



Climate Change Strategic Plan

September 2013, updated April 2016

Confederated Salish and Kootenai Tribes of the Flathead Reservation



Tribal Resolution

Resolution No. 13-52

**RESOLUTION
OF THE TRIBAL COUNCIL OF
THE CONFEDERATED SALISH AND KOOTENAI TRIBES
OF THE FLATHEAD INDIAN RESERVATION, MONTANA**

**RESOLUTION TO DEVELOP A CONFEDERATED SALISH & KOOTENAI TRIBES
CLIMATE CHANGE STRATEGIC PLAN**

**BE IT RESOLVED BY THE COUNCIL OF THE CONFEDERATED SALISH AND
KOOTENAI TRIBES THAT:**

WHEREAS, The Confederated Salish and Kootenai Tribes are a federally recognized tribe, recognized by the United States Government and all of its Governing bodies and agencies; and

WHEREAS, there is overwhelming scientific evidence of climate change driven in part by the release of greenhouse gases into the atmosphere, the effects of which may significantly affect environment, natural resources, and infrastructure on which the Tribes have traditionally relied on; and

WHEREAS, the Natural Resources Department has received funding from the Roundtable on the Crown of the Continent and the Great Northern Landscape Conservation Cooperative to support the efforts to develop this Climate Change Strategic Plan and will oversee and coordinate the CSKT Climate Change Strategic Planning Initiative; and

WHEREAS, the potential impacts of 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

NOW, THEREFORE, BE IT RESOLVED that the Confederated Salish and Kootenai Tribal Council 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 on or to the Confederated Salish and Kootenai Tribal community and the Flathead 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 Tribe and the 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 change and contributing to reduction of the causes;

To communicate and coordinate with 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; and

BE IT FURTHER RESOLVED that the Natural Resources 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 CSKT Climate Change Strategic Plan; and

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

CERTIFICATION

The foregoing resolution is duly adopted by the Tribal Council of the Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation on November 29, 2012, with a vote of 9 for, 0 opposed, and 0 not voting, pursuant to the authority vested in it by Article VI, Sections A, C, D, and, U of the Tribes' Constitution and Bylaws; said Constitution adopted and approved under Section 16 of the Act of June 18, 1934 (48 Stat. 984), as amended.

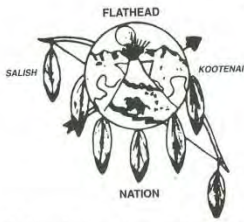


Chairman, Tribal Council

ATTEST:


Secretary, Tribal Council

Tribal Chairman's Proclamation



A Confederation of the Salish,
Pend d' Oreilles
and Kootenai Tribes

THE CONFEDERATED SALISH AND KOOTENAI TRIBES OF THE FLATHEAD NATION

P.O. BOX 278
Pablo, Montana 59855
(406) 275-2700
FAX (406) 275-2806
www.cskt.org



A People of Vision

TRIBAL COUNCIL MEMBERS:

Joe Durglo - Chairman
Carole Lankford - Vice Chair
Reuben A. Mathias - Secretary
Ron Trahan - Treasurer
Leonard W. Gray
Lloyd D. Irvine
Steve Lozar
Jim Malatare
James Bing Matt
Terry Pitts

Forward

By

Joe Durglo

Chairman, Council Confederated Salish and Kootenai Tribes

Our people have long lived by an idea that we know best how to govern ourselves. We pursue every opportunity to take back control of our lands, our government, and our resources. This report is another example of our pursuit for a better homeland for future generations.

Our lands and resources are the basis of our spiritual life. That's been our way since time began. By preparing for further environmental changes, we can mitigate threats to our way of life. Our traditions rely on abundant populations of native fish and wildlife, healthy plant communities, clear air, water, undisturbed spiritual sites, prehistoric and historic campsites, dwellings, burial grounds, and other cultural sites because these areas reaffirm the presence of our ancestors. These resources also provide our future leaders with a connection to their ancestors and native traditions.

Our culture committees remind us that many of these foods, medicinal and cultural resources are non-renewable. Our survival is woven together with the land. This plan is the foundation that will support new strategic efforts to preserve and protect the local environment. These recent efforts are a continuation of the work our elders have done for years in observing and considering climate changes on our lands. As is our practice, we look ahead to prepare for coming challenges and apply the values taught by our ancestors. This is how we've always survived, and how we will continue to thrive as a people.

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Acknowledgments

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Project Team

Michael Durglo Jr., Environmental Director, Climate Change Planning Coordinator	Natural Resources Department
Jim Durglo, Department Head	Forestry Department
Rich Janssen, Department Head	Natural Resources Department
Roian Matt, Educational Outreach Coordinator	Forestry Department
Clayton Matt, Director	Tribal Services
Tony Incashola, Department Head	Salish-Pend d'Oreille Culture Committee

Planning Committee

Jason Adams, Executive Director	Salish Kootenai Housing Authority
Dale Becker, Tribal Wildlife Program Manager	Natural Resources Department
Craige Couture, Chief of Police	Tribal Law & Order
Mike Durglo Sr., Co-Director (St. Ignatius)	Historic Preservation/Cultural Preservation
Rick Everett, Professor, Wildland Fire Sciences	Salish Kootenai College
Clint Folden, Regulatory Specialist	Natural Resources Department
Bill Foust, Division of Water Manager	Natural Resources Department
Judy Gobert, Suicide Prevention Trainer	Social Services Department
Ralph Goode, General Manager	Mission Valley Power
Tony Harwood, Division Manager	Forestry Department
Patricia Hewankorn, Director	Kootenai Culture
S. Kevin Howlett, Director	Tribal Health & Human Services
Carole Lankford, Vice-Chair	Tribal Council
Janene Lichtenberg, Wildlife Mitigation Biologist	Natural Resources Department
Tom McDonald, Division Manager	Natural Resources Department
Constance Morigeau, Department Head	Social Services Department
Dale Nelson, Coordinator	Emergency Services
Fred Steele, Health & Safety Officer	Safety Division
Arlene Temper, Department Head	Division of Human Resource Development
Teresa Wall-McDonald, Department Head	Division of Lands
Germaine White, Information & Education	Natural Resources Department

Other Contributors

Louie Adams (Valley Creek)	Tribal Elder
Angelique Albert, Contract Manager	Next Seven Group, LLC
Randy Ashley, Air Quality Program Manager	Natural Resources Department
Craig Barfoot, Fisheries Biologist II	Natural Resources Department
Patrick Bixler	University of Montana
Shivon Brite, Strategic Planner	Next Seven Group, LLC
Janet Camel, Planning Director	Economic Development
Whisper Camel-Means, Wildlife Biologist II	Natural Resources Department
Anne Carlson, Ph.D., Climate Associate	Wilderness Society
Arlene Caye	Tribal Preservation
Dennis Clairmont, Range Conservationist	Tribal Lands Department
Yvonne Conko, Executive Assistant	Tribal Health & Human Services
Ignace "Ig" Couture (Elmo)	Tribal Elder
Les Evarts, Fisheries Manager	Natural Resources Department
Mickey Fisher, GIS Analyst	Natural Resources Department
Lois Friedlander	Social Services Department
Robert "Buzz" Fyant	Historic Preservation/Cultural Preservation
Pete Gillard, GIS Program Manager	Natural Resources Department
Stephanie Gillin, Tribal Wildlife Biologist	Natural Resources Department
Rose Leach, Program Manager	National Environmental Policy Act
Sara McAllister, Research Mechanical Engineer	USDA Forest Service
Chauncey Means, Non-Point Source Coordinator	Natural Resources Department
Chuck Page, Air Quality Specialist	Natural Resources Department
Patrick Pierre (Camas Prairie)	Tribal Elder
Sadie Saloway (Elmo)	Tribal Elder
Stephen SmallSalmon (Post Creek)	Tribal Elder
Thompson Smith	Salish-Pend d'Oreille Culture Committee
Sarah Velk, Intern	University of Montana
Martin Zobel, Cartographer/Digitizer	Natural Resources Department

Climate Change Oversight Committee

Michael Durglo Jr., Environmental Director,	Natural Resources Department
Climate Change Planning Coordinator	Natural Resources Department
Whisper Camel-Means, Wildlife Biologist	Natural Resources Department
Kari Eneas, Wildlife Biologist	Forestry Department
Jim Durglo, Department Head	Forestry Department
Roian Matt, Educational Outreach Coordinator	Forestry Department
Tony Harwood, Division Manager	Economic Development and Planning
Janet Camel	Disaster and Emergency Services
Dale Nelson	Natural Resources Department
Chauncey Means	Salish Kootenai College
Rick Everett, Forestry Department	Salish Kootenai College
Adrian Leighton, Forestry Department	Salish Kootenai College
Janene Lichtenberg, Wildlife and Fisheries Department	The Wilderness Society
Anne Carlson	Center for Large Landscape Conservation
Melly Reuling	Roundtable on the Crown of the Continent
Kim Davitt	Flathead Basin Commission
Caryn Miske	U. S. Geological Survey
Tabitha Graves	US Environmental Protection Agency Region 8,
Diana Hammer, MPH, MS Biomimicry	Montana Office

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Key Terms

Adaptation (climate change): 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.

Global Warming: average increase in the temperature of the atmosphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced.

Greenhouse Gas (GHG): any gas that absorbs infrared radiation in the atmosphere; examples include carbon dioxide, methane, nitrous oxide, ozone, and water vapor.

Mitigation (climate change): 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.

Planning Area: this is an area in which the tribal government manages, plans, or makes policy affecting the services and activities associated with built, human, and natural systems. For example, within the sector Utilities, you might have planning areas of Water and Electricity.

Preparedness Actions: actions or activities that the tribe could take to achieve its climate change preparedness goals.

Preparedness Goals: what the tribe wants to accomplish in the priority planning areas through preparedness actions.

Priority planning areas: planning areas of particular importance to the tribal government or community which are vulnerable to climate change impacts.

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.

Risk: Risk is the consequence of an impact times the probability or likelihood that the impact will happen.

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 as a result of projected climate change, it should be considered sensitive to climate change.

Traditional Ecological Knowledge (TEK): considerations related to your planning areas (Forestry, Water, Air, etc.) concerning climate change. TEK refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeway's, including but not limited to hunting, fishing, trapping, agriculture, and forestry.

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 to be vulnerable to climate change impacts.ⁱ

Executive Summary

This Confederated Salish & Kootenai Tribes (CSKT) Climate Change Strategic Plan represents an early step towards addressing the impacts of climate change on the Flathead Reservation in Montana. This initiative's purpose is to improve the Tribal community and Natural Resources resiliency by effectively informing climate change impact planning decisions made by the Tribes. It is designed to initiate collectively beneficial climate change impact mitigation and adaptation solutions.

This process was led by the CSKT Office of Environmental Protection and was assisted by Next Seven Group, LLC. It was completed in collaboration with the Tribes' administration, elders, scientific leaders, and other stakeholders and experts. Historical information was adapted from the Flathead Reservation Comprehensive Resource Plan and local climate change scenarios were adapted from the Missoula County Climate Action: Creating a Resilient and Sustainable Community report. Traditional Ecological Knowledge was provided by the Salish-Pend d'Oreille Culture Committee, Kootenai Culture Committee, and Historic Preservation/ Cultural Preservation Department. Local impact assessments on forestry, land, fish, wildlife, water, air, infrastructure, people, and culture were developed by CSKT Tribal Departments and local organizations.

The Climate Change Strategic Planning Committee included a representative group of administration and staff from various Tribal departments and local organizations. The level of involvement of each contributing committee member was on a compulsory and/or voluntary basis. This planning resulted in the establishment of priorities and related preparedness goals and actions. The priority levels for forestry range from low to high, land are medium, fish and fish habitat are high, wildlife range from low to high, water are high, air are medium, infrastructure are low, people range from low to high, and culture are high. The goals and actions are diverse – addressing each sector's needs. Available Traditional Ecological Knowledge has been included.

This plan represents an early step in the Tribes' effort to mitigate the effects of climate change on the Flathead Reservation. It is designed to serve as the foundation for developing effective strategies to protect and preserve the local environment. Results from this planning should be incorporated into guiding documents, such as the Comprehensive Resource Management Plan and the Forestry Management Plan. This strategic plan should be regularly revisited and modified as priorities and needs of the Tribes change and new information regarding the climate science and impacts becomes available. As implementation plans are developed, effective monitoring and evaluation policies and procedures should be established. These measures should determine if the Tribes' actions are meeting the Tribes' preparedness goals.



1. Introduction

Overwhelming scientific evidence demonstrates that human inputs of greenhouse gases are almost certain to cause continued warming of the planet. (Environmental Protection Agency, 2013) The Northwest has already observed climate changes including an average increase in temperature of 1.5°F over the past century. (Karl, Melillo, & Peterson, 2009) Locally, all models predict warmer temperatures, lower snowpack, and more frequent and severe droughts and floods. (Marni E. Koopman, 2011) The Confederated Salish and Kootenai Tribes acknowledge these change and its potential impacts on the Flathead Reservation in Montana.

Historically, Tribal elders have recognized and prepared for climate change. Climate change planning has been occurring for centuries. As such, the Confederated Salish and Kootenai Tribes Climate Change Strategic Plan sets forth the foundation for developing effective, culturally-sensitive climate change adaption and mitigation strategies needed to ensure healthy social, environmental, and built environments on the Flathead Reservation. These efforts have been authorized through Tribal Resolution No. 13-52 and are in direct support of the Tribes' mission to provide sound environmental stewardship that preserves, perpetuates, protects and enhances natural resources and ecosystems.

Indigenous people of the world have a special moral stature on this issue [of climate change] and may have a special role to play in coming together to advocate for action.

- Salish-Pend d'Oreille Culture Committee

The Confederated Salish and Kootenai Tribes Climate Change Strategic Plan's mitigation and adaptation strategies are guided by local impact assessments. These assessments investigate the vulnerabilities and risks of the forestry, land, fish, wildlife, water, air, infrastructure, people, and culture sectors to the impacts of climate change. Vulnerability is the susceptibility of a system to harm from climate change impacts. Risk is the consequence of an impact times the probability or likelihood that the impact will happen. These assessments determine the urgency of each planning area, ranging from low to high priority. They guide the development of preparedness goals and actions. These goals and actions vary based on a variety of factors, such as the types and magnitudes of projected climate change impacts and the scale of the planning effort.

Overall, this plan represents an ongoing and evolving adaptive management process. Implementation planning which determines the tasks to be completed, resources needed, responsible parties, collaborations, and evaluation measures needed to fulfill the goals is the next step in improving the Tribal community and its lands resiliency to the impacts of climate change.



1.1 Characteristics and History of the Tribes

The Confederated Salish and Kootenai Tribes (CSKT) include the Salish, Kootenai, and Pend d'Oreilles Tribes. As the first to organize a tribal government under the Indian Reorganization Act of 1934, the Tribes are governed by a tribal council. The Tribal Council has ten members. The council elects from within a Chairman, Vice Chairman, Secretary and Treasurer. The Tribal Council represents the Arlee, Dixon, Elmo, Hot Springs, Pablo, Polson, Ronan, and St. Ignatius districts in Montana. The CSKT employs nearly 1,400 people. (Camel, 2012)

As of 2012, there were about 7,900 enrolled tribal members. (Camel, 2012) Approximately 5,300 tribal members live on the Flathead Reservation and 2,600 tribal members live off the Reservation. (Camel, 2012) The 2010 population of the Reservation was 28,324, an eight percent increase over the 2000 census, but non-Indians outnumbered Indians by two-to-one. (Bureau, 2010) (Independent Record, 2011)

The Tribes' mission is guided by traditional principles and values. As stated in the 2011 Confederated Salish & Kootenai Tribes Annual Report, "we adopt traditional principles and values into all facets of tribal operations and services; invest in our people in a manner that ensures our ability to become a completely self-sufficient society and economy; and strive to provide sound environmental stewardship that preserves, perpetuates, protects and enhances natural resources and ecosystems."

The Tribes' vision is to maintain traditional principles and values. "Traditional values that served our people in the past are embedded in the many ways we serve and invest in our people and communities, in the way we have regained and restored our homelands and natural resources, in the ways we have built a self-sufficient society and economy, in the ways we govern our Reservation and represent ourselves to the rest of the world and in the ways we continue to preserve our right to determine our own destiny." (Confederated Salish & Kootenai Tribes Annual Report, 2011) Today, the CSKT are recognized as a model of a self-sufficient sovereign nation of the United States. The Tribal government offers a number of services to tribal members and is the chief employer on the Reservation.



Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

Location, definition of tribal lands

The Salish, Pend d'Oreille and Kootenai Tribes originally lived between the Cascade Mountains and Rocky Mountains. These aboriginal territories spanned over 20 million acres of what is now known as western Montana, northern Idaho, and parts of southern Canadian provinces. On July 16, 1855, the Tribes ceded most of this land, reserving about 1.3 million acres, through the Treaty of Hellgate. This formed the Flathead Reservation in Montana.

The Reservation is located in Northwest region of the United States, in western Montana on the Flathead River. It comprises the lower quarter of the Flathead River Basin, and encompasses the south half of Flathead Lake and the Lower Flathead River. It includes portions of Lake, Sanders, Missoula, and Flathead Counties. The largest community on the Reservation is the city of Polson, MT, which is also the county seat of Lake County.

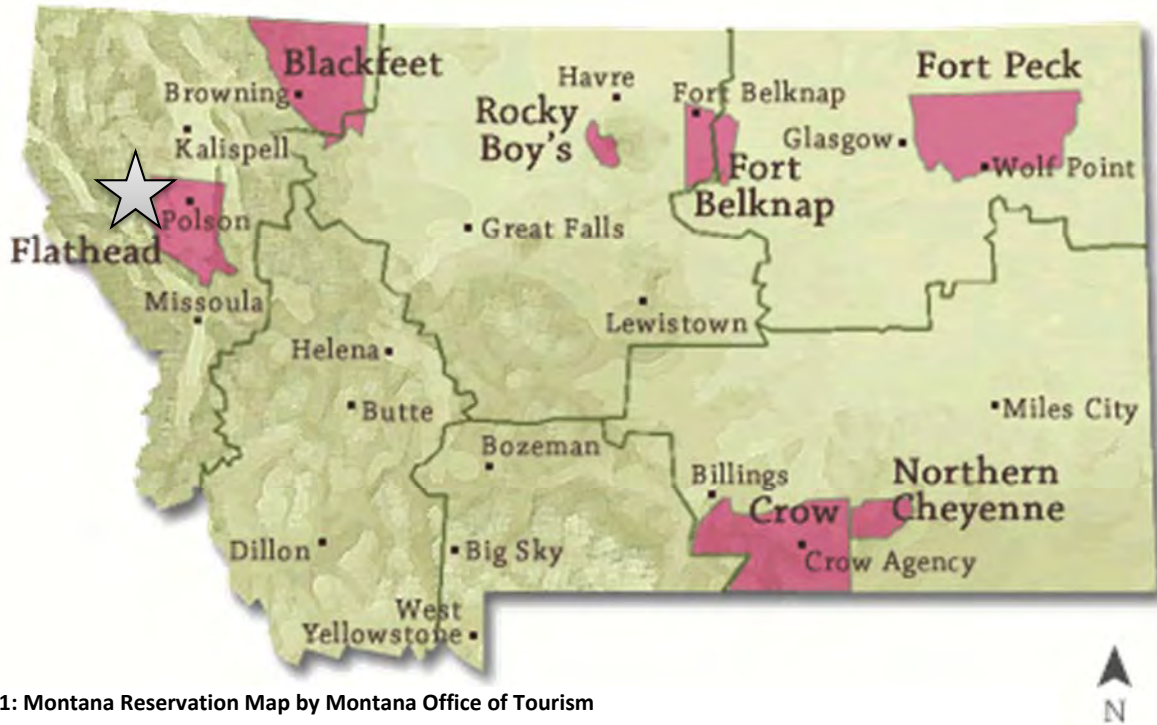


Figure 1: Montana Reservation Map by Montana Office of Tourism

Today, the Flathead Reservation is 1.317 million acres, of which just over 790,000 acres are owned and managed by the Tribes and its members. (About SKGS, 2013) However, Tribes' territory is fragmented due to the Flathead Allotment Act. This Act opened the Reservation to non-Tribal members in 1910. The Flathead Nation's land use is depicted in the 2013 Land Status map.



Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

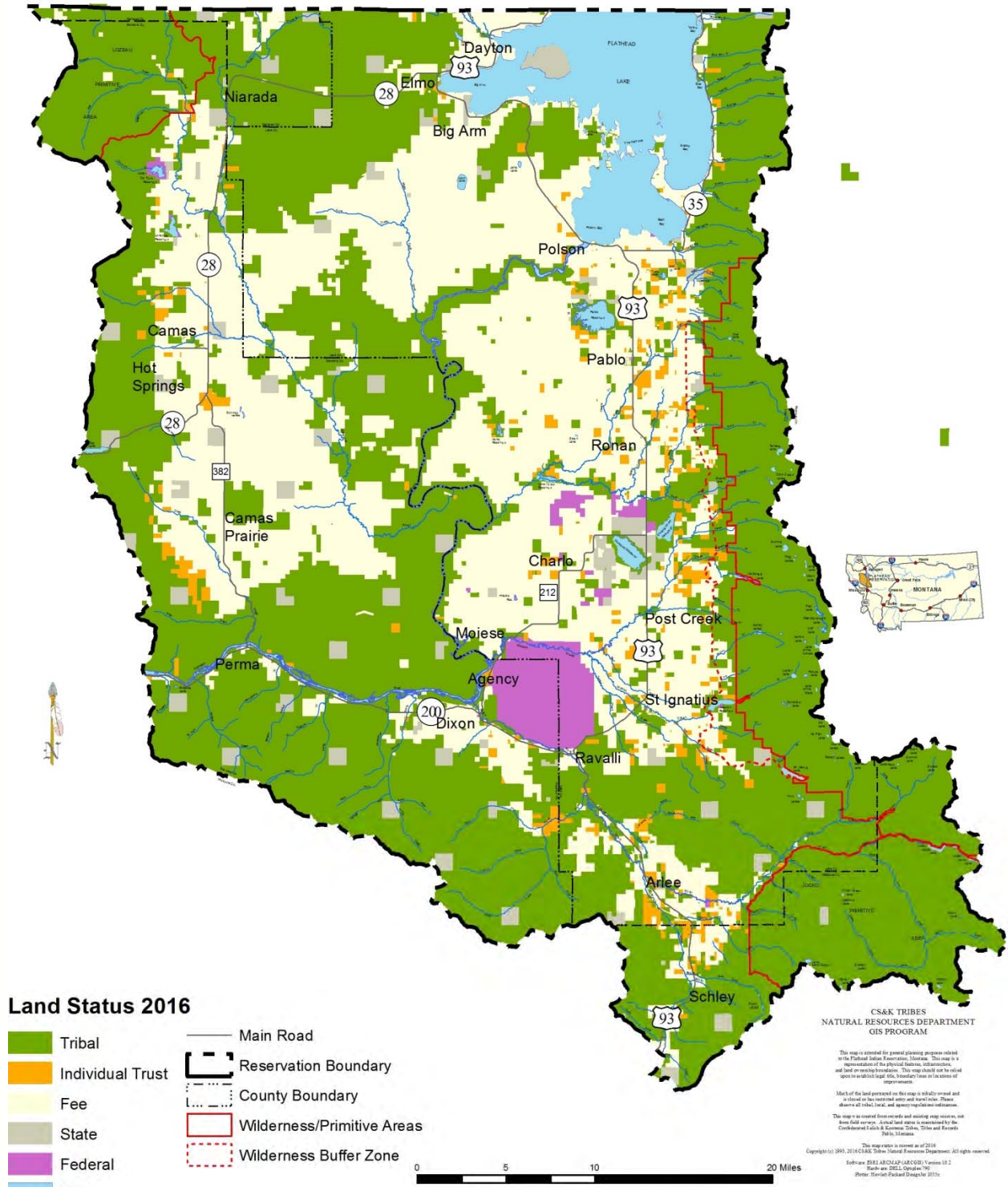
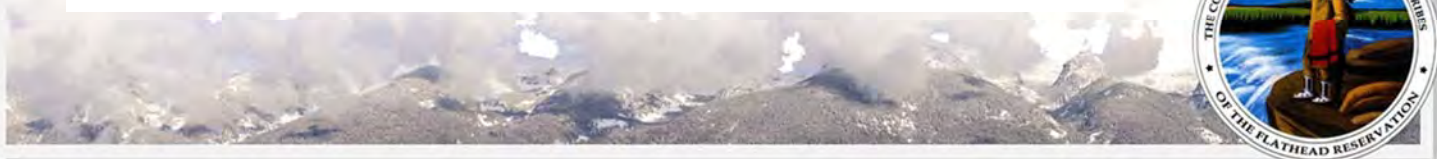


Figure 2: Land Status Map of the Flathead Indian Reservation. Map indicates land ownership distinguished by color. Map created by CSKT GIS Program.



Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

History of tribes, include traditional ways of life

Each of the Tribes on the Reservation is culturally unique and has its own belief system, yet all three are similar in at least two fundamental ways. The first is that each holds knowledge of the natural environment. The second is that each has a profound respect for all of creation. Both of these traits have enabled the Tribes to survive for thousands of years.ⁱⁱ The subsistence patterns of Tribal people developed over generations of observation, experimentation and spiritual interaction with the natural world. This has created a body of knowledge about the environment closely tied to seasons, locations, and biology. This way of life was suffused with rich oral history and a spiritual tradition in which people respected the animals, plants and other elements of the natural environment. (CSKT History & Culture, 2004) Through the teachings of elders, these tribal ways of life continue to this day.



Figure 3: Historical photo of Dancing Boy near Arlee, MT by unknown photographer



1.1.1 Salish Culture

On the Flathead Reservation, the designation “Confederated Salish” encompasses not only the Salish and the Pend d’Oreilles, but also Kalispel and Spokane Indians who settled on the Reservation. Elders say that these and other Tribes were once one Salish speaking tribe. Thousands of years ago this ancestral tribal group divided into a number of different bands that later became Tribes and occupied much of the Northwest, from British Columbia to Montana and beyond. Some bands lived throughout Montana from the Bitterroot to the Yellowstone valleys. The Pend d’Oreilles eventually settled in the Flathead Valley and a band of Kalispel camped along the Flathead River near Perma, Camas Prairie, and Paradise.

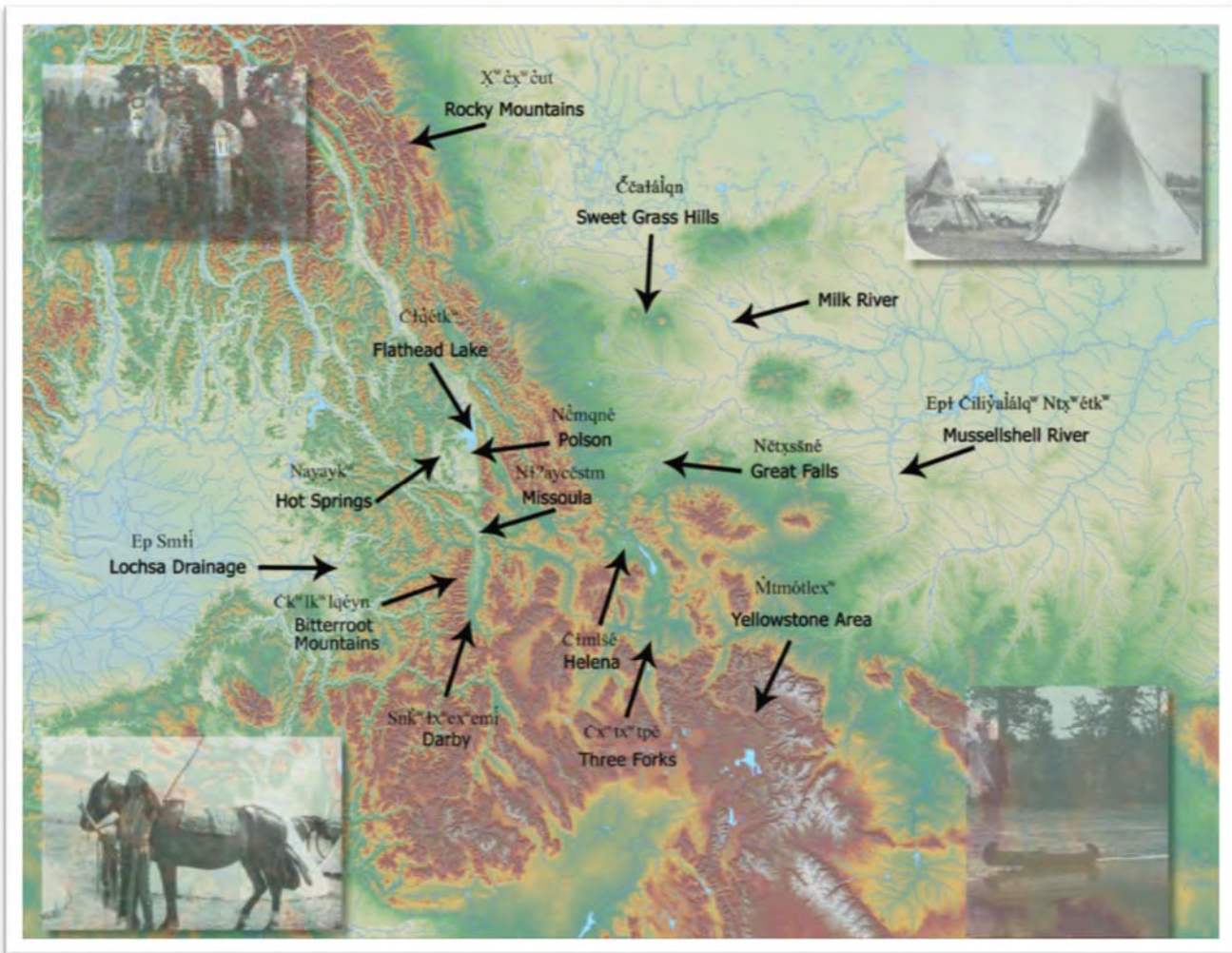


Figure 4: Aboriginal Territories of the Salish & Pend d'Oreille People courtesy of CSKT SPCC and Natural Resource's GIS Department



Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

Economy and Government

Before the time of the Reservation, the Salish Tribes gained subsistence from a tribal system of hunting, fishing and harvesting. The quest for food began in the early spring with the bitterroot harvest. Tribal leaders appointed elders to watch for when the bitterroot was ready. When the time came, the leaders called the people together to dig enough roots for a feast to celebrate the year's first food and to pray that food would be plentiful.

Along with bitterroot, the people harvested other plants such as camas bulbs, tree moss, onions, Indian potatoes, Indian carrots, and medicinal plants. The people fished year-round. In summer and fall, the Salish hunted and picked berries, first strawberries and service berries, and later huckleberries, raspberries, chokecherries and hawthorn berries. All of these activities were communal. The people worked together and helped each other.

In the fall, the men concentrated on hunting while the women dried meat and prepared hides for robes and buckskins. The Salish hunted many different animals, but mainstays were deer and bison. Every year, the people traveled east of the mountains, where game animals were plentiful. After a group hunt, the hunters divided the meat among all the people in the camp. They piled cut meat in one place, and people from each lodge took what they needed. The successful hunters shared with those who were unsuccessful. The Tribe used everything and wasted nothing. The Salish spent the winter months trapping and fishing. Women repaired clothing and sewed new garments from deer and elk skins. They decorated their work with porcupine quills colored with natural dyes.

Each tribe had a leader or leaders chosen for their character. The leaders governed by consensus, under the guidance and advisement of respected elders. Different leaders had particular strengths or skills and their responsibilities reflected this. One chief might be in charge of the hunt. Another might lead various camp activities. A third would command war expeditions. Pete Beaverhead once said, "In most of the stories there are three big chiefs above all the rest of the people. They are all regarded with the same respect. None [is] higher than the other two. This is among the [Pend d'Oreilles] Indians. Then the smartest warriors are right behind them. There were always very many of these men."

Lodging, Transportation, Recreation, and Trade

The Salish made lodge coverings from elk and buffalo hides and fashioned tools such as needles, mauls and grinding stones from wood, bone and rock. The Salish travelled long distances to collect raw materials not available locally. The Salish had a strong trade relationship with the Nez Perce



Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

and traded bitterroot and high quality buckskin for Nez Perce corn husk bags filled with camas. Before the introduction of the horse, the Salish used travois to haul possessions between camps. The people held celebrations after battles, successful hunts and other important events and interwove song and dance with daily activities.ⁱⁱⁱ

1.1.2 Kootenai Culture

Before contact with non-Indians, the Kootenai Nation (also spelled Kootenay or Kutenai) numbered over ten thousand. Kootenai Indians inhabited what is now eastern British Columbia, the southern half of Alberta, northern Idaho, eastern Washington and Montana. The name comes from the Kootenai practice of setting traps in the creeks during the large fish runs.

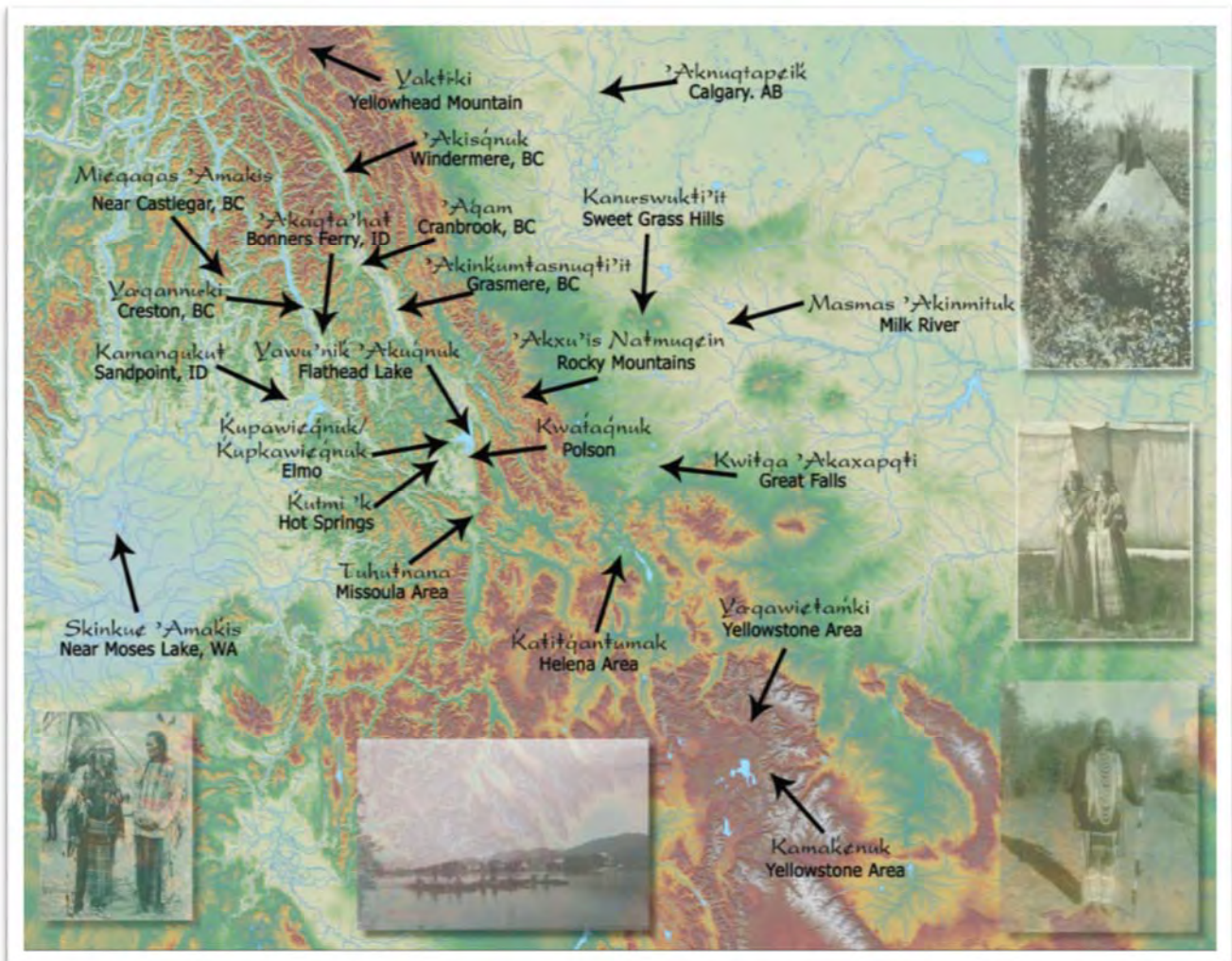


Figure 5: Aboriginal Territory of the Ksanka Band of Kootenai Indians map courtesy of NRD and Kootenai Culture Committee



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Economy and Government

The Kootenai moved seasonally over a large territory. The seasonal round began in the early spring when the people travelled to fishing grounds. There the Kootenai caught bull and cutthroat trout, salmon, sturgeon, and whitefish using a simple bone device and line, or harpoons with a detachable barbless point. The people also set traps and weirs in streams.

In early May, as the fishing season came to a close, the root harvest began. The people dug bitterroot, camas and other roots. In mid-June the band traveled east of the divide to hunt buffalo. Weeks later the people returned with heavy loads of meat. From mid to late summer the Kootenai harvested service berries, chokecherries, huckleberries and other fruits. When fall approached, some of the Kootenai organized communal deer drives. Others returned to the Plains to hunt buffalo. The Tribe cached surplus food for winter.

Deer were the most accessible and abundant of the game animals. Deer meat was one of the most essential foods, but the Kootenai also hunted elk, moose, caribou, buffalo, mountain sheep and bear, and birds such as grouse, geese and ducks. H. H. Turney-High, an ethnographer, wrote that the Kootenai “considered their land a fortunate one wherein any industrious man could get plenty to eat for himself and [his] family.”

Lodging, Transportation, Recreation, and Trade

The Kootenai lived in skin and mat-covered tepees (the latter woven from tulle and dogbane). The people used canoes to transport family and gear, and to fish for salmon. They manufactured a unique covered canoe with a long projection at both bow and stern. During times of peace the Kootenai traded with other Tribes, such as the Shoshone, Nez Perce, and Blackfeet. Other Tribes coveted the native tobacco cultivated by the Kootenai. The Kootenai traded it and famous tanned buckskin hides for stones used to make pipes, various tools and material goods.

The Kootenai always had time for story-telling and games. Girls played with dolls that, according to Helen Charlo, were “made mostly out of buckskin and deer hair.” Paul Mathias said boys made bean shooters and sling shots for hunting rabbits and groundhogs. Mary Antiste has talked of how boys made bows and arrows. Others told of how children made tops by winding strings around oval rocks. By pulling the strings they could make the rocks spin. The adults played a game called shinny. In the evenings the people told stories.^{iv}



1.1.3 Socioeconomic Profile

Today, the socioeconomic profiles of these Tribes have dramatically changed, as compared to their historical status. The Flathead Reservation is a rural area, bordered on the south by Montana’s second largest urban trade center and on the north by one of Montana’s fastest growing counties. It is largest reservation in Montana. It grew by eight percent to 28,359 people in 2010. But non-Native Americans on the Reservation outnumbered Indians by more than two-to-one. (Independent Record, 2011). Unlike many Indian Reservations, the Flathead Reservation is not isolated from the larger state and regional economies. Located in the center of western Montana’s dynamic economy, the Reservation contributes to and is influenced by the region’s development.

Today, socioeconomic challenges face tribal members. The poverty rate for American Indian families in Lake County (largest county on the Reservation) is 29.1 percent while the official unemployment rate for Lake County is 10.2 percent. CSKT’s Department of Human Resource Development which manages 35 income/social service programs reports an unemployment rate of 36 percent among Tribal members in 2007. 60 percent of Tribal members residing on the Flathead Reservation received services from CSKT Workforce Investment Act, Child Care, and Temporary Assistance for Needy Families, or General Assistance as reported in 2008. Furthermore, CSKT reported the following employment data to the Bureau of Indian Affairs (BIA) for 2010:

Table 1: CSKT Employment Data		
Category	No.	% of Enrolled Members
Enrolled Tribal Members	7,773	100%
Able & Willing But Unable to Find Work	1,860	24%
Employed Part Time	2,072	27%
Employed Full Time in the Public/Tribal Sector	1,947	25%
Employed Full Time in the Private Sector	1,231	16%
Employed with Earnings Below Poverty	514	7%

Table 1: CSKT Employment Data, reported to BIA in 2010

According to this employment data, nearly one out of four tribal members is able and willing but unable to find work while only sixteen percent are employed full time in the private sector.



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Tribal enterprises and organizations

The principle sources of income for the Tribes are derived from timber industry sales and revenues from the co-license for the Kerr Dam facility with Montana PPL. The Tribes also operate the following enterprises and organizations.

S&K Technologies, Inc. is a federally-chartered corporation headquartered in St. Ignatius, Montana. It has six subsidiary businesses including S&K Technologies, LLC, S&K Aerospace LLC, S&K Global Solutions LLC, S&K Environmental LLC, S&K Logistics Services LLC, and S&K Security Group LLC.

S&K Gaming, LLC, operates two properties—KwaTaqNuk Best Western Hotel and Casino in Polson, Montana, and Gray Wolf Peak Casino north of Evaro, Montana.

S&K Electronics (SKE) is a leading, high-tech manufacturing company in based in Pablo, Montana.

S&K Holding Company manages Boulder Hydro, a small-scale hydroelectric facility northeast of Polson, Montana, S&K Self-Storage in Pablo, Montana, and Sovereign Leasing and Financing in Ronan, Montana.

Energy Keepers is the Tribal Corporation that manages the Tribes energy resources. It intends to acquire and manage Kerr Dam in 2015.

Salish Kootenai Housing Authority operates as a separate Tribal entity that maintains approximately 500 low-rent properties, 30 ownership properties, 19 transitional living units for homeless families and individuals, 60 trailer park lots, and 50 rental assistance slots.

Tribal Credit was established in 1936 to help raise the social and economic status of Tribal members by providing loans for purchase of property and homes.

Eagle Bank is the newest bank to be chartered on the Flathead Reservation. This community bank is owned by the Confederated Salish and Kootenai Tribes on behalf the Tribal members.

Educational programs include Early Childhood Services (Early Head Start and Head Start), Salish language immersion elementary school, Two Eagle River middle and high schools, Kicking Horse Job Corps (a vocational training center), and Salish Kootenai College.^v



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Current land use, transportation

The Tribes participate in statewide transportation planning. Transportations projects are prioritized through cooperation and input from the Tribal Council and the Reservation Transportation Committee. US Highway 93 is the major transportation corridor through the Flathead Reservation. This is the principal north/south highway in Western Montana. Highway 28 connects the northern portion of the Reservation to the western half, Highway 200 runs east and west along the southern portion of the Reservation, and Highway 35 follows the eastern side of Flathead Lake in the northern portion of the Reservation. (CSKT, Flathead Reservation Transportation Plan, 2007-2017) This area also contains thousands of miles of roads.



Figure 7: Bus, photo by Corky Sias, DHRD Transportation Manager



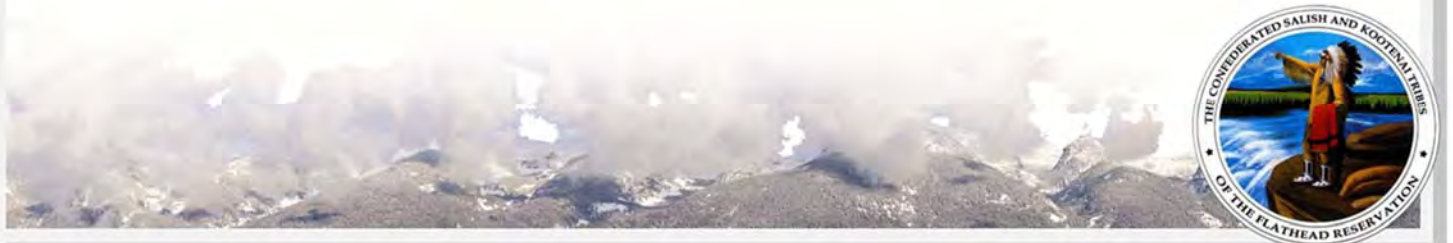
Figure 6: Buses, photo by Corky Sias, DHRD Transportation Manager

There are six types of roads located on the Reservation. They include nearly 4,197 miles (6,757 km) of Tribal, BIA, and other Federal, state, city and county roads. There are 2,580 miles (4,154 km) of Tribal forest roads, 372.5 miles (600 km) on the Bureau of Indian Affairs Road System, 89 miles (143 km) of National Highway roads, 165 miles (270 km) of State roads, 70.5 miles (114 km) of city streets in Polson, Ronan, St. Ignatius, and Hot Springs, and approximately 920 miles (1,481 km) of county roads in Lake County, Sanders County, Flathead County, and Missoula County. (CSKT,

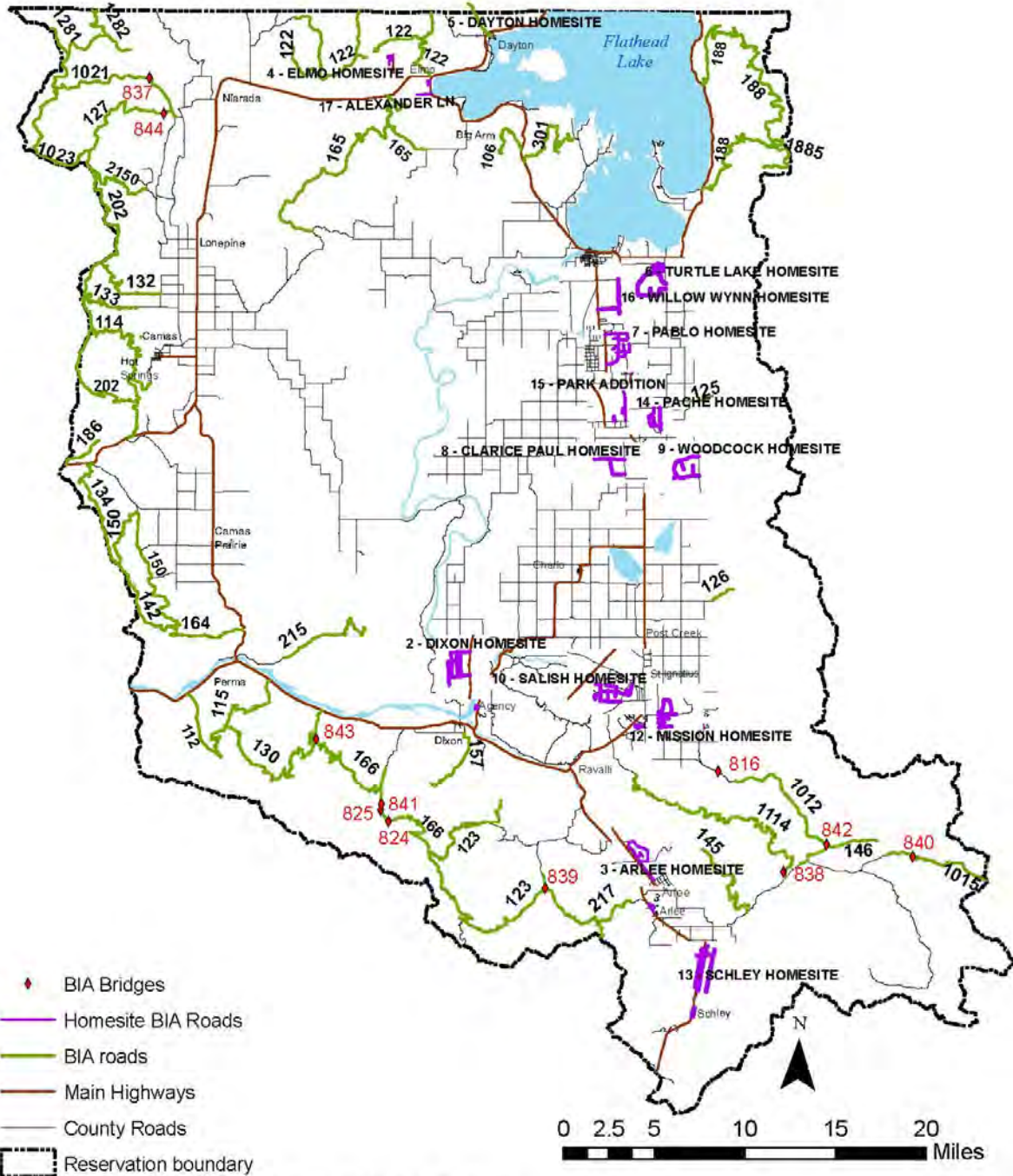


Confederated Salish and Kootenai Tribes Climate Change Strategic Plan

Flathead Reservation Transportation Improvement Program, 2009-2013) Land use planning by the Tribes includes cultural considerations for natural resources.

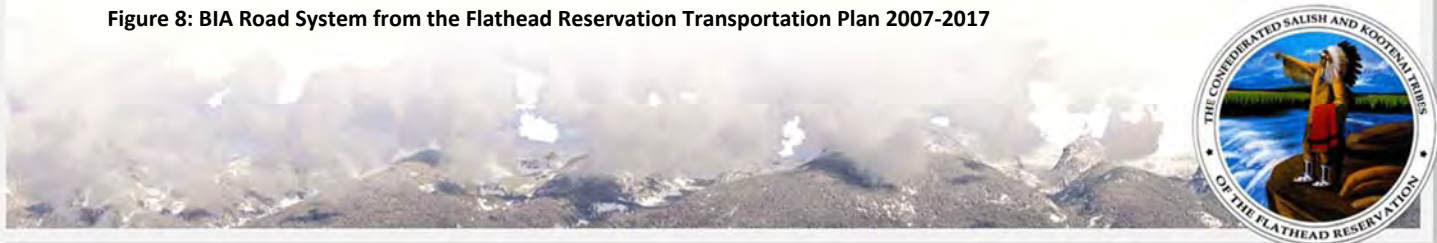


THE BIA ROAD SYSTEM



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Figure 8: BIA Road System from the Flathead Reservation Transportation Plan 2007-2017



1.1.4 Cultural Considerations Regarding Natural Resources

Cultural traditions rely on abundant populations of native fish and wildlife, healthy plant communities, clean air and water. Undisturbed spiritual sites, prehistoric and historical campsites, dwellings, burial grounds and other cultural sites are important, too, because they, in the words of the Flathead Culture Committee, "reaffirm the presence of our ancestors, how we are alive today only because of them. These places are part of the basis of our spiritual life." They provide young people with a connection to ancestors and native traditions.

Many food and medicinal plants grow on Reservation and aboriginal lands. Some grow in mountain areas, others along river and stream corridors, still others in arid places. Many have multiple uses. The Tribes have used most of them for thousands of years. Tribal elders report that some human activities, such as logging and grazing, have damaged some of the areas where these plants grow. Work is ongoing to protect these sites.



Figure 9: Chauncey Means at River Honoring, photo by Conrad Durglo



Figure 10: River Honoring, photo by Conrad Durglo



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There are other cultural resources on the Reservation and aboriginal lands that must be protected. These include hunting and fishing grounds, spiritual sites, dancing grounds, trails, and occupational sites. Salish and Kootenai cultural resource specialists use the term “site” for areas of historical, cultural or spiritual importance. These areas sometimes, but not always contain artifacts. They may be the site of past or present-day Tribal activities.

Many cultural resources are non-renewable resources. They can be one day or thousands of years old. Their destruction is a gross violation of everything we value.

— Flathead Culture Committee

Tribal, federal, and state laws prohibit the destruction of land-based cultural resources. The cultural committees provide training to natural resource managers about the importance of cultural resources. To protect sites, the committees have developed cultural awareness programs for people interested in Tribal cultures and resources. They also work with federal, state, and local agencies, as well as Tribal departments for cultural resource protection.

Importance of traditional knowledge

Cultural resources are precious Tribal resources. They encompass the Tribes’ elders, languages, cultural traditions, and cultural sites. They include the fish, wildlife and plants native to the region and land forms and landmarks. Tribal elders and the languages are perhaps the most vital of these resources because they teach and communicate the histories and traditional lifestyles of the Tribes. The traditions depend on land based cultural resources. These land-based resources include native fish and wildlife and their habitats, food and medicinal plants and the areas where they grow, prehistoric and historical use sites, and other land areas where Tribal members currently practice cultural traditions.



Figure 11: Clark's Nutcracker, photo by Eugene Beckes



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The Earth is our historian; it is made of our ancestors' bones. It provides us with nourishment, medicine and comfort. It is the source of our independence; it is our Mother. We do not dominate Her, but harmonize with Her.

—Flathead Culture Committee

The Tribes believe everything in nature is embodied with a spirit. The spirits are woven tightly together to form a sacred whole (the Earth). Changes, even subtle changes that affect one part of this web affect other parts. Protecting land-based cultural resources is essential if the Tribes are to sustain Tribal cultures. This is one of the most important goals of Tribal natural resource management on the Reservation. It is also a goal that the Tribes have for Tribal aboriginal territories managed by other entities.^{vi}

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1.2 Why the Tribes are Planning for Climate Change

Climate change is expected to impact the Flathead Reservation. These impacts may substantially affect ways of life that have been at the core of Tribal culture for generations. As such, the significance of these impacts merits special focus, especially related to the connection between traditions and issues of community resilience and sovereignty.

Tribes' Commitment to Planning

The Confederated Salish and Kootenai Tribes recognizes and acknowledges the potential impacts of climate change and declare their commitment to addressing the effects of the climate change. This commitment includes determining the potential effects of climate change; developing appropriate strategies; establishing programmatic and regulatory actions to address these effects; and communicating relevant entities to coordinate efforts and identify funding sources. These efforts support the Tribes' mission to provide sound environmental stewardship that preserves, perpetuates, protects, and enhances natural resources and ecosystems.



Figure 12: Flathead Reservation, photo by Roian Matt

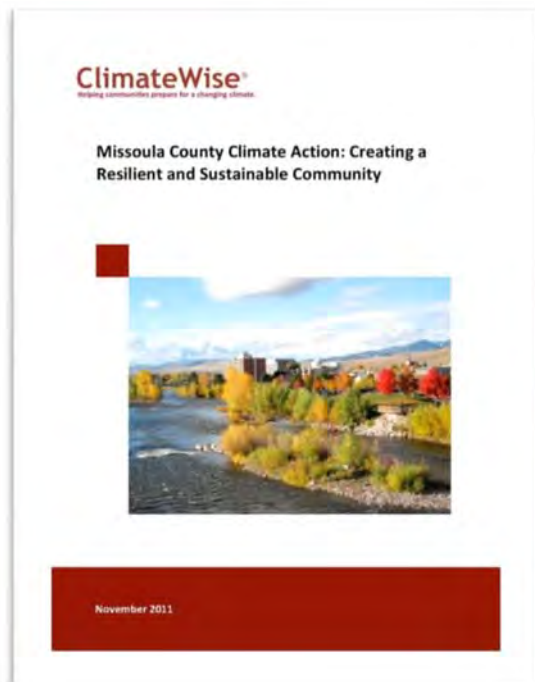


Reason for Planning

This planning effort is intended to improve the Tribal community and its lands' resiliency to climate change by effectively informing planning decisions made by the Tribes. Addressing these impacts is important to the long term health of the community. The impacts of climate change can directly and indirectly affect a broad range of resources. Taking practical steps now enables the Tribes' to reduce future risk and realize possible near term benefits.

1.3 Planning in a Regional Context

Climate change adaption planning has been recognized as a priority by other organizations and governments. The Western Climate Initiative is a collaboration launched in February 2007 between the Governors of several western states to meet regional challenges raised by climate change. This organization is identifying, evaluating and implementing collective and cooperative ways to reduce greenhouse gas emissions in the region. (Western Climate Change Initiative, 2013) Beyond this initiative, two regional plans have been developed in response to the impacts of climate change. They include the Montana Climate Change Action Plan and the Missoula County Climate Action: Creating a Resilient and Sustainable Community report.



The Montana Climate Change Action Plan, released November 2007, was developed based on the recognition of the profound consequences that global warming could have on the economy, environment, and quality of life in Montana. (Committee, 2009) The Missoula County Climate Action: Creating a Resilient and Sustainable Community, a report released November 2011, assesses how a changing climate might affect Missoula County, a neighboring city, using climate change modeling. This information was used to develop adaption strategies across different societal and environmental sectors to protect people and the natural resources. (Marni E. Koopman, 2011) These efforts align with the Tribes efforts to mitigate and adapt to the impacts of climate change.

Figure 13: Missoula County Climate Actions: Creating Resilient and Sustainable Community report cover



2. Climate Impacts

Climate conditions vary naturally. However, overwhelming scientific evidence demonstrates that human inputs of greenhouse gases are almost certain to cause continued warming of the planet. In 2000, the U.S. Global Change Research Program released the first national assessment of climate change impacts on the United States. The report examined how 21st century climate may change in the U.S. and provided an initial assessment of major national and regional vulnerabilities to climate. (Center for Science in the Earth System, University of Washington, & King County, Washington, 2007)

The U.S. National Assessment found many common national concerns, including the following:

- average annual air temperature is projected to increase in all regions of the country, with the average national increase projected at the time of the assessment to be 5-9°F by the end of the 21st century;
- warmer temperatures, and in some regions lower snowpack, are expected to increase the risk of drought across the country;
- sea level rise and increased storm surges are expected to pose greater threats to coastal ecosystems and human communities;
- shifts in the types and distribution of forest species are likely;
- a near-term increase in forest growth is expected in most regions, because moderate increases in temperature and atmospheric concentrations of CO₂ have a temporary “fertilizing effect” (a phenomenon referred to as the “CO₂ fertilization effect”). On the other hand, overall forest growth could decrease over the long term, due to increased forest fires, insect outbreaks, and disease;
- natural ecosystems are particularly vulnerable to projected warming given that many natural ecosystems are not able to prepare for or adjust quickly to climate change impacts, and also given that non-native species may benefit from climate change more than native species;
- in all regions, the results of non-climate stresses (e.g., habitat fragmentation and patterns of human development) will be exacerbated by climate change impacts.^{vii}



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The U.S. National Assessment also found important differences in how climate change could affect different regions of the country. For example, decreases in snowpack will have greater impacts on water supplies in the western U.S. where snowmelt runoff is the primary source of water supply. Changes in agricultural production vary depending on the region and crop. Agriculture in northern regions (the Midwest, West, and Pacific Northwest) generally fared better under climate change scenarios than southern regions. (Center for Science in the Earth System, University of Washington, & King County, Washington, 2007) Human health impacts, changes in extreme events, and impacts on coastal ecosystems vary from region to region.

2.1 Climate Impacts Regionally

The northwestern region of the continental United States consists of the Pacific states of Washington and Oregon and also includes Idaho and a portion of Montana. This area is home to roughly 45 Native American Tribes (Bureau of Indian Affairs, January). This region of the country is an ecologically diverse area that contains ecosystems from old-growth rainforests in the Cascade mountain range to the arid shrub-steppe habitat of southern Idaho (U.S. Fish and Wildlife Service, January). Climate change caused from greenhouse gas emissions is having an impact on a global to local scale. The growing population of the Northwest is beginning to witness profound changes that are impacting forest, mountain, river and coastline environments and consequently all living organisms (Karl, Melillo, & Peterson, 2009).



Figure 14: Northwest Region Map

The Northwest has already observed climate-related changes including an average increase in temperature of 1.5°F over the past century (Karl, Melillo, & Peterson, 2009). However, some areas have witnessed as much as a 4°F temperature increase. Warmer temperatures experienced during the winter months have been contributing to earlier snowmelt. In turn, this is affecting the region's water supply during the summer season. Earlier snowmelt has been impacting stream-



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flow, increasing runoff in the winter and early spring and decreasing it in the late spring, summer and fall. Over the past 50 years, runoff has begun to shift between one and two days earlier in some places to as much as 25 to 30 days earlier in other places.

Stream flow timing is extremely important for the already declining populations of salmon in the Northwest. Earlier runoff from a warming climate can contribute to the devastation of incubating eggs and the premature migration of young salmon to estuaries. Furthermore, warming water temperatures are known to stress salmon who favor colder temperatures while also creating a more hospitable habitat for disease and parasites. The warming temperatures are affecting not only water resources, but also northwestern forests, which are beginning to have an increased risk of wildfire (Karl, Melillo, & Peterson, 2009)

Continued future warming in this region is inevitable, even if all greenhouse gas emissions were halted today. According to the 2009 Global Climate Change Impacts in the United States report by Karl et al., temperatures are projected to increase anywhere between 3°F to 10°F during this century (depending on different emission scenarios). It is expected that snowpack in the Cascades might decline by as much as 40 percent by the 2040s, further impacting stream discharge that could potentially shift runoff between 20 and 40 days earlier by the end of this century. Water storage for the Columbia Basin is highly dependent on current winter snowpack in addition to stream flow. The decrease in snowpack would affect not only water available for human use, but also the region's hydropower operations.

Models suggest winter precipitation will increase and summer precipitation will decrease in the future. Heavier winter rainfall could increase the number of landslides in the Northwest and also cause more winter flooding. Furthermore, it is projected that the wildfire risk in this area will increase due to warmer temperatures that contribute to lower humidity levels as well as more favorable conditions for the mountain pine beetle and other insect infestations. Other climate change impacts on forests include the migration of species to new environments. It is speculated that this may ultimately cause a loss of biodiversity as a result of species extinction.

The changes that are already occurring in the Northwest, and that will continue to occur, have the potential to alter the region's water supply considerably and may have immeasurable implications not only for municipalities and industries, agricultural irrigation, hydropower production, navigation, and recreation, but also for many plants, animals and people in the Northwest (Karl, Melillo, & Peterson, 2009). Modeling has indicated that these regional changes are expected to have local impacts.^{viii ix}



2.2 Climate Impacts Locally

All models predict warmer temperatures, lower snowpack, more frequent and severe droughts and floods. (Marni E. Koopman, 2011) Scientific climate change modeling, conducted by Geos Institute using *ClimateWise* concludes the expected climate trends.

Table 2: Expected Climate Trends	
Certainty	Trends
High	<ul style="list-style-type: none"> • Up to 5° F warmer by 2035-45 • Lower and extended low stream flow in late summer • Earlier and greater spring runoff • Shifts in species ranges for wildlife and plants • Greater likelihood of severe wildfire, especially during warm phase Pacific Decadal Oscillation (PDO) • Increased spread of invasive plants and animals
Medium	<ul style="list-style-type: none"> • Up to 10° F warmer by 2075-85 • Continued declines in snowpack at lower elevations • Declines in aquatic species such as bull trout and cutthroat trout • Declines in alpine and subalpine species, including subalpine fir, Engelmann spruce, big horn sheep, pika, and mountain goat • More pest and disease outbreaks such as mountain pine beetle
Low	<ul style="list-style-type: none"> • Decline in summer precipitation • Increase in winter precipitation • Greater precipitation change at higher elevations • High tree species turnover, but continued forest cover in many areas • Declines in Douglas fir and lodgepole pine • Potential increase in oaks or other broadleaf tree species

Table 2: Missoula County Climate Action: Creating a Resilient and Sustainable Community, Expected Climate Change Trends for Missoula County

The Flathead Reservation and Missoula County share geographic, topographic, and climatic characteristics. As such, climate change trends and scenarios have been adapted from the Missoula County Climate Action: Creating a Resilient and Sustainable Community report, Section I. Considerations for temperature and precipitation, storm events, snowpack, hydrology, forest and vegetation, wildfire, snow events, air quality, and fish and wildlife are provided.



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Temperature and precipitation – Average temperature is projected to increase regardless of which model is used, with accelerated increase toward the end of the century. In contrast, model projections for precipitation in the area vary substantially. By mid-century average precipitation could decline by 29 percent or increase by 10 percent depending on which model is consulted. By late century (2075-85), all three models agree on slightly wetter conditions in winter. Higher temperatures leading to greater evaporation are likely to offset any positive change in precipitation.

Storm events - Climate change could increase the severity of individual storm events, even if average precipitation levels do not increase. As temperatures warm, more precipitation will fall as rain instead of snow, and more rain-on-snow events could occur. Heavy rainfall and rain-on-snow both increase the risk of flooding. Such storm events can be exacerbated by land use practices and infrastructure failures, making the impacts of flooding more severe. When rainfall occurs in a short period of time, most water runs off quickly without infiltrating soils or recharging groundwater aquifers.

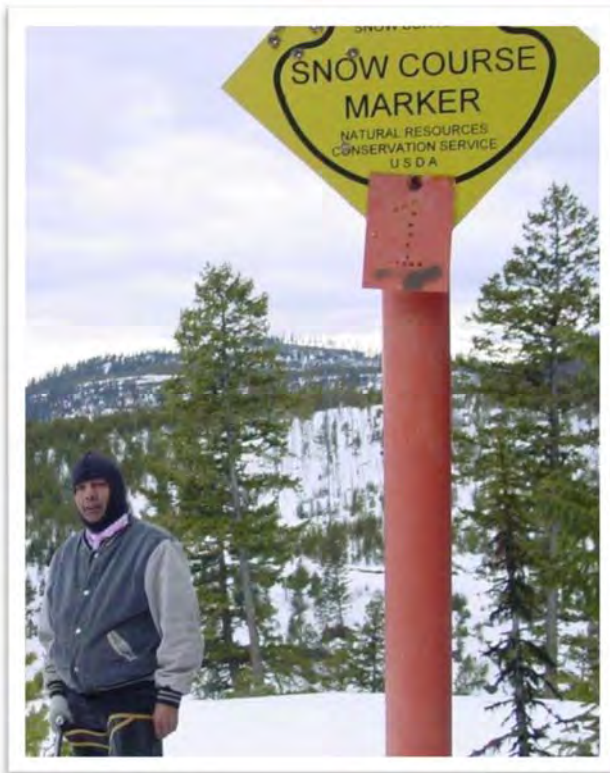


Figure 15: Martin Barnaby at Bassoo snow measurement site, photo by George McLeod

Snowpack – A recent study demonstrated synchronous declines in snowpack across the Rocky Mountains since the 1980s. Continued declines are expected as temperatures increase. Because many current water storage strategies rely heavily on snowpack, a substantial strain on supplies and infrastructure could result.

Hydrology – This area has already experienced many changes in hydrology patterns. The snow water equivalent (SWE) of winter snowpack has declined, stream flow has declined (especially late summer flow), and water temperatures have increased. The time of many events, such as average freeze and thaw dates, has also changed substantially over the last 50-100 years. Future expected trends include longer and lower summer stream flows, increasing flood risks and more precipitation falls as rain instead of snow, increasing summer stream temperatures, and declining groundwater recharge.



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Forest and vegetation change – 76 percent of Missoula County is forested. Overall, U.S. forests have become more productive in the last 55 years, likely due to a longer growing season and higher CO₂ levels. As conditions become warmer and drier in the summer, many forests are expected to become less productive due to lower soil moisture during the growing season, temperature stress, insect and disease outbreaks, invasive species prevalence, and wildfire.

Two different vegetation models to assess future vegetation patterns in this local area were consulted. The function model (MC1) projected a steep contraction of subalpine vegetation at higher elevations, in the northeastern and southwestern portions of the area, but continued coniferous forest cover in most other areas. In contrast, the climate envelope model indicated a decline in favorable conditions for many of the county's common tree species, including Ponderosa pine, lodgepole pine, Douglas-fir, and subalpine fir. Deciduous trees, such as oaks, may find more favorable conditions.

Wildfire - Fire severity can be expected to increase given warmer and drier conditions. An assessment of climate change and forest fires over North America Projected 10-50 percent increases in seasonal severity rating (SSR) over most of the U.S., implying increases in area burned and fire severity. Similarly, a recent study predicts substantial increase in fire frequency in the Greater Yellowstone Ecoregion (GYE). The MC1 vegetation model that was consulted showed a 26-30 percent increase in wildfire in the area. Increases in wildfire are primarily expected in the higher elevations.



Figure 16: Chippy Creek fire, photo by Ron Swaney

Air quality - Climate and air quality are closely related. Conventional pollutants such as ozone and particle pollution affect public health and also exacerbate climate change. Higher temperatures can cause increased ozone formation, even without additional pollutants. Increased forest fires may also affect air quality.



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Figure 17: Mountain goat, photo by Eugene Beckes

Fish and wildlife changes - Wildlife will respond in many ways to a changing climate, including range shifts, changes in migration and breeding seasons, changes in population size, increases in disease, population declines, and extinction. As climate change accelerates, it is increasingly expected to outpace the ability of wildlife to respond and adapt. Approximately 30% of all species could be lost by 2100.

Wildlife in the area expected to be the most vulnerable to climate change includes species dependent on snow, such as wolverine, lynx, and snowshoe hare. Also vulnerable are high-elevation species such as big horn sheep, pika, mountain goat, and wolverine, as well as rosy finch and ptarmigan. Other species, such as elk, may respond favorably to warmer winter conditions and lower snowpack.

More frequent wildfires can remove the vegetation that stabilizes steep slopes, resulting in increased frequency and magnitude of landslides and debris flows, which can degrade fish habitat. Many aquatic species are especially sensitive due to their dependence on clear, cold water streams and their inability to move to new areas. These include bull trout and westslope cutthroat trout. In the Rocky Mountains, warming is projected to cause a loss of up to 42% of current trout habitat by the end of the century. Invasive species, including noxious weeds, pine and spruce beetles, and others, are expected to continue to spread, partly due to declining or weakened native species and warmer temperatures. Warmer waters are also expected to benefit invasive aquatic species and aquatic pathogens. ^x



2.3 Climate Impacts on the Tribes

The spirit and direction of the Salish, Pend d'Oreille and Kootenai people is founded upon and reflective in its cultural heritage. The cultural foundation of the Tribes is to be preserved as a living part of our community life and development in order to give a sense of orientation to the Salish, Pend d'Oreille and Kootenai people. However, cultural resources of the Tribes are being lost, substantially altered, or destroyed with increasing frequency in the face of ever increasing energy, economic, residential, highway, sanitation and public health developments. The present programs that work to preserve the Tribes cultural resources must be strengthened to ensure future generations a genuine opportunity to appreciate it and enjoy the rich heritage of the Tribes.

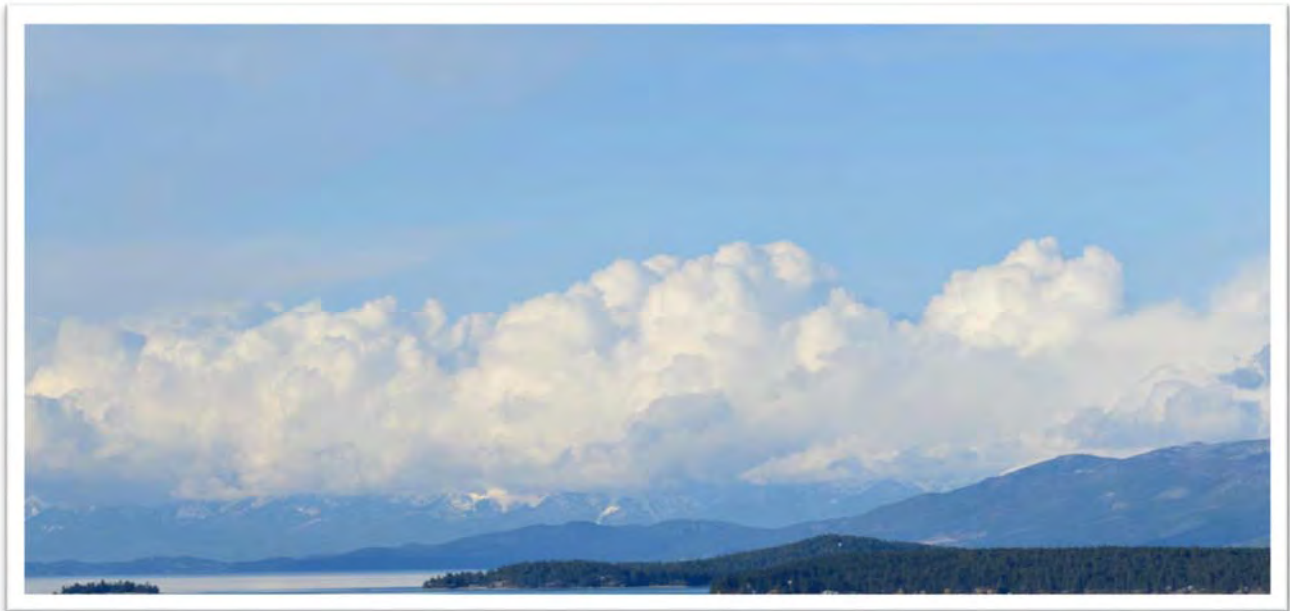


Figure 18: Flathead Lake, photo by David Nall

As such, measures are necessary to foster conditions under which modern society and the prehistoric, historic and cultural resources can exist in productive harmony to fulfill the social economic and other requirements of present and future generations. The Historic Preservation/Cultural Preservation Department recognizes that it is unknown if it is possible to reverse climate change, but that the Tribes need to protect cultural resources as much as possible while looking for solutions - that this work must be done now. ^{xi}



2.3.1 Traditional Ecological Knowledge

This summary is created as a guidance document to highlight the importance of Traditional Ecological Knowledge (TEK) in institutional science with the purpose of incorporating TEK as a resource tool for any and all agencies in natural resource management. The intention is to use traditional histories of the Flathead Indian Reservation (Reservation) and highlight how that TEK guides resource management in the face of Climate Change. Learning from the TEK of indigenous elders and practitioners may enable other landowners and managers to develop more robust and complex agroforestry systems that not only produce multiple products from the same piece of land, but emphasize the use of native plants suited to the local landscape and climate (Rossier & Lake 2014). The intent of this document is to promote collaboration between natural resource agencies and to facilitate the sharing of information and project cooperation.

History of tribes, a traditional way of life

Each of the Tribes on the FIR is culturally unique and has its own belief system, yet all three are similar in at least two fundamental ways. The first is that each holds knowledge of the natural environment. The second is that each has a profound respect for all of creation. Both of these traits have enabled the Tribes to survive for thousands of years. The subsistence patterns of Tribal people developed over generations of observation, experimentation and spiritual interaction with the natural world. This has created a body of knowledge about the environment closely tied to seasons, locations, and biology. This way of life was suffused with rich oral history and a spiritual tradition in which people respected the animals, plants and other elements of the natural environment (CSKT History & Culture, 2004). Through the teachings of elders, these tribal ways of life continue to this day. At the center of tribal cultures lay a deeply ingrained ethic of reciprocity between people, and between people and the land.

Cultural resources are precious tribal resources, encompassing the Tribes' elders, languages, cultural traditions, and cultural sites. They include the fish, wildlife and plants native to the region, land forms and landmarks. Tribal elders and the languages are perhaps the most vital of these tribal resources because they teach and communicate the histories and traditional lifestyles of the Tribes. The traditions depend on land based cultural resources. These land-based resources include native fish and wildlife and their habitats, as well as plants for traditional food and grazing of livestock, buffalo (*ǫʷeyǫʷay/ kamquǫkuʔ 'iyamu*) and horses (*snčtcaʔsqa*), and for medicinal purposes. The Tribes have used fire to help maintain the health and productivity of ecosystems and harvested traditional foods, such as woods rose (*sxʷyapaʔq*), camas (*sxʷeʔli*), huckleberries (*stšaʔq*), etc., in this area for generations.



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It is understood that ancestors have a unique perspective in regards to a changing environment and, therefore, restoration of historic structures and functions of cultural-use plants, foods, habitat, and animals will remain a priority.

Traditional Ecological Knowledge and Elders

Traditional Ecological Knowledge (TEK) refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment, knowledge which is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for sustenance, including but not limited to hunting, fishing, trapping, agriculture, and forestry (Rinkevich, Greenwood, & Leonetti, 2011). TEK facilitates the implementation of stewardship practices to this day, such as burning, pruning, sowing, tillage, and more. Involvement of respective Elders advisory groups in natural resource planning is a crucial element of the CSKT.

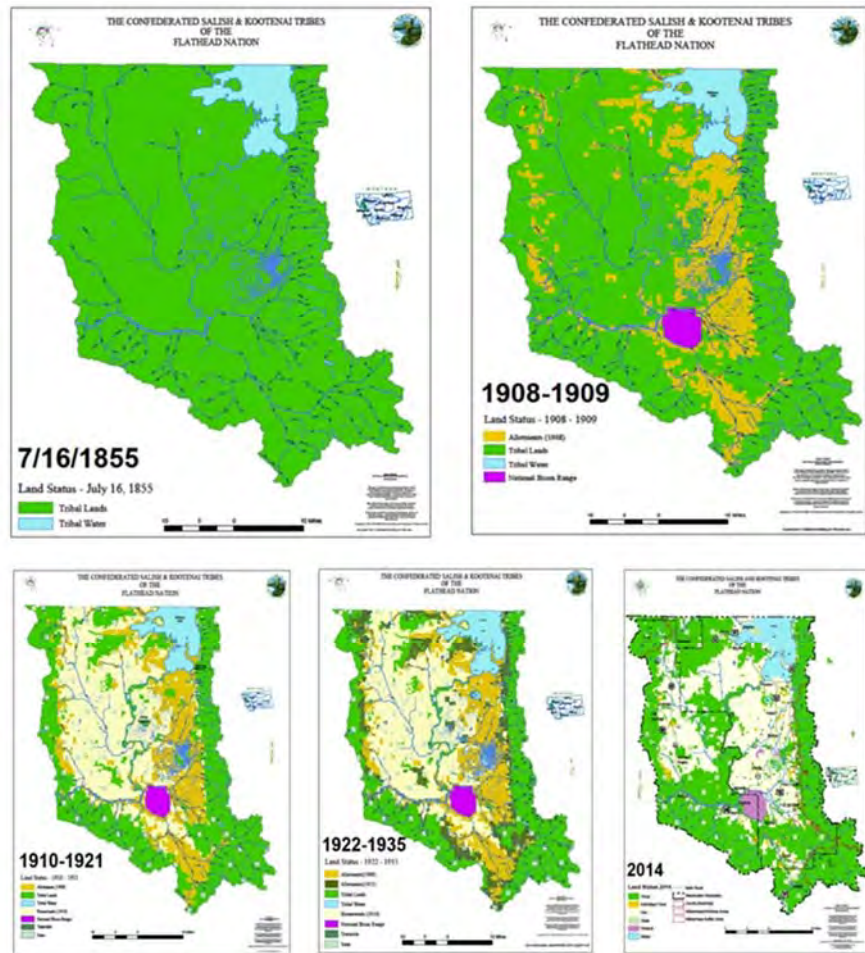


Figure 19. Land Ownership of CSKT from creation of Flathead Indian Reservation (1855) to current day ownership (2014).



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Communities around the world have practiced diverse and evolving forms of agroforestry for centuries. Because indigenous groups have lived in the same areas for long periods of time, each generation has built on the knowledge of the previous generation through observation and experimentation. In this manner, indigenous groups have evolved intricate ways to manage multi-culturally diverse ecosystems. These ecosystems are managed to provide food, fuel, building materials, agricultural and plant-tending tools, hunting and trapping equipment, baskets, and ceremonial spaces essential to life and maintaining cultural traditions. Many agroforestry practitioners in the United States are learning from these complex systems (Rossier & Lake, 2014).

Interest in TEK has grown in recent years due to recognition that such knowledge can contribute to the conservation of biodiversity, rare species, protected areas, ecological processes and to sustainable resource use in general (Berkes, Colding, & Folke, 2000). TEK addressed in this document is related directly to the Selis (Salish), Qlispe (Pend d'Oreille), and Ksanka (Kootenai) people of western Montana.

In the words of anthropologist Wayne Suttles, they had mastered the art of “coping with abundance” - capturing the brief, intense bounties of the plants and animals of their territory (Smith, 2014). They developed a profound geographical and ecological understanding of their homeland and of the population dynamics of its plants and animals across seasons - and across the longer spans of decades, even centuries. The ancestors came to know even the long climatic cycles of temperature and precipitation, whose variations would later raise havoc with non-Indian farmers and ranchers, who were less able to adapt quickly to periods of severe drought or unusually bitter winters (Salish Pend d'Oreille Culture Committee, 2003). This knowledge of how to judiciously manage, harvest, and steward ecosystems without destroying them results from observation, patience, experimentation... long-term relationships with plants and animals and the lessons passed down through generations of observation and experimentation in the same place. These lessons were traditionally taught by parents, aunts, uncles, grandparents, and other elders – in certain ways and at certain times of a young person’s life (Rossier & Lake, 2014). As has been extensively documented elsewhere, the tribes nurtured and augmented the productivity of plant and animal foods through the careful and highly skilled use of fire, which increased forage for game, and also revitalized and fertilized berry patches, camas fields, and other plant foods (Salish Pend d'Oreille Culture Committee, 2003).

In the Tribe’s Climate Change Strategic Plan (CCSP), management areas are divided into 9 sectors; each assigned the responsibility of a particular division or program within the working Tribal government. These sectors consist of air, culture, fish, forestry, infrastructure, land, people, water and wildlife. This TEK section was included into the Tribe’s CCSP in order to enhance our current Climate Change Plan in a way such that scientists will be able to use TEK in making difficult



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management decisions in the face of climate change (e.g. which species to focus conservation efforts on or to identify climactic trends based on local historical knowledge on ecosystems).

Take-away Message

Climate variability and change can affect plants and animals in a number of ways; including distributions, population sizes, physical structure, metabolism, and behavior (Root et al. 2013). Through stories and information passed down through the generations, Tribal elders have already been able to identify some of these affects. Indigenous people are inspired by cultural teachings which provide lessons for dealing with situations that relate to the changing landscape. Time should be taken for holistic, long-term decision making. Notice has been taken of changes in the local flora and fauna they once used for subsistence. These changes affect not only people and land, but also fish, wildlife, culture, and forestry sectors of the Tribal organization.

Both plant and wildlife species are changing under the effects of climate change. The ability of wildlife to adapt through migration and physiological change will be increasingly limited as the effects of climate change become greater. Threats that currently affect wildlife, such as habitat fragmentation and loss, environmental contamination, and invasive species, will also serve to pose an even greater challenge to the ability of wildlife to adapt (Root, Schneider, Warren, Price, & Mastrandrea, 2013). In an attempt to conserve wildlife and plant communities in anticipation of climate change, setting up interconnected nature reserves or networks of adequate habitat to allow species to move along habitat corridors is an option (Root, Schneider, Warren, Price, & Mastrandrea, 2013) . TEK can serve to provide a source of knowledge with which to begin identifying areas to preserve as wildlife connectivity corridors. TEK is not only restricted to tribal entities, but can be extended to include any long-term dataset for a specified area and, therefore, is a tool that can be applied to any region or area.

2.3.2 Tribal Elder Observations

Climate change observations have been made by Tribal elders whose ages are between 70 – 80 or more years old. However, the knowledge they gained from parents, grandparents and great grandparents dates back some 150 to 250 years. As such, these Tribal elders have made important climate change observations. To gather this knowledge, the Climate Change Planning Coordinator collaborated with the Salish Pend d'Oreille Culture Committee, Kootenai Culture Committee, and Historic Preservation/Cultural Preservation Department to conduct elder interviews. Excerpts about personal experiences of climate change from interviews with CSKT Tribal elders are included in this section.^{xii}



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Figure 20: Ignace Couture, photo by Frank Tyro

Ignace "Ig" Couture (Elmo, MT)

Weather changes are coming and it is going to get hotter. What do we do about it and how does this affect the animals, like the deer and elk that live around this area? I think the deer like it [the warmer weather] because they feed all year round now. Usually, there is a lot of snow so they have to eat the moss off the trees. They don't have to do that anymore. But then, the moss is probably going to be gone now too. You have got to do something.

Always the weather – everything has got to do with the weather. With the weather changes, there is not going to be that much water in the hills. The animals use that water year round. The springs are probably going to dry up.

When I was young, I went to grade school in the Elmo [Montana] here. In the winter we use to ice skate from November to at least February every year. [There was a] lot of ice out there. Now a-days you do not have it.

I do not know when the last time the lake completely froze. It has been awhile since it did that. I do not know if we will ever see that again.

In November, they would build fires along the lake to draw them [the fish] in. They'd catch them with a hook. In November, you'd see a couple of fires in the evening. Then you would know they were fishing for salmon. In Dayton Creek you use to be able to snag them [the salmon] out of there. Now, all of a sudden, they are gone.

I think the bitterroots are in trouble. They only pick them about one or two weeks out of the year. You lose one dry season and I do not know if you will have any up there.

Animals that live up there [in the mountains] will adapt - whatever we are going to have left. But, I always try to think of the future and how it is going to be because of the drastic changes. In the last 100 years, we have had the wagon buggy days of my mother and my dad to driving cars. Some of them have seen guys going to the moon. So, that is the drastic change.





Figure 21: Mike Durglo Sr, photo by Frank Tyro

Mike Durglo Sr. (St. Ignatius, MT)

At the time, you could tell it was winter because it was cold and the snow was deep. Sometimes, when you would go down the county road you only can see an inch of the fence post sticking out.

There was something wrong with it [our pine]. They were dying. But, I guess that was the pollution at that time. So, they [leadership] blamed it on the pollution. Which now I guess was global warming. Even today you can tell the difference. The seasons are not like they use to be. Even the birds started noticing that new kinds of different birds were coming into this area.

As an Indian people we get concerned especially for the higher elevation plants that we use for medicine - not only for medicine but some of the plants that we use for a mountain tea. Those look like those little huckleberries. I call them miniature huckleberries. We are concerned for those things. Not only the plants but for the animals.

Our [Historic Preservation/ Cultural Preservation] Department has the task for protecting our culture sites. The pine beetles started to infect brook pine or yellow pine. Some of the pine trees they are getting infected. Once they get infected [with pine beetles] they'll kill it.

But you still talk about it [the history]. You pass it on to the grand kids or to the young children that are there. You keep the history going. That is how we Indian people hand it down - through oral history. So that is what is going to happen with our plants today. Someday, we are going to talk about [the plants] that we do not see. They [the children] probably will not see it but they will remember. "Oh, so-and-so told me about it." Then they will pass it on to their children and grandchildren. It will not be there, but it will still be part of our history. That is how we kept [the history] going because we did not have books or anything to write it down.



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They said towards the end that coyote was going to come back. I don't know what they mean by that. Today, when we tell coyote stories, we depend on the weather too. When it gets cold, snow up there on the mountains - that is when we start telling our coyote's creator story. But what is going to happen when we don't have that cold and snow up in the mountains. So, our story will be kind of confusing.

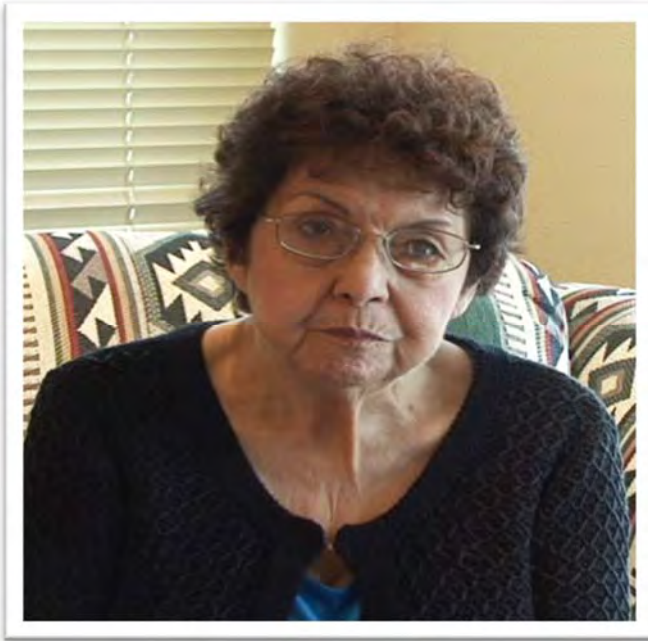


Figure 22: Sadie Saloway, photo by Frank Tyro

Sadie Saloway (Elmo, MT)

The huckleberries are just disappearing so fast. I have been away from there for 53 years, but the area's we use to go to, like Sand Creek (BC), Jaffray (BC) area, and in Elko (BC) ...were good places. They are all gone. I don't know if we need a good fire? I think that is part of it on the berries and the plants. I do not know why the climate changes. Probably contributes to the demise of a lot of the plants that we use to have.

Dad would mention the different things. One of the things he always did was we took a drink out of the creek we always put some back. So, you took a drink then you threw some [water] on the plants or somewhere.



Stephen Small Salmon (Post Creek, MT)

I remember Uncle Pete Beaverhead and I used to hear him talking. They say it's going to be changing - just like our language, our life, the snow pack. It seemed like they knew. I don't know how they knew. I guess they were wise. Maybe, they learned it from their folks. Handed it down generation-to-generation, then to me. I started to realize it [the weather] is changing. The life is changing. The world is changing. Everything is changing.



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Small Salmon Continued:

Figure 23: Stephen Smallsalmon, photo by Frank Tyro

Just like you are talking about fish and animals. I remember years ago, the snow was deep. It was cold.

That scary part is still not here, but it seems like we do not do [prepare] until it is here. Then we start getting all shook up.

My elders use to say "that's what we're supposed to do." Hand it down, hand it down, hand it down. We forget about those things. Hand it down - it's me, it's always me. I got to make the buck, you know, I have to pay my bills, I have to pay. And I watched that, you know.

Today we do not have more snow. Do you know why? Why is it? You know, how come we got so many fires? Is it too dry? What is it? There is not enough rain. Why is there bugs around, like those beetles? It's too dry. It's not cold enough to kill them all and there is that question.

When I was young... my dogs find quills. You do not see that anymore. You do not hear frogs. I remember hearing them in the nights. Just sit there and listen to the frog.

"How come that muskrat is way over there?" "Oh, it's going to be a cold winter you know." Or, "how come the squirrel or chipmunk is getting everything ready right away?" Oh, the old people use to say, "it's going to be cold." Yeah sure, enough it was. We went by that - you know.

There. (lighting sound) Things like that are scary. How could we prevent that? How could we clean up this world? How could we tell people?

We changed that...about the weather. You could tell by the choke cherries getting smaller and the huckleberries getting smaller. I saw that happen. Sometimes you could get in a really good batch. Why is that? Why- why- what- could we change. Now, it's getting mad. Somebody cutting choke cherries or taking the huckleberries...that is ours....even the stuff that we medicine ourselves in the mountains. We have got to protect ours. We have got to educate the people first. Say, let us take a bunch like Nkusum [students] to go out there. Some other people do go out there and study those medicine ways.



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I believe in that myself. It is our medicines. I am talking about the ones in the mountains. I am talking about the ones that seem like the young people do not use. Like using stuff for your hair to make you hair grow. And things like that.

Small Salmon Continued:

It's the rain - the rain. The weather pattern is different. I've noticed that. It could be snowing here [in Polson] and it will not be snowing up in Ronan.

Long time ago Indians, old Indian people like I say, went with the animals. The bears slept all winter. Today, they do not come out sometimes when it gets warm, because they have become mixed up too. You know, "oh, it's still winter time."

There are so many questions here about what is what. How could we prevent that? Do we do this or do we do that? So many questions out there we have to study. Last night, I went in a sweat and I prayed for the world. To me, I say it is the people, you know. It is the people, you know. We have got to do it. It is not you and you. It is I got - we have got to do it.

I always believe in the Creator. I pray. I go in a sweat. I pray a lot, when I got older. I have seen a lot of things in my times. A lot of things that my uncles, my grandfathers, they told me in those times. I saw that they always say I went down this trail. But young guys will come up and argue with you. They think they know you know.

The weather [may bring a] big change and then maybe the world will go back the other way. Can never tell you know. Like going up to the moon and stuff like that.



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Figure 24: Patrick Pierre, photo by Frank Tyro

Patrick Pierre (Camas Prairie)

We are the original people here in this country.

The elders would sit down and they would tell stories, this was especially up in the Little Thompson during the hunting. They would have a big camp up there and all the people that gathered at our place, maybe six, seven families, everybody had wagons or buggies go up there and we would camp for a couple of weeks, hunt. They would tell stories around this big fire and I would always listen. They would talk about a certain thing that was coming and you will see it in your time.

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I have seen a lot of these things that they talked about back then, and I witnessed it, and one of the things that I want to bring out today, is happening now, is one day this earth is going to become warm. They said the snow and ice is going to melt in the north and the oceans are going to fill up, islands are going to flood and the earth here is going to be warm, summer time will be extremely hot, winter time you aren't going to get cold weather, maybe short cold weather, but most of the time it will be warm, I am witnessing that today and I am glad I can talk about. I never believed it back in those days but I have actually seen the change.

The other thing they talked about was the face of this earth may burn up, but it's not going to destroy you, the timber will be gone, there will be no more timber but you're going to survive because you are who you are you are Indian you understand the earth, you're one with the earth, you understand that and you're going to survive and today I am witnessing forest fires burning thousands of acres right here on our Reservation. So these are the things that I have witnessed in my lifetime and those are very important for now. We can pass these things on to the next generation that they will listen and they will learn to observant all the time.



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Figure 25: Louie Adams, photo by Frank Tyro

Louie Adams (Valley Creek)

In the past I used to see the old people go away and any time they went away they took a ton of knowledge with them, our tradition and or ways with them. When I was growing up the people always said the four main things, the Bitterroot people, number one was of course Creator (kwlncutn) and number two was earth (stulixw). See our people didn't have mother earth and father sun and all that stuff as other tribes did, which was okay, it is for the Bitterroot Salish that I speak. Sweat (snlaqi) is number three and number four was lightning (suwecm), because they always said that when he (kwlncutn) cleans house he uses fire. That's been going on

for thousands of years, since the earth was made. My grandmother used to say that sometimes when they stayed in the Bob Marshall it would be smoky all summer long from fires but still everything was still good, good fishing, good hunting.

When I was little it seemed like there was always a lot of snow in the winter time. But any more it's not like that. The old people used to say that in the winter when it got cold you could hear the trees pop, it sounded like a rifle shot, then the coyote stories could come out, then in the spring when you hear the first thunder then that when you put them away.

Up valley creek when I was young, we moved up there when I was 9 years old, when the spring would break and the snow start melting, valley creek would be just roaring, there would be brush going down the creek and stumps, now it's not like that, yah you get runoff and high water but nothing like I remember.

This is something that the old people used to say about cold weather, maybe they didn't know what germs were but they knew that we had to have some really cold weather during the winter in order to get rid of sickness (scaal).



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That's what the old people said, if you see an eagle flying around, a hawk sitting on a tree or a meadowlark sitting on a post, rabbits coming around close to you or any of these little creatures that come fairly close, they are telling you in their own silent way "hey", we are still here, we were here when you got here and we will be here with you till the end and that's why you are supposed to take care of them and that's why they check on you once in a while, because they have no voice and that's what I have in my heart.

4. Planning Focus

Elder observations indicate that the climate has noticeably changed within their lifetime and as stated prior, the knowledge they gained from parents, grandparents, and great grandparents goes back at least three generations. These first-hand accounts of the impacts of climate change further demonstrate its effect on the Tribes. As such, it emphasizes the value and importance of this adaptation and mitigation planning effort. It also establishes the need to engage regional, national, and global planning efforts to develop comprehensive strategies. As such, the Confederated Salish and Kootenai Tribes Climate Change Strategic Plan is dedicated to assessing the impacts of climate change on the Flathead Reservation. Considerations are provided for the built, natural, and social environments, with specific focusses on nine sectors, which include forestry, land, fish, wildlife, water, air, infrastructure, people, and culture.

Planning process, methodology

The climate change strategic planning process included a series of meetings, trainings, and collaborative planning sessions.^{xiii} The planning committee was responsible for providing oversight and/or ongoing project collaboration, including direct communication between the Office of Environmental Protection and their respective entities. They were also responsible for assisting, where needed, in data collection and providing feedback on the plan's development.

Local impact assessments were completed by Tribal departments and local organizations using a survey based on the Adaptation Planning Spreadsheet and Matrix. Surveys were developed using Microsoft Word, SurveyMonkey, and Portable Document Format. They were administered online, via email, and in-person, upon request. Inter- and intra-departmental collaboration and consideration of Traditional Ecological Knowledge was highly encouraged during the research process. This information establishes the preliminary foundation of the plan – guiding the direction and scope of its mitigation and adaptation strategies.^{xiv}



3.1 Forestry Focus

The focus of the Forestry Sector is CSKT forestland timber, rangeland (fire), interior grass, shrub, and forb (phorb)¹ vegetation in four fire regimes types.² The sector includes the Non-Lethal, Mixed, Lethal, and Timberline Fire Regimes and associated wildland fire behavior. The Forestry Sector planning area is Tribal/Individual Trust and Tribal Fee forested lands within the exterior boundary of the Flathead Reservation.

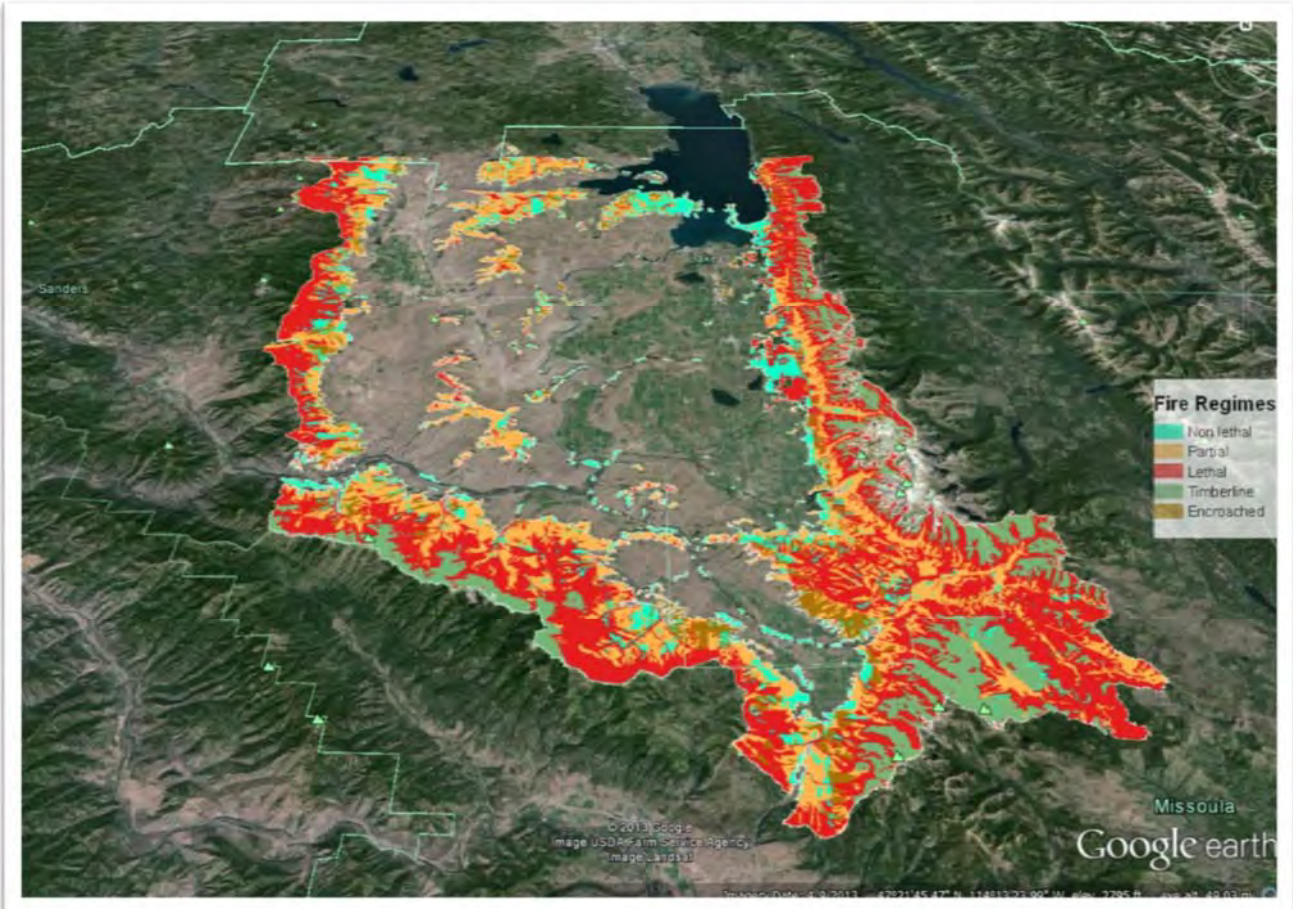


Figure 26: Flathead Reservation Fire Regimes, figure by John Holub, GIS Analyst, CSKT Division of Forestry

¹ A forb (sometimes spelled phorb) is a herbaceous flowering plant that is not a graminoid (grasses, sedges and rushes). The term is used in biology and in vegetation ecology, especially in relation to grasslands and understory.

² A fire regime refers to the general pattern in which fires naturally occur in a particular ecosystem over time.



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Widespread changes in Fire Regime vegetation compositions, structures, functions, and area extent, with increased wildland fire behavior impacts define the geographical impact of climate change on the Forestry Sector. All four fire regimes will experience increased forest disturbance regimes timber mortality from insect infestations and drought, increased site occupation by invasive species, and decreased water holding capacities.

Non-Lethal Fire Regime areas will shift upslope in elevation and will increase in area to replace most of the Mixed Fire Regime and the lower elevation portion of the Lethal Fire Regime areas. The Mixed Fire Regime will lose productivity and forest fuel diversity. Seral³ species will be the pre-dominant vegetation type, in both fire regimes with an overall decrease in Douglas-fir and Grand Fir timber and forbs. Grass and shrub rangeland will replace both fire regimes at lower elevations.

Lethal Fire Regime areas will greatly shrink in area and will occupy only the highest elevation areas on the landscape, mostly on north aspects and high mountain basins and plateaus. At lower elevations, Lethal Fire Regime riparian⁴ areas will be replaced by the Non-Lethal Regime with a loss of spruce and cedar timber species and a decrease of wetland forbs. The Timberline Fire Regime will not change in area, but will experience a loss of timber composition, structure and associated functions.

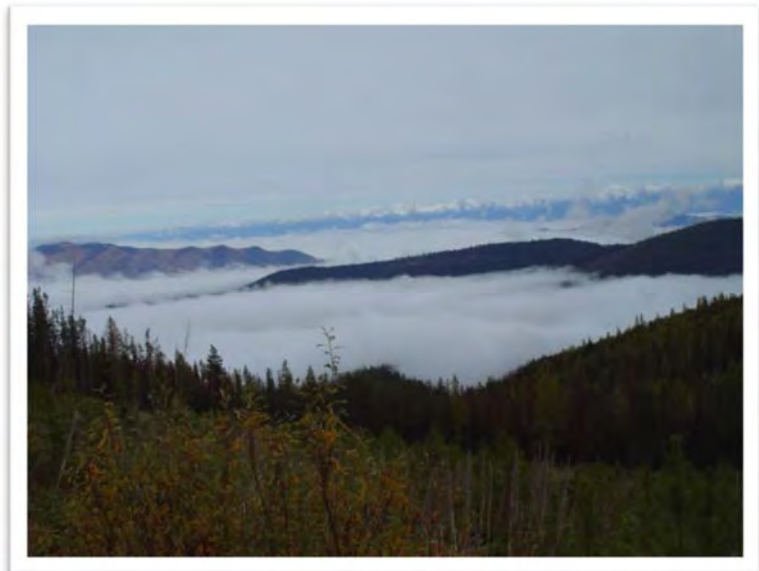


Figure 27: Flathead Reservation, photo by Roian Matt

Fire Regime changes will be slow, and environmental impacts will be minor over the near- and intermediate-term periods. The greatest impacts will be experienced in the long-term time period with the earliest and most rapid changes and impacts to the Lethal and Timberline Fire Regimes followed over a longer future time period by the Mixed and Non-Lethal Fire Regimes. These

³ A seral community (or sere) is an intermediate stage found in ecological succession in an ecosystem. An example of seral communities in secondary succession is a recently logged coniferous forest.

⁴ A riparian area refers to zones relating to, or situated on the banks of rivers; riverine.



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estimated impact and change timeframes are based on the medium and high certainty climate model predictions associated with *Section 2.2 Climate Impacts Locally*.

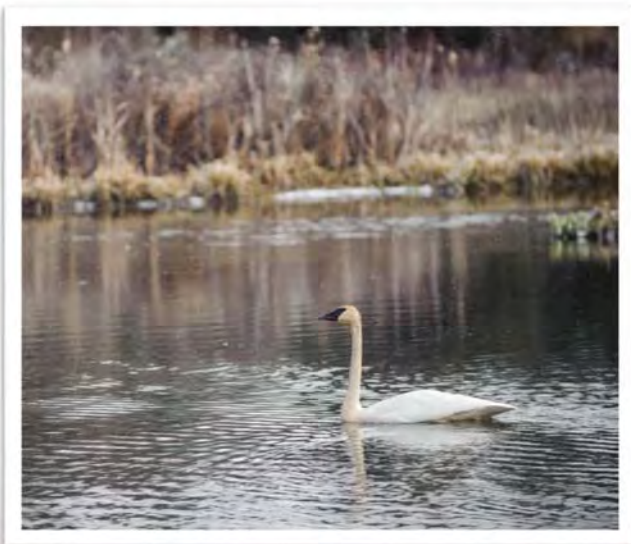
3.2 Land Focus

The focus of the Land Sector is native plant community trends and ecological sites, including the monitoring and managing of noxious weeds. This sector considers the impacts of climate change to long-term changes in plant communities and cropping patterns. The Land Sector planning area is Tribal/Individual Trust and Tribal Fee lands within the exterior boundary of the Flathead Reservation. The geographical impact/extent covers one hundred thousand acres of intermountain grasslands throughout the foothill, riverine, and prairie areas that will be impacted. Twenty thousand acres of irrigated and dryland cropland throughout the valley areas will be impacted by reduced water supply and shifting to alternatives to crops. The timeframe for these expected changes are estimated to be in the near-term (0-10 years) to long-term (26+ years).

3.3 Fish Focus

The focus of the Fish Sector is fish and fish habitat with the intent to assess the benefits of healthy functioning fish habitat versus degraded habits in the context of climate change. This planning area includes bodies of water and substrate required for fish spawning, breeding, feeding, and growth which are located on and near the Flathead Reservation. The geographical impact is expected to be throughout Western Montana. The timeframe for these expected changes are estimated to be in the near-term (0-10 years).

3.4 Wildlife Focus



The focus of the Wildlife Sector is terrestrial wildlife species (birds, mammals, amphibians and reptiles) and their habitats. Warmer temperatures and changes to precipitation will alter native wildlife habitat. Desiccation (state of extreme dryness) of wetland habitats will increase, with generally negative impacts upon wildlife and wetland habitats. Grassland habitats become drier, also resulting in negative species impacts. Alpine habitats will



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likely become drier. The species of plants and wildlife in these locations will change.

Figure 28: Swan, photo by David Nall

The geographical impact to wildlife includes all Reservation habitat types, such as grasslands, agricultural lands, rangelands, wetland riparian areas, mountain forests, alpine habitats, and the other biotic features entailed in those habitats. It is expected that nearly all activities in those habitats may potentially affect wildlife and their habitats. The timeframe of these impacts range from near-term (0-10 years) through the long-term (26+ years). Initial adverse changes upon habitats are likely occurring now and will continue to increase overtime.

3.5 Water Focus



Figure 29: Flathead Lake, photo by David Nall

The focus of the water sector is the quality and quantity of groundwater and surface water. This planning area includes most of Western Montana west of the continental divide, north to the Flathead River headwater streams up into Canada, and west to the Columbia River Basin. The Clark Fork River drainage encompasses the area from Butte, Montana to the Idaho boundary.

Observations over the last 30 years indicate that the accumulation of snow pack now begins later in the fall and spring melt is trending to occur approximately two weeks earlier in the spring.⁵ This is due to warmer temperatures and warmer Pacific influence rains. This trend points to less storage for irrigation in the fall, warmer and less water for fisheries, changes in ground water recharge, and changes in management for hydroelectric management.

The geographical impact/extent of water resources that relate to the Tribes lands reaches beyond the boundaries of the Flathead Reservation. It encompasses the entire Flathead River drainage located above and adjacent to the Reservation which is most of Western Montana. The timeframe

⁵ This trend can be documented by NRCS SNOTEL information as well as USGS Stream Flow information that are related to the Reservation's watersheds.



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of some of these impacts are near-term (0-10 years). There is potential for certain areas to start losing water temperatures desirable for the existence for some species and irrigation water supply will certainly be affected.

3.6 Air Quality Focus

The focus of the air quality sector is impacts to health caused by increases in criteria pollutants⁶ from climate change within the exterior boundaries of the Reservation in the two non-attainment areas and outside those areas in the prevention of significant deterioration Class I area.⁷ The planning area is Polson Non-attainment Particulate Matter, Ronan Non-attainment Particulate Matter, and the Prevention of Significant Deterioration (PSD)⁸ of criteria pollutants within the exterior boundaries of the Reservation. Attainment area is an area considered to contain air quality as good as or better than the National Ambient Air Quality standards as defined in the Clean Air Act (CAA). An area may be an attainment area for one pollutant and a nonattainment area for others.

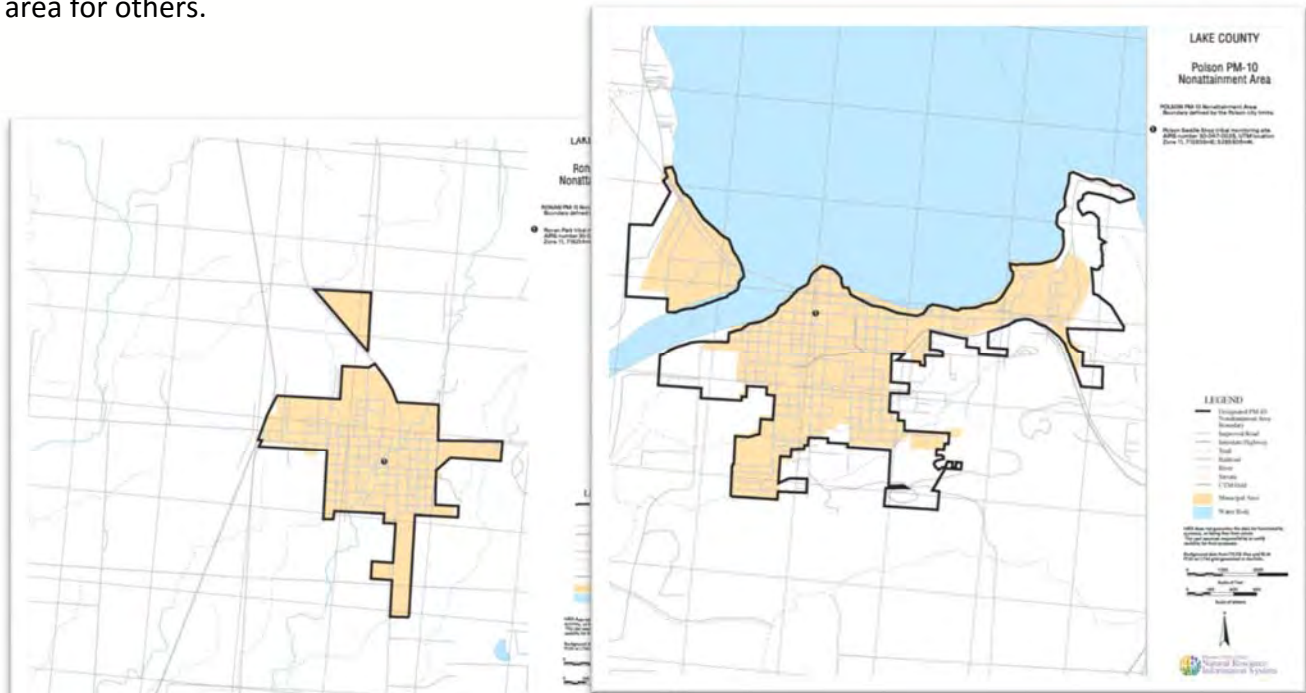


Figure 30: 1998 Polson PM-10 Non-attainment Area,

⁶ The six Environmental Protection Agency (EPA) criteria pollutants are Lead, Carbon Monoxide, Nitrogen Dioxide, Sulfur Dioxide, Carbon Monoxide and Particulate Matter (dust).

⁷ Figure 31: 1998 Ronan PM-10 Non-attainment Area, Montana State Library Natural Resource Information System
Class I areas include national wilderness areas greater than 5,000 acres in size and national parks that are greater than 6,000 acres.

⁸ Prevention of Significant Deterioration (PSD) is an Environment Protection Agency (EPA) program in which state and/or federal permits are required in order to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standard.



The geographical impacts are localized health impacts to the Non-Attainment areas and extend to widespread impacts to the PSD. The PM10 Non-Attainment areas of Ronan, MT and Polson, MT will experience increases in dust due to predicted drought conditions and finer particulates from smoke as increased wildfire activity occurs. Outside of the city limits of Ronan, MT and Polson, MT the extent of dust impacts will be lessened due to decreased anthropogenic⁹ activity. The timeframe for increased smoke impacts is near term (0-10 years). A greater increase in smoke from wildfires and dust events caused by drought will occur in the intermediate term (11-25 years).

3.7 Infrastructure Focus

The focus of the infrastructure sector is housing and power. The housing planning area includes the 28 water and/or waste water systems and over 500 units of affordable housing that are owned by the Tribes and operated by the Salish Kootenai Housing Authority. Analysis of climate change impacts to housing is unavailable. The power planning area includes customers on and near the Reservation. Analysis of power indicates that there are no notable current and/or foreseen challenges to providing power. Energy efficiency incentives are currently considered effective in energy conservation. The geographical impact of housing includes Evaro, MT to the south end of the Reservation. Then Dayton to the north end of the Reservation, with numerous systems in between. The geographical impact of power includes the Flathead Reservation to the north end by Niarada and Lake Mary Ronan. The estimated timeframe for impacts to the infrastructure are long-term (26+ years).

3.8 People Focus

The focus of the people sector is social services, safety, tribal health, and human resources. Services, safety, health, and resources are distinct, yet interrelated aspects of this sector. Combined, these categories provide a more complete analysis of the expected impacts of climate change upon people on the Reservation.

Social Services

The focus of the social services section is the emergency welfare services for Tribal people, as related to climate change. Tribal Social Services Department clients are some of the most

⁹ Anthropogenic refers to environmental pollution and pollutants originating in human activity



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vulnerable populations on the Flathead Reservation. They include parents, foster children, foster parents, guardians, children in our group home, general assistance clients, and trust Management clients. Many if not all of the Tribal Social Services Department clients are socially and economically fragile to any adversity in their daily lives. Due to this, measures must be taken to ensure there is a system in place to deliver services quickly and efficiently.

The geographical impact on people is Reservation wide. It is expected that the more isolated communities will be affected the most by climate change. Some of the impacts will include increased flooding that washes out roads and bridges. This will make service delivery and emergency response more difficult. The timeframe of these impacts is near-term (0-10 years).

Safety

The focus of the safety section is work environments, tribal facilities, tribal food services, and domestic animal control. Support provided by safety programs address suicides, drowning, motor vehicle accidents, child safety seat program, fire prevention, poisoning, and more. Extreme and unpredictable weather patterns create safety related issues.

The geographical impact is Reservation-wide. Climate change is expected to impact tribal facilities. This impact will result in the need for additional maintenance and improvements. Impacts are also expected to affect highway safety and fire prevention. The timeframe for these changes is estimated to be in the near-term (0-10 years) through the long-term (26+ years).

Health and Human Resources

The focus of the health and human resources section is community's healthcare and transportation. This analysis recognized that changing weather patterns caused by climate change could result in increased environmental health and emergency issues. These impacts may also create transportation barriers that may affect access to healthcare and other critical services and resources.

The geographical impact/extent includes the entire Reservation. The timeframe for these expected changes are estimated to be in the near-term (0-10 years) through the long-term (26+ years). In the intermediate term (11-25 years) air quality and transportation issues are anticipated. In the long-term, this will likely result in a rise in respiratory conditions and traffic congestion.



3.9 Cultural Focus

The focus of the cultural sector is on the Salish, Pend d'Oreille and Kootenai people. The intent of this analysis is to understand the full meaning of the expected impacts of climate change to the Tribes - including the Tribes cultural survival. It is also intended to understand the causes of climate change and potential solutions from a cultural perspective. The threat posed by climate change to the Tribes cannot be understood without also knowing the ways in which affected lands, waters, plants, and animals are not just environmental resources but also cultural and spiritual resources - without which our cultures and traditional ways cannot survive.

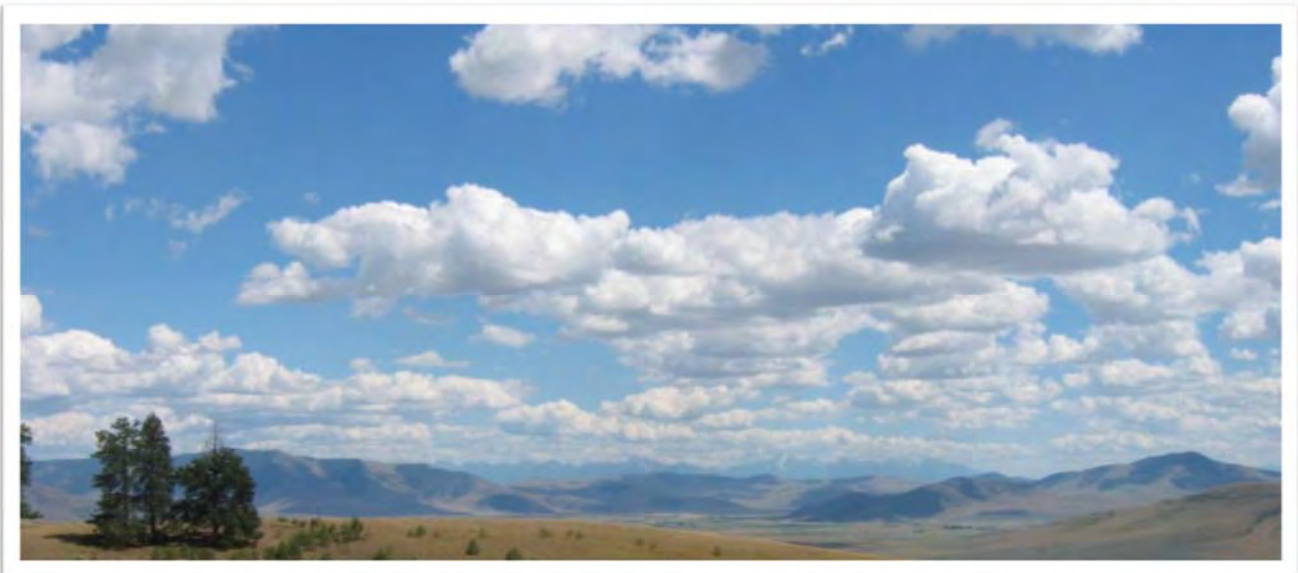


Figure 32: Flathead Reservation, photo by Roian Matt

Regarding cultural perspectives on the causes and potential solutions of climate change, the Tribes have an important role to play in educating people on how this problem is the result of the worldwide establishment of a way of life that is fundamentally at odds with the traditional ways of tribal people here. How those traditional ways, including respect for our entire environment and a sense of obligation to take care of it for future generations, continue to hold out hope that humanity has the capacity to re-learn how to live sustainably.

The geographical focus is the entire Reservation, as well as all aboriginal territories both east and west of the Continental Divide. This comprises lands and waters of cultural meaning and importance. All of these areas will be affected by climate change. The timeframe for these expected changes are estimated to be in the near-term (0-10 years) through the long-term (26+ years), and well beyond for many generations to come.



4. Vulnerability and Risk

This section summarizes the vulnerabilities and risks of the forestry, land, fish, wildlife, water, air, infrastructure, people, and culture sectors to the impacts of climate change. This assessment was completed by Tribal departments and local organizations using the Vulnerability Matrix, Risk Matrix, and Identifying Priority Planning Areas tool.^{xv} Vulnerability is the susceptibility of a system to harm from climate change impacts. Generally, systems that are sensitive to climate and less able to adapt (low adaptive capacity) to changes are considered vulnerable to climate change impacts. Risks are the consequences of an impact times the probability or likelihood that the impact will occur.^{xvi} This analysis is conducted to establish each planning areas priority.

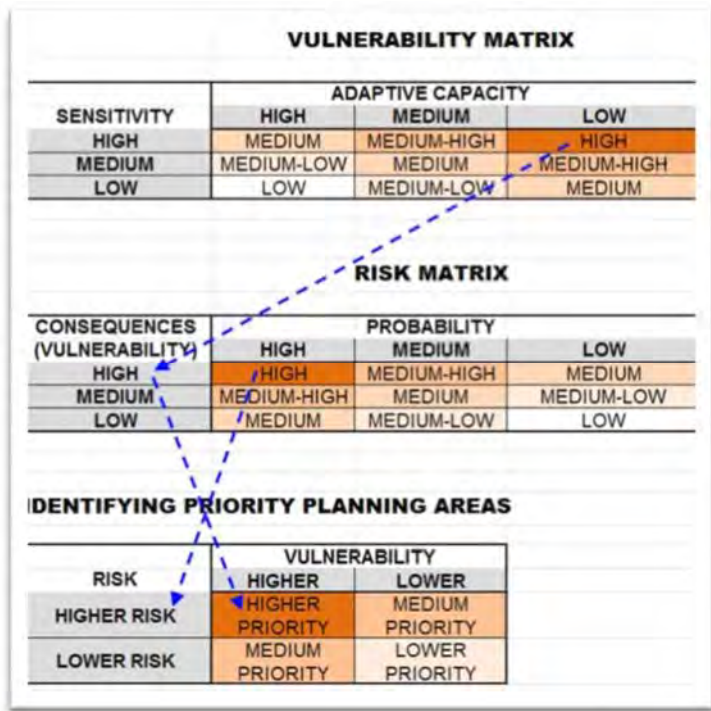


Figure 33: Adaption Planning Tool used by CSKT

4. 1 Forestry Assessment

The forestry sector’s probability of the impacts from climate change is based on estimated changes to four fire regime types. The estimation that something will happen is rated medium for the Non-Lethal, Mixed, Lethal, and Timberline Fire Regimes based on present medium and high certainty climate predictions referenced listed in *Section 2.2 Climate Impacts Locally*.

The vulnerability of the planning area to climate change is rated high for the Lethal Fire Regime because of the predicted effects of change from moisture-drought stress and increased fire behavior. The Non-Lethal Fire Regime has a lower level of predicted vulnerability because of inherent tolerances to decreased moisture and increased fire disturbance regimes over the planning period.



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Figure 34: Flathead Reservation, photo by Roian Matt

The sensitivity of the planning area to climate change varies. The Mixed, Lethal, and Timberline Fire Regimes are rated with medium sensitivity to climate change because of expected changes and impacts to regime species compositions, structures and functions as affected by decreased moisture, and increased fire behavior regimes. The Non-Lethal Fire Regime is rated as low sensitivity because of adaptive capabilities and tolerances to increased temperatures, decreased moisture, and increased fire behavior affects.

The adaptive capacity of the planning areas also varies. The Non-Lethal Fire Regime has a high adaptive capacity to the projected climate change and will have the ability to respond to changes in climate with minimal disruption. The Lethal and Timberline Fire Regimes have a low adaptive capacity for climate change because of increased stress on the regime vegetation compositions and structures as temperatures rise, with decreased moisture for plant growth and regeneration.

The risk to the systems in the planning area ranges from medium-low to medium/high. The Lethal Fire Regime is rated medium/high risk for the consequence of loss, or decline of this important forest habitat type because of the projected climate change and associated environmental impacts. The Non-Lethal Fire Regime is rated at medium/low risk because this regime is less sensitive and vulnerable to the projected climate change impacts, and has higher adaptive capacity to tolerate changes to plant composition and structure.

The priority of the planning area related to the risks for Non-Lethal Fire Regimes is low, Mix Fire Regimes is medium, Lethal Fire Regimes is high, and Timberline Fire Regimes is medium. The Lethal Fire Regime has a higher priority for action because of the highest risk and vulnerability to change from the projected climate change impacts to this vegetative type.



4.2 Land Assessment



Figure 35: Flathead Reservation, photo by Roian Matt

The land sector's probability of and vulnerability to the impacts from climate change is medium/high for plants, noxious weeds, and agriculture. The sensitivity of plants to climate change is medium/high and the sensitivity of noxious weeds and agriculture is medium. The adaptive capacity, risk, and priority of the plants, noxious weeds, and agriculture are medium.

4.3 Fish Assessment

The fish sector's probability of and vulnerability to impacts from climate change is high. The sensitivity of this planning area to climate change is high and the adaptive capacity is low. As such, the risk to the fish sector is high and the priority of this planning area is high.

4.4 Wildlife Assessment

The wildlife sector's probability of impacts from climate change is medium, with impact variations between different habitats. Some habitats will experience compounded/additive effects of climate change overtime. The vulnerability of wildlife and habitat resources to climate change is medium. Impacts are likely to be subtle initially, with increased impacts over time for affected species.

The sensitivity of the wetland wildlife to climate change is high due to lessened water quantity and quality. Species in other habitats will have a low level of sensitivity. The adaptive capacity of most wildlife is medium. However, some may have both high and low capacities for adaptation. Some shifts in areas of use and habitat types can be expected. The risk to the systems in forested habitat is medium, wetland habitat is high, grassland habitat is low, alpine habitat is medium, riparian habitat is low, and agricultural habitat is low. The priority of the systems in forested habitat is low, wetland habitat is high, grassland habitat is medium, alpine habitat is medium, riparian habitat is low, and agricultural habitat is medium.



4.5 Water Assessment

Water quality and quantity have been assessed to determine each characteristic vulnerability and risk. These aspects have been researched independently. However, the inherent connection between water quality and quantity is recognized.

Water Quality

Water quality probability of impacts from climate change is high. Agricultural activity throughout the western United States threatens water quality. This threat will be magnified due to climate change in the form of an earlier runoff and more precipitation in the form of rain. More rain precipitation will mean more overland runoff producing sediment from erosion and delivering more pollutants to waterways. Droughts in the summers will decrease the availability of clean water.

The vulnerability of water quality to climate change is high because this planning area is under stress from multiple municipalities producing storm water runoff and wastewater treatment sites. Agricultural runoff that includes bacteria and erosion sources as well as the increase in temperature from irrigation return flow ditches also put enormous stress on the system. The sensitivity of water quality to climate change is high because of outside influences such as temperature, bacteria, sediment, and over use. Water is directly affected by climate change due to the direct increase or decrease of water coming into the system as well as in what form the water becomes available (rain versus snow) and when the water becomes available (winter versus spring/summer). Water loss can also be seen during drought conditions that would show up in the summers.

The adaptive capacity of water quality to climate change is low. With an increase in overland runoff during the spring season more pollutants will make it into the waterways than by normal slow snowmelt runoff. The water that will usually flush the contaminants downstream will dry up or will be lower than normal flow in the summers due to the increase in likelihood of a drought leaving the contaminants within the stream, lakes, wetlands, or sediments.

The risk to water quality is high. The waterways are home to many species of fish and other aquatic fauna. The water is also used by some municipalities for drinking purposes as well as agricultural and industrial uses. The increase in pollutants from more overland runoff due to more rain as well as drought in summers puts all these beneficial uses at risk. The priority of water quality is high. With less water during the summer season, the greater the need will become for all users; traditional (fish, plants, wildlife), agricultural, industrial, and municipalities.



Water Quantity



Figure 36: Stream Measurements at Post Creek, photo by W. Keenan

Water quantity probability of impacts from climate change is medium/low. This is due to a lower snow pack and only a change in the timing of run-off. Management of the watersheds systems will require adjustments. If spring or summer rains become more intense the impact may become higher. The vulnerability of water quantity to climate change is medium/high. These impacts may result in: native species with low adaptability to specific parameters, such as temperature, may cease to exist; limiting of irrigation in the late summer season; and wetland resources would cease to exist because of more arid summers.

Water quantity has a high sensitivity because of dependent resources (fisheries, wildlife, and plants) important to the Tribes. Increased water temperature would affect dependent species that are capable of living in the changed environment. Changes from flooding or drought would have to be addressed. During the longer drier summer current cropping may not be able to continue to be farmed. Spring floods, depending on their scale, could be controlled.

The adaptive capacity of water quantity is high. More limited water resources with a high demand may result in considerable cost increases to consumers. Much of the valley system has been converted from its natural channels into an irrigation system that delivers water to approximately 130,000 acres. Water ways have been cut off and cleared of vegetation. New storage may need to be developed for hydroelectric as well as irrigation. As this occurs, it will also put pressure on domestic water supply. The risk and priority to water quantity is high for domestic, municipal, and industrial users. Additional considerations about the impact of climate change on water quantity should be made by those managing the dependent resources.



4.6 Air Quality Assessment

The air sector's probability of the impacts from climate change to Non-Attainment Polson, Non-Attainment Ronan, and Prevention of Significant Deterioration (PSD)¹⁰ is medium. The estimations of medium impacts to all three sectors is based on observed increases in higher particulate data measurements in Ronan and Polson from Wildfire and documented regional haze analysis from the CSKT's existing Interagency Method of Protecting Visual Environments (IMPROVE) monitoring.

The vulnerability of air quality to climate change in Non-Attainment Polson and Non-Attainment Ronan is low. The vulnerability of PSD is medium. The communities of Ronan, MT and Polson, MT engage in mitigation efforts to reduce dust. One such activity is street sweepers that are employed at a minimum every Friday. Other predicted pollutant increases as a result of climate change are increases in Ozone.¹¹ However, the base emissions rate in these communities is well below the threshold levels set by the Environmental Protection Agency (EPA).

The sensitivity of Non-Attainment Polson, Non-Attainment Ronan, and PSD is medium. A water shortage due to drought could affect a community's ability for dust suppression. One of the tools used in the past to suppress dust was water. Recently Magnesium Chloride has taken on a larger role in this activity and it will continue to do so in the future. This will help make the air quality less sensitive to climate change.

The adaptive capacity of air quality in Non-Attainment Polson and Non-Attainment Ronan is high. The adaptive capacity of PSD is medium. The local communities of Polson, MT and Ronan, MT have a high adaptive capacity to projected climate changes. Efforts to mitigate impacts would be to limit outdoor activities during limited visibility days to prevent health effects to the elderly, people with respiratory illness and to small children and infants. The larger PSD area has no monitoring activity and therefore is less likely to be forewarned by ongoing events.

The risk to air quality in Non-Attainment Polson and Non-Attainment Ronan is medium. The risk to PSD is medium/low. The non-attainment areas are at medium probability of impacts but the risks remain at medium due in large part because most impacts will occur during the summer

¹⁰ Prevention of Significant Deterioration is an Environment Protection Agency program in which state and/or federal permits are required in order to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standard.

¹¹ Ozone, or trioxygen, is a triatomic molecule, consisting of three oxygen atoms. It is often referred to as smog. Ozone is an oxidant that has applications related to oxidation. Concentrations of ozone above about 100 ppb can damage mucus and respiratory tissues in animals and tissues in plants, making it a respiratory hazard and pollutant near ground level.



months. Most sanding operations occur within city limits and along the major highways reducing risk for the greater PSD area. Other risks exist from the predicted higher temperatures and the ability of the population to cope with this type of stress. Another risk is the predicted higher temperature resulting in unknown disease infestations and pestilence. This includes considerations for how these could be spread by airborne pathogens and affects the populace. The priority of the Non-Attainment Polson, Non –Attainment Ronan, and PSD is medium. The priority remains medium as impacts to air are directly linked to human health.

4.7 Infrastructure Assessment

The infrastructure sector includes specific considerations for housing and power. Housing’s probability of and vulnerability to the impacts from climate change is low. The sensitivity of this planning area to climate change is low and the adaptive capacity is high. As such, the risk to the systems in this planning area is low. The priority of housing is low. Power’s probability, vulnerability, and sensitivity of the impacts from climate change are low. The adaptive capacity is also low. The risk to this planning area is low. The priority of power is low.

4.8 People Assessment

The people sector includes considerations for services, safety, health, and resources. These are distinct, yet interrelated aspects of this sector. Combined, they provide a more comprehensive assessment of the risk and priority of this planning area.

Social Services

The social service’s population’s probability of impacts from climate change ranges from medium to high. Families and foster families are considered to have a medium priority. Elderly indigent and children (group home, foster children) have a high probability of impact. The vulnerability of people to disease vectors is medium and to heat-related illnesses is medium/high. The vulnerability of people to decreased potable water is medium and to pollution related illnesses, mainly from increased fires, is medium/high. The sensitivity of people to disease vectors is low and to heat-related illnesses is medium. The sensitivity of people to decreased potable water is medium and to pollution related illnesses is medium. The adaptive capacity of people to disease vectors is medium and to heat-related illnesses is low. The adaptive capacity of people to decreased potable water is medium and to pollution related illnesses is medium.



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The estimated risk of people to disease vectors is medium and to heat-related illnesses is higher risk. The estimated risk of people to decreased potable water is medium/low and to pollution related illnesses is high. The priority planning related to the risk of people to disease vectors is medium and to the risk of people to heat-related illness is high. The priority planning related to the risk of people to decreased potable water is low and to pollution related illnesses is high.

Safety

The safety services' area's probability of impacts from climate change is medium. The vulnerability of new facilities to climate change is medium because improved building and safety products withstand extreme weather conditions. However, aging tribal infrastructure's vulnerability is high. The sensitivity, risk, and priority of this planning area to climate change impact are medium.

Health and Human Resources

The tribal health's populations' probability of impacts from climate change related health issues is low. However, their vulnerability to respiratory health issues is high. The sensitivity of elderly, youth, and those with existing chronic health conditions is high. The adaptive capacity of this population is undetermined. The risk to the healthcare system is low and the priority is medium. The human resources probability of and vulnerability to the impacts from climate change is medium. The sensitivity of this planning area to climate change is low and the adaptive capacity is medium. The risk to the human resources system is low and the priority is low.

4.9 Cultural Assessment

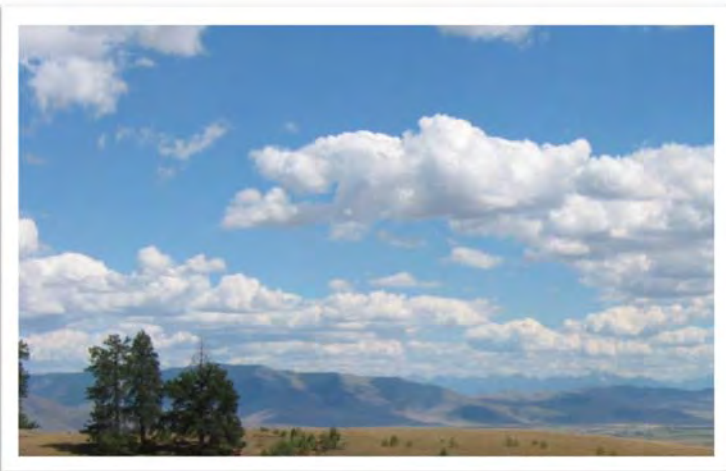


Figure 37: Flathead Reservation, photo by Roian Matt

The cultural sector's probability of impacts from climate change is high. The vulnerability and sensitivity of this planning area to climate change is high. The adaptive capacity is uncertain. For example, how can the bitterroot ceremony be conducted if there are no more bitterroot? What would happen to Tribal people if this were to happen? The risk to the systems in this planning area is high and the priority is high.



5. Goals and Actions

This section provides the recommended preparedness goals and actions for addressing the climate change impacts. Preparedness goals are priorities that the Tribes' want to accomplish in the planning sectors. Preparedness actions are activities that the Tribes could take to achieve the climate change preparedness goals. These goals and actions vary based on a variety of factors, such as the types and magnitudes of projected climate change impacts and the scale of the planning effort.^{xvii} Information related to timeframes, authority, and funding is also included in this section. Given the importance and nature of these efforts, considerations for Traditional Ecological Knowledge are provided.

5.1 Forestry Goals and Actions

Responsible: Forestry Department

Purpose: Ensure the health of the forest through effective resource planning and management.

Priorities: The priority of Non-Lethal Fire Regimes is low, Mixed Fire Regimes is medium, Lethal Fire Regimes is high, and Timberline Fire Regimes is medium.

Forestry sector's preparedness goals for all priorities include:

- Update and revise the Forest and Fire Management Plans.
- Develop and implement a Forest and Rangeland Monitoring Plan.
- Develop and implement a Whitebark Pine Habitat Management Plan (Timberline Fire Regime only).
- Conduct Forestry Sector Climate Adaptation Needs Assessments for planning, monitoring, operations, greenhouse capacity, research, communication, staff education, and funding.
- Develop and maintain greenhouse capacity to grow and plant native and cultural plant species.

Forestry sector's preparedness actions and their timeframes include:

All Priorities (All Fire Regimes):

- Develop and maintain greenhouse capacity to grow and plant native and cultural plant species (11-25 years).
- Design and employ strategies for aggressive tree mortality salvage systems (11-25 years).



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- Create and employ strategies for the use of appropriate silvicultural systems to provide resilient landscape ecological conditions (0-10 years).
- Create and employ strategies to manage invasive species across the landscape (0-10 years).
- Increase coordination of interagency and inter-departmental climate change adaptation education, research, and communications (0-10 years).
- Continue and increase inter-departmental cultural awareness and incorporation of Traditional Ecological Knowledge as a necessary component to climate adaptation forest and rangeland planning and actions (0-10 years).

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Higher Priority (Lethal Fire Regime):

- Create and implement strategies that employ silvicultural systems and wildland fire response actions to maintain appropriate fire regime structures and functions (i.e., early and late seral conditions) (26+ years).

Medium Priority (Mixed Fire Regime):

- Create and implement strategies that employ appropriate silvicultural systems and prescribed fire use to provide diverse fuel mosaic conditions (i.e. early and mid-seral conditions) (26+ years).
- Increase re-introduction of periodic prescribed fire to non-lethal stand types (0-10 years).
- Increase and maintain hazardous fuel mitigation activities (0-10 years).

Medium Priority (Timberline Fire Regime):

- Employ appropriate projects, prescribed fire, and wildland fire response actions to sustain viable Whitebark Pine habitats (i.e. early to late seral condition) (11-25 years).
- Coordinate and collaborate with academic and research institutions to develop Whitebark Pine Restoration Strategies (11-25 years).

Lower Priority (Non-Lethal Fire Regime):

- Create and implement strategies that employ appropriate silvicultural systems to maintain mature and park-like forest conditions (i.e. mid and late seral conditions) (26+ years).
- Increase re-introduction of periodic prescribed fire (0-10 years).
- Increase and maintain hazardous fuel mitigation activities (0-10 years).



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Required and Existing Authority/Capacity

The required authority needed to implement these preparedness actions is held by the Confederated Salish and Kootenai Tribes. They have the required self-governance authority. By a federal directive from the U.S. Department of Interior, the Department of Forestry is required to address climate change in agency management plans. Climate change information will be included in future forestry and fire management plans as updated or revised.

Existing capacity to implement the preparedness actions include:

- Tribal Government (i.e. Constitution, Ordinance, Resolution, and Referendum)
- Tribal Policy (i.e. Forest and Fire Management Plans, Comprehensive Resource Management Plan)
- U.S. Department of Interior, (DOI) Bureau of Indian Affairs (BIA) (i.e. Policy, Regulations, Directives, and other guidance)
- Counties (i.e. County Wildfire Protection Plans)
- Code of Federal Regulations
- National Indian Forest Resources Management Act

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- CSKT Natural Resources Department
- CSKT Department of Lands
- CSKT Tribal Preservation and Tribal Culture Committees
- Local Public School Districts
- Salish Kootenai College (SKC)
- University Systems (i.e. University of Montana, Northern Arizona University)
- Northern Rockies Fire Science Network
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Intertribal Timber Council
- DOI, BIA
- Lake, Sanders, Missoula, and Flathead Counties
- Montana Department of Natural Resource and Conservation
- Rocky Mountain Research Station
- Aldo Leopold Wilderness Research Institute



Potential funding sources for addressing the estimated impacts include:

- Forest and Fire Management Planning (i.e. BIA, CSKT, and grants)
- Monitoring Planning and Coordinator Position (i.e. BIA, CSKT, and grants)
- Department of Forestry Forester Positions (i.e. BIA and CSKT)
- Department of Forestry Research Projects (i.e. DOI, BIA, USFS, SKC, CSKT, and grants)
- Fuels Mitigation Program Staff and Projects (i.e. DOI, BIA, USFS-TFPA, and CSKT)
- Greenhouse Capacity (i.e. BIA and CSKT)

Funding needs for addressing the estimated impacts to forestry are to be determined.

5.2 Land Goals and Actions

Responsible: Tribal Lands Department

Purpose: Ensure the health of soils, plants, and water sources through research and management.

Priorities: The priority of the plants, noxious weeds, and agriculture is medium.

Land sector's preparedness goals include:

- Evaluate soil health, crop requirements, and irrigation water sources to support shifting to alternative crops.
- Engage in practices to promote more vigorous native plant communities.

Land sector's preparedness actions include:

- Use prescribed burning to improve land health (0-10 years).
- Continue noxious weed management (0-10 years).
- Managed grazing systems (0-10 years).
- Identify alternative crops and educate producers, as needed (0-10 years).

Required and Existing Authority/Capacity

The Tribes have the authority to implement the preparedness actions. However, there is a need to increase the land planning area's staff and staff capacity.

Partners and Potential Funding Sources



Partners capable of assisting with the preparedness goals and actions include:

- Tribal Forestry Department
- Natural Resources Department
- Natural Resources Conservation Service
- U.S. Fish and Wildlife Service Home
- U.S. Department of Agriculture Farm Service Agency
- Flathead Reservation Extension

Specific funding needs and sources for addressing the estimated impacts to land are to be determined. However, additional funding for rangeland and cropland management is needed.

5.3 Fish Goals and Actions

Responsible: Natural Resources Department - Fish

Purpose: Ensure the health of fish through improved planning and use of ecological principles.

Priority: The priority of fish and fish habitat is high.

Fish sector's preparedness goal includes:

- Improve integration of ecological principles into tribal agricultural leases that negatively affect native trout.

Fish sector's preparedness action and its timeframe include:

- Develop comprehensive fish habitat restoration plans (0-10 years).

Required and Existing Authority/Capacity

Tribal Council has the required and existing capacity to implement the preparedness actions.

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Montana Fish Wildlife and Parks
- US Fish and Wildlife Service



Potential funding sources for addressing the estimated impacts include:

- Water Compact damage claim funds
- Hydro power mitigation funding
- Grant funding

Funding needs for and sources for addressing the estimated impacts to fish are to be determined.

5.4 Wildlife Goals and Actions

Responsible: Natural Resources Department - Wildlife Management Program

Purpose: Ensure the health of wildlife through improved research and planning.

Priorities: The priority of forested habitat is low, wetland habitat is high, grassland habitat is medium, alpine habitat is medium, riparian habitat is low, and agricultural habitat is medium.

Wildlife sector's preparedness goal includes:

- Anticipate and plan for climate change impacts upon each species.

Wildlife sector's preparedness actions and timeframes include:

- Conduct a thorough analysis of the level of documented and anticipated adverse impacts upon all species of wildlife and their habitats (0-10 years).
- Complete multi-function climate change modeling and analysis (0-10 years).

Required and Existing Authority/Capacity

The required authority needed to implement the preparedness actions is held by the Tribes. The required capacity includes a coordinated planning effort between the Wildlife Management Program and other wildlife and habitat management programs and agencies in western Montana. Jurisdictional differences should be considered throughout this planning process.

Existing capacity to implement the preparedness actions include:

- Montana Fish, Wildlife and Parks
- Montana Natural Resources Department
- U.S. Forest Service



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- U. S. Fish and Wildlife Service
- The University of Montana
- Lake, Sanders, Missoula, and Flathead Counties

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Montana Fish, Wildlife and Parks
- Montana Natural Resources Department
- U. S. Forest Service
- U. S. Fish and Wildlife Service
- The University of Montana
- Lake, Sanders, Missoula, and Flathead Counties

Specific funding needs and sources for addressing the estimated impacts to wildlife are to be determined. However, additional funding is needed to research and monitor potentially-affected wildlife and their habitats.

5.5 Water Goals and Actions

Responsible: Natural Resources Department – Division of Water

Purpose: Ensure the health of and access to water through improved planning and management.

Priorities: The priority of water quality and quantity is high.

Water quality and quantity preparedness goal include:

- Improve water resources management through research, planning, and mapping.

Water quality and quantity preparedness actions and timeframes include:

- Develop a drought management plan (0-10 years).
- Develop a hydroelectric management plan (0-10 years).
- Develop a reservoir storage plan (0-10 years).
- Develop a flood management plan (0-10 years).
- Develop a groundwater management plan (0-10 years).
- Develop an irrigation efficiency plan (0-10 years).



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- Develop a municipality's drinking water management plan (0-10 years).
- Continue monitoring and real-time management, early warning, and mapping (0-10 years).

Required and Existing Authority/Capacity

The required authority needed to implement the preparedness actions is held by the Tribes. The required capacity includes a coordinated planning effort between Tribes, state, local governments. These should collaborate on water resource management and planning.

The Tribes have developed a draft water rights compact with the state of Montana. Many of the compact's terms protect water resources. This compact is necessary for the protection of the quantity of the water on the Flathead Reservation.

Partners and Potential Funding Sources

Partners capable of assisting with these preparedness goals and actions include:

- Natural Resources Department
- State of Montana
- Montana Department of Natural Resources and Conservation
- Lake County Commissioners
- Flathead Indian Irrigation Project
- Flathead Basin Commission
- The University of Montana Biological station
- Regional municipalities
- Cooperative Management Entity (CME)
- Local users

Water quality funding needs are to be determined. Water quantity requires \$500,000 per year. The capacity of the Water Management Program should be increased. The Environmental Protection Agency is a potential funding source.

5. 6 Air Quality Goals and Actions

Responsible: Natural Resources Department – Air

Purpose: Ensure the quality of air through improved investigation and management.



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Priorities: The priority of Non-Attainment Polson, Non –Attainment Ronan, and Prevention of Significant Deterioration is medium.

Air quality preparedness goal for all priorities include:

- Monitor air quality changes through inventories and assessments.

Air quality preparedness actions and timeframes for all priorities include:

- Update the Emissions Inventory (0-10 years).
- Conduct the Tribal Minor New Source Review assessment (0-10 years).

Required and Existing Authority/Capacity

The Tribes have Treatment as State for Management of the Air shed within the exterior boundaries of the Reservation under the Tribal Authority Rule of the Clean Air Act. The CSKT is a class I air shed as approved by Congress in 1980. Areas designated as Class I areas are those national parks greater than 6,000 acres, wilderness areas, national memorial parks greater than 5,000 acres, and all international parks in existence on August 7, 1977. States and Tribes may designate additional areas. (Quality, 2011)

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Environmental Protection Agency
- Lake, Sanders, Missoula, and Flathead Counties

Air quality funding needs are to be determined. Environmental Protection Agency Section 103 and 105 grants are potential funding sources.

5. 7 Infrastructure Goals and Actions

Responsible: Salish Kootenai Housing Authority and Mission Valley Power

Purpose: Ensure access to housing and power through research and long-range planning.

Priorities: The priority of housing and power is low.

Infrastructure preparedness goal includes:



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- Improve the integrity of housing and access to power through enhanced investigation.

Housing preparedness actions and timeframes include:

- Investigate the use of different building methods for housing in case traditional wood products became scarce due to climate change impacts (0-20 years).
- Investigate new methods for providing water and waste water systems, with an emphasis on addressing those systems vulnerable to the impacts of climate change (0-20 years).

Power preparedness action and timeframe includes:

- Investigate and adopt new power delivery methods continuously (0-20 years).

Required and Existing Authority/Capacity

The required and existing authority to implement the housing preparedness actions rests with the Executive Director and Staff of the Salish Kootenai Housing Authority. The required and existing authority to implement the power preparedness actions rests with the Mission Valley Power Utility Board. Both the Tribes and the Bureau of Indian Affairs review and approve any major policy and procedures changes.

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Affordable housing providers in the State of Montana and the Northern Plains region
- Builders and craftsmen that design new products and methods for building housing
- Municipalities in Montana that provide water and waste water services
- Designers and developers of water and waste water systems
- Utilities in the Northwest

Specific funding needs and potential funding sources is to be determined. Mission Valley Power's operating funds are provided by rate payers.



5.8 People Goals and Actions

Responsible: Social Services, Office of Administrative Services, Tribal Health & Human Services, and Department of Human Resources Development

Purpose: Ensure the health and safety of people through improved planning, coordination, and system developments.

Priorities: The priority of social services ranges from low to high. The priority of safety is medium. The priorities of healthcare medium and human resources are low.

Social services preparedness goals include:

- Enhance or develop a system to address people's risk to disease vectors.
- Develop a cooling plan for increased temperatures for each community, especially for those populations most vulnerable to heat-related illnesses.
- Develop a potable water plan for each community to address the needs of those at risk of not having access to clean water.
- Develop a response plan to high particulate counts for various sub-eco systems within the Reservation.
- Develop education and policies to decrease catastrophic fire incidence.
- Identify and map the geographical location of the most vulnerable populations.
- Develop a collaborative plan that addresses the most vulnerable populations needs.

Social services preparedness actions and timeframes include:

- Ensure disease vector monitoring and reporting is robust and resilient (1-3 years).
- Ensure most vulnerable populations have heat and cooling sources (0-10 years).
- Ensure building codes include adequate provisions for cooling (11-25 years).
- Provide emergency cooling centers and retro-fit community centers (26+ years).
- Analyze most vulnerable populations' water sources and impact of flooding and drought (0-10 years).
- Educate communities on sustainable water preservation measures (11-25 years).
- Ensure households have ways to purify water (26+ years).
- Analyze buffer zone and fire closure areas and increase, if needed (0-10 years).
- Ensure vulnerable populations and communities have air quality education (11-25 years).
- Decreased use of wood for heating (11-25 years).
- Increase medical response to those most vulnerable (11-25 years).
- Implement strategies for burning protocols and home heating policies (26+ years).



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Safety services preparedness goals include:

- Improve social services through collaboration, planning, and resource development.

Safety services preparedness actions and timeframes include:

- Develop proactive committees to address future climate change events (0-10 years).
- Update shelf plans that should address current needs (0-10 years).
- Direct more funding to Tribal infrastructure (0-10 years).

Health and human resources preparedness goals include:

- Promote the healthy lifestyles of Tribal members.
- Improve the use of the Tribal transportation system to reduce fossil fuel consumption and carbon emissions created by vehicles.
- Provide practical knowledge about growing gardens and how to preserve the vegetables through the community gardening.

Health and human resources preparedness actions and timeframes include:

- Provide ongoing education to the Tribal Health Department (0-10 years).
- Expand the bus fleet to accommodate more riders (3-5 years).
- Expand the community gardens and recruit more participants (3-5 years).

Required and Existing Authority/Capacity

The required and existing authority to implement these preparedness actions rests with the Tribal Council and Tribal Administration.

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Tribal Departments
- Health Departments
- School Systems
- Salish Culture Committee
- Kootenai Culture Committee



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Specific social services, safety, health, and human resources funding amounts and potential sources are to be determined. Safety services planning areas requires funding to address climate change related facility and safety improvements. Human resources planning area requires funding to purchase buses to enhance the current transportation program and to buy more seeds and gardening tools for the community gardens.

5.9 Cultural Goals and Actions

Responsible: Salish-Pend d'Oreille Culture Committee, Kootenai Culture Committee, and Historic Preservation/ Cultural Preservation Department

Purpose: Ensure cultural preservation through education and advocacy.

Priorities: The priority of culture is high.

Cultural preparedness goal includes:

- Educate people about climate change, its cultural import, and the need to speak out for action (local, national, international) to minimize its severity.

Cultural preparedness actions are to be defined.

Required and Existing Authority/Capacity

The required and existing authority/capacity to implement the preparedness actions rests with the Tribal Council and CSKT Elders Advisory Council.

Partners and Potential Funding Sources

Partners capable of assisting with the preparedness goals and actions include:

- Tribal Council
- CSKT Elders Advisory Council
- National Forest Service and National Parks
- Federal Fish and Wildlife
- Bureau of Land Management

Specific funding needs for addressing the estimated impacts are to be determined. Potential sources of funding include U.S. Army Corps of Engineers and Bonneville Power Administration.



6. Implementation of Plan

The CSKT Climate Change Strategic Plan represents an ongoing and evolving adaptive management process. It presents an overview of current climate issues and concerns, including potential impacts. This plan is to be regularly revisited and modified as new information regarding the climate science and impacts becomes available and as priorities and needs of the Tribes change.

As part of an adaptive management process, the Tribes will:

- Establish and maintain a Climate Change Oversight committee which would coordinate funding requests and collaboration with regional climate change centers, research centers, academic institutes, and other relevant entities.
- Monitor and measure progress in implementing the preparedness actions you have recommended, and identify whether these efforts are helping the Tribes meet their goals regarding climate change preparedness.
- Review basic assumptions, including those related to assessing the vulnerabilities and risks that guided the planning committees in identifying of priority planning areas, the Tribes' overarching vision and goals, the preparedness goals that establish the priority planning areas, and the information collected measuring the results of the actions.
- Continue to research Traditional Ecological Knowledge (TEK) and its application towards climate change adaptation and mitigation planning.
- Incorporate the strategic planning results into the guiding documents such as the Flathead Reservation Comprehensive Resource Plan and the Forestry Management Plan.
- Update the climate change adaptation plan regularly, based on the information collected from measuring progress and reviewing assumptions.



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Endnotes

ⁱ Key terms and definitions have been adapted from the Tribal Climate Change Adaption Plan Template, developed by the Institute for Tribal Environmental Professionals. This content has been provided to be inserted and/or modified to for the development of climate change strategic plans.

ⁱⁱ Paragraph one featured in Section 1.1 General Characteristics and History of the Tribes, part History of tribe, including traditional ways of life, was adapted from the 1996 Flathead Reservation Comprehensive Resource Plan, Volume I Existing Resources, Chapter 3: History and Culture, Tribal Differences and Similarities 3-8. Project Coordinators of this plan are Janet Camel and Doug Dupuis.

ⁱⁱⁱ Content featured in Section 1.1.2 Salish Culture was adapted from the 1996 Flathead Reservation Comprehensive Resource Plan, Volume I Existing Resources, Chapter 3: History and Culture, Salish Culture, 3-2. Project Coordinators of this plan are Janet Camel and Doug Dupuis.

^{iv} Content featured in Section 1.1.2 Kootenai Culture was adapted from the 1996 Flathead Reservation Comprehensive Resource Plan, Volume I Existing Resources, Chapter 3: History and Culture, Kootenai Culture, 3-6. Project Coordinators of this plan are Janet Camel and Doug Dupuis.

^v Tribal enterprises and organizations descriptions are summarized from the 2012 Confederated Salish and Kootenai Tribes Economic Development Facts at a Glance. This report was created by Janet Camel, CSKT Office of Economic Development.

^{vi} Content featured in 1.1.4 Cultural Considerations Regarding Natural Resources was adapted from the 1996 Flathead Reservation Comprehensive Resource Plan, Volume I Existing Resources, Chapter 17: Land-Based Cultural Resources, Existing Conditions, 17-3. Project Coordinators of this plan are Janet Camel and Doug Dupuis.

^{vii} The national concerns featured in Section 2. Climate Impacts have been adapted from the "Preparing for Climate Change, A Guidebook for Local, Regional, and State Governments," page 22. This guide was developed by Center for Science in the Early System, Joint Institute for the Study of Atmosphere and Ocean, and University of Washington. It can be accessed at <http://www.cses.washington.edu/db/pdf/snoveretalgb574.pdf>.

^{viii} Content featured in Section 2.1 Climate Impacts in the Northwest has been adapted from the Tribal Climate Change Adaption Plan Template, developed by the Institute for Tribal Environmental Professionals. This material has been provided to be inserted and/or modified in the regional climate change impact section of climate change strategic plans. All appropriate citations have been included.

^{ix} More information at about climate change scenarios can be found that the Climate Change Impact Group's website at <http://cses.washington.edu/cig/fpt/ccscenarios.shtml>.

^x The climate change trends and scenarios featured in Section 2.2 Climate Impacts Locally have been adapted from the Missoula County Climate Action: Creating a Resilient and Sustainable Community report, Section I. Climate Change in Missoula County. The Flathead Reservation and Missoula County share geographic, topographic, and climatic characteristics. As such, Anne Carlson, Ph.D., Climate Associate, The Wilderness Society determined during the March 20, 2013 Planning Meeting that this information is applicable to the Flathead Reservation. Jill Alban, Clark Fork Coalition, provided permission to use this information in this plan on March 27, 2013 via email.

^{xi} The introduction in Section 2.3 Climate Change Impacts on the Tribes was adapted from Section 9.3 Historic Preservation of the Confederated Salish and Kootenai Tribes Local Impact Assessment Results Report, released June 30, 2013. It was provided by Michael Durglo Sr., Co-Director of Historic Preservation/Cultural Preservation.



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- ^{xii} These Tribal Elder interviews were recorded on video and the conversations were transcribed. The excerpts provided in this plan have been approved by the respective cultural committees for this purpose.
- ^{xiii} This committee formally convened to collaborate on this project during the dates of October 24, 2012, November 13, 2012, December 23, 2012, January 16, 2013, February 27, 2013, March 20, 2013, April 17, 2013, May 15, 2013, and June 12, 2013.
- ^{xiv} The Confederated Salish and Kootenai Tribes Local Impact Assessment Results Report, released June 30, 2013, provides the raw, qualitative data collected by the Climate Change Strategic Planning Committee and its partners.
- ^{xv} The qualitative data from of this research is featured in the Confederated Salish and Kootenai Tribes Local Impact Assessment Results Report, released June 30, 2013.
- ^{xvi} Additional vulnerability and risk assessment resources include Preparing for Climate Change guidebook, Chapter 8: “Conduct a Vulnerability Assessment”, and Chapter 9: “Conduct a Climate Change Risk Analysis” Section 9.1 “Assess Your Climate Change Risks.” They are located at <http://cses.washington.edu/cig/fpt/guidebook.shtml>.
- ^{xvii} Additional preparedness goals and actions planning resources include Preparing for Climate Change guidebook, Chapter 10: “Set Preparedness Goals and Develop Your Preparedness Plan.” This is located at <http://cses.washington.edu/cig/fpt/guidebook.shtml>.

