

FORT BELKNAP INDIAN COMMUNITY CLIMATE CHANGE ADAPTATION PLAN



**Fort Belknap Indian Community
656 Agency Main Street
Harlem, Montana 59526
Climate Change Program
April 24, 2023**

Fort Belknap Indian Community

WHEREAS, the Fort Belknap Indian Community Council is the governing body of the Gros Ventre and Assiniboine Tribes of the Fort Belknap Indian Community, Fort Belknap Indian Reservation, Montana, by the authority of the Constitution and By-Laws of the Fort Belknap Tribes approved on the 13 day of December 1935, and

WHEREAS, under the Constitution and By-Laws of the Fort Belknap Indian Community, the Community Council is charged with the duty of protecting the health, security and general welfare of the Fort Belknap Indian Community, and

WHEREAS, the Fort Belknap Indian Community Council (FBICC), acting through their governing body, the Fort Belknap Indian Community, have a compelling interest to improve the coordination and capacity of the various tribal departments that address disaster response and provide environmental services that help sustain and meet the needs of community; and

WHEREAS, there is scientific proof of climate change, which has been driven partially by the emission of greenhouse gases released into the atmosphere, which has significant affect on the environment, natural resources and infrastructure on which the Tribes have traditionally relied upon; and

WHEREAS, the potential impacts for climate change may include loss of habitat, reduced viability of fish and wildlife species, damage to forest resources, reduced air and water quality and quantity, damage to infrastructure and facilities, and associated risks to human health and welfare; and

WHEREAS, inaction in the present may yield negative social, environmental, cultural and economic consequences in the future; and

WHEREAS, the Department of Interior (DOI), Bureau of Indian Affairs (BIA), Office of Special Trust (OST) seeks to fund tribal climate adaptation planning and ocean and coastal management planning projects through the tribal cooperative landscape conservation program to improve tribal communities' capacity to administer feasible and proactive environmental services that help departments and partnering agencies to effectively address disaster mitigation and response efforts for their community members to achieve resiliency as well as for the protection and the proactive use of tribal resources; and

NOW THEREFORE BE IT RESOLVED, that the FBICC does hereby approve and authorize submission of application to the DOI, BIA, OST, Indian Self-Determination and Education Assistance Act (ISDEAA) in the total amount of \$250,000 for a 1-year period with no match requirement and indirect cost rate applied at 25.70%; and

BE IT FURTHER RESOLVED, that the FBICC recognizes and acknowledges the potential impacts of climate change and declares the intent and commitment of the Tribes to address effects of climate change, and also hereby declares and directs the following actions to be taken under this initiative:

"To undertake efforts to determine the potential effects of climate change or to the Fort Belknap Indian Community and Fort Belknap Indian Reservation including effects and projected impacts on the local environment, forestry, agriculture, fish and wildlife, water and air quality, as well as critical infrastructure and public health.

To develop appropriate policies and strategies for addressing effects and projected impacts of climate change on the Tribes and Reservation and for contributing to reduction of climate change.

To develop potential programmatic and/or regulatory actions and changes consistent with said policies, strategies and goals, as appropriate to addressing the effects of climate changes and contributing to reduction of the causes.

To communicate and coordinate with tribal, local, state, regional and national entities and jurisdictions on addressing projected impacts of climate change, including government-to-government cooperation and identification of funding sources and opportunities as possible and available."

BE IT FURTHER RESOLVED, that the Environmental Department, along with all other departments within the Tribal government, shall assess how best to implement the actions under this initiative and how best to incorporate such actions into programs and activities; and

BE IT FURTHER RESOLVED, that Traditional Ecological Knowledge shall be integrated into the FBIC Climate Change Strategic Plan; and

BE IT FURTHER RESOLVED, that the FBIC Climate Change Strategic plan shall remain in effect indefinitely and shall be re-evaluated on an annual basis.

BE IT FINALLY RESOLVED, that the FBICC hereby delegates the authority and responsibility to the Council Officers to sign all documents necessary to effect this action.

ATTEST:



Mark L. Azure, President
Fort Belknap Indian Community Council



Benita Plain Feather, Secretary-Treasurer
Fort Belknap Indian Community Council

CERTIFICATION

I, the undersigned, as Secretary of the Fort Belknap Indian Community Council of the Fort Belknap Indian Reservation, Montana, do hereby certify that the Fort Belknap Indian Community Council is composed of 10 members, of whom 8 members, constituting a quorum were present at a meeting thereof, duly and regularly called, noticed, convened and held this 13th day of April, 2015; and that the foregoing DOI, BIA, ISDA & ISDEAA, 2015 Tribal Cooperative Landscape Conservation Program - Climate Adaptation Planning

Fort Belknap Indian Community

WHEREAS, the Fort Belknap Indian Community Council is the governing body of the Gros Ventre and Assiniboine Tribes of the Fort Belknap Indian Community, Fort Belknap Indian Reservation, Montana, by the authority of the Constitution and By-Laws of the Fort Belknap Tribes approved on the 13 day of December 1935, and

WHEREAS, under the Constitution and By-Laws of the Fort Belknap Indian Community, the Community Council is charged with the duty of protecting the health, security and general welfare of the Fort Belknap Indian Community, and

WHEREAS, The Fort Belknap Indian Community, Climate Change Program, developed this Resolution, so the Fort Belknap Indian Community Council can recognize, support and authorize the Adoption of the Climate Change Advisory Committee; and

WHEREAS, climatic weather patterns are being influenced by the world's dependence on Fossils Fuels, causing Green House Gases to impact the planet, which is significantly affecting our environment, natural resources, traditions and our cultural way of life; and

WHEREAS, the need for a Climate Change Advisory Committee, that would assist the Climate Change Coordinator in developing activities, actions and practices, relating to developing a Climate Change Strategic Adaptation Plan, for our community, to ensure our ways of life continue, through hosting meetings, trainings and workshops; and

WHEREAS, the Fort Belknap Indian Community has received funding from the Bureau of Indian Affairs, Cooperative Landscape Conservation Program, Category 2: Climate Adaptation Planning; and

WHEREAS, the Cooperative Landscape Conservation Programs, Climate Change Adaptation Management Initiative, is intended to support tribes as they identify and address climate challenges; and

WHEREAS, impacts caused from climate change include, loss of habitat from shifting migration patterns, reduced fish and wildlife species, the onset of increased Disease Vectors, such as West Nile Virus, Zika Virus, Epizootic Hemorrhagic Disease, Bubonic Plaque, and other disease pathogens that increase with the warming of the atmosphere, damage to Forest Resources from the increase in the Mountain Pine Beetle, reduced Air and Water Quality and Quantity, damage to Infrastructure from Flooding, Storm events, and the health risks to our community members; and

WHEREAS, The Fort Belknap Indian Community Council (FBIC) recognizes and acknowledges that current impacts are caused from climate change, which directs our goals through Adaptation Planning, that addresses climate change, and FBIC also hereby supports our actions under the BIA, Landscape Cooperative Initiative, Climate Change Adaptation Grant, to develop planning action items, including appropriate programmatic policies and regulatory strategies, that will protect

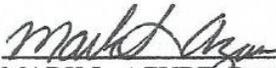
and reduce impacts from climate change, to our natural resources, tribal waters, infrastructure, human health, and our traditional-cultural practices, on the Fort Belknap Indian Reservation; and

THEREFORE, BE IT RESOLVED the Fort Belknap Indian Community Council recognizing and acknowledging these impacts are caused from climate change, does hereby establish the Climate Change Advisory Committee whose members shall consist of the following: Fort Belknap Indian Community Natural Resource Committee Chairmen, FBIC Natural Resource Committee Co-Chair, Tribal Climate Change Coordinator, Tribal Environmental Protection Department Manager, Tribal Fire Management Officer, Tribal Transportation Director, Tribal Planning Department Manager, Tribal Disaster Coordinator, Tribal Environmental Protection Department Water Quality Coordinator, Tribal Historic Preservation Office Program Director, Tribal Tourism Director, Aaniiih Nakoda College Environmental Science/Natural Resource Instructor, Natural Resource Conservation Service District Conservationist, Montana State University Extension Service, and tribal community representatives from Fort Belknap Agency, Hays, Lodge Pole, and Dodson.

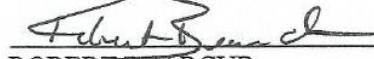
THEREFORE BE IT FURTHER RESOLVED, that the FBIC Climate Change Advisory Committee, shall assess how best to implement the actions under this initiative and how best to incorporate such actions according to provisions in the BIA Climate Change Adaptation Grant; and

BE IT FINALLY RESOLVED, that the council officers are hereby delegated the authority and responsibility to sign all documents necessary to effect this action.

ATTEST:



MARK L. AZURE, President
Fort Belknap Indian Community Council



ROBERT BEARCUB,
Secretary-Treasurer
Fort Belknap Indian Community Council

CERTIFICATION

I, the undersigned, as Secretary of the Fort Belknap Indian Community Council of the Fort Belknap Indian Reservation, Montana, do hereby certify that the Fort Belknap Indian Community Council is composed of 10 members of whom 8 members, constituting a quorum were present at a meeting thereof, duly and regularly called, noticed, convened and held this 11th day of September 2017; and that the foregoing Resolution of the Fort Belknap Indian Community Council was duly adopted and approved by the affirmative vote of 8 for; 0 opposed; 0 not voting; 0 temporary absent; 2 absent: and that the said Resolution has not been rescinded in any way.

DATE: 9/15/17 _____



ROBERT BEARCUB, Secretary-Treasurer
Fort Belknap Indian Community Council

FORT BELKNAP INDIAN COMMUNITY
COUNCIL
Tribal Government

FORT BELKNAP AGENCY
HARLEM, MONTANA 59526
Address

Disclaimer: FBIC Climate Change Adaptation Plan

The FBIC Climate Change Adaptation Plan is designed to increase conversations around climate change and invite participation and feedback in the community. It is a formal attempt to support growing investment in climate change mitigation and adaptation in the Fort Belknap Indian Community. **In no way does this plan express the views of community members who were not at the planning meetings. Additionally, planning participants listed in the Acknowledgments section had varying degrees of input, and their participation should not imply that they agree with any particular parts of the draft plan.** We invite community members to attend future planning meetings when we periodically update and revise this Climate Change Adaptation Plan, and to provide any comments.

Acknowledgements

Financial support for this project has been provided by the Bureau of Indian Affairs' Climate Resilience Program. This plan would not have been possible without the contributions of many people. We would like to acknowledge the following individuals:

Donovan Archambault, *Indian Nations Conservation Alliance*
Steve Archambault, *Tribal Historic Preservation Office*
Morris Davy Belgard, *Environmental Protection Dept. (Non-Point Source) and White Clay Cultural Society*
Lee Blackcrow, *Fire Management*
Michael Black Wolf, *Tribal Historic Preservation Office*
Koda Cochran, *Tribal Health Department*
William Cochran, *Environmental Protection Department (Brownfields)*
David Crasco, *Rancher*
Peggy Doney, *Tribal Lands Department*
Tonya Doney, *Tribal Health Department*
Velva Doore, *Tribal Health Department*
Chet Gladstone, *Bureau of Indian Affairs Forester*
Angelina Gonzalez-Aller, *Center for Large Landscape Conservation*
Randy Hawley, *Fire Management Fuels Specialist*
John Healy, *Director, Tribal Transportation Services*
Mitchell Healy, *Environmental Protection Department (Water Quality)*
Thomas Jones, *Fish and Wildlife Department*
Libby Khumalo, *Center for Large Landscape Conservation*
Brandi King, *Fort Belknap Indian Community Council Member*
Harvey King, *Tribal Historic Preservation - Cultural Monitor /Tribal Community Member*
Byard LameBull, *Fire Management/Disaster and Emergency Services Coordinator*
Michelle Lonebear, *Tribal Health Department*
Dennis Longknife, Jr., *Central Administration – Climate Coordinator*
Harold Main, *Fish and Wildlife Department*
Warren Morin, *Tribal Council*
Ina Nez Perce, *Manager - Environmental Protection Department*
Dolores Plumage, *Blaine County Commissioner*
Kollynn Plumage, *Tribal Historic Preservation Office*
Anne Racine, *Hays Community Member*
Kermit Snow Jr., *Environmental Protection Department (Brownfields)*
Avis Spencer, *Tribal Health*
Lenore Stiffarm, *Tribal Planning Department*
Grace Stonecipher, *Center for Large Landscape Conservation*
Jeremy Walker, *Environmental Protection Department (Water Quality)*
Elizabeth Werk, *Montana State University Extension*
Gerald Hockhalter, *BIA Soil Conservationist*
Donna Young, *Compliance Officer – Environmental Protection Department*
Harlen Young, *FBCEDC – Economic Development Corporation*
Donald Bear, *Brownsfield Coordinator - Environmental Protection Department*

Ashley Kennedy, *Tribal Land*

Caroline Yellowrobe, *Grant Writer – Planning Department*

Shaun Holcomb, *NRCS Extension Agent*

Roc Becenti, *Aphis-Indian Nations Conservation Alliance*

Christina Flansburg, *Brownfields TRP Coordinator – Environmental Protection Department*

Kendra Allen, *Center for Large Landscape Conservation*

FORT BELKNAP INDIAN COMMUNITY STATEMENT FOR CLIMATE CHANGE ADAPTATION PLAN

The main objective was to develop a Climate Change Adaptation Plan that identifies and lists impacts from climate change to our natural resources and cultural ways of life. The main emphasis was also to capture what the Aaniiih Nakoda Tribes are currently doing to make ourselves more resilient to the effects from climate change.

The Fort Belknap Indian Communities' (FBIC) Climate Change Adaptation Plan received financial support from the Bureau of Indian Affairs (BIA), Tribal Climate Resilience Program (TCRP). Many people participated in the development and preparation of this plan. The Fort Belknap Indian Community, would like to acknowledge contributions of the following individuals: The Fort Belknap Indian Community, Climate Advisory Planning Committee, consisting of:

Natural Resource Committee Chairmen, George Horse Capture, Warren Morin and Lynn Cliff
Fort Belknap Indian Community Councilmen Co-Chair, Brandy King, Dominic Messerly
Climate Change Coordinator, Dennis Longknife Jr.
Environmental Department Manager, Ina Nez Perce
Tribal Fire Management Officer, Lee Blackcrow, William Blackcrow, Fuels Specialist/John Young
Transportation Director, John Healy and Wes Cochran
Tribal Planning Director, Loretta Hawley, Delina Cuts The Rope, Amy Murdock, Grant Writer/Loretta Kirkaldie and Caroline Yellowrobe
Tribal Land, Peggy Doney
Tribal Roads, Pete Bishop
Disaster Emergency Services Coordinator, Byard Lamebull and Gilbert "Buddy" Horn
Environmental Department-Water Quality Coordinator, Mitch Healy
Aaniiih Nakoda College, Dan Kinsey/Natural Resource Instructor
Natural Resource Conservation Service Agent, Shawn Holcomb, Blake Stiffarm/Service Tech
MSU Extension Service Agent, Elizabeth Werk, Hilary Maxwell
BIA Soil Conservationist, Gerald Hockhalter
BIA Forestry, Chet Gladstone
Environmental Department-Non Point Source Program, Morris "Davy" Belgard, Compliance Officer, Kermit Snow, Jr
Tribal Health Representative, Avis Spencer and Michelle Lonebear
Tribal Historic Preservation Office Manager, Michael Blackwolf
Fish and Game, Harold Main and Tom Jones
Fish and Game Biologist, Michael Kinsey
Buffalo Program, Bronc Speak Thunder
Language Preservation, Ray Cichosz
Aaniiih Nakoda College, MSU Extension Program, Manny Morales

Additional Contributions/Review:

Kolynn Plumage/Fort Belknap Agency community member, Don Racine, Harvey King/Hays community members, Donovan Archambault and Hannah Has Eagle/Lodge Pole community members, Warren Matte and Joey Kill Eagle/Dodson community members
Elders: Dr. Lenore Stiffarm, Dan Spencer, John Allen.

Special Thanks to the following groups and individuals for their dedicated participation:

Libby Kumhalo, Angelina Gonzales-Aller and Rebecca Watters/Center for Large Landscape Conservation, Michael Durgalo/Confederated Salish and Kootenai Tribe's, Cultural Preservation Director, Delores Plumage/Blaine County Commissioner, Roc Bacenti/Indian Nations Conservation Alliance.

Special Thanks to the Institute for Tribal Environmental Professionals (ITEP), and their Climate Change Training Program: Dennis Longknife, Jr., benefitted greatly from the trainings given by ITEP, to lead his climate change program. Thanks to Sue Watkins/former ITEP Climate Change Coordinator, and Thanks to Co-Managers Nikki Cooley and Karen Cozzetto.

FBIC Climate Change Adaptation Plan

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Key Climate Change Terms¹

Adaptation: actions in response to actual or expected climate change and its effects, that lessen harm or exploit beneficial opportunities. It includes reducing the vulnerability of people, places, and ecosystems to the impacts of climate change.

Adaptive Capacity: the ability of a system to accommodate or respond to the changes in climate with minimum disruption or cost. Generally, systems that have high adaptive capacities are better able to deal with climate change.

Climate: the “average weather” generally over a period of three decades. Measures of climate include temperature, precipitation, and wind.

Climate Change: any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period of time (decades or longer). Climate change may result from natural factors and processes and from human activities that change the atmosphere’s composition and land surface.

Exposure: the presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.

Mitigation: actions that reduce the levels of greenhouse gases in the atmosphere; includes reducing emissions of greenhouse gases and enhancing sinks (things that absorb more greenhouse gases than they emit). Examples include switching to renewable energy sources and implementing energy efficiency measures.

Resilience: ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to absorb stress and change.

Sector: general grouping used to describe any resource, ecological system, species, management area, etc. that may be affected by climate change. For example, Transportation, Utilities, Water Resources, Forest Resources, Human Health, or Cultural Resources and Traditions.

Sensitivity: how much a system is directly or indirectly affected by changes in climate conditions (e.g., temperature and precipitation) or specific climate change impacts (e.g., sea level rise, increased water temperature). If a system is likely to be affected by projected climate change, it should be considered sensitive to climate change.

Vulnerability: the susceptibility of a system to harm from climate change impacts. It’s a function of how sensitive the system is to climate and the adaptive capacity of the system to respond to such changes. Generally, systems that are sensitive to climate and less able to adapt to changes are considered vulnerable to climate change impacts.

Introduction

Tribal histories, governance, and culture

Fort Belknap Indian Community is home to the Gros Ventre and Assiniboine Tribes (the Aaniiih and Nakoda Nations). The Gros Ventre call themselves “AH-AH-NE-NIN” meaning the White Clay People, and the Assiniboine refer to themselves as “Nakoda” meaning the generous ones.¹ For the purpose of this plan, we will be referring to the community as Fort Belknap Indian Community, or FBIC for short. The Gros Ventre and Assiniboine peoples were nomadic hunters and warriors who followed the buffalo which provided them all the necessities of life.² The reservation is located 43 miles south of the Canadian Border and 20 miles north of the Missouri River, which is on the route of the Lewis and Clark Expedition.

Established in 1888 by an act of Congress, the reservation is part of the vast ancestral territory of the Gros Ventre (not Blackfeet) and Assiniboine Nations. Over 720,000 acres in size, it extends 28 miles east to west, and 35 miles north to south. Almost 92% of the reservation is located in Blaine County, with the rest in Phillips County.³ Fort Belknap Indian Community has 8,000 enrolled members and three main communities on the Reservation, and one community called Dodson, located near the northeast boundary. Hays and Lodge Pole communities are located on the southern end in the Little Rocky Mountains, with about 840 and 270 people, respectively.⁴ Fort Belknap Agency (Agency), with an estimated 1,290 people, and the Dodson area that has a small population of American Indians living there.⁵ The town of Harlem is located just outside the reservation to the north, with an estimated 840 people, over half of whom are American Indian.⁶

The Reservation land is mostly rolling plains, with the Milk River as the northern border, including the Milk River Valley, and Short Grass Prairie, and the Little Rocky Mountains on the south. A portion of land in our mountains (Notch) was taken away from FBIC in a land deal called the Grinnell Agreement, in which George Bird Grinnell negotiated and threatened to take away rations if FBIC did not sign - all for gold which was discovered in the early 1890's. In another landmark case, called the 1908 Winters Doctrine (*Winters v. United States*), the US Supreme Court was pivotal in determining reserved water rights for tribes. The Fort Belknap Tribes pursued the case as non-Indian settlers began diverting and using water from the Milk River on their northern border. This case set standards (or the precedent?) for the federal government acknowledging that indigenous water rights supersede settlers for the continuing survival and self-sufficiency of tribal peoples.

¹ ftbelknap.org, “Home of the Nakoda and Aaniiih Nations,” Welcome to Fort Belknap Indian Community, 2019, <https://ftbelknap.org/history>.

² ftbelknap.org. (2019). Home of the Nakoda and Aaniiih Nations. Retrieved October 10, 2019, from Welcome to Fort Belknap Indian Community website: <https://ftbelknap.org/history>

³ “DPHHS Takes Step to Prevent West Nile Virus Infection,” June 28, 2018, <https://dphhs.mt.gov/aboutus/news/2018/westnilevirus>.

⁴ “U.S. Census Bureau,” 2010, <https://www.census.gov/prod/cen2010/cph-2-1.pdf>.

⁵ “U.S. Census Bureau.”

⁶ “Harlem, MT Population - Census 2010 and 2000 Interactive Map, Demographics, Statistics, Quick Facts – Census Viewer,” accessed October 25, 2019, <http://censusviewer.com/city/MT/Harlem>.

Together tribes have developed and maintained a community that has deep respect for its land, its culture, and its heritage.⁷ The Fort Belknap Indian Community Council (Tribal Council) governs the Fort Belknap Reservation. The Council is charged with protecting the security, health, and general welfare of the community. The Council has eleven members, including the President and Vice President, who serve four-year terms, four Gros Ventre and four Assiniboine members who are elected every two years, and a Secretary Treasurer who serves four years.

Ways of Knowing and Environment

Elders from the Gros Ventre and Assiniboine Tribes tell us that the Ways of Knowing - how we lived - centered around the Sundance Religion, which was handed down to us from generation to generation. The word “culture” was not in our vocabulary. Our climate and weather patterns influenced how our native plants and animals persisted in the environment, developing the capacity to become resilient, including how our Ways of Knowing and lifestyles have evolved and changed throughout history.

We live in a prairie environment and enjoy living off our land, hunting, fishing, gathering and harvesting native plants like our ancestors did. Our natural resources provide lots of wildlife, such as upland game birds like the pheasant, quail, sharp-tailed grouse and sage grouse, and migratory waterfowl such as the mallard, northern pintail, Canada geese. We also have big game animals such as the whitetail, mule deer, elk, moose, black bear, mountain lions, pronghorn antelope, and bighorn sheep. In the Milk River we have walleye, perch, carp, suckers, channel catfish, and northern pike, and in our streams, reservoirs, and lakes, we have stocked fish such as largemouth bass, rainbow trout, and eastern brook trout. Within the prairie streams, we have several species of prairie fish/minnows, such as: Long-nosed Dace, Northern Redbelly Dace, Iowa Darter, Black Bullhead, Fathead Minnow, and Brook Stickleback. Our prairies are home to two separate bison herds, the Yellowstone herd is located near Peoples Creek, numbering over 145 buffalo, and the Snake Butte Herd has over 1400 buffalo. *(2022 estimate-Bronc Speak Thunder/Buffalo Manager)*

Our tribes rely heavily on bison, deer and elk. The meat is either sliced and hung to dry, called “Dry Meat”, or mostly just cut up and shared with family members and elders. Before we take something from the ground, there is a ceremonial practice that takes place, we pray to the Creator, and give offerings or burn tobacco. In turn, the Creator will bless us. We always watch for “Signs”, being observant makes you a better hunter. One such teaching is teaching our young to respect your elders and to keep quiet and Listen when an Elder speaks. These practices increase the overall success of the hunting party and life in general.

We still continue our cultural practice of harvesting berries, mainly the June Berry (Service Berry), which we offer at our ceremonial gatherings, pow-wows and annual community events.

Socioeconomic profile

The Fort Belknap Indian Reservation is located 40 miles south of the Canadian border and 20 miles north of the Missouri River. Encompassing approximately 720,000 acres, Fort Belknap is the fourth largest

⁷ ftbelknap.org, “Home of the Nakoda and Aaniiih Nations.”

Indian Reservation in Montana. Home to both the Gros Ventre and Assiniboine Tribes, roughly 50% of the 7,000 enrolled tribal members live on or near the reservation.⁸

Four community districts make up the reservation: Agency, Hays, Lodge Pole, and Dodson (Just off the eastern boundary). Agency is the dominant regional job center with the primary employers being the tribal government, Indian Health Service, Bureau of Indian Affairs, and Aaniiih Nakoda College. And while the Tribes operate a 477 Program aimed at providing more effective tribal employment, training and related service programs, socioeconomic challenges still face many tribal members today.⁹ The unemployment rate has gone up significantly, rising from 11.4% to 26.5% in just three years (2012-2015), and roughly 41% of residents live in poverty.¹⁰ The unemployment rate of FBIC is significantly higher than the state of Montana which reported an unemployment rate of 4.2% in 2015.¹¹ Located in north central Montana, Fort Belknap is isolated from major economic hubs in the state and because of its limited retail establishments, a majority of the wages earned on the reservation are spent in neighboring towns off the reservation, and many community members travel upwards of 220 miles one-way for weekend entertainment, rest and relaxation.¹²

Where there are challenges there is also success. In 3 years alone, the 477 program has served over 5,000 people, helping achieve an average earnings gain of \$4.50 per hour.¹³ Agriculture is also present. With rolling plains making up a large area of the reservation, small cattle farms and raising alfalfa hay for feed and larger farms is a big industry.¹⁴

Pre-existing weaknesses and threats that will likely interact with climate change

Climate change interacts with preexisting conditions in complicated ways that affect a community (or other living things) ability to adapt and thrive. Weaknesses are challenges within a community that are usually under a community's direct control, and threats, which are challenges beyond the control of a community, both influence the ability of a community to respond to climate change. Weaknesses and threats can exacerbate climate change vulnerability, increasing people's exposure and sensitivity to climate change impacts while reducing adaptive capacity and the ability of people's ability to recover and withstand consequences of climate change. This section provides a brief overview of four major challenges that will likely interact with climate change impacts. Additional threats and weaknesses are listed as existing areas of vulnerability in sector chapters. Addressing any number of these weaknesses and threats could fortify the Fort Belknap Indian Community and increase our adaptive capacity.

⁸ Montana Governor's Office of Indian Affairs et al., "Fort Belknap Reservation Demographic and Economic Information," October 2013, <https://lmi.mt.gov/Portals/135/Publications/LMI-Pubs/LocalAreaProfiles/Reservation%20Profiles/RF13-FortBelknap.pdf>.

⁹ FBIC, "Fort Belknap Indian Community, Montana P.L.102- 477 Employment and Training Program Year 2014 Annual Report," 2014, https://www.bia.gov/sites/bia.gov/files/Fort.Belknap.AR_.2013.2014%20Comp%20508.pdf.

¹⁰ MSU, "Fort Belknap Reservation: Montana Poverty Report Card" (Montana State University Extension, August 2017), file:///C:/Users/ANGELINA/Downloads/FortBelknapUnemployment.pdf.

¹¹

¹² FBIC, "Fort Belknap Indian Community, Montana P.L.102- 477 Employment and Training Program Year 2014 Annual Report."

¹³ FBIC.

¹⁴ "2017 Fort Belknap Indian Community Directory," n.d.

Most recently, changing land ownership patterns in the region are threatening access to land. People and organizations with high levels of power and money are moving into the region with ideas about land ownership that differ from the recent past and/or the values of FBIC. Some planning participants have reported that with new landowners in the region, people are losing access to places where they used to hunt, where landowners once welcomed them to hunt on private property.

Hazardous mining waste

Fort Belknap Indian Community works hard to protect its water. This is particularly a challenge since Pegasus Gold Corporation abandoned the Zortman-Landusky Gold mine, just south of FBIC in the Little Rocky Mountains. Pegasus went bankrupt twenty years ago and left a \$100 million-dollar clean-up bill.¹⁵ Resulting water contamination has elevated levels of heavy metals that have killed off all aquatic life in the streams.¹⁶ The contaminated water also flows past the powwow and Sundance grounds, and through the tribal community of Hays.

Communication barriers

While many, if not most, challenges to the Fort Belknap Indian Community are threats posed from outside the reservation, several planning participants explained that communication barriers in the community can impede much-needed planning and action. Several people explained that often people struggle with communicating their problems and frustrations directly. Climate change is a complicated issue that will require careful and regular communication to ensure that problems are discussed and confronted in effective ways.

¹⁵ Mark Olalde, "Mining Companies Polluted Waters, Leave Taxpayers Holding the Tab," The Billings Gazette, March 24, 2019, https://billingsgazette.com/business/mining-companies-polluted-waters-leave-taxpayers-holding-the-tab/article_1b909ecd-8325-5e96-b4f5-45bd24af38fa.html.

¹⁶Olalde.

Water Warriors... Water Protectors: Prevailing Amidst Major Challenges

By Dennis Longknife, Jr.

Water is essential for life, as tribal people we hold WATER very SACRED, and to be able to work in the water quality field is an HONOR. How are we going to adapt for times of water shortages? Will we have to fight for our right to have water? It's not too late to begin developing ways we can protect our water resources!

When I was a young college student, I became involved with our Environmental Department, as a college intern, collecting and sampling water in the Little Rocky Mountains. At this time, we had one of the largest Cyanide Heap Leaches Gold Mining operations in the world, called the Zortman-Landusky Gold Mine, at the headwaters of our reservation. After every storm we had in the mountains, it would wash the cyanide and mine tailings down into our streams, plugging up all our beaver dams, and the bedrock in stream bottoms, with mine silt and Acid Mine Drainage (1990's). One very sacred mountain known to us was called Spirit Mountain - they removed it, all for a truck load of Gold. We fought for years to get the Gold Mine shut down, and finally in 2000, after several water quality violations, we won our fight, but it came with a very expensive burden, our groundwater is forever contaminated for the rest of our lives, and has to be treated indefinitely.

I always tell the younger college students, "You have a bright future ahead of you. Some may have a harder time getting through it all, just like me, but keep your head up and stay strong." I followed through with my promise to my tribal community and now I am giving you a challenge. Become educated in any science field, bring back what you learned and apply those principals to begin protecting your Natural Resources, for your tribal communities.

As I got more educated, I eventually got hired by my tribe as a Wetlands Specialist, for the Environmental Protection Department and developed an Aquatic Resource Protection Ordinance (ARPO) in 2004, that protects our Wetlands and Riparian Areas, from construction or development. I did not complete this on my own, I had help from a few other tribal members, Morris "Davy" Belgard, former Water Quality Coordinator and Dan Kinsey, Natural Resource Instructor-Aaniiih Nakoda College. In 2004 we were all awarded the "Frank DeCouteau Award", from EPA Region 8, for the development of the "Aquatic Resource Protection Ordinance", for our tribal community. There is a Legacy you can leave behind, to ensure our future generations can enjoy and benefit from your work.

Fort Belknap Indian Community 2050

Throughout the course of developing this plan, community members and participants in the planning process developed and reviewed a series of vision statements intended to capture how the community would like to see itself by 2050. At its core, climate change adaptation is planning for the future, and sharing a vision for the future is one way to anchor adaptation planning in a way that serves the needs, goals, and interests of the community. Over the course of the next thirty years, the Fort Belknap Indian Community wishes to collectively build a community with a safe and healthy environment that preserves the harmony of people and nature living in tandem with each benefitting from the presence of the other. Specifically, the people of FBIC envision a future...

- where the reservation and people are protected by the upholding of treaty rights that extend to secure land ownership and hunting rights for tribal members;
- where people are respectfully and carefully passing on customs and traditions like traditional ecological knowledge and hunting traditions;
- where people know and understand the importance of language and land;
- where people are not defined by blood degree, and people are recognized by their connections to the community, where the community acknowledges individuals and individuals acknowledge the community;
- with improved infrastructure from higher quality housing to safe drinking water and improved plumbing, to community facilities that are well-maintained, and high-quality educational opportunities for youth;
- the community is supported by a well-funded healthcare system which is carefully monitored to ensure the needs of the people are met;
- where everyone is able to live free from alcohol, abuse, drugs, and violence;
- where a well-developed and informed climate adaptation plan guides actions and helps the community protect itself, the land, and every living being in a changing world.

Shared values

Values are something important to you, a guiding light, something you protect or hold in your heart, and is often something you share with others. During a planning workshop, participants shared some of the things that they hold dear. The sharing session was designed to serve as a reminder to ourselves of why we are planning for the future and how the climate adaptation plan will reflect these values. Everyone was handed note cards and asked to write a word representing a value they hold. The note cards were collected and arranged on the wall to help visualize shared values. A short discussion followed. Here is a list of the values discussed: family, spirituality, water, people and the resources needed to sustain them, past and present history of my family, the future, commitment, honesty, customs and traditions, ceremony, friendship, health, entertainment, sharing, objectivity, air, earth, wind, fire, land, fishing areas, birds, hunting deer.

Why is the Fort Belknap Indian Community Planning for Climate Change?

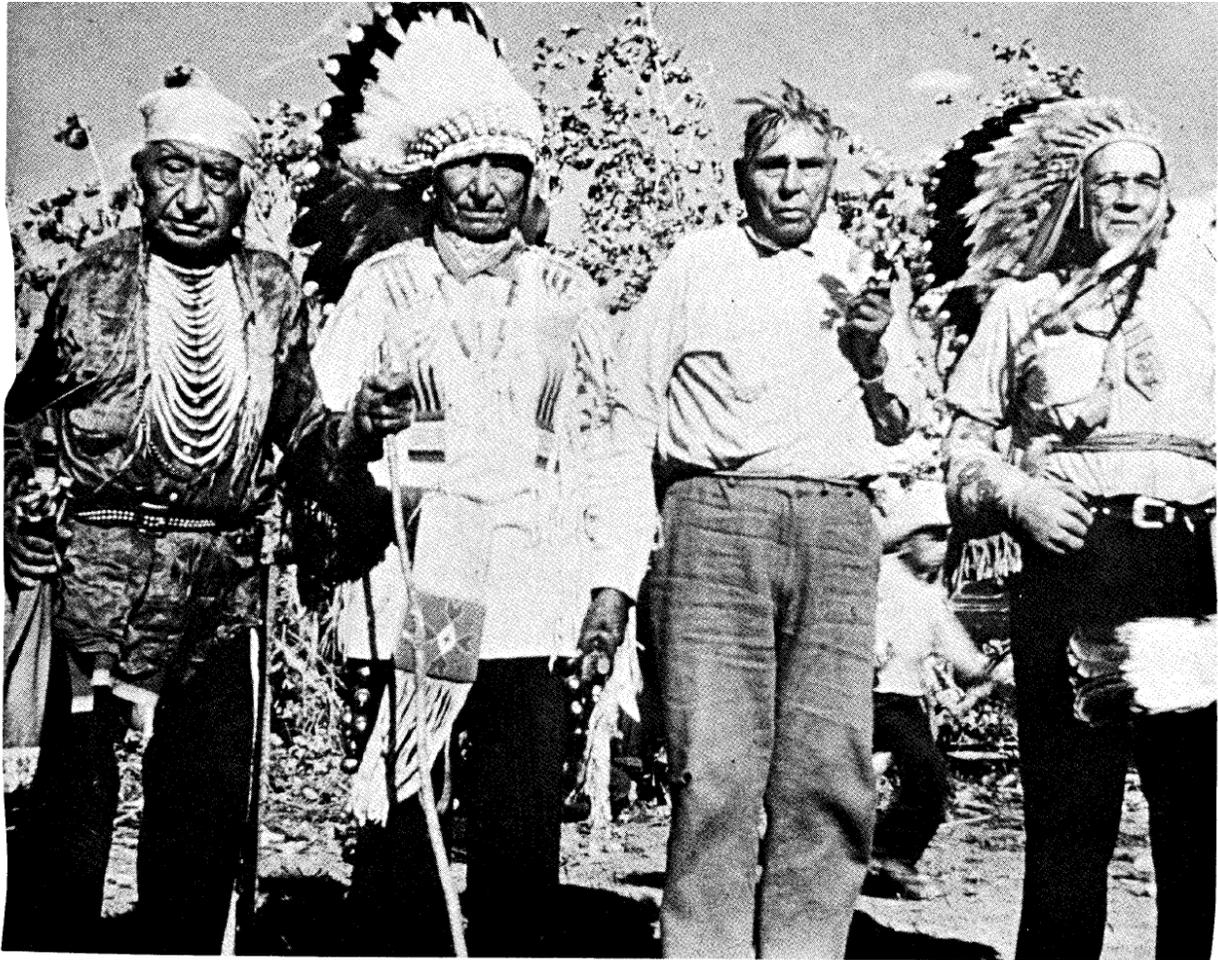
For hundreds and thousands of years, bison roamed free on our prairies, and tribes lived in harmony with the land, taking only what we needed to survive, nothing was wasted - that's the approach we need to take, if we want to be successful in restoring our sagebrush habitat. Climate change is beginning to impact our prairies and all the wildlife that depend on them; we need to ensure that the prairie habitat is protected and preserved. Although sagebrush looks very hardy, it is

very sensitive to variances on how healthy the surrounding ecosystem is. Working in this sage dominated landscape you see how it provides important habitat for all prairie species, as a shelter from snowstorms, shade from the hot summers, and breeding areas for our grassland bird species, such as the prairie chicken and sage grouse. In fact, these sagebrush habitats are very fragile "vulnerable" habitats and lack the "adaptive capacity" to regenerate efficiently, especially in areas where we have poor grazing practices. Adaptation plans to develop a native grassland restoration and education-outreach program will enable the sage to not only regenerate, but to revive and flourish.

Almost all the Elders will say that our winter snows were deep and lasted longer. Current generations are dealing with shorter, colder winters and drought patterns that are beginning earlier in the spring. These weather changes are causing some impacts to our natural resources, and it is up to us to begin planning how we will adapt to the changing climate. How will we do this? That is the task that we are faced with: **“To develop a Climate Change Adaptation Plan for our community and highlight how we as a people will continue to adapt, to ensure our traditions and culture flourish”**. Adaptation planning includes identifying and prioritizing wildlife and plant species we rely on for subsistence and helps us focus our vision for the future.

To have a truly unique adaptation plan specific to the needs of FBIC, our tribal community will be using both western science methodologies and Traditional Ecological Knowledge (TEK). Our ancestors before us used signs given to us by nature and observed how plants and animals reacted to the climate changes, and stories were created this way, which were handed down through the generations, by campfire to campfire. Those stories are still guiding our planning efforts.

"As long as the earth is here, we are here." – An Elder



ELDERS OF THE FORT BELKNAP RESERVATION POSE DURING A CELEBRATION IN THE EARLY 1950'S. THEY ARE FROM RIGHT TO LEFT: MR. SAM KING, MR. PETER WING, MR. PAUL PLUMAGE, AND AN UNIDENTIFIED MAN. EVEN AT THIS LATE DATE NUMEROUS ITEMS OF TRADITIONAL ART CAN STILL BE SEEN. MR. KING IS WEARING A CROW STYLE NECKLACE AND A TRADECLOTH BREECH CLOTH. MR. WING IS WEARING A QUILLED SHIRT.

Photo of elders from a 1977 calendar published at Ft. Belknap

Planning goal: a statement from the planning workshops

Change is imminent. A new era of changes is already visible. Climate change affects everything around us, including health. We want to take care of ourselves, help each other, and bring our community back together. We want to protect our community from catastrophic changes.

To protect our community, we need to increase resilience. Resilience is like a sponge that bounces back when you press on it. We want to prepare for changes and make a plan to meet new situations and conditions so that we bounce back. Every one of us has a stake in our reservation and way of life, whether we own land or not. Conservation is important. We want to know when and where to focus on issues – to create a set of priorities. And then we want to act on our priorities, to stabilize the situation.

Climate change mitigation accomplishments

Both mitigation and adaptation are crucial for protecting life on earth. While this plan focuses most on climate change adaptation, opportunities for reducing greenhouse gas emissions (“mitigation”) are also highlighted. Many proposed adaptation actions, like wetlands protection and restoration, also have the effect of reducing carbon in the atmosphere.

FBIC has taken a variety of actions to reduce greenhouse gas emissions, for example:

- A wind turbine powers the Transportation Office;
- In 2011, the Gros Ventre and Assiniboine Tribes completed the Fort Belknap Energy Efficiency Plan;
- The Tribes retrofitted 8 Tribal buildings and 2 offices with energy efficient lighting in 2011 and 2012; and
- The Tribes Installed ten solar panels in Tribal program offices in 2011 and 2012.



Planning in a regional context

In 2007, the State of Montana released the Montana Climate Change Action Plan which provides over 50 policy recommendations to help reduce the state's greenhouse gas emissions by 2020. In 2017, researchers from the University of Montana and Montana State University released the *Montana Climate Assessment*, detailing climate change impacts to forests, water and agriculture in the state. While some cities have developed climate change plans, including Bozeman, Whitefish, Helena, and Missoula, there are few, if any, places in eastern Montana with climate adaptation plans. **This plan makes FBIC a leader in climate adaptation for the eastern Montana region.**

Community-based observations of climate change impacts

Community members are already observing many changes as a result of shifting climate. It is worth noting that this section includes some contrasting observations, as we seek to highlight how different people are observing and interpreting both climate trends and weather events. This chapter first highlights five areas of change observed by Dennis Longknife, Jr., FBIC Climate Change Coordinator. The second part of the chapter provides a summary of observations from twenty community members who were surveyed at the 2019 Mid-Winter Fair.

Five areas of change

By Dennis Longknife, Jr.

Shifting Habitats

Many plant and animal species are being found further north and at higher elevations than previously observed. Rising temperatures, changing precipitation patterns and shifts in native plant communities are changing the effective range and distribution of many wildlife species. These habitat shifts impact species and ecosystems. **Mosquitos** that were only found along the Milk River Valley, are now found in places on the prairies and foothills of the Little Rocky Mountains.

Changing Migration Patterns

Climate change is causing migration patterns to change, such as migrating waterfowl, that either come early or late depending on winter weather patterns. As a result of vegetation and water changes, big game migrations are shifting to areas better suited for them. Being able to adapt as a hunter is key to being successful.

More Pathogens/Viruses

As it gets hotter and drier, disease vectors have increased, bringing in strains of new viruses, such as the **West Nile Virus**, which is already beginning to cause problems in secluded areas of our reservation. Horses and horse handlers are most susceptible. Mosquitos and birds are the carriers. It is even being observed that the Mosquito habitat is spreading into tribal communities that did not have any mosquito problems in the past (like in Elk Habitat).

Epizootic Hemorrhagic Disease (EHD) is a virus caused by a black fly/midge carrying the EHD Virus. In the fall, if the weather and climate patterns are just right (hot and dry), these midges can effectively wipe out or drastically reduce whitetail deer populations. For example, back in 2013, deer population was drastically affected and our Tribal Fish and Game Department had to shut down hunting in the Milk River, which affected many tribal members who rely on harvesting deer for subsistence.

Avian Influenza Virus (Avian Bird Flu, H5N1) is a virus that most commonly spreads from bird to bird. For that reason, migratory birds are considered to have played an important role in the spread of this dangerous virus. It is deadly to most birds, and it can be deadly to humans and to other mammals that catch the virus. How bird species are expected to modify their wintering sites in response to climate change, and in turn affect the geographic distribution (hot spots) of the risk associated with H5N1 outbreaks is unknown and research is still on-going. Our reservation is located within the Central Flyway for migrating waterfowl. In 2015, officials from the Montana Department of Livestock officials confirmed cases of avian influenza in chickens in Judith Basin County, less than a week after the disease killed a captive falcon in Columbia Falls. It is the first case of the disease in a domestic flock in Montana. One hundred chickens were placed under quarantine and were killed, burned, or buried to prevent further spread of the disease.

Catastrophic Wildfires

Climate change is driving rapid forest degradation, jeopardizing water, people, and wildlife. A century of fire suppression as a management tool and the rise in extreme weather conditions has resulted in catastrophic wildfires which burn hotter, longer, and ignite more quickly than before. To address this, we are beginning to go back to the practice our ancestors used: using fire as a tool to manage forests and make them healthy again. In the fall of 2018, we had some controlled burns that were very successful in reducing fire potential near our tribal communities. This included burning thinning piles in the forests, which contain both bug-killed and disease-damaged trees.

Mountain pine beetle is a native insect that can grow into large epidemics and cause lots of damage to forest trees. Hot and dry weather patterns seem to be the catalyst, so proper forest management needs to take place to lessen the impacts. Beetle infestations can also make forests more susceptible to wildfires. Currently the Little Rocky Mountains do have populations of the Mountain Pine Beetle.

Drought

In 2017, we had one of the worst droughts on record, brought on by no snow pack the previous year, followed by no spring precipitation. By the end of June, we were already beginning to fall into the drought pattern. Wildlife perished, including livestock, and water resources dried up. Our agriculture was hit hard. Our prairies are home to many resilient species, from native plants such as wild onion, turnips, sage, yarrow, and buffalo grass, to western meadowlarks, antelope and of course our buffalo.

Our prairies can be a very rough and arid environment to live in, however to experience all three impacts (drought, wildfires and pathogen attacks) at the same time, just goes to show you how resilient our land is. How we prepare for these impacts, by coordinating various meetings within our tribal structure is important. When it comes to protecting our community, our tribal programs show incredible resolve.

Observations from the community

Climate vulnerability: seasonal change, extreme weather, traditional activities, human adaptation, and wildlife

In February 2019, Dennis Longknife, Jr., distributed a questionnaire at the Mid-Winter Fair in Fort Belknap Agency to help understand what people are observing about climate change impacts and vulnerability in the community. Twenty elders from our community responded. This section provides a summary of the responses. The lettered numbers in parentheses, for example “R15”, indicate a coded respondent number that reflects each of the twenty respondents.

Perceived changes and impacts to seasons and weather events like storms

Respondents reported seeing changes in weather severity, predictability, fluctuation, and timing. Ten people described seeing changes in weather severity. While five people reported “milder winters with less snow” (R9), one respondent reported seeing “more snow” (R15). Reduced snowfall was sometimes linked to drought and land being “very dry” (R7, R18). Other people reported seeing more severe spring and summer storms and more severe wind, hail, and snow (R1,R5).

“We used to get our first (winter) storm in September, now it comes in November to December, this year it was January”

Two people described the weather as being less predictable, saying weather is “fluctuating more” and that people “used to be able to predict how weather was going to be” but that “patterns are not consistent like they used to be” (R5) and that there are now “bigger weather and temperature changes” (R16).

Changes in seasonal timing also emerged as a theme. One respondent found that it “snowed later in the year” (R6), but two others find that the winter season is lasting longer (R7, R8). Another respondent observed that there is a “longer summer season” (R2).

Perceived impacts of seasonal change and storms on natural resources

Respondents reported a variety of impacts climate change is having on natural resources. In regards to wildlife, two people reported seeing “more grasshoppers and bugs” (R15, R16), another is seeing that “birds that are supposed to be gone for the winter are still around” (R2), and someone else observed that fish are being affected by water temperatures (R18). Extreme events like heavy precipitation and flooding were mentioned, as were some of their impacts: changes in water movement and “natural water trails, plus erosion, and “natural water trails” (R13, R3).

*“Last year this place could have been the land of 10,000 lakes, it was the most flooding I’ve ever seen.”
-Dennis Longknife, Jr.*

People also reported drought and “not enough moisture” (R6, R19) and wind damage to buildings and trees (R15, R16, R10).

“By the end of June the effects of drought were already being felt, but September was the worst of it.” -Dennis Longknife, Jr.

Perceived impacts of storms on people

Respondents highlighted two key ways storms impact people: damage to infrastructure; and sparking adaptation. In regard to infrastructure, respondents highlighted water damage, power outages, and loss of access to drinking water due to frozen pipes (R18, R3). Six people highlighted that while there are still significant needs for adaptation, people are already taking action. For example, one person said “because not many people burn wood anymore when the weather knocks the power out, more and more there is a need for back-up power such as generators (R11). Another respondent reported seeing “emergency generators at the community center” (R8), and another that “families are resorting back to wood stoves and firewood to heat their homes” (R20). Perhaps these kinds of actions are why another respondent stated that “people are becoming more aware of storms and are starting to prepare better for them” (R18). People also observed that there are “more plows on the road” and a “need for more firewood” (R3, R14). These responses demonstrate some of the ways FBIC is becoming more resilient in the face of climate change impact.

Perceived changes in timing of traditional and cultural activities

The questionnaire asked people to comment on changes in the timing of traditional and cultural activities, whether due to native plants blooming at different times or wildlife populations and habitat change, or other impacts to activities. Six people listed seeing changes to the timing of plant harvesting, including finding: “earlier harvesting of wild turnips” (R1); that “berry picking and root harvest seem to happen later in the season” (R2); and that there are changes with “picking sweet sage” (R4). The timing of celebrations and ceremonies have also been impacted. For example, the “Hays Powwow and Sun Dance have been moved to late summer due to colder, wetter weather” (R8) and “spring welcoming and fall goodbye” have changed as well (R15, R16). Fire restrictions and burn bans during periods of high fire risk also limit the use of roads and trails that provide access to cultural activities. Lastly, several respondents mentioned changes in the timing of planting, growing, and gardening (R4, R13, R17).

Types of wildlife that have disappeared or are rarely seen that used to be in large numbers

Respondents identified ten types wildlife they perceive have disappeared or are rarely seen that used to be in large numbers, though their answers do not reflect whether or not the respondent links wildlife changes to climate or other drivers of decline. For example, one person said, “back in the early 1970's, sage grouse were all over the place” (R11). This sentiment was also captured from a participant at a workshop that said, “sage grouse were plentiful, and our diets included them as one of our main foods, usually made into soup.” In addition to sage grouse, they listed magpies, white tail deer, antelope, prairie chicken, buffalo, elk, pheasants, bees, and butterflies as animals that are less commonly seen.

Climate Trends and Major Areas of Impacts in North Central Montana

An introduction to climate change impacts in the region

In September 2017, an extreme flash drought hit northeastern Montana. The drought, according to Tanja Fransen of the National Weather Service in Glasgow, was “unprecedented” in recorded history in terms of its speed of intensification and its severity.¹⁷ It triggered a drought emergency declaration by Montana’s Governor Steve Bullock. It hurt farmers and cattle ranchers, with three quarters of producers experiencing crop losses, and it cost the Northern Great Plains region an estimated \$2.5 billion.¹⁸ Then in April of 2018, spring runoff and rains flooded the region and forced another emergency declaration for multiple counties and the Fort Belknap Indian Reservation.¹⁹ Several homes had to be evacuated in Harlem, and roads were damaged by floodwaters.²⁰



Photo Nov. 2022

One of one of our perennial streams called, Little Peoples Creek, that actually dried up for a brief period, so cattle drank water from the pools left in the drought.

¹⁷ Kathleen McLaughlin, “The Unprecedented Drought That’s Crippling Montana and North Dakota,” *The Guardian*, September 7, 2017, <https://www.theguardian.com/environment/2017/sep/07/flash-drought-north-dakota-montana-wildfires>.

¹⁸ Lewis Kendall, “‘The Worst Drought We’ve Ever Had:’ Farmers, Ranchers across the State Struggle with Historic Dry Spell,” *Bozeman Daily Chronicle*, September 3, 2017, https://www.bozemandailychronicle.com/news/agriculture/the-worst-drought-we-ve-ever-had-farmers-ranchers-across/article_fc65ca8b-ef2b-5781-8671-ca2b9dd823e1.html; “Research Links Specific 2017 Extreme Weather Events to Climate Change,” *Mongabay Environmental News*, January 2, 2019, <https://news.mongabay.com/2019/01/research-links-specific-2017-extreme-weather-events-to-climate-change/>.

¹⁹ “Snowmelt Floods Roads, Fields in Much of Northern Montana, Prompting Flooding Emergency | Montana News | Billingsgazette.Com,” accessed June 5, 2019, https://billingsgazette.com/news/state-and-regional/montana/snowmelt-floods-roads-fields-in-much-of-northern-montana-prompting/article_4a4eff4b-318e-5aa0-ac0d-19ae60fb1620.html.

²⁰ “Snowmelt Floods Roads, Fields in Much of Northern Montana, Prompting Flooding Emergency | Montana News | Billingsgazette.Com.”



Massive flooding in Chinook, MT, in 2018. Photo from www.weather.gov/tfx/SpringFlooding2018

Are these weather events unusual occurrences or part of a trend?

For many people, the 2017 flash drought and 2018 flooding are tangible examples of how climate change is already impacting the Fort Belknap Indian Community and broader North Central Montana region. While it can be challenging or even misleading to attribute any single weather event like a flood or drought to climate change, climate projections for the region predict that more frequent droughts and floods are part of an overall trend, along with other extreme weather events.²¹

Temperature and precipitation patterns are changing

The average annual temperature in Montana increased 2.7°F between 1950 and 2015.²² Average temperatures in the North Central Climate Region have been increasing in .51°F each decade since 1950.²³ With rising average temperatures, Montana's growing season length has increased by 12 days since 1951.²⁴ However, actual growing capabilities have not necessarily increased since they are limited

²¹ C Whitlock et al., "2017 Montana Climate Assessment" (Bozeman & Missoula MT: Montana State University and University of Montana, Montana Institute on Ecosystems, 2017), <http://montanaclimate.org/chapter/title-page>.

²² Whitlock et al.

²³ Whitlock et al.

²⁴ Whitlock et al.

by water availability. Stream discharge in the Central Rocky Mountains has declined in the last half century, particularly in August.²⁵ Decreasing snowpack will reduce irrigation capacity, impacting crops like hay, sugar beet, malt barley, potatoes, and market gardens.²⁶

There is evidence that across Montana, average temperatures will continue to increase (high agreement, robust evidence), annual precipitation will increase in winter, spring, and fall (moderate agreement, moderate evidence), and precipitation will decrease in the summer across Montana (moderate agreement, moderate evidence).²⁷ These broad trends will continue to have local and regional level impacts, many of which are discussed in this plan.

Is climate change the result of natural cycles or is it driven by human activities – and does it matter?

At least 97% of scientists agree climate change is happening and that it is human-caused.²⁸ Climate change is caused by greenhouse gasses that trap heat in the atmosphere. The primary greenhouse gasses are carbon dioxide, methane, nitrous oxide, and fluorinated gasses. People release greenhouse gasses by burning fossil fuels to produce energy and for powering transportation. People also release greenhouse gasses in industrial processes like refrigeration, deforestation, livestock production and other agricultural practices, decay of organic waste in landfills, and other means.²⁹

Becoming more resilient

Identifying the causes of climate change can help our tribal community choose the most effective actions to prevent harm to all living beings that the creator has given us. **The degree to which climate change will impact us depends on what we do now.** The evidence suggests we should focus our efforts on both mitigation and adaptation, rather than just adaptation. Actions we take now can both prevent climate change from growing more extreme (mitigation) and help people prepare for and respond to changes already underway (adaptation). These actions make us more resilient.

What can we do?

To protect life on earth, it is crucial to prioritize both adaptation and mitigation. This climate change adaptation plan focuses mostly on adaptation – ways to avoid or reduce climate change impacts and to bounce back more quickly from predicted impacts. Mitigation (preventing greenhouse gas emissions and storing carbon) is also crucial. There are several ways to reduce our emissions and reduce the severity of changes to our climate:

- 1) Reduce our reliance on fossil fuels by getting more power from renewable energy. This can have the added benefits of reducing our energy costs and diversifying our energy sources, making us less dependent on a few energy companies and foreign sources of fossil fuels.

²⁵ Jason Leppi et al., “Impacts of Climate Change on August Stream Discharge in the Central-Rocky Mountains,” *Climatic Change* 112, no. 3 (2012): 997–1014.

²⁶ Whitlock et al., “MCA.”

²⁷ Whitlock et al.

²⁸ John Cook et al., “Consensus on Consensus: A Synthesis of Consensus Estimates on Human-Caused Global Warming,” *Environmental Research Letters* 11, no. 4 (April 2016): 048002, <https://doi.org/10.1088/1748-9326/11/4/048002>.

²⁹ OAR US EPA, “Overview of Greenhouse Gases,” Overviews and Factsheets, US EPA, December 23, 2015, <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

- 2) Increase energy efficiency across the Reservation to reduce overall energy consumption. Improving insulation and switching to LED lighting are just two of many ways that we can increase energy efficiency and save money.

- 3) Protect the health of our lands. Protecting soil health on our farms and ranches, keeping native grasslands intact, protecting and restoring our wetlands, and keeping our forests healthy are all significant ways to store carbon and protect our climate. They also have the added benefits of protecting our air and water, livelihoods, wildlife, and Indigenous Lifeways.

This climate change adaptation plan highlights many possible actions we can take to adapt, with some focus on mitigation. A number of the proposed adaptation actions will also mitigate climate change. While this plan is mainly focused on adaptation, FBIC is working to identify ways to reduce the community's greenhouse gas emissions and has already made progress in mitigation (see Climate Change Mitigation Accomplishments section).

What changes are impacting us?

Many people experience some or all of the following climatic changes that may impact our communities.

Higher air temperatures

More frequent and severe droughts

Earlier and increased stream runoff

More frequent flooding

Low stream baseflows

Warmer stream temperatures

Longer growing season

More frequent and intense wildfires and smoke

Changes in the timing of plant life cycles

Extreme weather events

Planning Areas and Plan Scope

This is the beginning of a conversation, not the end, and we invite you to share your ideas and comments on this document (see the Next Steps chapter for ways we intend to involve more people in planning). This climate change adaptation plan could not have been completed without leadership from the Climate Change Coordinator and Advisory Committee, and we introduce you to them in this chapter. We conclude the chapter by outlining the process we used to complete this draft plan and introduce key works that guided this process.

How do we plan for climate resilience?

Adaptation planning is a circular process of prioritizing goals and actions, implementing actions, and then learning from actions to plan next steps. Figure I shows a climate change adaptation cycle. This draft plan represents the first stage, and we hope to move into action, learning, and adjusting phases after this draft plan is revised and completed.

Adaptation can help build resilience to climate change by reducing the vulnerability of people, places and ecosystems to climate change. **Adaptation** is a set of actions in response to actual or expected climate change that lessen harm. **Resilience** is the capacity to absorb stress and change.

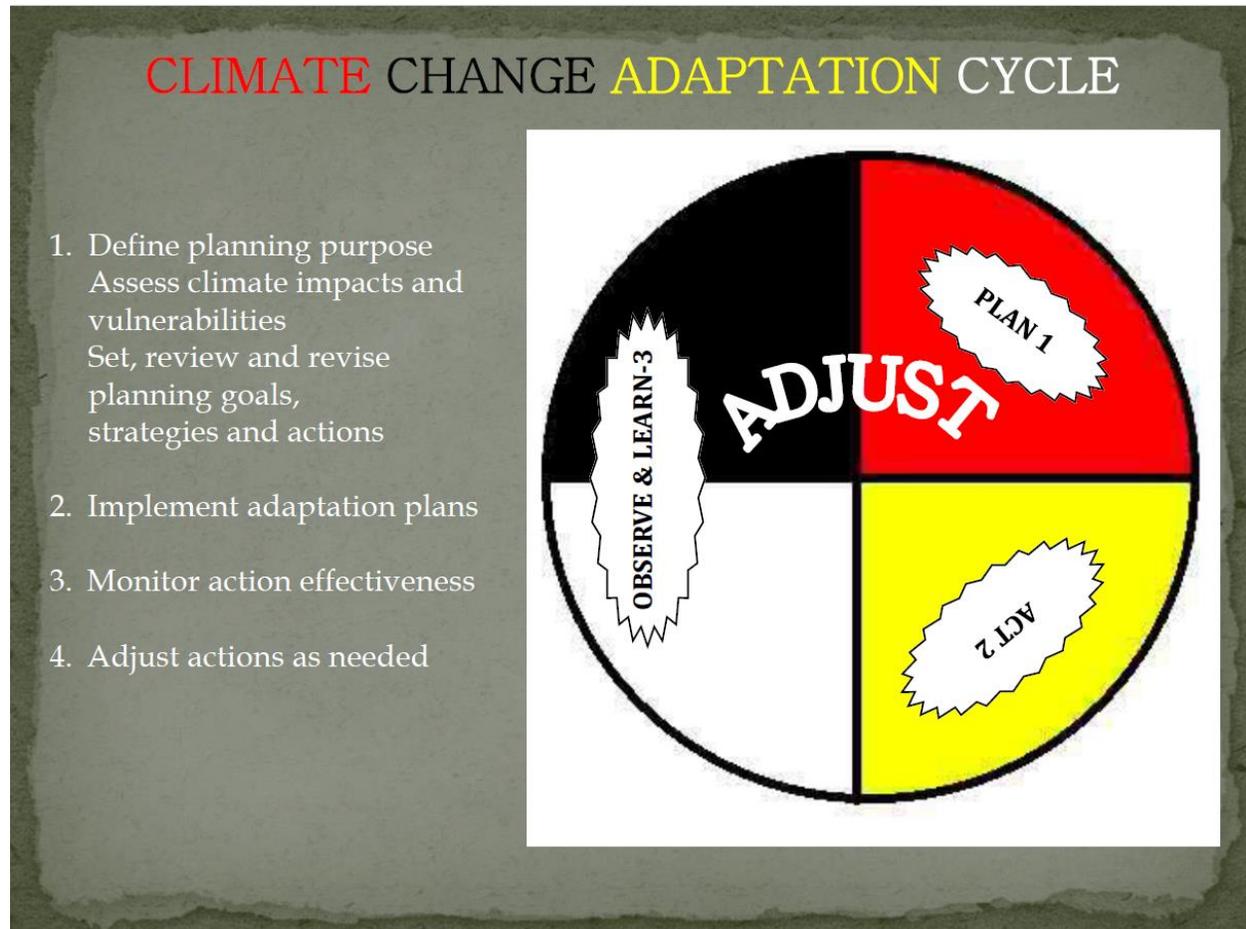


Diagram by Dennis Longknife, Jr. Modified from Climate Smart Conservation Cycle Framework in Climate-Smart Conservation: Putting Adaptation Principles into Practice³⁰ and DPIPWE 2014 after Jones 2005, 2009

<https://www.betterevaluation.org/sites/default/files/Tasmanian%20Parks%20and%20Wildlife%20Service.jpg>

³⁰ "Climate-Smart Conservation: Putting Adaptation Principles into Practice" (Washington, D.C.: National Wildlife Federation, 2014), https://www.nwf.org/~/media/PDFs/Global-Warming/Climate-Smart-Conservation/NWF-Climate-Smart-Conservation_5-08-14.pdf.

FBIC Climate Change Coordinator



Climate Change Coordinator Dennis Longknife, Jr.

Fort Belknap Indian Community hired its first Climate Change Coordinator, Dennis Longknife, Jr., in December 2015. The Climate Change Coordinator directed the planning process that resulted in this climate change adaptation plan. The Coordinator formed the Climate Change Advisory Committee, hired and supervised climate change consultants, and recruited people to participate in the planning process. The Coordinator has also been instrumental in ensuring that climate change adaptation is integrated and mainstream across the Tribes' planning processes. As a result of the Climate Change Coordinator's leadership, the following new plans include specific references to climate change impacts and/or actions that build adaptive capacity in a changing climate:

- The 2018 Fort Belknap Indian Community Agricultural Resource Management Plan and Programmatic Environmental Assessment
- The 2018 Fort Belknap Indian Community Strategic Plan
- The 2013 Tribal Multi-Hazard Mitigation Plan
- The 2013 Noxious Weed Strategic Plan
- The 2011 Strategic Energy Plan
- The 2010 Wetlands Work Plan
- The 2004 Aquatic Resource Protection Ordinance

Integrating climate change adaptation in regional plans

FBIC has contributed its climate change expertise to regional planning processes as well. For example, the Climate Change Coordinator and other FBIC representatives participated in Blaine County's 2018 Multi-Hazard Mitigation Planning process. Not surprisingly, Blaine County's plan includes multiple references to how climate change is increasing vulnerability to natural hazards. The Climate Change Coordinator also contributed to the 2019 Northern Plains Drought Assessment.

Climate Change Advisory Committee

The Climate Change Advisory Committee was formed in 2017 and grew to include 20+ people, many of whom are natural resource managers. It is charged with examining and assessing the impacts of climate change, by prioritizing our Natural Resources and Cultural Activities and Traditions that are vulnerable or sensitive, which include Disaster Mitigation and Emergency Response, as top climate change objectives for the Fort Belknap Indian Community.



Climate Change Adaptation Plan workshop

Making up the Climate Change Advisory Committee, is our Natural Resource Committee Chairmen, and the FBIC Natural Resource Committee, Co-chairmen, including the following departments: Environmental Protection, Planning, Disaster and Emergency Response, Fire Management, Fish and Wildlife, Water Resources, Tribal Land, Social Services, Tribal Historic Preservation Office, Language Preservation, Buffalo Program, Transportation, Tribal Health, Aaniiih Nakoda College, Natural Resource Conservation Service and our four tribal community representatives from Hays, Lodge Pole, Dodson and the Fort Belknap Agency.

Planning Process

The Climate Change Coordinator and Advisory Committee helped select consultants to facilitate the planning process. In the fall of 2018, FBIC contracted the Center for Large Landscape Conservation (CLLC), a non-profit organization with a history of working with tribes and Indigenous communities on climate change adaptation planning. Working with the consultants, the Coordinator hosted four workshops that collected information from a total of 31 planning participants from 19 programs. The Coordinator also conducted multiple face-to-face meetings to interview representatives of tribal programs who were unable to attend the workshops. This proved to be a valuable tool in gathering information that would otherwise have been missed.

Drawing upon state-of-the-art climate adaptation planning guidelines used by CLLC, ITEP and other agencies, proved to be an important tool, designed to invite participation and input from everyone in attendance. Workshops focused on a variety of topics and activities, as outlined in the following sub-sections. Following each workshop, the Coordinator sent out notes from the previous meeting and an agenda for the next workshop.

Workshop 1: November 2018

Workshop activities focused on:

- Reviewing local and regional climate change impacts
- Identifying planning principles and climate change impacts
- Determining sectors that will be included in the plan and the contents that would be outlined in each sector's chapter
- Naming specific people and departments who the Coordinator should invite to participate in the remainder of the planning process

There was an unanticipated gap between the first and second workshops due to the federal government shutdown.

Workshop 2: February 2019

Workshop activities focused on:

- Reviewing the planning process and decisions from the previous meeting
- Envisioning the community people would like to experience in 2050
- Identifying existing strengths in the community, including features, capacities, characteristics, and resources that will help FBIC adapt to climate change
- Identifying weaknesses in FBIC that can reduce adaptive capacity
- Reviewing causes of climate change and examples some of regional impacts
- Discussing participants' observations of climate change impacts

Workshop 3:

- Reviewing, discussing, and prioritizing vision statements for the community in 2050
- Reviewing content and organization for the draft adaptation plan
- Reviewing major categories of climate change impacts
- Beginning an impacts assessment by using a matrix used to identify impacts across sectors, climate drivers, and timeframes.

Workshop 4:

- Reviewing rough drafts of each sector chapter to correct inaccuracies, add clarity, and add more information
- Brainstorming possible adaptation actions for each sector
- Discussing next steps in the planning process

At the conclusion of the four workshops, the Coordinator and the consultants synthesized input from the workshops with reviews of climate change science and additional information collected by the Coordinator between 2016-2019 to form a plan draft. The draft was circulated through email to all participants for their review and comments. The Coordinator and consultants revised the draft based on the review by participants and then completed the final draft. The Coordinator and consultants presented the draft plan to the Tribal Council in October 2022. The Council approved the draft plan.

Outreach

The Climate Change Coordinator invited the following tribal departments and programs to participate in the planning workshops. He also advertised workshops using a flyer posted in public areas:

Emergency Services:

Tribal Roads, Fish and Game, volunteer fire department in each community, Fire Management, EMT's, Environmental, Tribal Council Representative, Prairie Mountain Utilities, Chief of Police, Department of Emergency Services, Livestock – range riders (Mike McCabe, Daniel Long Fox)

Health:

Public Health Nursing, Tribal Health, Environmental Health – Sanitation, Injury Prevention, Avis, Indian Health Service (IHS), Safe on All Roads (SOAR), Environmental Health, Tribal College Nursing Program, Harvey King (or another community representative)

Water:

Prairie Mount Utilities (Ray King), Environmental-Water Quality Staff, Soil Conservationist (Gerald BIA), Irrigation, Natural Resources Conservation Service (NRCS) tribal field office representative, Indian Nations Conservation Alliance (INCA), Indian Health Service Sanitarian

Forestry:

Bureau of Indian Affairs (BIA) - Chet Gladstone, Fire Management, Environmental, Historic Preservation, Land, Council Representative, Fish and Game

Fish and Wildlife:

Environmental, Fish and Game, Tribal Historic Preservation Office (THPO), Buffalo Program, Forestry

Land Use:

Land department, Fort Belknap Housing Association (FBHA), Environmental, Landowners/operators, BIA, Council Representative – Land Committee, Montana State University (MSU) Extension

The Way:

Tribal Historic Preservation Office (THPO), Buffalo Chaser Society, White Clay Society, spiritual leaders, elders-Warren Matte, youth, Language Preservation, Aaniiih Nakoda College,

Plan review

The following plans were reviewed by the consultants to better understand programmatic context and to inform sector planning:

- FBIC Tribal Transportation Safety Plan, 2014
- FBIC Noxious Weed Management Strategic Plan, 2013-2018
- Multi-Hazard Mitigation Plan: Blaine County, Montana, City of Chinook, and Harlem, 2018
- Greater Sage-Grouse Habitat Conservation Strategy, 2014
- Fort Belknap Wildlife Fire Management Plan, 2017-2026
- Tribal Multi-Hazard Mitigation Plan for the FBIC Community, North-Central Montana, 2013
- Agricultural Resource Management Plan and Programmatic Environmental Assessment, 2018
- Fort Belknap Strategic Energy Plan, Gros Ventre and Assiniboine Tribes, 2011
- Wetland Program Workplan FBIC, 2010-2015
- FBIC Strategic Plan, 2018
- 2007 FBIC Forest Management Plan

Planning principles

During the first planning workshop, participants determined that we should integrate the following principles - guidelines for how we plan - into our climate change adaptation planning process:

- Involve all generations in planning, from elders to school-aged children. We want to involve elders because they know what has been here and what has gone. We want to know how they survived in cold and heat;
- Include many perspectives, to listen, acknowledge, and respect different viewpoints since different people have different needs;
- Incorporate past lessons learned;
- Learn about and honor the spiritual connection between land and people;
- Focus on strengthening our community;
- Use native knowledge, to know and share key contributions of Native peoples;
- Promote education;
- Incorporate an environmental ethic;
- Think about longer term issues of climate change instead of just short-term profit (For example, consider that job creation and climate change adaptation can go together, and identify those opportunities);
- Pull together communities (each one) to do their own planning and share; and
- Help each other and bring our community back together.

Plan Organization

The next part of this climate change adaptation plan is organized into seven planning sector chapters focused on: emergency services, fish and wildlife, forestry, health, land use, culture and water. Each chapter includes a discussion of the sector's goals, strengths, and observed and expected climate impacts. Each chapter also includes a discussion of some existing vulnerabilities, as well as a list of ideas for strategies and actions that might be taken to adapt to climate change.

Woven throughout several of the chapters (Culture, Fish and Wildlife, Health, and Water) are boxes that highlight several first foods. The highlights provide examples of how plants and animals are fundamentally important to our Ways of Life, including deer, elk, buffalo, turnips, sage, yarrow and serviceberries (juneberries). The highlights are not meant to imply that any plant or animal is more important than another. The species highlighted here offer examples of some of the ways in which climate change is impacting our first foods. First foods are traditional foods that have provided sustenance and health in indigenous societies for countless generations. Some people point out that breastmilk is the very first food of all. This is by no means a complete list, and these are in no way all the animals and plants that are important to us. We believe that it is hard for Native people to pick one species over another, as all animals and plants matter. Everything is alive. When we are praying in ceremony, all the animals are sacred, in all directions. Animals are part of nature, from the smallest insect to the biggest buffalo. We thank everything. If we lose one part of something here, the whole world is going to lose it.



Milk River Dam Flood of 2011

Chapter 1: Emergency Services

The Disaster and Emergency Services (DES) Coordinator is responsible for coordinating emergency preparedness and response. Having a DES Coordinator allows the Tribes to prepare for more extreme weather events. The DES Coordinator works across departments in emergencies, coordinating with Fire Management, law enforcement, Tribal Roads, utilities, the Environmental Department, Social Services, Transportation, Housing, and Tribal Construction. These departments pool resources and share equipment during emergencies.

Goal of the sector

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan. Currently, this chapter includes a focus on transportation, fire, and extreme weather.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about

climate change can produce apathy or outright resistance.³¹ We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate.

Incident command system

The Emergency Management Program has an incident command system, which not only provides better emergency response but is also creating new job opportunities. Disaster Emergency Services is working on getting radios for communications and has been providing trainings on incident command and disaster management.

Transportation system

FBIC has five buses (two of which are diesel), offering affordable transportation for accessing education, health services, and employment, with the result that community members have more independence. They offer transit to Great Falls and the towns in-between on Tuesdays and Thursdays. FBIC also operates school buses, taking children to and from school and giving them access to afterschool activities. Island Mountain's bus shuttles employees back and forth to work, servicing the Hi-Line area and Hays, Lodge Pole, Agency, Havre, and Dodson. Additionally, Opportunity Link operates in the area, going all the way to Great Falls.

Tribal and County Level Hazard Mitigation Plans

FBIC's 2013 Tribal Multi-Hazard Mitigation Plan (also called the Pre-Disaster Mitigation Plan) profiles significant hazards and identifies mitigation projects that can reduce impacts. While the plan explicitly refers to climate change as driving more severe droughts, it identifies wildfire, flooding, severe winter and summer weather, communicable disease, and landslides, all of which have clear links to climate change. Similarly, Blaine County's 2018 Multi-Hazard Mitigation Plan includes a vulnerability assessment and mitigation strategy in relation to risks from wildfire, flooding, severe weather, and drought. FBIC's Climate Change Coordinator and other FBIC representatives participated in Blaine County's mitigation planning process. Not surprisingly, Blaine County's plan includes multiple references to how climate change is increasing vulnerability to natural hazards.

Emergency response

Disaster and Emergency Services provides emergency shelters in Hays, Lodge Pole, Agency, and Dodson. The Tribes plow people out who are snowed in, especially people with medical emergencies. The Tribes will also plow a path to feed buffalo in heavy snows. In times of emergencies, Fire Management brings firewood to elders and other people in need.

Infrastructure replacements

Two bridges were replaced, the Savoy Bridge 7 miles east of Harlem in 2006, and the Merrill Bridge 5 miles west of Harlem in 2009. Three other bridges on Highway 66 were replaced, because of damage from the 2011 and 2013 Floods to Peoples Creek: Crazy Bridge, Prince Brockie Bridge and the Thomas Bridge, all in the old Hays area where Peoples Creek crisscrosses the highway. The Fort Belknap College was built in 1984, with newer additions added over the years, including a greenhouse.

³¹ Per Espen Stoknes, *What We Think About When We Try Not To Think About Global Warming* (Chelsea Green Publishing, 2015).

The Fort Belknap Agency-Milk River Dam was replaced in 1980's, and the Harlem Bridge was replaced in 1960's. The Milk River Bridge (Harlem) is very narrow and needs to be replaced, it is getting old (50+ years), over the years several fatalities have occurred on or near this bridge. There is absolutely no space on the sides of the bridge to walk, only drive, with one lane going each way with a guard rail.

Caring for each other

The people of FBIC value community and are resourceful in their efforts to care for one another. People assist one another in times of need, providing food, shelter, and help when needed. For example, at one planning meeting, a participant shared that a young person was selling breakfast sandwiches outside IHS and giving them to elders for free. People are already caring for each other by feeding people in need when there are emergencies.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategies and action ideas presented later in the chapter.

Heavy snows

Workshop participants reported observing extreme weather impacts, particularly from heavy snows. They are finding that heavy snows are making roads and transportation inaccessible at times. This challenge is made worse when there is inadequate staffing in the Roads Department and when equipment breaks down. Heavy snows also sometimes break transmission lines, and knock down power poles, shutting down the power grid and even placing people at risk of electrocution from the downed power lines. Heavy snows can also prevent people from accessing food and from getting hay to livestock.

Floods

As referenced in the above Infrastructure replacements section, flooding in 2011 and 2013 resulted in several bridges on Highway 2 being replaced.

Predicted impacts

Workshop participants expressed concern that there will be more hail damage to cars and infrastructure in the future, worse flooding and more canals breaking open, and more tornadoes.

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation combine with other weaknesses and threats to influence the overall vulnerability of our community. This is a summary of some of the weaknesses and threats related to the Emergency Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exacerbate vulnerabilities to climate change:

- There are currently no places for people to go in the event of a tornado, only crawl spaces.
- Infrastructure is aging, and with more flooding expected, aging canals, dams, and bridges increase risk.

- People's Creek near Dodson floods every year and floods houses when that happens. The flooding happens on a lower section of the Creek that has been rechanneled.

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community's resilience:

- Traffic incidents, special events, storms, congestion mitigation, and access management should be considered in relation to climate change
- It is important to be proactive with road maintenance so people can get out in heavy snows
- Feeding people in need in the community is important in emergencies and something community members have already been doing
- Shelters need backup generators
- Promote personal preparedness
- Promote caring for each other
- Share knowledge about canning and food preservation
- Can apply for a public health emergency preparedness grant
- Address funding/costs of emergencies (spend money ahead of time to prepare)
- Coordinate hay transportation
- Monitoring by the Finance Department is needed during emergencies to manage budget (need a daily situational report)
- The Tribal Multi-Hazard Mitigation Plan should be improved. The current plan is scattered. It should integrate better and include outside resources like the Harlem gym, Hays school, and churches. It should also include the Climate Change Coordinator in the revision process to ensure that climate change preparedness is integrated into the plan.
- Need to replace head gates at Dodson dam
- Need to build up riverbanks to prevent wash outs
- More snow ploughs are needed (approximately 5 in the next 10 years)



**Fort Belknap Indian Community
Fish and Wildlife Department
Draft Five-year Conservation Plan
October 1, 2021 – September 30, 2026
-Version: June 8, 2021**



- Hunting and Fishing Regulations
- Climate Adaptation & Resilience-identifying strengths and weaknesses
- Protecting Grassland Habitats, including mountain and river corridors
- Recovery and Conservation of wildlife species
- Monitoring Keystone Species
- Priority Species of Concern-Endangered Species

Chapter 2: Fish and Wildlife

The Fish and Wildlife Department currently has a Director, one administrative assistant, three certified Game Wardens who are sworn officers, and an animal control officer. The department employs biologists when needed and funding is available. For example, under a private black-footed ferret grant, the Department had a biologist for a while. The Department fills a couple of temporary positions in the summer and works with a few interns from the college each summer as well. The Director has worked with the Department for twelve years and served on the Tribal Council for four years. In addition to its staff, there are many strengths underpinning FBIC's fish and wildlife management, including habitat protection, providing tribal members with opportunities for engaging in subsistence hunting and cultural activities, protecting species of concern, bringing income to the Tribes, and partnering with conservation organizations.

Goal of the sector

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

Some existing programs that contribute to resilience (strengths)

The FBIC Fish and Wildlife sector has a number of programs in place that support wildlife populations, habitat health, economic activities, and Aaniiih and Nakoda customs and traditions that are interwoven with wildlife. These programs provide a solid basis for continued development of work to mitigate climate change effects and cultivate resilience.

Protecting habitat

FBIC protects vital fish and wildlife habitat. For example, the Snake Butte Recreation Area protects wildlife and cultural areas. It provides recreation, water, and berries. The Tribes own most of the land within reservation boundaries, which is not the case in all reservations. Of the 648,920 acres of land within the reservation boundaries, 162,933 acres, or approximately 25%, are held in trust by the Tribes, with another 427,579 acres, or approximately 66%, allotted to Tribal members. This is considered to be a major strength for the adaptive capacity of FBIC.

Providing opportunities for subsistence and cultural activities

Fish and wildlife management provides many opportunities for practicing Aaniiih and Nakoda Ways of Life. Treaties preserve the right to hunt. The tribal fish and wildlife code dictates hunting regulations. Each year, the Fish and Wildlife Department works with the state's data to set hunting quotas. Most families on the reservation subsist, in part, from elk and deer, pheasant, grouse, and juvenile ducks. The majority of tribal members hunt to put food on the table, which occurs during the fall hunting season.

As one planning participant explained, "We hunt for survival and to share meat with our elders. We do not hunt for trophies. We leave an offering of meat to Eagle after a hunt. We prayed for everything. We always prayed for a good hunt and smudged with tobacco"

The Buffalo Program provides excellent meat for community members. Additionally, the Milk River provides recreation, fishing, and ice fishing opportunities.

Protecting species of concern

The Department works with partners in the region to protect several species of concern. For example, they reintroduced black-footed ferrets, and to protect them, the Department has had some success with mitigating Sylvatic plague in the prairie dog population through work with the World Wildlife Fund. They reduce plague by dusting for fleas each summer. The Department also works with the Montana Raptor Conservation Center in Bozeman, taking injured birds to Lewistown from where they are transferred to the Center.

Income for the Tribes

Hunting generates income for the Tribes, with antelope, bighorn, and deer bringing paying hunters to the reservation. Benefitting from hunting are the local businesses, tribal hunting guides and Fort Belknap Fish and Wildlife Department.

A compelling conservation partner

A variety of conservation groups want to work with FBIC thanks to the outstanding natural resources and habitat that includes undisturbed grasslands. Groups like Defenders of Wildlife and the World Wildlife Fund want to work with the Fish and Wildlife Department on wildlife and habitat conservation projects.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed

impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Drought, berries, and shifting migration patterns

Shortages in water on and around the reservation impact fish, big game, and bird life. Earlier droughts and drier seasons impact wildlife habitat, plant growth, and forage. Mountains are receiving less snowfall. Drought winters mean there is not sufficient moisture in spring, resulting in a lack of berries and grasses. This has widespread effects on birds and other animals. For example, deer, elk, and moose browse on berry shrubs in the winter and bears eat the berries in the summer. As a result, changes in berry plants have direct effects on wildlife food sources and forage.

Migration and habitat patterns are shifting. For example, in the spring of 2017 FBIC experienced low snowpack from winter and little rain, resulting in fewer wetlands. As a result, migrating waterfowl did not stop; they kept going north, and bypassed the reservation. When they fly south, they usually come in August or September, but we saw them in December and January because they were going out further north. Sometimes you see geese going south in the winter when temperatures are below zero. Wolverines have occasionally been reported on the reservation. These are likely younger animals that are dispersing through the area. Warmer temperatures and decreases in snowpack may affect the ability of cold-loving wolverines to disperse effectively.

Higher runoff, flooding, fish, and nesting birds

High runoff and flooding is impacting fish and nesting birds. Impacts in the river valleys or larger creeks are displacing or causing the loss of some waterfowl and nesting birds. Some winters have high or deeper snowfall levels and coupled with later thawing these conditions can flood out groups of nesting birds. Spring fishing, for example walleye fishing in particular, is impacted by floods because access to river, trails and roads are impacted by flooding. Climate change is impacting access to ice fishing. As one person explained, “we used to get about two months of hard ice to ice fish. Nowadays the weather changes so much we are lucky to get two weeks of solid ice for ice fishing”. Erosion of banks increases sediment in creeks, affecting fish spawning areas. In 2011, flooding washed all the dams out at Beaver Creek. As of 2019, beavers have already replaced a dam, which demonstrates how resilient this species is. These dams also help protect infrastructure and stream habitat.



Streams provide habitat for fish – *photo of Milk River by Dennis Longknife, Jr.*

Lower stream baseflows impact fish

Lower stream baseflows are impacting native fish and causing the loss of certain prairie species of native minnows and fish, to die off. By the end of summer, some streams are completely dry. If there is sufficient spring runoff minnows and fish return in the stream drainages. Sedimentation can also impact fish spawning areas by covering up gravel substrates that fish use to lay their eggs. Fish are migrating to colder water upstream or getting trapped in ponds within the stream reaches and dying off.

Warmer stream temperatures impact fish

Some of our native fish are impacted severely by rapidly changing water temperatures, and sometimes even by slow changes in water temperatures. Some of the smaller reservoirs warm up enough where fish are unable to survive. Warmer stream temperatures pose a danger to fish by influencing parasites, reproduction, and habitat fragmentation. Warmer temperatures can cause a loss of benthic macroinvertebrates.

More frequent and intense wildfires

Fires impact all animals. Birds lose their nesting habitat, plus their food sources, like small seeds and bugs. Timber loss impacts all wildlife with loss of cover and forage. Wildfires would probably have an effect on the streams through sedimentation from run-off.

Extreme weather

Extreme weather can impact wildlife population sizes. For example, 2011 wiped out 55% of the antelope population due to severe cold and snow, similar to the conditions we had experienced this in the winter of 2018/2019. In 2017, antelope populations were down to about 45%. We went from about 100 antelope bucks to 45. Late snows and heavy frosts are killing animals like chicks. This is caused by

warming chinook winds that can rapidly melt snow caves used by the birds, which use them for shelter, and since a good percentage of them are hens, the egg production drops as a result of snow caves caving in on the birds, suffocating them under the weight of the snow.

Sage grouse, buffalo, elk, deer, antelope, and moose

Participants highlighted several species in more detail, and they are discussed in this subsection.

Sage Grouse

Sage grouse need special attention. As told by a planning participant, “when you lose a lek, they never come back. Currently, there is a lek southeast of Hays, but each year we are seeing fewer and fewer. I believe a lot of that is due to climate change.” There are sharp-tailed grouse near the government reservoir, but no sage grouse. In 1994 we had 100 roosters per lek, now we have about 9 roosters per lek. There are usually three to five hens per rooster. From the 1990’s to today, every year we are seeing a decline. A big issue for sage grouse is overgrazing. Another issue is the rise in temperatures, especially on the chicks. Predation is also a problem. There are a lot of issues with the sage grouse, but less with the sharp-tailed grouse. The sage grouse is a delicate bird which is less resilient in the face of climate change.

Elk, deer, antelope, and moose

In working with the State of Montana, the Fish and Wildlife Department has learned that elk populations are extremely high in some areas, and average in others. Elk are trying to move into the mountains because there is suitable habitat there. Mule deer populations are high, which might be related to climate change and feed being more accessible. White tail deer populations are down, as are antelope populations. The 2017/2018 winter season brought a lot of snow which impacts antelope. In 2015 there was a large die off of whitetail deer caused by warm temperatures which caused black flies/midges to become active and spread pathogens such as epizootic hemorrhagic disease (bluetongue disease) that are deadly to deer. Workshop participants expressed concern climate change will bring more invasive species and pathogens like the Bluetongue virus and chronic wasting disease.

Predicted impacts

A close look at climate predictions and several large mammals

A changing climate affects all parts of life from the health and safety of our community to the animals that share this land as home. Variations in climate have substantial impacts on the population sizes of hoofed mammals (called ungulates), affecting their growth, development, and reproduction.³²

³² Jay V. Gedir et al., “Effects of Climate Change on Long-Term Population Growth of Pronghorn in an Arid Environment,” *Ecosphere* 6, no. 10 (2015): art189, <https://doi.org/10.1890/ES15-00266.1>.

Climate change affects bison, elk, deer, and antelope directly by increasing average temperatures and increasing the frequency of extreme weather events. Climate change also indirectly affects large mammals by changing the quality and availability of their food supply and natural habitat.³³ Climate change may also drive ecosystem changes like increasing the presence of disease and parasites.³⁴



Photo-Snake Butte Buffalo herd

Buffalo (Bison bison)

Climate change is increasing temperatures and increasing the variability in climate. Ambient air temperature affects a buffalo's ability to stay warm during cold winters and to cool down in warm summers.³⁵ Climate change negatively effects plant nutritional quality by reducing the amount of protein in grass. In a study of bison herds across North American grasslands, researchers found that bison weight declines as the climate becomes drier or hotter.³⁶ Buffalo in Saskatchewan, for example, are about 30% bigger than buffalo in Texas because it's cooler in the northern region.³⁷

³³ Jeff M. Martin, Jim I. Mead, and Perry S. Barboza, "Bison Body Size and Climate Change," *Ecology and Evolution* 8, no. 9 (April 10, 2018): 4564–74, <https://doi.org/10.1002/ece3.4019>; Joseph M. Craine, "Long-Term Climate Sensitivity of Grazer Performance: A Cross-Site Study," *PLOS ONE* 8, no. 6 (2013): e67065, <https://doi.org/10.1371/journal.pone.0067065>.

³⁴ Kevin S. McKelvey and Polly C. Buotte, "Effects of Climate Change on Wildlife in the Northern Rockies," in *Climate Change and Rocky Mountain Ecosystems*, ed. Jessica E. Halofsky and David L. Peterson, vol. 63 (Cham: Springer International Publishing, 2018), 143–67, https://doi.org/10.1007/978-3-319-56928-4_8.

³⁵ Martin, Mead, and Barboza, "Bison Body Size and Climate Change."

³⁶ Craine, "Long-Term Climate Sensitivity of Grazer Performance."

³⁷ Martin, Mead, and Barboza, "Bison Body Size and Climate Change."



*“We are like the buffalo,
we are still here. We are
resilient. Just like buffalo,
they tried to exterminate
us. We are still here.”*

Buffalo at Snake Butte-Photo courtesy of the Smithsonian

By midcentury (2040-2069) average temperatures in North Central Montana are expected to increase by approximately 4.4-6.1° F.³⁸ Based on a Kansas State University study, these increasing temperatures could result in smaller buffalo sizes, reducing male size by about 35-52 pounds and female size by about 25-37 pounds by midcentury.

“The bison is the link to the past. Bison are how we got here. They would follow the migrations, wherever the bison went, that is where the humans had to go.”

Bison extermination changed our Lifeways. We would use buffalo for food and ceremony. Bison tongue, for example, is required for many ceremonies which went away when the bison were exterminated.

Pronghorn (Antilocapra americana)

Pronghorn require a high-quality diet of grasses, forbs, sagebrush and other prairie plants, making pronghorn populations sensitive to changes in their food supply.³⁹ Pronghorn do poorly in heavy snowfall, which makes it hard for them to find their food sources. Periods of prolonged deep snow have resulted in adult animals having insufficient food and have lowered the numbers of Pronghorn reaching adulthood.⁴⁰ Pronghorn are also at risk of contracting Bluetongue, a viral disease that is thought to be cold-weather limited.⁴¹ Bluetongue is transmitted by midges, which do not survive as well in colder climates. Warming climates may allow Bluetongue disease to expand into the Northern Rockies, putting Pronghorn further at risk.

³⁸ Whitlock et al., “MCA.”

³⁹ Gedir et al., “Effects of Climate Change on Long-Term Population Growth of Pronghorn in an Arid Environment.”

⁴⁰ K. S. Christie et al., “Long-Term Changes in Pronghorn Abundance Index Linked to Climate and Oil Development in North Dakota,” *Biological Conservation* 192 (December 1, 2015): 445–53, <https://doi.org/10.1016/j.biocon.2015.11.007>; B.W. O’Gara and J. Yoakum, “Mortality Factors,” in *Pronghorn Ecology and Management*, ed. B.W. O’Gara and J. Yoakum (Boulder, CO: University Press of Colorado, 2004), 379–408.

⁴¹ McKelvey and Buotte, “Effects of Climate Change on Wildlife in the Northern Rockies.”

Elk, Mule Deer, and White-Tailed Deer

Rocky Mountain Elk (*Cervus canadensis*), Mule Deer (*Odocoileus hemionus hemionus*) and White-tailed Deer (*O. virginianus*) have broad ranges in North America.⁴² Climate change is expected to have both positive and negative effects for ungulates like deer and elk. Warmer winters and wetter summers could increase their numbers. Severe winters naturally control populations of deer and elk, and the lack of severe winters due to a warming climate puts these animals at risk of overpopulation.⁴³ As winters warm, deer and elk populations may rapidly grow, both by harming vegetation through over browsing, and by increasing the transmission of diseases spread by ticks that deer and elk carry.⁴⁴ The risks of climate change to wild game combines with other risks to wildlife such as habitat fragmentation caused by roads, fences, and the conversion of native prairie for cropland or other purposes.⁴⁵ Natural resources programs that address climate change together with these other threats will improve wild game conservation.

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation events combine with other weaknesses and threats to influence the overall vulnerability in our community. This is a summary of some of the weaknesses and threats related to the Fish and Wildlife Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exaggerate vulnerabilities to climate change. They include management challenges, competing land uses, diseases, and tensions between economic development and sustainable land uses.

Management challenges: protected areas, hunting, and navigating a fragmented land ownership system

Managing protected areas and hunting activities pose many challenges. For example, people hunt near Snake Butte, even though it is a protected area.

Accessing land and navigating a patchwork of jurisdictional boundaries that separate state and tribal lands has limited hunting. Treaties are not always enforced, and access to land is being reduced or restricted. The Bear Paw Mountains are rich with elk but are difficult to access. There have been tribal members in court over hunting and boundary issues. A few years back there was a particular State game warden who was harassing tribal members who were hunting on federal or state land. A major challenge with checkerboard land ownership is that when people are chasing down animals they have

⁴² McKelvey and Buotte.

⁴³ Guiming Wang et al., "Impacts of Climate Changes on Elk Population Dynamics in Rocky Mountain National Park, Colorado, U.S.A.," *Climatic Change* 54, no. 1 (July 1, 2002): 205–23, <https://doi.org/10.1023/A:1015725103348>; Christie et al., "Long-Term Changes in Pronghorn Abundance Index Linked to Climate and Oil Development in North Dakota"; Scott Creel and Michael Creel, "Density Dependence and Climate Effects in Rocky Mountain Elk: An Application of Regression with Instrumental Variables for Population Time Series with Sampling Error," *Journal of Animal Ecology* 78, no. 6 (2009): 1291–97, <https://doi.org/10.1111/j.1365-2656.2009.01581.x>.

⁴⁴ Steve D. Côté et al., "ECOLOGICAL IMPACTS OF DEER OVERABUNDANCE.," *Annual Review of Ecology, Evolution & Systematics* 35, no. 1 (December 2004): 113–47; John B. Bradford and N. Thompson Hobbs, "Regulating Overabundant Ungulate Populations: An Example for Elk in Rocky Mountain National Park, Colorado," *Journal of Environmental Management* 86, no. 3 (February 1, 2008): 520–28, <https://doi.org/10.1016/j.jenvman.2006.12.005>.

⁴⁵ Christie et al., "Long-Term Changes in Pronghorn Abundance Index Linked to Climate and Oil Development in North Dakota."

just shot, the animals can cross into non-tribal lands. There is currently no agreement between the State and Tribes in terms of enforcement.

Several times, tribal members have reported seeing non-tribal people in airplanes and helicopters chasing herds of deer and elk off the southern end of the reservation. Some people hypothesize this might be because there are hunting outfitters and guides that can benefit from these game animals on their land, which is adjacent to tribal lands. Hunting outfitters have also been caught and fined for guiding clients onto reservation land with state-issued permits.⁴⁶

Jurisdictional issues around hunting and treaty rights can be challenging, especially as the tribe acquires land that is off the reservation and that they wish to manage according to hunting rights defined in treaties.

Competing land uses

A variety of competing land uses means that wildlife can be displaced. More land is being cultivated for wheat in the region. Renewable Energy projects such as Wind Power, can impact sage grouse, as wind developers look for the exact same habitat as sage grouse look for. Overgrazing threatens sage grouse, and cattle frequently trample sage grouse eggs.

Diseases

Chronic Wasting Disease is in Blaine County, and it is found all across the area north of Milk River. It seems to be moving south. Additionally, a 2013 outbreak of epizootic hemorrhagic disease (“Bluetongue”) impacted whitetail deer. The Fish and Wildlife Department had to close the hunting season in the valley in 2001 due to an outbreak. The disease’s vectors are midges, and they are brought on by hot, dry weather in the fall – the same weather that triggers West Nile Virus.

Tensions between sustainability and economic development

Development and other forms of land fragmentation can pose problems for wildlife. For example, many types of birds and mammals have been found to alter their behavior or migratory routes to avoid oil and gas infrastructure.⁴⁷

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community’s resilience:

- Wildlife management is a key component of planning for changing climate. More data needs to be collected, for example there is a need to monitor birds.
- Update all of Fish and Wildlife Department’s equipment.

⁴⁶ FWP Reports “Outfitter sanctioned for illegally guiding clients on Fort Belknap Reservation;”

<https://www.montanaoutdoor.com/2012/12/fwp-reports-outfitter-sanctioned-for-illegally-guiding-clients-on-fort-belknap-reservation/>

⁴⁷ Christie et al.

- Get adequate salaries for the Fish and Wildlife Department.
- Hire a wildlife biologist.
- The Wildlife Department would like to do their own surveys, especially of antelope, deer, elk, bighorn sheep, birds.
- Would like to understand how fire impacts bighorn sheep.
- More training for staff.

Chapter 3: Forestry

The Fire Management Department has three professional staff: a Fire Management Manager, a Fuels Program Manager, and a staff member who serves as both the Dispatcher and the Disaster and Emergency Services Coordinator. FBIC has 40,000 forested acres which include cultural areas and old growth ponderosa pine trees. Fort Belknap's forests are island forests, or as Henderson and others call them, "refugia of trees and tree-dependent species isolated in a sea of grass".⁴⁸ Island forests are significantly at risk from climate change because they are relatively small ecosystems and may have less genetic diversity and greater vulnerability to major disturbances like wildfire, pathogen attack, and severe drought.⁴⁹ At the same time, they can host important species that live at the very edges of natural ranges.⁵⁰ Island forests also supply water to the surrounding plains.⁵¹



[Eagle Child Peak-Little Rocky Mountains]

⁴⁸ N. Henderson et al., *Climate Change Impacts on the Island Forests of the Great Plains and the Implications for Nature Conservation Policy: The Outlook for Sweet Grass Hills (Montana), Cypress Hills (Alberta-Saskatchewan), Moose Mountain (Saskatchewan), Spruce Woods (Manitoba) and Turtle Mountain (Manitoba-North Dakota) Prairie Adaptation Research Collaborative (PARC) Final Report* (Prairie Adaptation Research Collaborative, 2001).

⁴⁹ Henderson et al.

⁵⁰ Henderson et al.

⁵¹ Henderson et al.



The Little Rocky Mountains are majority mixed ponderosa and lodgepole pine forests, as well as Douglas Fir. The 2007 to 2021 Forest Management Plan and the 2017 to 2026 Fort Belknap Wildland Fire Management Plans guide FBIC’s programs and decisions about forest management.

Goal of the sector

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about climate change can produce apathy or outright resistance.⁵² We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate.

Managing fire and creating habitat through thinning and controlled burns

The Fire Management Department has thinned 5,000 acres in the wildland urban interface, in the Hays and Lodge Pole area, in an effort to improve forest health and protect homes and families from catastrophic wildfires. The Department has also completed prescribed burns. Thinning protects forests in a warming, drying climate because overcrowding reduces tree health and increases crown fire risk. Thinning must occur between July 1st and December 31st because the engraver beetle (*Ipspini*) is attracted by the scent of fresh-cut trees and must be managed by the timing of cutting and prescribed burns. As explained by a forestry expert, “we also trap for the engraver beetle after we thin. We let the thinning piles cure for at least six months to a year and then burn them in the winter. When we do

⁵²Stoknes, *What We Think About When We Try Not To Think About Global Warming*.

prescribed burns, it is ideal to have some snow on the ground. The ground has to be saturated with water. Now we are doing understory burns every five years.”

Native grasses often return after thinning and burning. The Fire Management Department is careful when thinning to leave dead standing trees (“habitat trees”) wherever there is any evidence of woodpeckers or other nesting birds. The department has successfully involved some local youth in forest thinning. The department can employ 20 to 40 people at a time with a forest thinning project, generating both income and experience.

Post and pole plant

A Bureau of Indian Affairs grant is helping establish a post and pole plant on the reservation, probably located in Hays. Most of the timber coming from the mountains, particularly timber from thinning work, is too narrow in diameter to be sawed into boards or used for other purposes, but timber of this diameter is perfect for posts and poles. The tribe bought a peeler-pointer for peeling and sharpening posts. As of 2021, the plant itself is not yet running, although the equipment has been purchased.

Recreation

The forested areas of the Reservation provide numerous recreation opportunities including hiking and camping. The powwow grounds located in the Little Rockies are also a hub of cultural events and community gathers. The Fire Management Department also assisted the Trails Program, that Dennis Longknife, Jr., was managing at that time, and constructed 4 trails called: Hole in the Wall Trail (photo on next page-courtesy of Dennis Longknife, Jr.), South Fork Little Peoples Trail, West Fork-Kid Curry Trail and Kid Curry’s Cave trails, which serves as tourist attractions and generates income.



Plants and Wildlife

The Little Rockies is an island mountain habitat, offering potential habitat for plant species with ranges that are shifting upward in elevation towards cooler temperatures. The mountains are also a refugia to wildlife such as mountain lions, bighorn sheep and species of concern such as the Pinyon Jay and Northern Goshawk. Many large mammals such as moose, black bears have returned to the Little Rockies and community members even report wolves and wolverine sightings.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Aspen, heavy snows, and diseases

Aspen are an important, culturally relevant plant. They have been affected by heavy spring storms because heavy snows damage aspen. However, the heavy storms also protected baby shoots by creating natural fencing that prevents browsing by ungulates. In recent years, community members report higher incidences of diseases that affect aspens and aspen groves such as blight which travels from shrubs to trees and back again. Blight also affects first foods and the traditional practice of harvesting berries. In 2018, there was a "bumper crop" of June Berries and in 2019, many berries were affected by blight, which reduces the nutritional value and taste. These changes from year to year make it difficult to plan for harvesting.

Hotter air temperatures, pathogens, and beetles

In our mountains, the increase in temperatures creates a better habitat for pathogens and beetles. Beetles in our forests include mountain pine beetles (*Dendroctonus ponderosae*), coarse writing engraver beetles (*Ips calligraphus*), and pine engraver beetles (*Ips pini*). High points on the temperature graph correspond with bad fire years, notably the late 1980's and 2012. Lower slopes are heating up, necessitating adaptive management like tree thinning and fuels reduction. The entire Little Rocky Mountain ecosystem is affected since the Little Rockies are an island mountain range. It is more susceptible since it is surrounded by prairie. It's a mass of all these beetles now due to higher temperatures and drought.



Thinning project site showing work in progress, 2021 – *photo by Dennis Longknife, Jr.*

Drought, beetles, and hydrophobic soils

Droughts are impacting FBIC's forests in multifaceted ways. For example, mountain pine beetle numbers are driven by warmer weather. Drought also stresses trees, making them easier targets for beetles, which is killing off trees and resulting in more intense fires.

Hydrophobic soils can be an issue with increasing drought: when soils get too dry, they do not readily absorb water when rain comes again.

More widespread and intense wildfires

"Fires are nuking the forests."

FBIC is experiencing more intense fires due to low moisture. If fuel moisture is less than 20%, there is a high risk of wildfire. Additionally, FBIC has been experiencing more fires in the prairies. In the summer, FBIC Fuels Officer checks the fuels moisture content for the day or the week. "We are noticing we are getting more risk days due to less moisture. It seems once the rain stops now, we are not getting anything until the fall, meaning we are on call 24 hours a day now waiting for a fire. We are getting many requests to go to Idaho, Washington, North Dakota, and other places to help fight wildfires." As a result of these requests, FBIC is left with fewer people on site when there is a fire on the reservation. This is a widespread problem across the western states and federal funding has not kept pace. There is less money to go around, even with more intense fire seasons.

Lower stream baseflows impede firefighting

Lower stream levels have been making it harder to find places to draft water from for firefighting. Sometimes streams are not even running in the summer. The fire hydrants in Hays are not working, requiring firefighting teams to draft from the streams.

Predicted impacts

Fire is going to be a big challenge in the future. Downscaled climate models for North Central Montana show that average annual temperatures will increase throughout the century, with estimated increases of 6 to 11°F by 2099. Precipitation will likely decrease in the summer months.⁵³ Decreased spring snowpack has been observed and is predicted into the future⁵⁴, as is earlier spring snowmelt. The warmer temperatures and reduced snowpack are likely to increase the frequency and severity of drought conditions in the late summer and early fall and exacerbate drought conditions when they do occur.⁵⁵ The hotter, drier conditions will continue to impact already-stressed ponderosa pine communities and increase their susceptibility to beetles and fire.⁵⁶ Combined with climatic changes that are increasing wildfire season length, frequency, and total area burned⁵⁷, the adaptive capacity and functionality of ponderosa pine ecosystems are under threat. So much so, that in other regions, ponderosa pine forests are converting from forests to grasslands.⁵⁸ As forests dry and stand-replacing fires consume them, they convert from carbon sinks to carbon emitters.⁵⁹

While ponderosa pine woodlands are usually fire-adapted ecosystems, fire suppression since European colonization has altered fire cycles in the Little Rocky Mountains from a fire occurring about every 12 years to one every 80 years.⁶⁰ This has changed the very structure and function of the ecosystem. When ponderosa pine is succeeded by fire-intolerant vegetation like Douglas-fir, dense forest canopies and

⁵³ Whitlock et al., "MCA."

⁵⁴ Whitlock et al.; Halofsky et al., "Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains - Part 2"; Hamlet and Lettenmaier, "Effects of 20th Century Warming and Climate Variability on Flood Risk in the Western U.S."; Romero-Lankao et al., "North America."

⁵⁵ Whitlock et al., "MCA."

⁵⁶ USFS, "Warming and Warnings: Assessing Climate Change Vulnerability in the Rocky Mountain Region," Rocky Mountain Research Station, accessed April 5, 2019, <https://www.fs.fed.us/rmrs/warming-and-warnings-assessing-climate-change-vulnerability-rocky-mountain-region>.

⁵⁷ Abatzoglou and Williams, "Impact of Anthropogenic Climate Change on Wildfire across Western US Forests"; Westerling Anthony LeRoy, "Increasing Western US Forest Wildfire Activity: Sensitivity to Changes in the Timing of Spring."

⁵⁸ Kimberley T. Davis et al., "Wildfires and Climate Change Push Low-Elevation Forests across a Critical Climate Threshold for Tree Regeneration," *Proceedings of the National Academy of Sciences* 116, no. 13 (March 26, 2019): 6193, <https://doi.org/10.1073/pnas.1815107116>.

⁵⁹ Zoeann Murphy and Chris Mooney, "Gone in a Generation: Across America, Climate Change Is Already Disrupting Lives.," *Washington Post*, 2019, January edition, <https://www.washingtonpost.com/graphics/2019/national/gone-in-a-generation/>.

⁶⁰ Warren Morin, Telephone Conversation, Warren Morin, Fort Belknap Indian Community Tribal Councilman, April 1, 2019; Tania Schoennagel, Thomas T. Veblen, and William H. Romme, "The Interaction of Fire, Fuels, and Climate across Rocky Mountain Forests," *BioScience* 54, no. 7 (July 1, 2004): 661–76, [https://doi.org/10.1641/0006-3568\(2004\)054\[0661:TIOFFA\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2004)054[0661:TIOFFA]2.0.CO;2); Kevin C Ryan, Eric E Knapp, and J Morgan Varner, "Prescribed Fire in North American Forests and Woodlands: History, Current Practice, and Challenges," *Frontiers in Ecology and the Environment* 11, no. s1 (August 2013): e15–24, <https://doi.org/10.1890/120329>.

homogenous structures develop that invite more Crown fires and impact soil productivity and water-holding capacity.⁶¹ Severe, stand-removing Crown fires can slow or stop streamflow, amplifying growing water shortage effects from prolonged periods of hot temperature that compromise the quality and quantity of drinking water.⁶² By increasing wildfire risk, drought can also introduce sediment, ash, and other debris into surface water.⁶³ Fires and heavy precipitation can lead to erosion and landslides, as experienced in FBIC, especially when coupled with growing risks of extreme weather. This is why restoring historic fire regimes are essential adaptation and restoration strategies. Without intervention, tree species that are found only at the top of the mountains, like subalpine fir and whitebark pine, may disappear as the climate changes.⁶⁴

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation events combine with other weaknesses and threats to influence the overall vulnerability in our community. This is a summary of some of the weaknesses and threats related to the Forestry Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exaggerate vulnerabilities to climate change. They include a history of fire suppression, insects and diseases, unenforced property rights, limited funding, forest thinning management, lack of diversity on forest age structure, and dams impacting cottonwood trees.

Fire suppression

Climate change impacts are combining with preexisting challenges to forest health, including overcrowded forests and beetle outbreaks. The story of fire suppression has been an incomplete story, as represented by the Smoky the Bear campaign that urged for all forest fires to be suppressed. Management for fire suppression has allowed fuels build-up in the forests, resulting in mega-fires. We need to manage expectations about the role of fire and fire suppression, to learn about fire as a natural ecosystem process. To take care of forest pathogens, we need to let forests burn.

⁶¹ Russell T Graham and Theresa B Jain, “Ponderosa Pine Ecosystems” (USDA Forest Service, 2005), https://www.fs.fed.us/psw/publications/documents/psw_gtr198/psw_gtr198_a.pdf.

⁶² Centers for Disease Control and Prevention, “When Every Drop Counts: Protecting Public Health During Drought Conditions—A Guide for Public Health Professionals” (Atlanta, GA: , U.S. Environmental Protection Agency, National Oceanic and Atmospheric Agency, and American Water Works Association, 2010), https://www.cdc.gov/nceh/ehs/docs/when_every_drop_counts.pdf; Morin, Telephone Conversation, Warren Morin, Fort Belknap Indian Community Tribal Councilman.

⁶³ Centers for Disease Control and Prevention, “When Every Drop Counts: Protecting Public Health During Drought Conditions—A Guide for Public Health Professionals.”

⁶⁴ Henderson et al., *Climate Change Impacts on the Island Forests of the Great Plains and the Implications for Nature Conservation Policy*.

Indigenous people across North America traditionally managed the landscape using fire.⁶⁵⁶⁶⁷ In many places, this knowledge is being revived for management purposes, notably in California⁶⁸ and the Southwestern US⁶⁹. Traditional fire management techniques are an important resource for resilient landscape management in the face of climate change⁷⁰, as well as for changing outdated assumptions that fire is always destructive and should be suppressed⁷¹.

Insects and diseases

Bark beetles and disease weaken trees and can cause growth loss and mortality.⁷² Many species of bark beetle rely on temperature-induced life history phases, with periods of deep cold serving as a pause on reproduction and development. Warming temperatures may accelerate reproduction in some species, including *Ips pini* and mountain pine beetle, which in turn may accelerate infestation cycles.

Furthermore, periods of deep cold in the spring, when certain species of bark beetles are least tolerant of cold temperatures, previously killed off bark beetles, but the loss of those periods of spring cold have meant that more beetles survive, further accelerating infestation cycles. Finally, the trees themselves may suffer from other climate effects, including drought, which lower their natural defenses against insects and make them weaker and more susceptible to beetle infestation.⁷³

⁶⁵Delcourt, H.R. and Delcourt, P.A. (1997), Pre-Columbian Native American Use of Fire on Southern Appalachian Landscapes. *Conservation Biology*, 11: 1010-1014. <https://doi.org/10.1046/j.1523-1739.1997.96338.x>

⁶⁶Native American fire management at an ancient wildland–urban interface in the Southwest United States Christopher I. Roos, Thomas W. Swetnam, T. J. Ferguson, Matthew J. Liebmann, Rachel A. Loehman, John R. Welch, Ellis Q. Margolis, Christopher H. Guiterman, William C. Hockaday, Michael J. Aiuvalasit, Jenna Battillo, Joshua Farella, Christopher A. Kiahtipes. *Proceedings of the National Academy of Sciences* Jan 2021, 118 (4) e2018733118; DOI: 10.1073/pnas.2018733118

⁶⁷Keeley, J.E.. (2002), Native American impacts on fire regimes of the California coastal ranges. *Journal of Biogeography*, 29: 303-320. <https://doi.org/10.1046/j.1365-2699.2002.00676.x>

⁶⁸Cagle, S. 2019. "Fire is Medicine: The tribes burning California forests to save them" *The Guardian*, published online 21 November 2019, accessed 26 May 2021 <https://www.theguardian.com/us-news/2019/nov/21/wildfire-prescribed-burns-california-native-americans>

⁶⁹Carol Raish, Armando González-Cabán& Carol J. Condie (2005) The importance of traditional fire use and management practices for contemporary land managers in the American Southwest, *Global Environmental Change Part B: Environmental Hazards*, 6:2, 115-122, DOI: [10.1016/j.hazards.2005.10.004](https://doi.org/10.1016/j.hazards.2005.10.004)

⁷⁰Norgaard, KM, and Worl, S. 2019. What Western States Can Learn from Native American Wildlife Management Strategies. "The Conversation," published online October 29 2019, accessed 26 May 2021. <https://theconversation.com/what-western-states-can-learn-from-native-american-wildfire-management-strategies-120731>

⁷¹Nikolakis, W. D., and E. Roberts. 2020. Indigenous fire management: a conceptual model from literature. *Ecology and Society* 25(4):11. <https://doi.org/10.5751/ES-11945-250411>

⁷² FBIC Forest Management Plan

⁷³Barbara J. Bentz, Jacques Régnière, Christopher J Fettig, E. Matthew Hansen, Jane L. Hayes, Jeffrey A. Hicke, Rick G. Kelsey, Jose F. Negrón, Steven J. Seybold, *Climate Change and Bark Beetles of the Western United States and Canada: Direct and Indirect Effects*, *BioScience*, Volume 60, Issue 8, September 2010, Pages 602–613, <https://doi.org/10.1525/bio.2010.60.8.6>

Property rights

Rights to land, trees, and hunting are not always enforced.

Funding

There are insufficient funds for fighting fires and forest management in the West. Additionally, the Tribes have many expenses.

Lack of diversity in forest age structure

The big fire of 1936 wiped out the Little Rockies, so most of our forest is young. Forest stands are coming back but they are still young and therefore unmarketable. Due to the fire, stands lack diversity in age structure.

Dams impacting cottonwoods

Cottonwood trees are dying off along the Milk River due to the construction of dams. This means a loss of habitat for wildlife. It will drive changes in species in the water since many species breed in the shade of cottonwood trees. The dams upriver mean there is no more natural flooding, so the cottonwoods are not regenerating naturally anymore. We are seeing more small trees. Old growth trees are dying, and there are few undergrowth replacement stands. As temperatures increase, there is not enough water for the trees.

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community's resilience:

- Duff and soil management, especially during periods of drought.
- Need to collect data from soil to improve soil management (soil scientist)
- Do hydrologic cycle education (highland mountains) and relation to forestry
- Plant trees
- Treat forested areas of the reservation to increase resilience to drought and fire. Continue thinning the Little Rockies.
- We need to manage expectations about the role of fire and fire suppression, to learn about fire as a natural ecosystem process. To take care of forest pathogens, develop and implement a "let it burn" policy.
- Identify funding to improve infrastructure development of project that can capture and hold water and to repair dikes and drains in the reservoirs, especially recreational ones.
- Create a forestry management class at the community college.
- Write a plan for establishing a seed bank and seedling nursery to protect forest genetic diversity. Increasing and protecting forest genetic diversity is essential for building adaptive capacity in a changing climate.⁷⁴ Cataloguing and storing genetically diverse seeds will assist with replanting untreated forest areas after severe fires.

⁷⁴ Whitlock et al., "MCA."

- Do outreach to promote adaptive management techniques and climate change integration across tribal and regional programs.
- Monitor changes in the forest, streams, cultural resources, and community awareness in order to promote adaptive management.
- Consider planting more climate tolerant tree species in the forest if the current tree species are dying out

Additional recommendations from the Prairie Adaptation Research Collaborative:⁷⁵

- Retain forestry cover and support the diversity of existing species and ecosystems:
 - Maintain age stand diversity
 - Prevent excessive fuel build-up by managing fuel loads
 - Create and maintain fire breaks
 - Use prescribed fire when appropriate
 - Replant where needed to aid regeneration
 - Slow insect or vegetation disturbances by using biological, chemical, or physical controls, if necessary
- Establish a breeding program to establish which varieties and species are best adapted to the range of likely future climates in the forest

⁷⁵ Henderson et al., *Climate Change Impacts on the Island Forests of the Great Plains and the Implications for Nature Conservation Policy*.



Chapter 4: Health

Climate change influences exposure, risk, and human health outcomes. The impact climate change has on health disproportionately affects pregnant women, children, people with disabilities and preexisting conditions, elderly, low income, emergency response personnel, and those who work in outdoor conditions or without heating/cooling. Research and community members have already documented ways in which the shifting climate is impacting our health by way of air pollution, virus and disease transmission, drought, flooding, increased temperatures, and increased extreme weather events. Community health in FBIC is challenged by limited access to healthcare and other institutions that provide a social safety net. While these challenges are daunting, the Tribal Health Department, Indian Health Services, churches, and dedicated volunteers create opportunities for better health in the community.

Goal of the Sector:

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about

climate change can produce apathy or outright resistance.⁷⁶ We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate. There are a host of people and programs who provide health services in the community, ranging from providing youth education to enhancing food security to preventing illnesses. This section focuses on a few.

Youth education and activities

A variety of programs contribute to fostering health in the community, including the Tribal College's nursing program, Head Start, and the immersion school. The young generation is full of promise, with high academic achievement and many talents.

The Tribal Health Program has an initiative that involves kids from the Head Start schools, Immersion, Lodge Pole, St Paul's Mission school, Dodson, and Hays' junior high and high school in healthy activities. Every month we host a different sports activity. Kids attend practice two times a week and then play a game on the weekend. This happens in Hays, Lodge Pole, Dodson, and Fort Belknap Agency. The activities help kids get to know each other, get exercise, and have fun. The Chemical Dependency Center puts on basketball leagues and camps for kids in three communities.

Montana Indian Ministries hosts numerous activities every summer, and many people participate. With direction from Bruce Plummer, they bring cowboys and horses from Texas and host a week-long rodeo school on the southern end of the reservation. They bring basketball players too, and this summer they will have a week-long basketball camp. They also do soccer camps. They also have a youth camp where kids camp out by Beaver Creek where they do activities hiking and learning from speakers from the community about native plants and other things.

Food security

The Tribal College promotes food sovereignty through its garden and greenhouse. The garden produce is sold to the community and the proceeds are used by the college to buy seeds and other supplies for the next season. They grow vegetables, corn, tobacco, squash, potatoes, pepper, onions, cabbage, carrots, tomatoes, and radishes. The greenhouse starts the medicinal plants and involves students in that. It also has a medicinal garden run by Cheryl Morales which is used to educate people about traditional uses of medicinal plants. She also teaches classes and children learn how to make their own tea bags and tinctures. The College also has an aquaponics operation.

Lodge Pole has a greenhouse by the store for starting vegetable plants, and a second one is being built. There is a community garden next to the greenhouse.

Hays has a community garden. MSU Extension teaches garden tours. Community members get their own plot so people can grow their own food. There are also food preservation workshops in the four major areas of the reservation.

Fort Belknap opened food banks during the January 2019 federal government shutdown. During the shutdown, community members were able to get both vegetables and buffalo meat, regardless of income. The meat came from buffalo that the Tribes harvested to feed the community. The Methodist Church from Browning also supported the community by delivering food during the shutdown. The food

⁷⁶Stoknes, *What We Think About When We Try Not To Think About Global Warming*.

bank continues to operate even after the shutdown has ended, and people can continue to get food as well as diapers and formula every Thursday from 3 – 6 pm. There are food banks in Fort Belknap Agency, Hays, Dodson, and Lodge Pole.

As a result of more people gardening in the community, there are more farmers' markets now in the summer. They are happening in every community on the reservation. People sell everything from vegetables to fresh mint they grew themselves!

Indian Health Service and the Tribal Health Program employs a nutritionist who provides schools with menus for healthy lunches. She also teaches food classes in the Diabetes Prevention Program. She provides nutrition classes at senior centers in Hays and Lodge Pole. She provides healthy recipe suggestions for families that use affordable ingredients that people will most likely have at home.

Health Educator

A Health Educator goes into schools and talks with kids about sex education and other issues, doing outreach in Harlem, Hays, Lodge Pole and the Dodson area.

Mosquito abatement and West Nile Virus prevention

In 2017 and 2018 Montana had several counties which had positive pools for the West Nile Virus, which included our counties of Phillips and Blaine. West Nile Virus is most commonly transmitted to people by mosquitoes. One in five people infected with West Nile Virus will develop symptoms. Generally, symptoms are mild and may include headache, body aches, joint pain, vomiting, diarrhea, or a rash, Serious symptoms of infections in or around the brain develop in rare cases (fewer than 1 in 100).⁷⁷ The Mosquito Abatement Program seeks to protect our community members from health effects from mosquito borne viruses and diseases associated with West Nile Virus. The Program has operated in FBIC since 2005. Mosquito abatement administrative work begins in March-April with inventory and ordering supplies for the upcoming season. Mosquito spraying usually begins in April-May and our season usually ends in October, with the onset of colder weather. Staff not only spray for mosquitoes, but they also add larvaecide to ponds and standing water, before the mosquito larvae get a chance to develop into flying adults. Larvaecide sites include roadside ditches, ponds and standing water. Mosquito abatement reduces the risk to spreading vector borne illnesses like West Nile as well as safeguarding against the spread of other diseases that may reach the region because of climate change.

⁷⁷ "DPHHS Takes Step to Prevent West Nile Virus Infection."



A dip cup used to collect mosquito larvae in standing water bodies



Observing the larvae and identifying what life stage the larvae are in is an important step in predicting when a big hatch will occur, helping to decide when to begin spraying for mosquitos.

Steps to a Successful Mosquito Abatement Program

By Dennis Longknife, Jr.

In order to have a good mosquito abatement program, you need to address five things:

Education: You need to inform the community on what you do and when you are doing it, through newspaper, radio or other media.

Survey and Mapping: You need to survey and map all your routes to ensure your sprayers know where and when to spray.

Surveillance and Trapping: Check each water body around our communities where you plan on larvaeciding, and see if the mosquito larvae are actually developing. Trapping also tells you what type of species you are dealing and how the population is.

Larva Control: You dip the ponds and check to see if you see any “wigglers” (larvae), if so, that is the time to apply the larvaecide. If you apply too late you are wasting your chemical and it is expensive.

Adult Control: This is the main phase of mosquito abatement, when you are running your fogger out in the public. Knowing when to fog and what time of the day to spray is important, mainly because we don’t want to be spraying if the mosquitoes are not active and searching for a meal.

Diabetes Prevention

Tribal Health’s Diabetes Prevention Program takes people’s blood pressure and blood sugar, offers classes on cooking and healthy eating, provides an exercise room, supports public health nurses in providing a foot clinic for diabetic patients, and has lifestyle coaches who go out to Lodge Pole, Hays, and Agency to help promote exercise and health lifestyles. The Diabetes Prevention Program also offers healthy foods during lunch.

The Tribes also have a diabetes clinic at Indian Health Services. The clinic provides all enrolled members who have diabetes with gas money to get to their medical appointments and a Nurse Practitioner is available.

Tobacco program

The Tribal Health Program works to discourage smoking and vaping and counsels on how to stop using tobacco if they are already smoking or vaping. A staff member visits schools and is present in the community working to prevent tobacco use, including vaping.

Opioid prevention

The Tribal Health Program works to prevent opioid abuse and works with opioid abuse organizations to prevent opioid use and assist those who are living with opioid addiction.

Fitness

In addition to offering a youth fitness program, Tribal Health promotes fitness by offering weekly yoga classes in Fort Belknap Agency. It also sponsors a walking club and offers access to fitness coaches who work with people to improve health and fitness.

Powwows

Powwows require that you be in physically good shape to dance. They bring the community together, and promote traditional values, health, and fun. With increasing temperatures due to climate change, we are educating the public on the Tribal Health page about the signs and symptoms of heat stroke, especially during the powwow.

Other

Indian Health Service's Sanitation and Safety Program provides free car seats.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Higher temperatures, allergies, pathogens, and heat stroke

With warmer weather, there are more pathogens and diseases. Mosquitos have made their way south in the Reservation to Hays and Lodge Pole. With warming climate trends, we are also concerned about heat-related illnesses like heat exhaustion and heat stroke. Due to temperature changes, plants are beginning to grow earlier in the year which increases the growing season- when plants extend their growth time, pollen spores and other allergens and irritants are in our air for an extended period as well. Scientists project that allergy season will worsen with the extra pollen in the air and suggests that people who suffer with severe allergies may need to stay indoors during times of particularly high pollen count. This will likely have an effect on people who enjoy spending time and exercising outdoors.

Healthcare officials are finding it increasingly important to educate communities about heat stroke and its warning signs and symptoms. It is expected that as temperatures continue to rise so will heat related illnesses such as heat exhaustion and heat stroke.

Correlating with climate change, scientists are finding that the geographic and seasonal distribution of pathogens and pests are evolving as well. For the region of the Fort Belknap Indian community, this may include disease vectors like mosquitoes, ticks, and mice. For example, in 2017 and 2018, there have been cases of West Nile Virus detected in several Montana counties including Phillips and Blaine. As a response, many people in the community are opting to spend less time outdoors during times of high mosquito densities, which often overlaps with powwows and other outdoor and cultural events which are meant to promote traditional values, physical health, community, and fun. As climate change continues, researchers are expecting more vector-borne illnesses to reach northcentral Montana such as the mosquito spread zika virus, and potentially unknown pathogens as well.

Drought, water restrictions, and mental health

Reduced availability of both ground and surface water means there is less water for fisheries and stored for irrigation and agricultural purposes. When crops do not have access to the water needed to grow and produce, they likely will not survive to harvest. This stress on agriculture not only impacts the food supply and sovereignty of small communities, but also severely impacts farmers whose income and livelihoods depend on a successful harvest. Periods of severe drought and unsuccessful harvests have been correlated to elevated rates of suicide within the United States (Dumont et al., 2020).

For some, gardening may be a means for a healthy food supply. For others, it may be a way of meditation and relaxation - a way to connect with nature. Gardening is one of the top recommended activities for people who struggle with depression and other mental health related illnesses (Thompson, 2018). Drought will not only affect those with large scale agricultural operations, it will likely impact the mental health of those who enjoy tending to their gardens as lack of water and rising temperatures press on.

FBIC places restrictions on water use during droughts when water in the towers gets low. During drought periods people are using water faster than the water treatment plan is able to replace it in the water tower. When the pumps are pumping water in evaporation ponds that are low on water, the water plant operator has to wait till the ponds fill back up. As a result, during drought periods it takes longer for the water towers to get full and water quality is reduced. The water plan has to issue boil orders promulgated by the EPA when safe levels of water quality are not met. Boil orders are lifted when safe levels are reflected in water samples at which time water is deemed safe to drink.

As periods of drought increase in frequency and severity, we can expect an increase in dust, a decrease in clean water availability, and impacts to food and mental health.

Higher runoff, flooding, mosquitoes, mold, and mental health

The rapid increase in temperature over the spring months can trigger snowpack to melt at a speed that is faster than the processes of evaporation and groundwater recharge, which often results in flooding of low land areas. With flooding comes standing water, mold, inability to harvest crops, and waterborne illness. For example, in 2011, a large flood led to a lot of stress and anxiety within the community. As one person said, "I live by the river and I see it every day. The past decade, it has been up to the banks and I have never seen it that high." Due to the flooding powwow location was moved which caused a lot of anxiety and stress. As one community member put it: "it was extremely scary in 2011, because roads and bridges were getting washed out." Flooding also poses risks to health as homes can be infected with mold and there is also potential for more waterborne illness.

Standing water in the context of homes and communities often leads to mold and damage to infrastructure and roadways which can be very stressful and costly to repair. Mold also has the ability to harm to our health, by increasing asthma rates in children and asthma morbidity (Baxi et al., 2016). Standing water left unchecked is a breeding ground for mosquitoes, and as more places are flooding in the spring more places are experiencing mosquito impacts (see pathogens and diseases section for more on mosquitos). Mosquitoes and West Nile Virus are a concern with more standing water. The mosquito window lasts from about June through October. They affect people, horses, and cattle. They are of particular concern in Harlem. Mosquitoes have expanded to more areas in the reservation and into different seasons. People are seeing more mosquitoes in the mountains and in the southern part of the reservation, and also seeing them into the fall, which differs from past experiences. Worries about West Nile Virus means you can't enjoy your yard in the evening, and it keeps people from exercising as much. Here are what five people had to say about mosquitoes:

"All of the excess water flowing all over the place causes an alarming rate of mosquitoes. They are in places now they have never been. We never used to have mosquitoes out in Hays but they are there now due to the excess water. We are concerned about West Nile impacting people, horses, and cattle. People I know lost cattle due to West Nile. It's almost like torture leaving cattle out due to the mosquitoes."

"The Tribe and County go around every night spraying. I don't want my kids breathing that. I don't think it's healthy. Harlem is bad for mosquitoes. I have to make a mad dash from my car to my friend's door. Harlem does not have as much spraying as Fort Belknap. I don't remember mosquitoes when I was walking around town when I was younger."

"About 6 o'clock, mosquitoes practically run you back into the house."

"We have a powwow in the summer and people will want to know in advance how the mosquitoes are. They spray a lot and that makes it comfortable around the arbor."

"What I worry about is low-income families, with kids walking around." They can't afford bug spray. They are on the bike path going to the store or going to the park and can get bit by mosquitoes"

Additionally, moisture saturated soils can make crop harvesting difficult or impossible. For example, in 2018 a potato harvest went poorly because harvesting equipment could not be used on the wet ground. Potatoes instead had to be dug by hand. Hundreds of pounds of potatoes went to waste because they could not be harvested. Instead, they rotted in the round. The potatoes were sorely missed during the January 2019 government shutdown when people needed food.

Wildfires and eye and lung irritation

A seemingly inescapable consequence of climate change is air pollution. Air pollution typically consists of ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), dust, smoke, and particulate matter (PM). Common contributors to air quality and pollution are industrial factories, dust, pollen, mold spores, and wildfire smoke.

As we find the land is often dryer than the year before, wildfires are moving closer to our communities and the effects of wildfire smoke are more frequent and widespread. Wildfire season in Montana is

typically a range of months beginning in July and lasting until September, but recently communities have noticed that the wildfire season has grown longer, and more severe, which means wildfire smoke exposure in our communities is following suit. Effects from wildfire smoke can be felt up to hundreds of miles away from the actual location of the wildfire. The primary smoke and wildfire related health issues that have been observed include increasing cases of eye irritation, asthma, and trouble breathing. Smoke inhalation can also cause other ailments such as chest pain, faster heartbeat, wheezing, sinus infection, sore throat, and difficulty breathing. People with asthma are particularly at risk to the effects of smoke. Other vulnerable populations include veterans with cardiopulmonary disease and *chronic obstructive pulmonary disease (COPD)*, some of whom developed the disease as a result of exposure to Agent Orange.

Extreme weather, access to food and shelter, livestock, and mental health

Extreme weather puts many communities at risk and the communities of FBIC are no exception. Extreme weather events such as severe storms, extreme temperatures, winds, flooding, and fires, all pose serious risks to the mental and physical health of our community members.

The reaction time after an extreme weather event is both crucial and dangerous and in rural communities it may take some time before it is safe for emergency medical services to be able to come to the rescue. The result of extreme weather events can include people left for extended periods of time without firewood or heat after winter storms, pipes freezing solid combined with a lack of plumbers, and roads, bridges, and homes washed away after wind and flood events. Following these extreme conditions are health challenges which include limited access to basic necessities such as food, water, medications, health care, and shelter. Dealing with the effects of these weather events creates a huge toll on physical and mental health in the community. One of the most common human reactions to an extreme and damaging event are stress and depression, and in cases where people's livelihood and living conditions are at stake, the stress can be severe.

People throughout the reservation have been experiencing spikes and swings in temperatures, where it goes from freezing to warm and back again. In addition to wide temperature variance, climate change is increasing the incidence of extreme weather events such as severe winter storms, lightning storms, tornados, floods and heat waves. Extreme weather events can limit access to basic necessities like food, water, medicine and medical care, putting people who are elderly or ill at greater risk. People sometimes run out of wood during long cold periods. Two participants described it this way:

“Our extreme weather has gotten worse. We just survived 50-below-zero weather, and then it gets really, really hot here in the summer. As a tribe we are not prepared. The Senior Citizens Center has been without water for two weeks due to weather.”

“Last winter we were without electricity for days... Some people did not even have a way outside of their house and were going for days without food.”

People can be exposed to health risks as they respond to extreme weather. For example, people with underlying health conditions can have heart attacks when shoveling heavy snow and ranchers may expose themselves to dangerous conditions in order to protect livestock.

Not surprisingly, extreme weather events are causing stress and depression, as they intensify already challenging climate conditions in the region. As one workshop participant put it:

“There is a lot of stress associated with living conditions and living in this region, from clearing snow and ice from rooftops to getting your car plugged in, or problems with pipes freezing and a lack of plumbers. On cold weather days, like -40°F, it’s difficult to get necessities and medications.”

Another participant explained how extreme weather can exacerbate existing vulnerabilities in the community:

“I get kind of depressed from the cold. It’s no fun being without water and not being able to go to the bathroom. I have a sister who has one of the worst roads here at Fort Belknap. She was gone for a while because she was snowed in. Her husband used to snowshoe in. Now they have a four-wheeler. We don’t have any housing in town so they can’t move into town.”

Longer growing season, allergies, outdoor play, and gardening

We are seeing an increase in gardening due to the warmer weather in the summer, and also because there is more information about it and resources available. This is a positive change. At the same time, some people are getting allergies earlier than they used to get. Allergies are also keeping people indoors more, including children who would normally be playing outside. With the increase of wildfires and longer allergy seasons it is expected that these health concerns will affect more members of our community, and potentially limit outdoor activities and gatherings during times of particularly bad visibility and air quality. Long term effects of air pollution and smoke inhalation often lead to cancer, lung, and heart disease.

Predicted impacts: a close look at berries

Wild berries and berry picking are important for Aaniiih Nakoda Lifeways and healthy diets. Many types of wild berries, including serviceberries (*Amelanchieralnifolia*) and chokecherries (*prunus virginiana*), are high in antioxidants. Antioxidants are good for human health and have been shown to reduce the risk of diabetes, heart disease, cognitive decline and cancer.⁷⁸ Climate change is expected to affect the life-cycle events of plants, changing the dates at which they bloom and give fruit.⁷⁹



Juneberry (*Amelanchieralnifolia*)

Juneberry (also known as saskatoon, serviceberry, shadbush, and sarvisberry) is the fruit of a small tree or shrub often found in lower elevation forests, foothills, and near streams. It is one of the earliest flowering shrubs of the Montana spring, identified by fragrant white star shaped flowers. Berries are dark purple and ripen in early summer. The amount and quality of berries given by a plant is strongly dependent on climate. Serviceberry is sensitive to temperature, with higher temperatures resulting in less berries.⁸⁰ Warmer spring temperatures are likely to mean less berries, or more years where there are fewer berries.⁸¹ In addition to the effects of temperature, serviceberry is vulnerable to the fungus *Entomosporium*spp which does well during periods of heavy rainfall or extended moisture.⁸²

Juneberries – photo by Dennis Longknife, Jr

⁷⁸ Jerry Hupp et al., “How Are Your Berries? Perspectives of Alaska’s Environmental Managers on Trends in Wild Berry Abundance,” *International Journal of Circumpolar Health* 74, no. 1 (January 1, 2015): 28704, <https://doi.org/10.3402/ijch.v74.28704>; Navindra P. Seeram, “Berry Fruits: Compositional Elements, Biochemical Activities, and the Impact of Their Intake on Human Health, Performance, and Disease,” *Journal of Agricultural and Food Chemistry* 56, no. 3 (February 1, 2008): 627–29, <https://doi.org/10.1021/jf071988k>; Lynn et al., “The Impacts of Climate Change on Tribal Traditional Foods.”

⁷⁹ Elisabeth Beaubien and Andreas Hamann, “Spring Flowering Response to Climate Change between 1936 and 2006 in Alberta, Canada,” *BioScience* 61, no. 7 (July 1, 2011): 514–24, <https://doi.org/10.1525/bio.2011.61.7.6>; Kelsey L. Dunnell and Steven E. Travers, “Shifts in the Flowering Phenology of the Northern Great Plains: Patterns over 100 Years,” *American Journal of Botany* 98, no. 6 (2011): 935–45, <https://doi.org/10.3732/ajb.1000363>.

⁸⁰ Holden et al., “Sensitivity of Berry Productivity to Climatic Variation in the Cabinet-Yaak Grizzly Bear Recovery Zone, Northwest United States, 1989-2010.”

⁸¹ Holden et al.

⁸² Dara Palmer, “Growing Serviceberries,” MontGuide (Bozeman: Montana State University Extension, 2018), <https://www.msuextension.org/publications/YardandGarden/MT201821AG.pdf>.

Chokecherry (*Prunus virginiana*)



Chokecherry – photo from Wikimedia

Chokecherry is a small shrub or tree often found near rivers and streams. A member of the rose family, the chokecherry shrub has 10-20 white blossoms on a long stem. Blossoms generally appear in May and each flower gives a single berry, tart in flavor and blue-black in color when ripe. Chokecherries often grow in low and mid-elevations, making them vulnerable to flooding.⁸³ Chokecherries are also susceptible to the fungus, *Plowrightiastansburiana*. While it is unclear how this fungus will be affected by climate change, climate change is expected to reduce chokecherry's ability to fight off infection.⁸⁴

Observations about climate change impacts to berries

People have contrasting observations on berry availability. For example, one person said, "I like to pick berries. I have been noticing more berries because of the warm temperatures in the summer, particularly Juneberries, chokecherries, and raspberries." Another community member said, "I am seeing a lot less berries. I think berries are down due to heat and drought."

One person noted that serviceberries and chokecherries are ripening later in the season. There are changes in the blooming season of plants which may affect bees and pollination of plants. Some people have noted blight on berries and aspen trees. Another person noted that cool season native plants in general are moving north.

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation events combine with other weaknesses and threats to influence the overall vulnerability in our community. This is a summary of some of the weaknesses and threats related to the Health Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exaggerate vulnerabilities to climate change. They include water contamination, racism and cultural insensitivity, food insecurity and emergency response, access to buffalo and wildlife, and competition for berries.

⁸³ "Climate Change Vulnerability Assessment in the Upper Snake River Watershed: Common Chokecherry" (Adaptation International, 2017), <http://www.uppersnakeivertribes.org/app/uploads/2017/03/USRT-Chokecherry-Climate-Summary-Sheet-Final.pdf>.

⁸⁴ "Climate Change Vulnerability Assessment in the Upper Snake River Watershed: Common Chokecherry."

Water contamination

There are problems with water contamination in some places on the reservation. E coli bacteria has contaminated water in tribal water bodies, often resulting from improper livestock usage and poor infrastructure in nearby residential areas. In many places, drinking water infrastructure is old and outdated, and there have been outbreaks of *Helicobacter pylori* (H. pylori) causing health issues.

In 2019, the Environmental Protection Department found elevated levels of mercury in Snake Butte fishing reservoir and also in the Milk River. The cause is not currently known, though it is suspected that the source is either from the fish hatchery or atmospheric deposition from coal fired power plants. The contamination is especially concerning since many families in the community eat a lot of fish.

Some people are concerned with visible and invisible pollutants in the Milk River. For example, people have seen dead cows floating down the river when winter ice breaks up in the spring and cattle can fall through the ice. Some community members wonder what kind of germs are in the water and whether it is safe to fish in the river.

Racism and cultural insensitivity in Harlem

There have been incidents of racism and cultural insensitivity around schooling in Harlem and other neighboring communities. There is need for more Native-focused education to ensure that members of our community feel safe moving about the region and to ensure that children educated in communities outside of the Reservation are able to receive quality education.

Food insecurity and emergency response

The whole community needs quick access to food banks and food distribution in times of climate emergencies. During the 2019 federal government shutdown, there were significant delays in emergency food distribution, as described by a community member:

“We have developed a food pantry program, however only one of our three tribal communities were set up and were prepared, so they made it a point to share out to the other two communities, and we all finally received our food boxes last week after we started back to work. It is events like this that makes us stronger... and finding lessons learned. What could we have done to make this food pantry program available and more efficient so we could get the food out there right away and not a month later?”

Access to buffalo and wildlife

One reason we got a buffalo herd is because we have a lot of diabetes in our Tribes. Having a herd means that people with diabetes have better access to low-cost high-quality meat. More recently, the Tribes’ Buffalo Program began selling the meat, and people with diabetes have less access. In the past, we also had buffalo so people could use it for ceremony without having to buy it. There is tension now between the monetary value of wildlife and the direct-use value of buffalo.

Competition for berries

During climate change planning meetings, several members of our community expressed concern that people other than tribal members, like the Hutterites, are accessing most of the berries in the region. Some nonmembers are gathering berries for economic gain at the expense of tribal members who are gathering berries for consumption, traditional practices, and ceremony.

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. The strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community's resilience. These ideas are just a sample of potential actions and should be carefully vetted and discussed before implementation:

- The Tribes do not have extreme weather work plans that permit people to work from home, but at the same time working from home can contribute to isolation. Finding a balance between preventing folks from driving in hazardous conditions and keeping employees socially engaged is important.
- Strengthen the Food Bank system so people receive food more quickly in emergency situations and federal government shutdowns
- Promote tribal garden farming and best management practices for harvesting.
- Plant more trees to provide shade and reduce heat levels in the communities. Trees should also be planted to add shade around fishing reservoirs, buffalo pastures, and along housing projects where they can also serve as wind breaks, and anywhere else is shade desired.
- Distribute bug spray, especially to low-income families. If feasible use natural bug spray and review the risks of using sprays with harsh chemicals.
- Look into using bat houses to help control mosquitoes.
- Build water catchment systems to prevent mosquitoes from laying eggs.
- Build outdoor fitness areas for the elderly
- Build a walking and running path with access to nature. Provide a place for people to go out with dogs.
- Schools should cancel sports practice when wildfire smoke is present.
- Make information about water and/or fish contamination public with signage.



Chapter 6: Land Use

FBIC's reservation lands consist mainly of rolling plains with the Little Rocky Mountains rising above the prairie at the southern end of the reservation. The eco-region of FBIC is generally characterized as Great Plains Mixed-grass Prairie, and is part of the Rocky Mountain Lower Montane, Foothill and Valley Grassland system.⁸⁵ Farming and ranching are important industries and major sources of livelihood on the Fort Belknap Indian Reservation. According to the 2012 USDA Agricultural Census, 555,480 acres of reservation land is used for agriculture and/or ranching.⁸⁶ Out of 150 farms, 121 are operated by American Indians⁸⁷ and eighty-eight farms have cattle.⁸⁸ There are 180,737 acres of total cropland and 18,336 acres of irrigated land on the Fort Belknap Indian Reservation.

In April 2019, as part of the Cobell Land Buyback Program, the U.S. Interior Department announced it would award more than \$27 million to landowners on the Fort Belknap Reservation. Nearly 3,000 FBIC landowners are eligible to participate.⁸⁹ A previous round of land buy-backs awarded \$60 million to tribal members and placed 200,000 acres in trust for the Assiniboine and Gros Ventre Tribes.

⁸⁵ "Gros Ventre and Assiniboine Tribes (Fort Belknap)," UM Natural Areas-Payne Family Native American Center Garden, accessed December 26, 2019, <http://hs.umt.edu/nativegarden/circles>.

⁸⁶ "U.S. American Indian Agriculture at a Glance" (USDA-NASS Montana Field Office, September 2014), https://www.nass.usda.gov/Statistics_by_State/Montana/Publications/Charts_and_Graphs/American_Indian_Profile_2012.pdf.

⁸⁷ "U.S. American Indian Agriculture at a Glance."

⁸⁸ "U.S. American Indian Agriculture at a Glance."

⁸⁹ Nicky Ouellet, "Interior Department Offers \$27 Million for Fort Belknap Land Buy-Back," April 29, 2019, <https://www.ypradio.org/post/interior-department-offers-27-million-fort-belknap-land-buy-back>.

The Lands Department has a Director, Assistant Director, a staff support clerk (who also works in the appraisal program), a GPS technician, a lands conservationist (who also coordinates with USDA and FSA), a temporary permitting and leasing clerk, a realty officer, a range rider, and a compliance officer. The Lands Department, in coordination with many departments, completed the Agriculture Resource Management Plan in 2018.⁹⁰ This sector includes a focus on housing, noxious weeds, and agriculture.

Goal of the Sector:

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about climate change can produce apathy or outright resistance.⁹¹ We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate.

Our land base

The Tribes' land base and rights over it are a major strength. Snake Butte, for example, protects wildlife and cultural areas and provides recreation, water, and access to first foods like berries. Authority over tribal lands is key component of tribal sovereignty and the Tribes are working to increase the land base through land purchases. For example, the Tribes recently purchased over 19,000 acres:

- In November 2018, the Tribes purchased the Gilbert Ranch. At 11,205 acres, it is the biggest ranch on the reservation. The Tribes are currently leasing the ranch, meaning the Tribes are collecting income from it that is being used to pay back the mortgage. It is a highly productive and well-managed ranch. Gilbert Ranch is currently going through the process of getting licensed to grow hemp, which could produce income for the tribe.
- The Tribes also bought the Spencer Ranch, the Pitman Ranch, called the Hancock Purchase, and the neighboring Mitchell Ranch. This area is known collectively as "the Tribal Ranch". At a little over 8,000 acres in total, this area is now being leased to a long-time local rancher. There are also various other land purchases known as Turtle Mountain Land, one section north of the town of Malta, that has 160 acres, Gumbo Butte, and FBIC is leasing some sections of Turtle Mountain Tracts, south of the reservation.

Some members of the community view the Tribes' resources as being underutilized, which means there are many opportunities for expanding livelihoods within the community. Others view it as a strength - that FBIC is not overusing resources and are more able to adapt to climate change as a result.

⁹⁰ Ouellet.

⁹¹Stoknes, *What We Think About When We Try Not To Think About Global Warming*.

Pride and Stewardship

The Gros Ventre and Assiniboine peoples take pride in their reservation and ancestral lands. As one planning participant explained, “our land base is a huge strength. Our natural resources are amazing. Our undisturbed prairie is pretty unusual, our wildlife, the bird migration that comes through. Our medicinal plants – people are still able to harvest them.” As another participant put it “Every one of us has a stake in this reservation – not just the landowners”.

Partnerships

FBIC has a lot of support and there are resources available to assist FBIC in carrying out restoration and conservation work that is aligned with tribal values. For example, Dennis Longknife, Jr., the current Climate Change Coordinator, plans to host a weed tour for people from around the state. Partners and resources include Montana State University Extension, Indian Nations Conservation Alliance (INCA), Intertribal Agricultural Council, Indian Land Tenure Foundation, Farm Service Agency, Montana Department of Agriculture, and others. INCA is providing funding to start a tribal conservation district and to develop biocontrol measures to combat weeds. Another example is the Natural Resource Conservation Service which works with farmers and ranchers to conserve the land. Yet another example is the Little Rockies Restoration Project, in which FBIC has partnered with the Center for Large Landscape Conservation to restore up to 300 acres of forest. Thinning forested areas will help protect against forest fires and build resilience to climate change effects in the Little Rockies.

Farmers and ranchers

The mainstay of the reservation is agriculture. We have several enrolled members who farm – the majority of whom are cattle ranchers. Our farmers and ranchers live off the land and have to make the land productive. Many farmers and ranchers understand that they need to work with the cycles of wildlife and plants, there is a strong culture of reciprocity with the land. When ranchers and farmers lease land, they are providing income to allotment owners, sharing the benefits with the broader community.

Combatting noxious weeds

Fort Belknap Indian Community is working hard to combat noxious weeds. FBIC has received funding from the Indian Nations Conservation Alliance to implement biocontrol. Biocontrol is important for reducing negative impacts to human health from the spraying of weeds. FBIC is using two different types of insects to reduce leafy spurge and spotted knapweed in agricultural areas. FBIC is also developing plans to use biocontrol to reduce the prevalence of Russian Olive. Another strength is the Noxious Weed Strategic Plan, although it is outdated, it only needs to be revised/updated. One of the challenges is getting funding from the Noxious Weed Trust Fund, as our tribes lack the technical ability to get selected for funding and will need to hire a consultant or partner to assist in that endeavor.

Housing

There is a shortage of housing on the reservation, due to lack of infrastructure and funding. The tribe has identified a possible area for development, Eagle Valley, but the lack of pre-existing streets, sewer lines, and electricity to the area is a major obstacle. The Lands Department recently leased ten lots to the Island Mountain group which plans to address the housing shortage by putting houses on the lots and selling the houses. The Tribes are currently putting together an advisory council to identify possible sources of funding to address the housing shortage on the reservation. Development requires environmental and cultural reviews, but in the past, planning for site conditions hasn't always been

carried out as thoroughly as it could have been. This creates problems managing infrastructure, such as burst pipes in the spring, which in turn costs the tribe work-hours when tribal sectors have to shut down to address them.

The Land Buyback Program allowed the tribes to acquire more land to potentially develop housing sites.

Tribal members who live in housing in nearby communities off the reservation often encounter difficulties in receiving adequate services from landlords, despite rental agreements. This underlines the importance of providing adequate housing on the reservation.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Warming temperatures, cattle, and weeds

People are observing that with warming temperatures, calving season has shifted to an earlier timeframe. These changes require ranchers and producers to prepare earlier calving seasons and to make other necessary changes. Additionally, water loss from transpiration and evaporation is increasing. Longer and hotter summers has impacts to grass and forage as plants dry up more quickly.

There are more problems with noxious weeds on dryland farming areas, including with leafy spurge and Canadian thistle. Climate change can create conditions that facilitate the spread of noxious weeds and invasive species [add citation].

Drought, crops, and cattle

With more prolonged and severe droughts, people are seeing “crops drying up” and smaller sized vegetables. With insufficient water, longer growing seasons are expected to produce reduced crop yields. Drought also brings grasshoppers that can further damage crops and exacerbate the effects from drought. We had a grasshopper epidemic in 2021-2022, some areas were hit harder than other areas, but still the impacts to the crops were felt reservation wide. We are in our second year of on-going drought. Drought is categorized by stages with D4 the worst. We have been in D3 to D4, and are currently in D3 right now.

“A lot of our range units, our water is drying up, and we don’t have wells.”

Drought also impacts cattle herds, especially when followed by floods or other extreme weather events. During a drought the quality of grass suffers, which affects the health of the cattle. As a result of this, herd sizes decline as some cattle die off. Water has become more limited later in the grazing season and many grazing units do not have wells or sufficient access to water during droughts requiring cattle to travel further to access water and further straining their health. For example, by the end of the summer, Lake 17 dried up entirely- which is a new development. Wind during droughts can further dry out forage. As cattle travel further into stream beds to access whatever water is left, they can become

trapped in the mud and if they are unable to free themselves, they can die in the creek bed. Some ranchers have found these challenges to be too great and have decided to close their operations.

Reduced availability of both ground and surface water also means there is less water stored for irrigation and agricultural purposes. When crops do not have access to the water needed to grow and produce, they likely will not survive to harvest. This stress on agriculture not only impacts the food supply and sovereignty of small communities, but also severely impacts farmers whose income and livelihoods depend on a successful harvest. Periods of severe drought and unsuccessful harvests have been correlated to elevated rates of suicide within the United States (Dumont et al., 2020).

Higher runoff and flooding impacts cattle, crops, and infrastructure

Crops

Higher runoff and flooding impacts crops and food security. For example, The Aaniiih Nakoda College garden was flooded in 2017. Flooding also spreads noxious weeds, complicating the ability to recover fully from the consequences of a flood. Similarly, runoff has depleted soil nutrients in some places, reducing alfalfa harvests and hay production:

“People have had to put more into the soil because of the runoff. Because of the flooding, especially in the valley, a lot of nutrients are being washed away... so there is less alfalfa. You don’t get as many bales.”

Sometimes farmers cannot access their crops due to standing water. Their first cutting is delayed because the ground is too saturated or there is still standing water. When water sits in agricultural fields for extended periods of time, it has the ability to soak and rot crops - ultimately resulting in crop failure. Sometimes if farmers are able to harvest their crops before rotting sets in their livelihood can be spared, but flooding also severely impacts equipment used for harvesting and often makes it impossible altogether.

With mass flooding also comes mass runoff. When the ground is unable to absorb water adequately or quickly enough, and evaporation is not occurring at a large enough scale, water's only option is to run off. Ground cover in the form of vegetation is incredibly important to the water cycle, the root systems allow for soil to absorb and hold moisture which helps with water infiltration for groundwater recharge. In times of drought the vegetation that provides essential ground cover often dries up and dies out. When there is nothing trapping water and moisture in the soils, the topsoil dries out and is washed away with the rest of the water to eventually pool up in lower elevations. Runoff can also occur on agricultural lands and often leads to water contamination like E. coli and algal blooms. In recent years increased runoff has led to high levels of mercury in places like the Snake Butte fishing reservoir and the Milk River. Once mercury is in the water source it is within the fish living in that water source. Mercury is often found in fish, but when the concentrations are high it is dangerous for human consumption.

Cattle

Farmers are not the only ones in the industry that feel the effects of flooding. Livestock and ranchers also have to battle with decreased grazing area, and West Nile and mosquito related illness in livestock. Research shows that mosquitoes have the ability to transmit several pathogens to livestock, but even in the event when a pathogen is not transmitted, mosquitos are capable of reducing livestock health,

fitness, and overall production (Garros et al., 2018). Additionally, flooding often corresponds with the calving season. In 2017, ranchers had to move calves and cows together to higher ground to avoid the flooding in the Milk River Valley. When cattle are relocated early to the range units, there is potential for overgrazing.

Seasonal shifts

Some people have noticed positive impacts from a “delayed start to winter”, noting alfalfa was green longer and that the gardening season was also lengthier. Some people are also seeing a later end to winter, even as winter *starts* later, resulting in an overall shift in the timing of the seasons:

“This past summer we were okay but the summer before that was when we had the drought and the really bad winter. I guess that is going to happen. I think there is a huge impact on the cycle of everything. Everything is a month later. Like just now, we are going colder later and it’s warmer later into November.”

“It seems that everything is just kind of off. The cycle of the plants seems to be late. The plants... it’s mostly the berries and the wildflowers and the apples are coming later on the southern end of the reservation. We have an orchard in Lodge Pole and some of that is late.”

Some people expressed concern that if cattle grazing and the growing season are not lined up, there is a risk of overgrazing young plants which will then not grow back. For farmers and gardeners, plants are beginning to grow earlier in the year which increases the growing season - however, the harvest time and time to take advantage of the longer growing seasons may actually be shortening

Wildfire, cheatgrass, and cattle

Several planning participants people expressed concern about the spread of cheatgrass. Cheatgrass is an invasive grass that grows early in the spring and matures and dries out in early summer, which then can burn rapidly, causing fires to start more quickly and burn more intensely. Some people are finding that there are more fires being started by lightning than in the past. Cattle ranchers struggle when fields burn because they have to find alternative grazing areas.

Extreme weather events impact crops, cattle, and infrastructure

Crops

Hail and heavy rainfall have damaged crops like wheat and hay, as well as people’s gardens.

Extreme heat can pose a threat to crops as well. As one participant noted: “Our extreme heat in the summer dries everything up. On Fort Belknap, we don’t have a lot of irrigated land, so we are really dependent on irrigation except for down in the valley on the northern end of the reservation along the Milk River.”

Cattle and Extreme Weather

Extreme weather can affect the timeframe for the calving season. For example, in 2018 the calving season started about two weeks later because of the colder winter with more snow. The extreme weather places increased stress on cows. For example, one person said:

“The biggest impact has been the extreme cold because it has been a huge impact on our livestock. The impacts from high amounts of snow and extreme cold limits their mobility, so the cattle can’t get to somewhere safe. Most ranchers can’t do anything about it when it’s negative 50 degrees out.”

Extreme winter weather has led to decreased calf births and decreased calf weight. A negative cycle ensues, as described by a planning participant:

“The cows don’t breed back well, and we had a lot of dry cows last year – because of the stress of the winter.”

In 2018, many cattle were stranded by the snow and died from exposure.

Infrastructure

Flooding and heavy rainfall and snows have impacted infrastructure, sinking roads and jeopardizing people’s access to homes. Due to flooding and heavy runoff water is getting into crawlspaces and basements. Even with proper drainage, heavy and sustained rain forces water into buildings. For example, the Environmental Department’s office building frequently floods. Flooding in buildings and other places can increase the risk of mold, which has health consequences and is expensive and difficult to remove. This especially effects families living in older homes which are susceptible to mold.

Many people are concerned about increasing infrastructure damage, whether it’s lagoons overflowing, pipes freezing or breaking, grain silos eroding into the river, or power lines breaking with subsequent outages. Electrical outages put people at risk because many homes lack alternative heat sources.

Predicted impacts

In addition to the impacts people are already observing, planning participants expressed concern that new invasive species could arrive to the Reservation as a result of climate change.

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation events combine with other weaknesses and threats to influence the overall vulnerability in our community. This is a summary of some of the weaknesses and threats related to the Land Use Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exaggerate vulnerabilities to climate change. They include inadequate housing, noxious weeds, overgrazing, and the loss of species such as black-footed ferrets.

Inadequate housing

There are many preexisting challenges with housing in the Fort Belknap Indian Community that make residents particularly vulnerable to climate change impacts. First, there is a shortage of housing. The Lands Department works with 2.5-acre home site leases but lacks sufficient home sites to meet demand. As a result, the majority of houses are overcrowded. Second, most housing is old and in need of repair, making homes susceptible to damage from extreme weather events. For example, many HUD homes here are old and dilapidated. Third, many homes lack proper landscaping, such as proper drainage. Poor drainage increases moisture collection around the home and causes molding. A lot of older homes were built without rain gutters allowing precipitation to pool around a home’s foundation. Finally, some houses are built in flood zones, primarily in scattered sites where people built on their own lands.

A major cause of the housing shortage is the fact that many people are unable to obtain home loans because they are living on tribal land, which they cannot use as collateral on a mortgage. Additionally, electricity is so expensive that many people cannot afford to run electricity out to houses. Utility rates are exceptionally high, estimated costs of getting meter box installed on a new home is around two thousand dollars- a significant barrier to the development of new homes. Similarly, getting power poles to run electricity from a transmission line to the meter box cost can range up to \$10 K.⁹²

Noxious weeds

Spotted Knapweed, Russian Knapweed, Russian Olive, Field Bindweed, Leafy Spurge, Cheatgrass, Canada Thistle, and Purple Loosestrife is a problem, and Leafy Spurge is being spread as people move winter hay. Leafy spurge is also a difficult noxious weed to control. Farmers are losing opportunities to sell hay because people are uninterested in purchasing hay with leafy spurge in it.

Overgrazing

Some people are concerned about overgrazing and the long-term consequences that overgrazing may have on native plant and animal species.

Black-footed ferret and prairie dogs

In recent years, FBIC reintroduced black-footed ferrets in hopes of restoring the black-footed ferret population and managing the prairie dog population. The prairie dogs were reducing the Animal Unit Months (AUM) stocking capacity by eating forage. Effectively, the population was high enough that they had become grazing competitors with livestock. FBIC was the first tribal nation to reintroduce black footed ferrets to its lands. An initial reintroduction in 1997 failed due to an outbreak of sylvatic plague. In addition, ferrets were released into the wild and succumbed to predation, because they had been raised in cages and not preconditioned for release.

In 2013, in partnership with the US Fish and Wildlife Service and WWF, FBIC initiated a second reintroduction program. With new tools available for plague mitigation, and a better preconditioning system prior to release, the ferret population successfully established itself and is currently producing kits and doing well. This may help reduce overgrazing by controlling the prairie dog population.⁹³

Additional challenges

Some people report experiencing challenges in communications and cooperation between the Tribes and the Bureau of Indian Affairs and feel that there are problems with national, state, and county politics, including with “big name” farmers and ranchers. Some planning participants expressed feeling that the BIA is not upholding their responsibility to protect the health and welfare of tribal people living on reservations.

Some planning participants expressed frustration and concern that American Prairie Reserve (APR) has not hired any tribal members, even as APR continues to buy a lot of land and expand their buffalo herds

⁹² Estimated 10k cost is for approximately 6-7 power poles.

⁹³ Bly, K. 2021.

within their own site and operations. There is also concern that APR will invade or overtake FBIC lands and displace indigenous peoples in order to fulfill their goals.

Large numbers of tumbleweeds take out fences, especially when followed by heavy snows. When the fences are not repaired, cattle cross over and graze. Snowmobilers, quad runners, and illegal hunters cut fences to go through areas, creating another source of problematic cattle grazing.

In addition to these challenges, participants expressed frustration that important plans like the Agriculture Resource Management Plan are not being implemented and are rather “just sitting on shelves”. Planning is often funded by the BIA and federal government, but funds for implementation are rare, making it difficult for the Lands Department and FBICC to take the lead on implementing the ARMP.

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community’s resilience:

- Find ways to prevent floods from damaging infrastructure and spreading weeds
- Diversify agricultural practices.
- Building codes/zoning/buffer zoning – Better site planning, better materials to preserve heat and lower use of electricity and other fuels for heating, siting developments in places where infrastructure will not be at risk, increased use of solar panels, energy efficient lighting requirements
- Work with the BIA to improve weed management
- Use the ARMP as a vehicle for adaptive management
- Create a Department of Agriculture of Natural Resources Department to reduce stress on the Land Departments
- Hay transportation – producers need to plan ahead and store available hay as needed to help cope with drought years when hay production is low. This will reduce the need to transport hay from elsewhere. Apply for USDA programs to help with hay shortage years.
- Develop outreach and education for ranchers dealing with beavers. Create non-lethal beaver management strategies and programs.
- Need to educate the land users/owners about assistance programs that are offered, beyond just the BIA and Tribal programs – USDA, EQIP, wetland reserve, etc.
- Continue to support and expand the climate change program to facilitate climate adaptation planning, education, outreach, and adaptive management.
- Continue to improve weatherization of homes and facilities such as roofing projects and drainage. Consider working with North West Energy on weatherization efforts.
- Develop plans for assisting ranchers during heavy snows
- Lake 17: Diverting water from a stream to add more water to the reservoir. Currently working with USDA on this. Section Creek is an ephemeral stream; capture the water while it’s running, after precipitation events. Lake 17 was built as a livestock watering pond, but is now also significant for a number of migratory bird species. During the current severe drought (2021) the

lake almost dried up. Dredging to make the lake deeper might be an option for increasing permanence of the lake.

- Using the ARMP as a guide, develop a strategic plan for the Lands Department, including a farm pasture code and a grazing ordinance.
- Develop and implement a weed/pesticide program.
- The Water Compact, currently under negotiation, should provide funds for water retention through dams and dikes.



Chapter 7: Culture

Words are powerful and reflect our values. Planning participants discussed a broad range of titles for this chapter. For example, some people objected to the term “culture” because it has been used to enact and reinforce colonization and to treat indigenous peoples and ways of life as “others”. Replacing the word “culture”, for many people, is an act of decolonization. A variety of alternative titles were proposed, including “customs and traditions”, “indigenous practices and cultural traditions”, “Aaniiih and Nakoda Ways of Life”, “The Way”, “The Red Road”, and “Lifeways”.

The Tribal Historic Preservation Office (THPO) and the Language Preservation Program work to protect Aaniiih Nakoda languages, customs, traditions, and ways of life. THPO oversees and enforces the FBIC Cultural Property Act, along with the Cultural Preservation Board. This chapter includes a focus on traditional practices and cultural sites. Educating people and restoring our languages and traditional ways is a major tribal priority.

Goal of the Sector:

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about climate change can produce apathy or outright resistance.⁹⁴ We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate.

The people of Fort Belknap Indian Community have rich tribal histories and many creative, talented, and generous people. We have people who pray and fast for the world. Our “Indian sense of humor” teaches humility and contributes to resilience. Societies such as the White Clay and Buffalo Chaser Societies play important roles in keeping people connected to one another and our traditions.

Language preservation

Our community is working hard to preserve our languages. The Fort Belknap Language Preservation Program’s mission is to preserve, strengthen, enhance and teach the Gros Ventre and Assiniboine language and cultural history for the present and future generations of the Fort Belknap Indian Community. Tribal Elders supported by various grants teach language classes in the evenings in FBIC’s 3 major communities. The White Clay *Immersion School* is a private *school* located in Harlem that has 12 students in grades 4-6. The school works to save the Aaniiih language.

Practicing our Lifeways

We practice our Lifeways through hunting, gathering, sun dances, songs, sweat lodges, round dances, fasting, holy sleeps, horse racing, beading, sewing, and stick games. The tribal government and people of FBIC are keeping our traditional ways alive.

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Drought and First Foods

Drought impacts First Foods. It can result in poor berry and root production and negatively affect the harvest of medicinal plants. Drought will reduce the availability of First Foods and traditional use plants. For example, berry crops are impacted by snow storms, hail, and moisture levels. When there is drought, there is less berry production and more limited access to berries and other First Foods.

Higher runoff and flooding impacts the powwow grounds and fishing

In 2011, the powwow and Sun Dance grounds flooded, requiring different sites to be selected. This flooding caused logistical challenges and anxiety for event organizers and community members. When runoff and flooding is high, fishing access is affected. In particular, walleye and pike fishing access has

⁹⁴Stoknes.

been affected by floods. For example, in the spring and summer of 2018 and 2019, the Milk River was too high to fish.

Lower stream baseflows impact fishing

Over time, elders have reported that Little Peoples Creek Canyon has been having less average flow seasonally. A lot of people fish, hunt, and gather First Foods and traditional use plants in the Little Peoples Creek Canyon raising concern that this important area is vulnerable to climate change.

More frequent and intense wildfire impacts sacred sites

Fires can make tipi rings more visible, exposing cultural sites. With increasing risks of wildfires, there are increasing risks of desecration and destruction of cultural sites. Historically, the tribes used fire as a land management tool to increase favorable vegetation grown and to reduce the risk of fire that impacts traditions ways of life. Fire suppression policies have increased the risk of wildfire and the potential for damaging sacred sites.

Changes in plant life cycles

Community members are observing changes to the timing of plant life cycles. Harvesting and gathering times have changed for chokecherry, Juneberries, and other berries and plants. For example, wild turnips are following the seasonal climate changes, depending on current climate and weather conditions they grow early one year and then later the next. Similarly, with warming temperatures, June berries are budding earlier but then can be killed off with frost. In general, juneberries are arriving later and are not as abundant.



Prairie turnip (*Psoralea esculenta*) is an important traditional food – photo by Dennis Longknife, Jr.

Predicted impacts: a close look at several medicinal and ceremonial plants

In recent years, large amounts of grassland and shrubland have been converted into cropland. From 2008-2012, 5.7 million acres of grassland and 584,000 acres of shrubland was converted into cropland, with much of this happening in North and South Dakota.⁹⁵ Compared to croplands, grasslands have much greater plant and animal diversity. The conversion of grasslands and shrublands into cropland throughout the Great Plains region interacts with climate change by reducing the number of plants and animals in the area.

Prairie Turnip (*Psoralea esculenta*)

Prairie turnip is an edible root high in proteins, minerals, and carbohydrates.⁹⁶ Prairie turnips often grow in the well-drained soils of the prairie and mountain foothills. Above the ground, the plant has blue or purple flowers in clusters with fuzzy stems and branches which bloom in the late spring. Prairie turnips are usually collected in late spring or early summer before the flowers and stalks break off, which makes finding the root difficult.⁹⁷ Across the Great Plains, the number of wild prairie turnips has been reduced by agriculture and the heavy grazing of pasturelands.⁹⁸ Changes in temperature and precipitation may alter the flowering time of prairie turnip, changing the window of time during which the plant can be identified and harvested.

Sage

Sage-steppe ecosystems are one of the most at-risk landscapes in North America. The near-endangerment of the sage-grouse (*Centrocercus urophasianus*) has brought attention to the condition of sage-steppe ecosystems throughout North America.⁹⁹ The sage grouse's habitat has been fragmented by development, and further damaged by the spread of non-native weeds such as cheatgrass, which contributes to more intense wildfires.¹⁰⁰ Fire is one of the primary causes of loss of sagebrush.

⁹⁵ Tyler J. Lark, J. Meghan Salmon, and Holly K. Gibbs, "Cropland Expansion Outpaces Agricultural and Biofuel Policies in the United States," *Environmental Research Letters* 10, no. 4 (April 2015): 044003, <https://doi.org/10.1088/1748-9326/10/4/044003>.

⁹⁶ April Stahnke et al., "Prairie Turnip *Pediomelum Esculentum* (Pursh) Rydb.: Historical and Modern Use, Propagation, and Management of a New Crop," *Native Plants Journal* 9, no. 1 (March 20, 2008): 46–58, <https://doi.org/10.2979/NPJ.2008.9.1.46>; Jeremy Trombley, "Foods Indigenous to the Western Hemisphere: Prairie Turnip," WoLakota Project, accessed January 30, 2019, <https://www.wolakotaproject.org/reservation-maps-and-prairie-turnips/>.

⁹⁷ Barry Kaye and D. W. Moodie, "THE PSORALEA FOOD RESOURCE OF THE NORTHERN PLAINS," *Plains Anthropologist* 23, no. 82 (1978): 329.

⁹⁸ Stahnke et al., "Prairie Turnip *Pediomelum Esculentum* (Pursh) Rydb."

⁹⁹ USFWS, "Why Care About America's Sagebrush?," 2014, https://www.fws.gov/mountain-prairie/factsheets/sage-steppe_022814.pdf.

¹⁰⁰ USFWS; Peter Lesica, Stephen V. Cooper, and Greg Kudray, "Recovery of Big Sagebrush Following Fire in Southwest Montana," *Rangeland Ecology & Management* 60, no. 3 (May 1, 2007): 261–69, [https://doi.org/10.2111/1551-5028\(2007\)60\[261:ROBSFF\]2.0.CO;2](https://doi.org/10.2111/1551-5028(2007)60[261:ROBSFF]2.0.CO;2); Schyler A. Reis et al., "Long-Term Effects of Fire on Vegetation Structure and Predicted Fire Behavior in Wyoming Big Sagebrush Ecosystems," *Ecosystems*, June 8, 2018, <https://doi.org/10.1007/s10021-018-0268-7>; David Pyke, "Born of Fire: Restoring Sagebrush Steppe" (Corvallis, OR: USGS, 2002), <https://pubs.usgs.gov/fs/2002/0126/fs12602.pdf>.

Sagebrush can take a long time to recover from fire, with some species needing anywhere from 35-120 years to recover.¹⁰¹

Sweetgrass

Sweetgrass (*Hierochloeodorata*), also known as Buffalo Grass or Vanilla Grass grows in moist prairie grasslands, wetland margins, and is often found along streambanks. Sweetgrass is found among other grasses, sedges, forbs, and shrubs. Like many native grasses, sweetgrass is susceptible to drought, fire, overgrazing, and the loss of natural growing areas due to oil and gas development or the spread of cropland.¹⁰² In Montana, Sweetgrass is a wetland species, requiring moist soil to grow and reproduce.¹⁰³ Sweetgrass is not drought tolerant and is also cool-season species: its seeds require a period of cold temperatures in order to grow.¹⁰⁴ Warming temperatures and the risk of drought resulting from climate change pose a risk to Sweetgrass.

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community's resilience:

- Develop strategies and plan to protect cultural resources in forested areas in cases of extreme drought and fire
- Develop strategies and programs to protect first food sources (plants and animals, berries, roots, hunting)
- Retain and work to regain access to treaty lands and treaty rights. For example, look at access/roads to Turtle Mountain lands.
- Establish original boundary (14,000 acres) in the Little Rocky Mountains
- Look at renewables (e.g. solar farm and wind energy) – an opportunity for jobs?
- Continue and expand programs to teach traditional lifestyles through educational activities.

¹⁰¹ William L. Baker, "Fire and Restoration of Sagebrush Ecosystems," *Wildlife Society Bulletin (1973-2006)* 34, no. 1 (2006): 177–85.

¹⁰² Susan Winslow, "Propagation Protocol for Hierochloe Odorata Sweetgrass.," *Native Plants Journal (Indiana University Press)* 1, no. 2 (2000): 102–3.

¹⁰³ Winslow.

¹⁰⁴ Winslow.



Chapter 8: Water

There are four watershed sub basins on the reservation: Middle Milk, Peoples, Beaver, and Fort Peck Reservoir. Milk River, Snake Butte Reservoir, Strike Lake, Weigand Lake, and Lake 17, are all sources of water on the landscape. In addition to these lakes, FBIC has many reservoirs created for stock water, as well as small lakes, such as Bigby Lake, and prairie potholes that hold water for short periods of time throughout the summer. The Fort Belknap-Montana Water Rights Compact was ratified by the Montana Legislature and signed by Governor Martz in 2001. The Compact has the stated purpose of “settling all existing water rights claims of the Gros Ventre and Assiniboine Tribes” and it quantifies water rights on the reservation. However, it has yet to be ratified by Congress even though a bill was introduced in 2011.¹⁰⁵

Goal of the Sector:

The goal of the sector will be determined in the next phase of planning, after gathering more community input on impacts, actions, and priorities, and will be included in the revised and updated climate change plan.

¹⁰⁵ “Fort Belknap Indian Reservation Compact — Montana DNRC,” accessed October 30, 2019, <http://dnrc.mt.gov/divisions/reserved-water-rights-compact-commission/fort-belknap-indian-reservation-compact>.

Some existing programs that contribute to resilience (strengths)

Why begin with a focus on our strengths? Climate change is a daunting challenge, and one that easily overwhelms people. In fact, scientists have documented some of the ways certain conversations about climate change can produce apathy or outright resistance.¹⁰⁶ We want to begin the conversation by focusing on ways we are already preparing ourselves for rapid change, reminding our community that we are not starting from zero. Instead, we have many resources we can use and strengthen to adapt to a changing climate.

The Tribes' Water Quality Program, the Non-Point Source Program, Water Resources Program and Prairie Mountain Utilities all work to protect water quality and quantity on the reservation. The Tribes also work with U.S. Geological Service on lake and reservoir sampling.

There are three tribal staff in the Water Quality Program, plus a GIS technician. The Water Quality staff sample surface water throughout the reservation. They test all four watersheds at the rate of one watershed per year. They also conduct stream surveys, collecting data in stream velocity, depth, flow, and benthic organisms. They collect fish tissue samples to test for mercury and arsenic. The Water Quality Program also collaborates with Aaniiih Nakoda College, collecting water samples that college students then test for contaminants like e coli. Water Quality also collaborates with the U.S. Fish and Wildlife Service on fish surveys, evaluating fish biodiversity and abundance. The GIS technician maps nonpoint source sites, pollution, and brownfields sites.

The Environmental Protection Department also has a Nonpoint Source Program that has one full-time employee. The focus of this program is improving water quality in livestock areas.

The Water Resources Program works to ensure our water rights are being met and stays in contact with the attorneys working on the Water Compact.

Prairie Mountain Utilities provides FBIC's drinking water. They operate a water treatment plant in Fort Belknap Agency and facilitate access to groundwater in Hays and Lodge Pole. They test for e coli and other contaminants.

FBIC has a conservation district, though it is unclear if it is currently active. FBIC has access to the Montana Department of Natural Resources and Conservation office in Havre. This office provides water resources and drought information for Blaine County. The U.S. Department of Agriculture Farm Service Agency operates a service center in Harlem. FBIC partners with the service center on water projects for farmers and ranchers. In 2004, FBIC's Tribal Council passed the Aquatic Resource Protection Ordinance (ARPO) to protect wetlands and riparian areas from construction or development.

¹⁰⁶Stoknes, *What We Think About When We Try Not To Think About Global Warming*.



Wetlands on the prairie, June 2022 – *Photo by RJ Watters*

Observed and predicted impacts

This set of observed and predicted impacts are sets of working hypotheses about climate change that are based on observations by people in the community. It has generally been assumed that observed impacts will continue to be a challenge into the future, while predicted impacts are ones that people are concerned will happen in the future even though they may not have been observed yet. Observations and predicted impacts form the basis for many of the strategy and action ideas presented later in the chapter.

Northern Leopard Frog Reintroduction Project

In 2006, I was contacted by Kirwin Werner, an Amphibian/Wildlife Biologist from the Confederated Salish and Kootenai tribes, Wildlife Management Department, In Pablo, Montana.

Kirwin has written several books and co-authored Montana's Amphibians and Reptiles. Kirwin

was interested in collaborating on a “Northern Leopard Frog Reintroduction Project”. The project was to collect Northern Leopard Frog egg masses here in Fort Belknap, and to relocate them into wetland release sites, on the Confederated Salish and Kootenai Tribes, reservation.

In the spring from 2006- 2016, I began going out in the field after the snow melted, to look for any signs that the frogs were beginning to get active and breed. Usually in late April is when the breeding would begin, and then I would contact Kirwin to come over to collect the egg masses. We followed quality assurance protocol and took only a small representative sample from a given area. We usually only took 3-4 egg masses per pond. Once the egg masses arrived back to a holding station in a laboratory on the Confederated Salish and Kootenai Tribes reservation, Kirwin would wait till the egg masses developed into tadpoles, then they were released at Wetland release sites in the flathead valley. After a few failed attempts to get a breeding colony started, in 2014 Kirwin started getting good results that he was looking for, the Northern Leopard Frog was beginning to show signs that they were in fact, beginning to breed on their own, however in the fall/winter of 2015, we lost Kirwin who passed away. He was my friend and mentor and his work was a success.

– Dennis Longknife, Jr

Warmer temperatures, algae, fish kills, and evaporation

Warmer temperatures are reducing water quality. Warmer temperatures increase algae blooms, which reduce dissolved oxygen and lead to fish mortality. Decomposing fish can then toxify the water.

Warmer temperatures also negatively impact aquatic species who are sensitive to temperature increases such as cold-water trout. Warmer water is also higher in bacterial content and parasites that affect water quality and the health of aquatic species. With higher temperatures, there is more evaporation and less water overall.

Drought

We are seeing lower creek and river levels, along with changing drought cycles. There is less snowpack in the Rockies. Intermittent streams are drying up earlier reducing water sources for wildlife and cattle.

Higher runoff, flooding, and water quality

Rapid snowmelts after extended periods of cold cause flooding and reduce water quality as more pollutants, debris and trash get into the water. *See more about water contamination in the health sector chapter.*

Longer growing season means more water demand

With a longer growing season, there is more demand for water. Combined with drought and higher temperatures there is both more demand for water and less water available.

Wildfires and water quality

Wildfires can negatively impact water quality as ash runs off into streams. Sedimentation and landslides caused by wildfires can also impact stream health.

Extreme Weather

See more about water and extreme weather section in the health sector chapter.

Predicted impacts: a close look at fish

Climate change is altering ecosystems worldwide, and the rivers, lakes, and streams of Montana are no exception.¹⁰⁷ As cold-blooded aquatic animals, fish cannot avoid overheating when water temperatures increase.¹⁰⁸ This makes fish especially sensitive to temperature changes as their metabolic rate is determined by the temperature of the water they inhabit. Climate change poses major risks to fish habitat such as rising water temperatures or changing water levels, which can quickly make a body of water uninhabitable. High temperature days (above 90F) also pose risks to fish as warmer water temperatures reduce the amount of dissolved oxygen in the water.¹⁰⁹ Wildfires also affect the quality of stream habitats through temperatures increases and changing stream chemistry by the addition of ash and sediment flows into rivers and streams.¹¹⁰

¹⁰⁷ Daniel J. Isaak et al., “The Past as Prelude to the Future for Understanding 21st-Century Climate Effects on Rocky Mountain Trout,” *Fisheries* 37, no. 12 (December 20, 2012): 542–56, <https://doi.org/10.1080/03632415.2012.742808>; Seth J. Wenger et al., “Flow Regime, Temperature, and Biotic Interactions Drive Differential Declines of Trout Species under Climate Change,” *Proceedings of the National Academy of Sciences* 108, no. 34 (August 23, 2011): 14175–80, <https://doi.org/10.1073/pnas.1103097108>; Whitlock et al., “MCA.”

¹⁰⁸ McKelvey and Buotte, “Effects of Climate Change on Wildlife in the Northern Rockies.”

¹⁰⁹ Steven Kinsella, Theo Spencer, and Bruce Farling, “The Impacts of Global Warming on Trout in the Interior West” (NRDC & Montana Trout Unlimited, July 2008), <https://www.nrdc.org/sites/default/files/trout.pdf>.

¹¹⁰ Isaak et al., “The Past as Prelude to the Future for Understanding 21st-Century Climate Effects on Rocky Mountain Trout.”



Walleye harvested from the Milk River by Ronnie Speak Thunder – *Photo by Dennis Longknife, Jr.*

Trout

Stream and river habitats that support trout and other fish are undergoing changes related to temperature and flow change, reducing trout's habitat and fragmenting trout populations.¹¹¹ The past century has seen major population declines of native trout resulting from intensive land use and the water demands of agriculture, mining, and energy development. Combined with potential habitat loss due to climate change, trout throughout north central Montana face many challenges.

Trout are cold water fish who depend on their environment to regulate their body temperatures. Most species of trout are adapted to live in water temperatures within the range of 50-63 degrees F and begin to experience physical problems when water temperatures reach the high 60's. Most fish do not survive temperatures above the mid 70's.¹¹² Warmer water temperatures are also likely to increase rates of

¹¹¹ Kinsella, Spencer, and Farling, "The Impacts of Global Warming on Trout in the Interior West."

¹¹² Kinsella, Spencer, and Farling.

whirling disease, a parasitic infection that thrives in warm and low-flow water conditions.¹¹³ Cutthroat trout and rainbow trout are especially vulnerable to this parasite.¹¹⁴

Native trout, such as the cutthroat trout are also at risk of population declines due to hybridization, or cross breeding. Cutthroat trout inhabit cooler waters, but as summer stream temperatures rise, the habitats of cutthroat trout and the introduced rainbow trout, who generally inhabit warmer waters than the cutthroat, begin to overlap.¹¹⁵ Fire is also of concern for trout as fires can change water temperatures and stream chemistry, and also destroy streamside growth such as trees that provide shade and cooler areas of water in the summer.¹¹⁶

Walleye

“We heavily rely on walleye fishing in the spring and fall. After we catch fish, we share it with our friends and family.”

Much like trout, warming waters are likely to shift the area of suitable walleye habitat northward.¹¹⁷ In Wisconsin, rising water temperatures are associated with significant walleye population declines.¹¹⁸ Habitat alteration, residential development around walleye lakes and changes to walleye food supply are likely additional factors.¹¹⁹ In general, walleye reproduce better in cooler water. As waters warm, many lakes that currently support natural walleye reproduction may no longer have the necessary thermal habitat for walleye reproduction, leading to decreases in walleye populations.¹²⁰

Sector vulnerability assessment and prioritization

Climate change does not operate in a vacuum. Climate drivers like warming temperatures and heavy precipitation events combine with other weaknesses and threats to influence the overall vulnerability in

¹¹³ Ronald P. Hedrick et al., “Whirling Disease: Re-Emergence among Wild Trout,” *Immunological Reviews* 166, no. 1 (1998): 365–76, <https://doi.org/10.1111/j.1600-065X.1998.tb01276.x>; Kinsella, Spencer, and Farling, “The Impacts of Global Warming on Trout in the Interior West.”

¹¹⁴ Ronald P. Hedrick et al., “Susceptibility of Selected Inland Salmonids to Experimentally Induced Infections with *MyxobolusCerebralis*, the Causative Agent of Whirling Disease,” *Journal of Aquatic Animal Health* 11, no. 4 (December 1, 1999): 330–39, [https://doi.org/10.1577/1548-8667\(1999\)011<0330:SOSIST>2.0.CO;2](https://doi.org/10.1577/1548-8667(1999)011<0330:SOSIST>2.0.CO;2); Kinsella, Spencer, and Farling, “The Impacts of Global Warming on Trout in the Interior West.”

¹¹⁵ Isaak et al., “The Past as Prelude to the Future for Understanding 21st-Century Climate Effects on Rocky Mountain Trout”; Clint C. Muhlfeld et al., “Invasive Hybridization in a Threatened Species Is Accelerated by Climate Change,” *Nature Climate Change* 4, no. 7 (July 2014): 620–24, <https://doi.org/10.1038/nclimate2252>; Wenger et al., “Flow Regime, Temperature, and Biotic Interactions Drive Differential Declines of Trout Species under Climate Change.”

¹¹⁶ Kinsella, Spencer, and Farling, “The Impacts of Global Warming on Trout in the Interior West.”

¹¹⁷ Doug Inkley et al., “Game Changers: Climate Impacts to America’s Hunting, Fishing, and Wildlife Heritage” (The National Wildlife Federation, 2015), https://www.nwf.org/~media/PDFs/Media%20Center%20-%20Press%20Releases/2015/NWF_Game_Changers_Report.pdf.

¹¹⁸ Andrew L. Rypel et al., “Eroding Productivity of Walleye Populations in Northern Wisconsin Lakes,” *Canadian Journal of Fisheries and Aquatic Sciences* 75, no. 12 (March 28, 2018): 2291–2301, <https://doi.org/10.1139/cjfas-2017-0311>.

¹¹⁹ Kat Kerlin, “Walleye Fish Populations Are in Decline,” UC Davis, *Science and Climate* (blog), April 5, 2018, <https://climatechange.ucdavis.edu/news/walleye-fish-populations-decline/>.

¹²⁰ Gretchen J. A. Hansen et al., “Projected Shifts in Fish Species Dominance in Wisconsin Lakes under Climate Change,” *Global Change Biology* 23, no. 4 (2017): 1463–76, <https://doi.org/10.1111/gcb.13462>.

our community. This is a summary of some of the weaknesses and threats related to the Water Sector that planning participants identified. These weaknesses and threats occur in addition to climate change and may or may not exaggerate vulnerabilities to climate change. They include deteriorating dam infrastructure, heavy metals contamination, agriculture, and programmatic gaps.

Saint Mary's Facilities needs repair

Saint Mary's Facilities is crucial for FBIC's water supply. The Facilities divert water from the St. Mary River and connect it to the Milk River which flows through the reservation.¹²¹ The Milk River provides water for more than 18,000 people and almost 700 farms and ranches across the Hi-Line. The Facilities are a century old and many people in the region fear its failure and the catastrophic losses that would follow. At this time, \$180 million dollars is needed for major upgrades.¹²²

Heavy metals contamination

The Water Quality Program has found elevated levels of mercury in fish. The source of the mercury in the fish is not found on the reservation. Potential sources of mercury include the fish hatchery (which does not test for mercury) or from atmospheric deposition. FBIC is also located downstream of many agricultural operations that contribute to non-point source pollution downstream.

On the southern end of the reservation, acid mining drainage from the abandoned Zortman-Landusky Mines have polluted wide swathes of streams.

Agriculture

Farms are polluting water with nutrients, pesticides, and herbicides. In some places, people are farming right to stream edges, not leaving buffers that would protect water and wildlife. Additionally, cattle grazing damages creeks and wetlands. FBIC does not currently have a wetlands program. Establishing one could help protect and restore wetlands and riparian areas.

¹²¹ "Special Report: Lifeline of the Hi-Line," May 23, 2018, <https://www.ktvh.com/news/2018/05/23/special-report-lifeline-of-the-hi-line/>.

¹²² "Special Report: Lifeline of the Hi-Line."

A WALK IN THE WILLOWS

by Dennis Longknife Jr.

As I began my annual trek down thru the twisted mats and patches of dog hair, meaning: Red Willow, Sandbar Willow, Bull Berry Brush, Wild Licorice and Wild Rose Bushes that seem to tenderize your legs from their sharp sticky thorns, my mind drifts into another era, a time when my ancestors did the same thing, on the same river banks, doing the same activity catching Channel Cats, Northern Pike, Walleye and harvesting Whitetail Deer.

It's springtime and that means fishing, I don't use a fishing pole or a spear, I use a long line with hooks baited on it, which are tied to a willow along the riverbank. Since it is spring that also means the wood ticks, are out in force too. Many a time, I have come home, only to find out that I'm infested with wood ticks, so I have to go through my clothes when I get home.

This habitat provides food and shelter, as small minnows and amphibians hide out in these areas, that have been used by the Beaver. The Beavers thin out pockets of willows and trees within the over story, and create their own trails along the riverbanks so that they can build their Dens underneath the river banks, usually below a good vegetated stand of grass and willows. The micro-climates created from the Beavers work, gives perfect habitat for the finned and webbed ones.

I wonder about my relatives that lived long ago, why they wore those "Leggins", the leather probably came from the thickest part of the deer, elk or buffalo they used at that time, so this would be good when protecting your legs from the elements and especially walking through thick, thorny brush. The scars on my thighs usually take about 2-4 weeks to heal up and for the scars to disappear. Don't worry about wearing new jeans, because they will be well broke in after the first trek. The thorns in my thighs are picked out one by one, but the thorns that penetrated deeper into the skin, we just leave them be and they usually fester out in a day or two.

Since I was raised along the river and know where the deer are, we often hunt in small parties, pushing or driving the Whitetail to a desired location. Since the brush where they hide out is thick, we have to teach the younger ones in our hunting party to stay on track, and go through the thickest parts of the brush, many times we passed up deer that have been missed by these younger men, simply because they didn't want to get scratched up and slapped in the face by the willows, the first slap in the face by a willow can make most young men very timid.

One particular time in the fall, down along the river here in the Milk River Valley, we come across some of the most unforgiving patches of willows and brush, so thick that even deer do not travel through there and avoid it as we do...so I wonder again about our elders and ancestors...did they use this to their advantage, and plan their deer hunts according to where these thick, cumbersome, unyielding patches of brush were, and set up ambush sites along them?

The first few times entering this valley-forest habitat, my mind and attention were set on finding signs that the deer were in the area, and how their trails went around the twisted tangled patches of brush, but then after stopping in this area to get my breath and rest a little, I began noticing something out of the ordinary... like I was being watched...by what, only Cottontail Rabbits and Pheasants were here. Your ears become accustomed to the slight variation in noises and instinctively know if it's a rabbit or a pheasant rustling about. But this was no normal sound, so I continued to stand there and the presence of nature got my full attention! I heard something up in the Cottonwood Trees above, that were intertwined with old growth willows, we call "Diamond Willows"...then it occurred to me...that I was not alone anymore...the trees and willows were talking to each other...how I knew this was no surprise...the branches were moving, the leaves were trembling, and the willows were waving!

I looked up into the sky, and it was a beautiful day, warm, partly cloudy with a slight breeze. I thought to myself as I enjoyed the weather, these trees and willows are also enjoying this weather. In our tradition when we notice something like that, it's a "Sign" meaning something good is happening or about to happen, so you pray to the "Creator", burn "Sweet Grass", or "Smudge" yourself, and of course you leave tobacco, as a blessing to the "Rooted Ones".

Adaptation brainstorm: strategy and action ideas

Planning participants brainstormed a variety of possible strategies and actions could help address climate change impacts to this sector. While sector goals will be identified in the next round of planning and more ideas will be brainstormed based on each particular goal, the strategies and actions listed below illustrate how planning participants are already thinking about moving from describing climate change impacts to building the community's resilience:

- Establish a wetlands program to help protect and restore wetlands and riparian areas.
- Increase stream meandering to decrease erosive floods
- Plant trees to shade water and reduce water temperatures.
- Plant trees in areas upstream of infrastructure to help reduce the damage from flooding
- Develop a land management plan and water management plan with a focus on wells and reservoirs.
- Stabilize the situation through natural solutions such as establishing more beavers and dams in the headwater streams of the mountains and the planting of drought resilient grasses, and the planning of native vegetation along streams.
- Find a way to catch and hold flood waters, for example, by building reservoirs
- Restore/create a wetland outside of Hays to divert water to when it floods. Consider this option in other communities such as Agency as well.
- Manage grazing to prevent degradation of streams and wetlands
- Restore impacted streams that used to flow and have fish and were used for ceremonial purposes.
- Expand to the GIS program to help inform decision-making and the development of interventions and programs
- Restructure to place Lands, Fire Management, Transportation, Water, GIS, and Planning under the same roof, or have some kind of structured collaboration

Chapter 9: Looking Forward

Mitigating climate change: protecting the planet has co-benefits

Mitigating climate change – reducing the amount of greenhouse gases in the atmosphere – will reduce the scale of rapid change and protect life on earth. We can reduce greenhouse gases *and* reap many other benefits at the same time, which are often called “co-benefits”. This section lists ideas for reducing greenhouse gases and describes additional benefits that accompany each action.

| Action | Potential Co-benefits |
|---|---|
| Install more solar panels and windmills. | <i>Creating income and green energy job opportunities. May increase energy independence while diversifying energy sources. Energy diversification can protect communities in extreme weather events when one or more energy sources fail.</i> |
| Increase collaboration with North Western Energy to promote more energy audits and get assistance with increasing energy efficiency. | <i>Reducing monthly energy bills as more efficient buildings and homes use less energy. It also has the potential of creating job opportunities in the energy sector.</i> |
| Build energy efficiency into housing strategies. | <i>Reducing energy cost.</i> |
| Recognize ecological importance of buffalo to the community as a whole because they ecologically restore grasslands. Increase buffalo herds. | <i>Supporting our Lifeways and traditions, providing educational opportunities, creating opportunities for tourism, and increasing our food security.</i> |
| Expand youth involvement in climate change mitigation and adaptation. | <i>Investing in future leaders for climate mitigation and adaptation to energizing youth action, and expanding awareness and attention to the issue of climate change.</i> |
| Add or expand green job curriculum at Aaniiih Nakoda College to meet the demand for renewable energy and energy efficiency jobs and to make students competitive in the job market. | <i>Preparing youth to be competitive for high-paying “green” jobs and ensuring there is the knowledge and talent to attract solar and wind energy to FBIC and the surrounding area.</i> |
| Increase soil and range health to store (“sequester”) carbon. | <i>Ensuring sustainability of farming and ranching, and possibly even increasing production.</i> |
| Restore and protect wetlands to store carbon. | <i>Wetlands offer countless benefits, including storing and cleaning water, providing habitat for fish and wildlife, and providing places for people to gather medicinal plants and have ceremonies.</i> |

| | |
|------------------------|--|
| Protect forest health. | <i>Not only do healthy forests store carbon, but they cool temperatures, provide wildlife habitat, protect water supplies, and provide livelihood opportunities.</i> |
|------------------------|--|

Next Steps

This climate change adaptation plan represents a major first step in advancing climate change adaptation and mitigation. It lists our goals, our planning guidelines (principles), impacts we are observing, and a set of brainstormed ideas for action. However, it is important that we continue to gather more input from tribal managers as well as from the community as a whole. It is also important that we then determine our priorities for action. This final chapter outlines our plans for updating and revising this climate change adaptation plan.

- 1) Ensure sustainable funding for the Climate Change Coordinator position. The Climate Change Coordinator is essential for outreach, for revising this plan, and for continuing to integrate climate change into all planning and management processes, including upcoming revisions to the Noxious Weed Plan and the Pre-Disaster Mitigation Plan.

- 2) Make the plan more comprehensive by gathering wider input from the community. We hope to do this by:
 - Meeting with tribal managers from each sector, at their offices, to get input on chapters over which they have the authority to implement action;
 - Hosting lunch-time conversations at four senior citizens' centers for input from elders, namely Hays' Kills at Night Center, Lodge Pole's Medicine Bear Lodge, and the centers in Fort Belknap Agency and Dodson;
 - Hosting general community meetings in Hays, Lodge Pole, Dodson, and Fort Belknap Agency to get community input on climate change impacts, priorities, and possible actions;
 - Meeting with students in the nursing and natural resources classes at Aaniiih Nakoda College to hear their ideas and priorities for climate change adaptation and mitigation;
 - Attending a producers' meeting hosted by Liz Werk and gathering input from producers;
 - Hosting a climate change booth at key community events, and collecting input from people, including at Native American Week, the powwow, and the Mid-Winter Fair; and
 - Asking Blaine County and Phillips County commissioners to comment on the climate change adaptation plan.

- 3) Prioritize the impacts on which focus from each sector chapter, and then identify each sector goal. Do this by incorporating input from community meetings and by setting up meetings with people in charge of implementing sector goals, and then work with managers to rank their priorities. Consider using the following criteria for ranking impacts:
 - High vulnerability: exposure + sensitivity - adaptive capacity
 - High risk of impact: likelihood x consequences (irreversible impact, high magnitude, threatens a unique resource)

- Tribal programs have the ability to influence impact
 - Impact is not already being addressed in existing programs or management plans (though it may be worth stating commitments to continue actions that are already building resilience)
- 4) Add a short review of climate change research to each sector chapter, related to selected focal impact areas.
 - 5) Brainstorming strategies that will help you reach the stated goals for each chapter. Ask: What are you already doing? What can you add to what you are already doing with a little more money and/or time? What would you want to do with a lot more money? What would enhance education and youth outreach while also addressing climate change? Then review and prioritize strategies. Do this by meeting with people in charge of implementing sector goals, being sure to incorporate input from community meetings. Consider using the following criteria for ranking strategies:
 - Strategy jointly addresses mitigation and adaptation
 - Strategy will have synergy with existing strengths
 - Strategy also addresses a preexisting weakness or threat
 - Strategy will be feasible to implement (cost and time)
 - 6) After selecting strategies, develop a detailed implementation plan with action steps for pursuing each strategy. Ensure that strategies are specific, measurable, achievable, relevant, and timely. Make it clear who will be in charge of each action step, who partners are, possible funding sources, and the timeframe for completing action steps. Make sure the plan has at least one climate change project that youth can take pride in.
 - 7) Write plans for monitoring progress towards each goal.
 - 8) Include climate change language to tribal law and order codes
 - 9) Send out revised-updated plan for review, then seek Council approval for the updated-revised plan.
 - 10) Implement the plan

Appendix 1: Survey Questions

ELDERS AND COMMUNITY MEMBER QUESTIONNAIRE

1. How has the land in our valley, prairie and/or mountains changed during your life?

Follow-up questions to add missing information or to bring out details...

Q. Any changes in plants or trees such as areas of dead or dying trees or bushes?

Q. Any kinds of plants or trees that have disappeared or any new ones?

Q. Have any of the changes made a difference to harvesting activities by members of your community, such as finding healing plants or harvesting berries?

Q. Have any of the changes on the land been good or bad for people in your community?

Q. Any changes in lakes, rivers and creeks, such as unusual water levels or color, or how warm the water is, or when it freezes and thaws?

Q. Any changes in the water plants in lakes and creeks? Have you seen new ones? Have any disappeared?

Q. Have you noticed unusual growth of green scum (algae) on any lakes or creeks?

Q. Do you think any of the changes in lakes and rivers have been good for people in the community?

Q. Have you noticed any wetlands or wet areas changing in size or looking different in any way? (ex: Beaver Dams, Oxbows-sloughs, wet meadows, cattail marshes, prairie potholes, ect.)

2. What changes have you seen in life on the land?

Q. Has fishing changed? For example, have you noticed any change in the kinds of fish or their size or their health?

Q. Have you noticed any changes in the places and times when fish spawn?

Q. Do people in your family eat as much fish as they used to? more? less?

Q. Have you noticed any changes in the migration of birds and the movement of animals on the land?

Q. Have you noticed any different birds, insects or animals that you haven't seen before?

Q. Are there more or less numbers of some birds, insects or land animals?

Q. Have you or others in your community altered your activities because of changes in birds, insects or land animals?

Q. Would you say that some of the changes you have seen in birds, insects and land animals have been bad or good for you and people in your community?

3. How has the weather changed since you were a child?

Q. How about the winter seasons?

Q. Has there been a change in the amount of snow during the winter?

Q. Have you noticed any changes in the snow pack ? Have they caused problems for people or land?

- Q. Have they caused problems for animals?

- Q. Have there been any changes in how warm or cold it is in winter?

- Q. Has the date of the first and last snowfall changed? From when to when?

- Q. Have you noticed changes in temperatures in the summer during the day and during the night ?

- Q. How about precipitation during the spring rainy seasons? How about the fall seasons?

- Q. Have there been changes in droughts and periods of dry weather and have they affected you and other people in your community?

- Q. Have you noticed any changes in the number of rainstorms? Are they more or less severe? Any changes in windstorms? Are there more or less windy days?

- Q. Are there changes in air and clouds? (ex. more or less windy days or more or less clouds?)

- Q. Have you noticed any changes in the air at any times of the year?

- Q. Have cloud shapes and patterns changed at some times of the year?

4. How have changes in the weather affected you and your community ?

- Q. Have changes in winter weather and ice on lakes and rivers affected land animals on the reservation?

- Q. Have there been changes in the ice on lakes and rivers that have affected people in your community?

- Q. How have people been affected?

Q. Have changes in weather damaged buildings in your community? What have people done to deal with the damage?

Q. Have the roads in your community been affected by weather? How has the community dealt with the effects on roads?

Q. Have changes in weather affected services such as electricity, heating fuel, natural gas, propane, gathering wood, sewage treatment and drinking water? and has the community been able to cope with them?

Q. Have you noticed changes in flooding in your community? Less or more? Is it troublesome?

Q. Are there changes in wildfires happening on the reservation, such as how often they happen, their size, the time of year when they happen, and how close they've come to your community?

Q. Are periods of hot weather (Droughts), a problem for some people? Is that new ? Are long periods with little rain causing problems in the valley, prairies and mountains? Is that new?

Q. How has Droughts affected domestic animals and wildlife (birds, reptiles, amphibians?), In what way?

Q. Are there any emergencies caused by the weather? (Limited visibility and access to transportation due to wildfire smoke, wind/dust storms, icy/snow covered roads and other extreme weather events).

Q. What difference has changing weather made to your life?

Q. Has changing weather resulted in any benefits to your community?

Q. Are there ways you think the community might be harmed or might benefit in the future if the weather keeps changing?

*Source

Nokiiwin Tribal Council is a non-profit Regional Chiefs' Council located in the Thunder Bay District, Ontario, Canada, serving five First Nations by providing advisory services and training. (Office: 807-474-4230). The questionnaire has been revised to meet the needs of the Fort Belknap Indian Community.