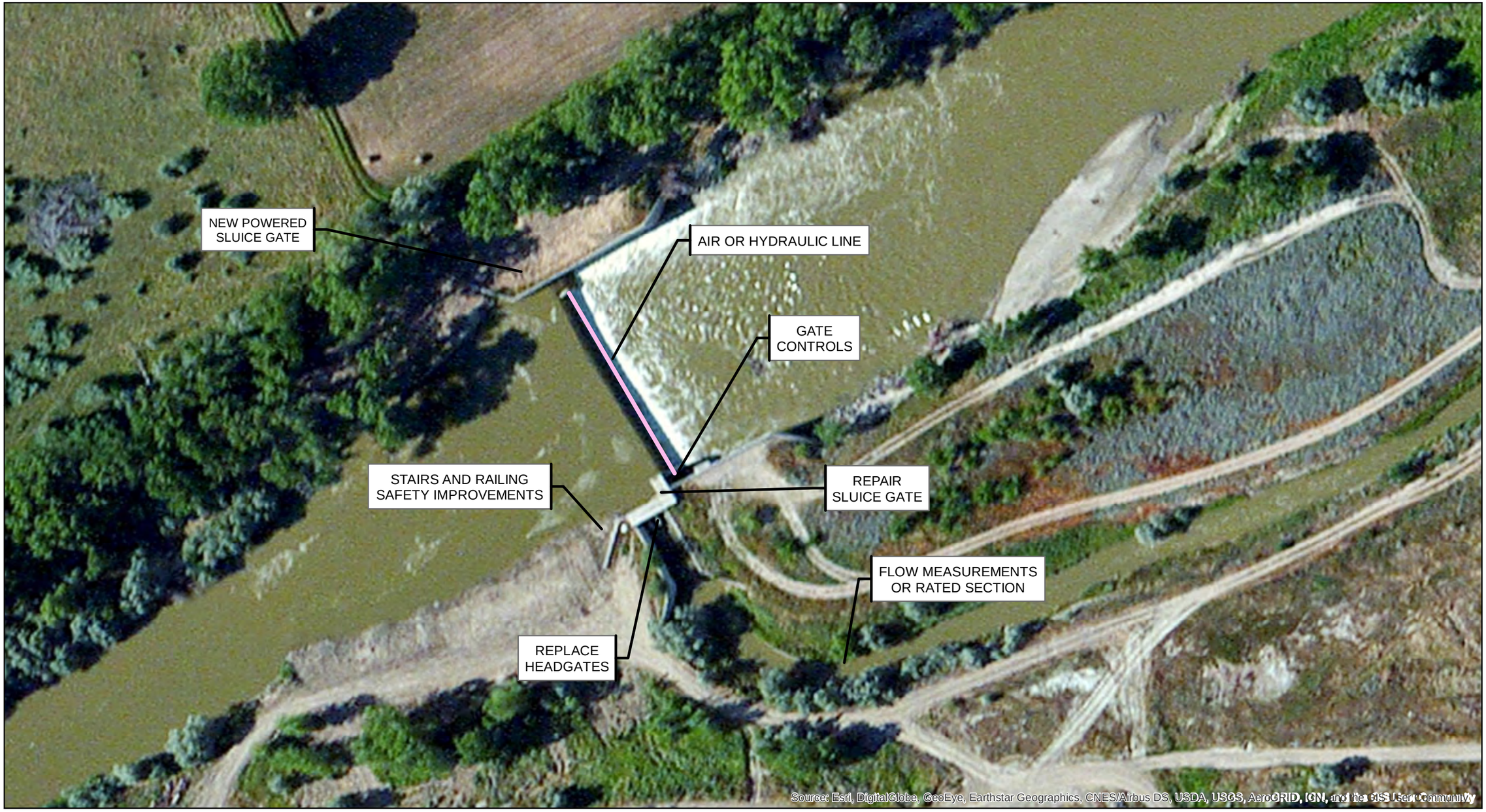

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FIGURE E-3

FORT BELKNAP
MILK RIVER DIVERSION
DAM REHABILITATION

FBIC ARMP PEA, FORT BELKNAP INDIAN COMMUNITY
FORT BELKNAP INDIAN RESERVATION
HARLEM, MONTANA

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APPENDIX F

ONSITE NEPA CHECKLIST

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United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Fort Belknap Agency
158 Tribal Way B
Harlem, MT 59526

NEPA CHECKLIST FORM

This checklist should be used to determine if a proposed action is adequately analyzed and conforms to the 2018 Fort Belknap Indian Community (FBIC) Agricultural Resource Management Plan Programmatic Environmental Assessment (ARMP/PEA).

Description of the 2018 FBIC ARMP/PEA Proposed Action: The FBIC proposes to develop and manage current and future trust and tribal fee agricultural lands according to the FBIC ARMP from 2018 through 2028, or until revised. The implementation of the FBIC ARMP would result in the completion and/or progress towards the holistic goals (listed below), objectives, and recommendations identified in FBIC ARMP.

FBIC ARMP Goals:

- Improve agriculture related communication, coordination, and transparency among the FBIC Tribal Council, tribal departments, and the BIA
- Uniformly and consistently enforce all federal and tribal rules, regulations, and ordinances
- Implement farming and livestock grazing practices to protect, improve, and increase the utilization of agricultural lands
- Honor and protect sensitive species and culturally significant species through responsible agricultural operations
- Improve the farm/pasture leasing process and the grazing permitting process to facilitate the use of trust lands for agricultural activities by tribal members
- Honor and protect cultural resources

Type of Proposed Action:

☐ Farm/Pasture Lease ☐ Grazing Permit

Location of the Proposed Action:

Range Unit #_____

Section/Township/Range: _____

Lease/Permit Information:

Farm/Pasture Lease #_____

Range Permit #_____

Attach a map of the location associated with the proposed action.

Land Ownership: ☐ Allotted Land ☐ Tribal Land (in trust)

Description of the Proposed Action: _____

_____

_____

Fort Belknap ARMP/PEA NEPA Checklist

Proposed Action Considerations:	Page in PEA	Yes	No	Requires Further Consideration
Is the proposed action **different** from the actions analyzed under the proposed action in the 2018 FBIC ARMP/PEA?	3-1			
Are the impacts (direct, indirect, and cumulative) that could result from implementation of the proposed action **different** (both quantitatively and qualitatively) from those analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-1			
Are the public involvement and interagency review associated with 2018 FBIC ARMP/PEA inadequate for the proposed action?	1-9			
Does the proposed action threaten and/or violate federal, state, local, or tribal law or requirements imposed for protection of the environment?	Not Applicable			
Does the proposed action have the potential to result in impacts to geological and/or paleontological resources?	Begins at 4-55			
Would the proposed action affect properties listed or eligible for listing in the National Register of Historic Places?	Begins at 4-48			
Does the proposed action have the potential to result in impacts to soils that are beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-2			
Does the proposed action have the potential to result in impacts to surface water and/or groundwater quality and/or quantity that are beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-9			
Does the proposed action has the potential to result in impacts to air quality that are beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-1			
Would the proposed action result in climate change impacts beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-18			
Would the proposed action result in impacts to vegetation beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-23			
Would the proposed action contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area, or promote the introduction, growth, or expansion of the range of such species?	Begins at 4-27			
Does the proposed action have the potential to result in impacts to wildlife and/or fisheries beyond the typical impacts from farming/ranching activities as described in the 2018 FBIC ARMP/PEA?	Begins at 4-36			

Fort Belknap ARMP/PEA NEPA Checklist

Proposed Action Considerations:	Page in PEA	Yes	No	Requires Further Consideration
Would the proposed action result in impacts to sensitive species beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-38			
Would the proposed action result in impacts to cultural resources beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-48			
Would the proposed action take place in an area that has a known cultural resource that should be protected and coordinated with the Tribal Historic Preservation Office?	Begins at 4-48			
Would the proposed action take place in an area that contains previously unbroken ground and/or would surface disturbance will be deeper than the plow zone (i.e., 24 inches) and the Tribal Historic Preservation Office has not provided a cultural survey clearance? *Attach a copy of the clearance to this checklist, if applicable.*	Not Applicable			
Would the proposed action will have a disproportionately high and adverse effect on low income and/or minority populations?	Begins at 4-53			
Would the proposed action result in impacts to roads or traffic resources beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-57			
Would the proposed action result in impacts to recreation opportunities beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-60			
Would the proposed action result in noise impacts beyond the typical impacts from farming/ranching activities as analyzed in the 2018 FBIC ARMP/PEA?	Begins at 4-64			

A "No" response to all of the questions indicates that no further analysis is needed pursuant to NEPA.
A "Yes" response to any question will require further analysis of the environmental impacts in an environmental assessment pursuant to NEPA.
A "Requires Further Consideration" response to any question will require additional documentation describing the steps to minimize potential impacts to be attached to this checklist.

Based on the review documented above, I conclude that this proposal conforms to the 2018 FBIC ARMP / PEA and that the NEPA documentation fully covers the proposed action and constitutes BIA's compliance with the requirements of the NEPA.

Preparer's Name and Title: _____

Preparer's Signature: _____ Date: _____

Conclusion

Cultural Resources

Based on my review, I conclude that this proposed action will result in:

- ☐ Potential Impacts to Cultural and/or Archaeological Resources
- ☐ No Potential Impacts to Cultural and/or Archaeological Resources

If applicable, see the Cultural Concurrence Letter for more information.
Date Cultural Concurrence Letter was signed: _____

Biological Resources

Based on my review, I conclude that this proposed action does not have the potential to result in impacts to **biological resources** that are beyond the impacts described in the 2018 FBIC ARMP/PEA.

Specialist's Name and Title: _____

Specialist's Signature: _____ Date: _____

BIA Range

Based on my review of the information provided in the checklist, I conclude that location and the lease/permit information is correct.

Specialist's Name and Title: _____

BIA Superintendent's Concurrence: _____ Date: _____
Superintendent
BIA Fort Belknap Agency

Note: The signed Conclusion on this checklist is part of an interim step in the BIA's internal decision process and does not constitute an appealable decision. However, the lease, permit, or other authorization based on this checklist are subject to protest or appeal under 25 CFR Part 2 and/or program-specific regulations.

Reminder: Upload a copy of this checklist to the BIA NEPA tracker.

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APPENDIX G

CULTURALLY SIGNIFICANT PLANTS

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NATIVE PLANTS OF THE LITTLE ROCKY MOUNTAINS AND NORTHERN GREAT PLAINS

*there are many more native plant species our tribes use, but these are the most common, all these native plants also have many other healing properties not mentioned here. (Copyright-D. Longknife 2016)

Kinnikinnick - used as a smoking mixture in ceremonies or gatherings, which is hung upside down and dried. It is added to tobacco until the flavor is milder to smoke. (*Arctostaphyolus Uva Ursi*)

Chokecherry - collected after the first frost when the berries are ripe, and used for many purposes. It was mainly used as a food source by drying the berries and crushing them with dry buffalo or dear meat and adding meat fat, that you would form into patties, called "Pemmican". This was carried on long trips, including buffalo hunts. (*Prunus virginiana*)

Buffalo Berry - you would gather the seeds of the plant after the first fall freeze, when the berries sweetened. The berries were removed by beating the bush and the berries would readily fall off, onto a deer skin or other cloth put below the bush. (*Shepherdia canadensis*)

Wild Mint - The leaves are collected and made into a tea and cures many illnesses, such as cold, coughs and fever, and cramps. The stems are square and when rubbed between the fingers, you can still smell the aroma in the winter after the plant has dried up. (*Mentha Arvensis*)

Wild Rose - has healing properties and petals eaten, high in vitamin C. (*Rosa woodsii*)

Wild Licorice - Has many healing properties and a distinctive fragrance. (*Glycyrrhiza lepidota*)

Yarrow - used to stop bleeding from wounds. You would chew or mash them in water and apply directly to wound, also boiled you could drink the tea made from the Yarrow leaves to cure headaches and pains. (*Achilea millefolium*)

Service Berry (June Berry) - Probably the most tasteful berry and was collected and stored for later use with other dried meats. It is commonly made into jams or added to other dishes like pancakes and breads. (*Amerlanchier alnifolia*)

Wild Onion - is commonly collected in early spring through the fall. It is used in soups, stew and meat dishes. It has three shiny long leaves with a nodding flower top. Two Types (*Allium geyeri/Allium textile*)

Oregon Grape - a yellow dye can be made from the shredded bark, which you boil with water. The berries are bitter tasting, but you can add sugar and water. (*Berberris repens*)

Arrowleaf Balsomroot - the young immature plants stems can be peeled and eaten like celery. (*Balsamoriza sagittata*)

Red-Osier Dogwood "Red Willow" - its inner bark was used as a mixture for ceremonial and religious pipe smoking, often added to kinnikinnick. (*Cornus serisea*)

Fringed Sage "Ceremonial Sage" - used in religious ceremonies to purify yourself, and hung above sweat lodges and tipis. The herb was used to drive away bad sprits such as Sweatgrass. A tea was made to cure womens menstral irregularity, which is sometimes called, "Womens Sage". (*Artemisia frigita*)

Silver Sage - Used for ceremonial purposes. (*Artemisia cana*)

APPENDIX G. CULTURALLY SIGNIFICANT SPECIES

Bitterroot - Regarded as a "Luxury Food", by many plains tribes, however these roots were very bitter and were stored for long periods, which would made them less bitter. Blooms on our prairies in early June. (*Lewisia Reddiva*)

Indian Paintbrush - Highly revered my plains indian tribes, has ornamental effect. (*Castilleja coccinea/Castilleja miniata-galli*)

Cattail - The seed heads were commonly used to prevent diaper rash and padding in newborn babies, and the young roots were eaten in early spring, which tastes like cucumbers. Also used for the insulating effect to keep baby warm. (*Typha lattifolia*)

Indian Breadroot "Turnip" - collected in June when the soil is still moist for digging. The roots go deep, several inches to reach the root or bulbs. These bulbs were dried or boiled and added as a stew. Turnips were usually braided by their long tapered roots and hung. (*Psoralea esculenta*)

Sweetgrass - Is braided and used in ceremonies and burned. Sweetgrass is also used to bless many things, and warriors would bless their arrows for a successful hunt. Sweetgrass have a reddish base on the stem. (*Hierocloe orodata*)

Yucca - stems, leaves and roots are used to cure most ailments, such as healing skin sores and purify blood Shampoo made with yucca prevents hair loss and dandruff, while creating soft, shiny strands. Using the root's powder form, acts as anti-inflammatory agent, reducing muscle spasms, pain, and symptoms of arthritis. (*Yucca glauca*)

Prickly Pear Cactus - plant can be peeled, burned and the inner cores eaten, and protects against thirst. (*Opuntia polyancantha*)

Prairie Cordgrass - used for insulating purposes. (*Spartina pectinata*)

Broom Snakeweed - used to clean out lodges and tipis. (*Gulieriezia sarothrae*)

Black Snake root - used to heal many ailments. (*Actaea racemosa*)

Sandbar Willow - used for many purposes, such as hanging meat, tipi stakes, sitting frames. (*Salix exigua*)

Birch tree - used for ceremonial purposes. (*Betula papyrifera/Betula occidentalis*)

Quaking Aspen - used in ceremonies and other activities. (*Populus temula*)

Ponderosa Pine Tree - sap used as chewing gum, and high in vitamins. (*Pinus ponderosa*)

Horsetail - rubbing the stem against your nails, makes them smooth and shiny, as used for scrubbing other things used around camp. (*Equisetum arvense*)

Wild Strawberry - mainly used in plains tribes diets. (*Fragaria glauca*)

Common Raspberry - mainly used in tribes diets, often mixed with dried meat. (*Rubus idaeus*)

False Solomans Seal - A special plant of Concern to our tribe. (*Smilacina racemosa*)

Red Saltwort - a source of nutrition. (*Salicornia rubra*)

APPENDIX G. CULTURALLY SIGNIFICANT SPECIES

Mountain Lady's Slipper - A Special Plant of Concern for our tribes. (*cypripedium montanum*)

Beaked Sedge - A Special Plant of Concern in the State of Montana. (*Carex rostrata*)

Skunkbrush Sumac - has healing properties. (*Rhus triobata*)

American Plum - has diaphoretic properties and a source of vitamin C. (*Prunus americana*)

Stinging Nettle - this plant has many healing properties. (*Urtica dioica*)

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APPENDIX H

STATE SENSITIVE LISTED SPECIES

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APPENDIX H. STATE SENSITIVE SPECIES

Common Name	Scientific Name	Habitat
Burrowing Owl	*Athene cunicularia*	Grasslands
Bobolink	*Dolichonyx oryzivorus*	Moist grasslands
Mountain Plover	*Charadrius montanus*	Grasslands
Long-billed Curlew	*Numenius americanus*	Grasslands
Loggerhead Shrike	*Lanius ludovicianus*	Shrubland
Brewer's Sparrow	*Spizella breweri*	Sagebrush
Ferruginous Hawk	*Buteo regalis*	Sagebrush grassland
American Bittern	*Botaurus lentiginosus*	Wetlands
Greater Sage-Grouse	*Centrocercus urophasianus*	Sagebrush
Sprague's Pipit	*Anthus spragueii*	Grasslands
Chestnut-collared Longspur	*Calcarius ornatus*	Grasslands
Baird's Sparrow	*Ammodramus bairdii*	Grasslands
Veery	*Catharus fuscescens*	Riparian forest
Golden Eagle	*Aquila chrysaetos*	Grasslands
Cassin's Finch	*Haemorhous cassinii*	Drier conifer forest
McCown's Longspur	*Rhynchophanes mccownii*	Grasslands
Northern Redbelly Dace	*Chrosomus eos*	Small prairie rivers
Iowa Darter	*Etheostoma exile*	Small prairie rivers
Northern Pearl Dace	*Margariscus nachtriebi*	Small prairie streams
Sauger	*Sander canadensis*	Large prairie rivers
Eastern Ringtail	*Erpetogomphus designatus*	Large prairie rivers, warm springs
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Caves in forested habitats
Hoary Bat	*Lasiurus cinereus*	Riparian and forest
Little Brown Myotis	*Myotis lucifugus*	Generalist
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Grasslands
Swift Fox	*Vulpes velox*	Grasslands
Spotted Bat	*Euderma maculatum*	Cliffs with rock crevices
Black-footed Ferret	*Mustela nigripes*	Grasslands
Greater Short-horned Lizard	*Phrynosoma hernandesi*	Sandy / gravelly soils
Plains Hog-nosed Snake	*Heterodon nasicus*	Friable soils
Desert Groundsel	*Senecio eremophilus*	Wetland/Riparian

Reference:

Montana Natural Heritage Program. 2017. Environmental Summary Report. Species Occurrence Data. Data obtained via personal communication with Dennis Longknife on January 5, 2018.