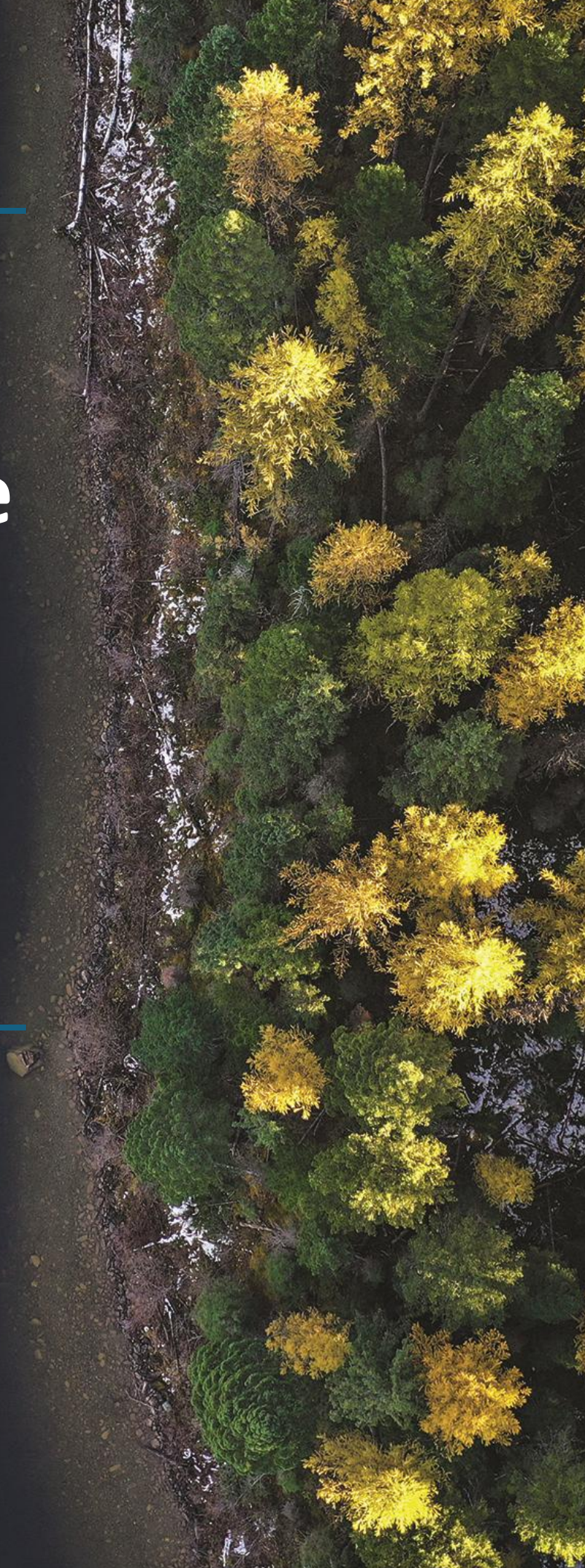
Confederated
Salish and Kootenai Tribes

Climate Change Strategic Plan

September 2025





A People of Vision



Pend d'Oreille Elder Stephen Small Salmon holds baby Piper as a representation of the CSKT Climate Change Adaptation Planning Committee's focus: "Learning from the past, planning for the future."

From the June 19, 2019, CharKoosta News article by Lailani Upham; photo by Lailani Upham.

Tribal Resolution

Resolution No. 23-016

RESOLUTION
OF THE GOVERNING BODY OF
THE CONFEDERATED SALISH AND KOOTENAI TRIBES
OF THE FLATHEAD NATION

RESOLUTION PROCLAIMING CLIMATE CHANGE AS A RISK TO THE HEALTH, SECURITY, AND GENERAL WELFARE OF THE TRIBES AND DIRECTING NECESSARY RESOURCES FOR CLIMATE CHANGE PLANNING, MITIGATION, AND ADAPTATION, AND TO INTEGRATE RESOURCE SUSTAINABILITY AND CLIMATE CHANGE MITIGATION AND ADAPTATION MEASURES THROUGHOUT TRIBAL GOVERNMENT OPERATIONS

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

WHEREAS, pursuant to Article VI, Section 1(a), the Tribal Council of the Confederated Salish and Kootenai Tribes is empowered "[t]o regulate the uses and disposition of tribal property, to protect and preserve the tribal property, wildlife and natural resources of the Confederated Tribes, to cultivate Indian arts, crafts, and culture, to administer charity; to protect the health, security, and general welfare of the Confederated Tribes"; and

WHEREAS, the Tribal Council adopted the Vision that "the traditional values that served our people in the past are imbedded 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"; and

WHEREAS, the Tribes' Mission "is to adopt traditional principles and values into all facets of Tribal operations and services. We will invest in our people in a manner that ensures our ability to become a completely self-sufficient society and economy. And we will provide sound environmental stewardship to preserve, perpetuate, protect and enhance natural resources and ecosystems"; and

WHEREAS, the Tribal Council has determined that impacts from climate change are occurring on the Flathead Reservation; that climate change presents immediate and long-term risks to the health, security and general welfare of the Tribes and its members and to our lands and non-human relatives; and that the effects of climate change have the potential to negatively impact our people, our lands, our relatives, the environment, and the economic, cultural, and social welfare of the Tribal community and resources; and

WHEREAS, the Tribes, on July 26, 2016, officially adopted the strategic priorities of Cultural Perpetuation, Economic Development, and Health and Wellness to drive future decision-making, and this resolution aligns with those previously established priorities; and

WHEREAS, the Tribal Council has determined that, consistent with the Tribes' Mission and Vision, it is in the best interests of the Tribes to combat climate change and ensure that climate change mitigation, adaptation, and resource sustainability measures are integrated into all Tribal government operations and into the daily lives of Reservation residents, and in a manner that recognizes that all things are connected and is guided by our tribal lifeways and traditional principles, values, and knowledge;

WHEREAS, the Tribal Council has determined that it is necessary to authorize and direct the Executive Officer to direct staff and resources to develop climate change mitigation, adaptation, and resource sustainability measures for use throughout Tribal government operations, build capacity, and communicate with Tribal government departments and the local community about issues and concerns regarding the local impacts of climate change, and measures individuals and groups can take to mitigate, adapt, and integrate regenerative processes into the daily lives of all Reservation residents; **NOW, THEREFORE,**

BE IT RESOLVED that the Tribal Council of the Confederated Salish and Kootenai Tribes hereby authorizes and directs the Executive Officer to direct staff and resources, build capacity, and take such other actions permitted by the laws and policies of the Tribes, to accomplish these objectives; and

BE IT FURTHER RESOLVED that the Executive Officer or his designee shall report to the Council on the progress of the directives established by this resolution on a regular basis; and

BE IT FURTHER RESOLVED that the Tribal Council may designate a Councilmember or Councilmembers to act as the Council's liaison for any such meetings and other engagements that may require representation of the Tribal Council to give effect to this Resolution.

CERTIFICATION

The foregoing resolution was duly adopted by the Tribal Council of the Confederated Salish and Kootenai Tribes on November 3, 2022, with a vote of 9 for, 0 opposed, and 0 not voting, pursuant to the authority vested in it by Article VI, Section 1 (a), (h), 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:
Tribal Secretary

Tribal Proclamation

THE CONFEDERATED SALISH AND KOOTENAI TRIBES
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A Confederation of the Salish,
Pend d' Oreilles
and Kootenai Tribes

A People of Vision

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Reuben A. Mathias - Secretary
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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.

Statement Date: 2016. Signed again in 2025.

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Figure 1: Braided Sweetgrass Ron Oden. Symbolizing the connectivity of All. Guidance for using this Plan.

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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.

Atmospheric Carbon: Carbon dioxide (CO_2) is a naturally occurring gas and also a by-product of burning fossil fuels from carbon deposits, such as oil, gas, and coal, and from land use changes and industrial processing (e.g., cement production). When in the atmosphere, it is the principal human-created greenhouse gas that affects how Earth retains the sun's energy. As the greenhouse gas primarily responsible for human-caused climate change, climate change scenarios are generally based on possible levels of atmospheric carbon dioxide given varying assumptions of future human actions, policies, and behaviors, definition directly or paraphrased from (IPCC, 2020).

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.

Climate Projection: The simulated response of the climate system to a scenario of future emissions or concentrations of greenhouse gases and aerosols, generally derived using climate models. Climate projections depend on the emissions, concentration, or radiative forcing scenario used, which, in turn, is based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized.

Drought: An exceptional period of water shortage for existing ecosystems and the human population(due to low rainfall, high temperature and/or wind). Drought can take multiple forms, such as agricultural drought, ecological drought, flash drought, hydrological drought, and megadrought.

Emissions: The release of climate-altering gases and aerosols into the atmosphere from human and natural sources.

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

Global Warming: Average increase in the temperature of the atmosphere, measured globally, 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.

Hazard: The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.

"Lifeways/Ways of Life": As stated in CSKT's Comprehensive Resource Plan, "The Tribes believe humans are not separate from their environment, and that there is a spiritual bond between people, plants, animals, and the earth." (1-2) This fundamental belief in the interconnectedness of things is the heart of traditional lifeways, as opposed to lifestyles that assume a separation between humans and the environment.

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.

Particulate matter: Atmospheric aerosol particles relevant to surface air quality. The particles of greatest health concern are those with a diameter less than or equal to 10 micrometers (PM_{10}) and less than or equal to 2.5 micrometers ($PM_{2.5}$).

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

Scenario: A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technological change, prices) and relationships. Note that scenarios are neither predictions nor forecasts, but are useful to provide a view of the implications of developments and actions (IPCC 2020).

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

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

Threshold: The value of a parameter summarizing a system, or a process affecting a system, at which a qualitatively different system behavior emerges. Beyond this value, the system may not conform to the statistical relationships that described it previously.

Traditional Ecological Knowledge (TEK): 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 the exposure of a system to climate change impacts plus the sensitivity of the system to climate offset by 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.

Executive Summary



Figure 2: CSKT Lifeways Wheel.

The Confederated Salish & Kootenai Tribes (CSKT) 2025 Climate Change Strategic Plan represents a critical next step toward addressing and preparing for the various impacts of climate change on the Flathead Reservation in Northwest Montana, home to the Séliš (Salish), Qlispé (Kalispel), and Ksanka (Kootenai) people and communities. As with the creation of the original plan in 2013 ("CSKT Climate Change Strategic Plan", 2013), the purpose of this document has been to improve the resiliency of these homelands and continue the commitment to protecting the well-being of the Tribal community, natural resources, and cultural lifeways by proactively preparing for the impacts that climate change will have on the many different aspects of the environment and economies of the Flathead Reservation. Over the past seven years, the plan and its implementation have been designed to facilitate climate change mitigation, improve resilience strategies, collectively implement adaptation solutions.

The decision to revise and update the first Strategic Climate Plan was rooted in the realization that climate change was accelerating so rapidly that many impacts projected to occur many years in the future, at the time the plan was written in 2013, were already evident on the Flathead Reservation by 2019. Warmer average temperatures, altered snowpack, increased wildfire activity and shifting hydrology patterns were no longer projections, but lived realities. Recognizing the urgency of these changes, CSKT initiated the comprehensive revision of the plan in 2019. A initial draft was completed in 2022, and another round of revisions occurred in 2025. The updated 2025 document reflects the continued efforts to prepare for climate impacts across different sectors on the reservation, the accomplishments of different departments for climate readiness, lessons learned, and emerging priorities for the Tribes. This update introduces two important features that were not included previously to guide the interpretation and use of the Plan: (a) an Indigenized model of CSKT lifeways that grounds adaptation in cultural values and interconnection, and (b) a section outlining how to use this plan most effectively to ensure that it serves as a practical, living resource for leaders and community members.

The process of updating the Climate Change Strategic Plan was led by the CSKT Department of Historical Preservation, CSKT Climate department, with assistance from the Montana Climate Office, Sapphire Strategies, the Center for Large Landscape Conservation, and The Wilderness Society. It was completed in collaboration with the Tribes' leadership, administration, elders, scientific leaders, community members, other stakeholders, and regional experts. Historical information was adapted from the Flathead Reservation

Comprehensive Resources Plan, and local climate change scenarios were adapted from Native Waters on Arid Lands (funded through a grant from USDA/NIFA

Water for Agriculture Challenge Area) (M. McCarthy, 2020). Traditional Ecological Knowledge was provided by the Ksanka Culture Committee, the Séliš-Qlispé Culture Committee, and the Historic Preservation/Cultural Preservation Department. CSKT Tribal Departments and local organizations developed the local impact assessments for the sectors:



- **Forestry**
- **Land**
- **Water**
- **Fish**
- **Air**
- **Wildlife**
- **Infrastructure**
- **People**

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 either compulsory or voluntary. The goals and actions of this plan are diverse, addressing the needs of each sector. Overall the framework of this plan is guided by deeply held Tribal values. Sovereignty, reciprocity, and intergenerational responsibility form the foundation for adaptation. This approach is supported by available Traditional Ecological Knowledge, survey results, supporting photographs, and strengthened integration of climate modeling and regional data have been included in this document to expand the message of resilience for the Confederated Salish and Kootenai Tribes.

This plan represents a critically important next step in the Tribes' efforts to mitigate the effects of climate change on the Flathead Reservation. It is designed to serve as a foundation for developing effective strategies to protect and preserve the local environment. Each chapter explores the impacts of climate change on each sector, the challenges, problem solving, achievements, and partnerships that engage in the work to address those issues. This document is also designed to be used by multiple audiences. For leadership, it offers a strategic framework that aligns adaptation actions with sovereignty, long-term planning, and interagency coordination. Results from this plan should be incorporated into future guiding documents, such as the Comprehensive Resources Plan and the Forestry Management Plan. For community members, it offers a resource that links climate change to impacts on community, environment, health, culture, and resilience. As part of the document planning, an ESRI Storymap Series is available for the public to view and read at cskt.org/climate/. This format allows for multimedia interactive elements that are easily updated. This strategic plan should be revisited and modified regularly as the priorities and needs of the Tribes change and new information regarding climate science and impacts becomes available. As implementation plans are developed, effective monitoring and evaluation policies and procedures will continue to be established as needs arise. These measures should help determine if the Tribes' actions are meeting the Tribes' preparedness goals.

Introduction to The Strategic Plan

Overwhelming scientific evidence demonstrates that human-generated contributions of greenhouse gases are causing unprecedented warming of the planet, and impacts are now clearly evident both globally and locally (Hansen & Stone, 2016). Montana has already observed temperature increases of 2.7° F between 1950 and 2015 (Whitlock et al., 2017). Locally, models project warmer temperatures, lower snowpack, and increased climate variability, resulting in more severe droughts and flooding events over time (Whitlock et al., 2017). The Confederated Salish Kootenai Tribes acknowledge these changes and their potential impacts on the Flathead Indian Reservation in Montana.

Historically, Tribal elders have recognized and prepared for climate change for centuries. As such, the Confederated Salish and Kootenai Tribes' Climate Change Strategic Plan lays the foundation for developing effective, culturally sensitive climate change adaptation and mitigation strategies necessary 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 (CSKT-Climate, 2016).

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 to the forestry, land, fish, wildlife, water, air, infrastructure, people, and cultural sectors from climate change impacts. Vulnerability refers to a system's susceptibility to harm from the impacts of climate change. Risk is the consequence of an impact multiplied by the probability of the impact occurring. 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 numerous 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, the resources needed, the responsible parties, collaborations, and evaluation measures required to meet objectives, is the next step in improving the resiliency of the tribal community and the land to the impacts of climate change.



The Séliš, Qi̓lispé, and Ksanka have stories and songs, handed down from the ancestors, that tell of a time before. Their relationship with the environment was, is, and continues to be based on a rich knowledge of tradition, experience, and practice. That knowledge is sacred and has tremendous meaning to the Séliš, Qi̓lispé, and Ksanka people. Sometimes these stories reflect evidence of significant past events. The tribes tell these stories and sing songs that remind them to acknowledge that the world, the animals, and the plants were put here first. It was with their help and guidance that tribal people survived and thrived for thousands of years. The elders have always spoken about a sense of indebtedness to the plants and animals, as they gave themselves to be food and medicine for the human-beings-yet-to-come. The Elders tell us that it is now our responsibility to care for those who cannot care for themselves.

As with all things, the people of the Confederated Salish and Kootenai Tribes follow the circle of life. The Tribal worldview encompasses the circle pathway. The elders always say that all things are interconnected and that any impact or action on one resource will have a ripple effect on all. To better reflect this perspective, the Climate Change Committee has attempted to analyze the impacts of climate disturbance on Tribal resources, similar to how the Flathead Reservation Comprehensive Resources Plan was developed in 1996 as an integrated resource management plan. The previous CSKT climate change plan was somewhat compartmentalized and lacked the interconnectedness and collaboration that could have been achieved, which this 2025 update addresses



Figure 3: CSKT Lifeways Wheel by Ron Oden of Ron Oden Designs.

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The CSKT Lifeways Wheel illustrates a Tribal way of thinking that is different from that of the previous climate change strategic plan. This CSKT Lifeways Wheel was developed to convey the integral nature of humanity and the natural and built worlds of the Séliš, Qlispé, and Ksanka peoples. The circles of life and relationships radiate outward from the individual and family at the center to community and culture, tribe, nation, and the world. The spokes on the Lifeways Wheel are the pillars of CSKT governance, representing the Departments that collectively have a role in adapting to a changing climate. These include Forestry, Wildlife, Fish, Water, Infrastructure, People, Lands, and Air. They are woven together by braided sweetgrass symbolizing healing, peace, and tradition. The authors of this report selected illustrations representing the different sectors on the wheel to highlight elements of CSKT Lifeways that are being impacted by a warming world and changing climate. These include *forests* populated by Whitebark Pine and huckleberries, *wildlife* paths of the moose and bear, streams flowing bull trout and other *fish*, *water* flowing over the Séliš Ksanka Qlispé (formerly Kerr Dam), lifesaving *infrastructure* corridors over our highway, our *people* - elders, youth, and community members honoring the river, the fertile *lands* of the Mission Valley, and the sweet *air* of Big Sky country. This is connected on relational scales of A. individual/family, B. community/culture, C. Tribe, D. Nation, E. World. (Durglo & Oden, 2022)

During a 2020 Climate Change planning session, CSKT resource managers participated in an exercise that revealed the central role of CSKT Lifeways in planning climate adaptation actions. Climate disturbances, including floods, droughts, wind events, and wildfires, will all impact Tribal resources, which in turn will impact Tribal cultures, traditions, foods, and spirituality as illustrated in the climate driver's graphic below. Impacts are also expected to be place-based and at varied scales, both temporally and spatially. For example, impacts in the high-elevation region will differ from those on resources in the dry grass and sage steppe ecoregions of the Reservation.

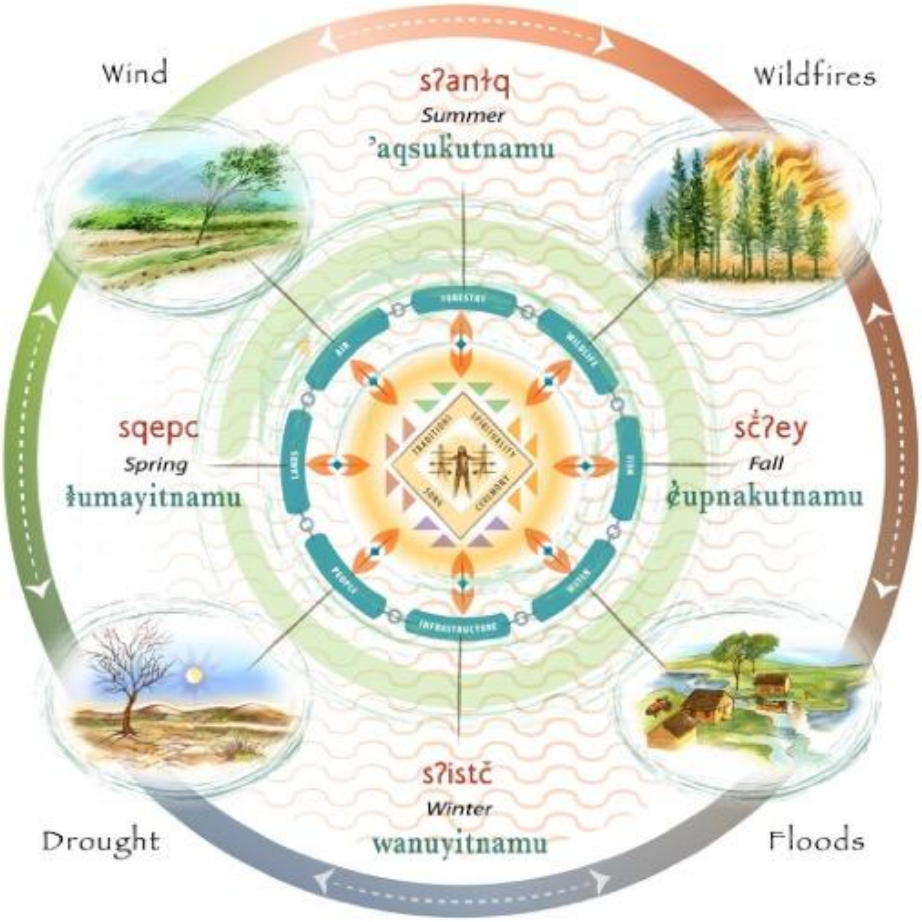


Figure 4: Climate drivers (drought, wind, wildfire, floods) are impacting all aspects of the CSKT lifeways.

At the core of our creation story is the message that the Creator made all of us, and that we must respect and love one another.

Creation consists not only of humankind but of everything in the animal world, the mineral world, and the plant world. Even element and the forces of nature are part of creation. Each has a spirit that lives, and we must respect and love each one.

The elders tell us that coyote and his brother are waiting at the edge of this island, and that one day they will come back. If, when they return, we are not living as one creation, as part of one big circle, it will be the end of our time, the end of this part of the universe.

Our stories teach us that we must always work for a time when there will be no evil, no racial prejudice, no pollution, when once again everything will be clean, and beautiful for the eye to behold – a time when spiritual, physical, mental, and social values are inter-connected to form a complete circle.

SPCC 1998

Climate change is already impacting all elements of the Lifeways Wheel for Séliš, Q̓ispé, and Ksanka peoples (see climate drivers graphic above). As global temperatures warm, our seasons are shifting. Summers are growing longer and drier, fall starts later and extends into what was once winter, the lifegiving snows of winter arrive in more intense storms in a shorter season, spring comes earlier and gives way to summer heat sooner. All sectors on the Lifeways Wheel experience these changes, often manifested in four major climate impact drivers: wildfires, floods, droughts, and extreme winds. The key to climate adaptation and community resilience is for all of us to learn to dance to the rhythm of nature's new clock, heeding the warning of more wildfires in summers, floods in spring, drier summers with fewer rains, and the driving power of winds across the lands of the Mission Valley and into the forests of the Mission Wilderness.

Specific climate impacts to the Flathead Reservation of the next several decades are described in detail in **Appendix A** of this report.

As noted throughout an essay by Thompson Smith entitled *'Saving the World That Coyote Made'*, Tribal perspectives and values of reciprocity and respect are needed to carry indigenous people forward (Smith, 2020).

"Séliš elder Agnes Vanderburg said. When it comes to the climate crisis, the truth does hurt. And as Sarah Krakoff has noted,**'** *American Indian tribes and people have contributed very little to the causes of global warming, yet for geographic, cultural, and demographic reasons, they stand to suffer disproportionately from global warming's negative effects.***'...** But people must not and need not despair. History, and particularly the history of indigenous peoples, shows us that human beings are capable not only of adapting to changing conditions, but also of living in profoundly differing way. People are able to live in ways that respect and care for our planet, and for one another. In fact, for the vast majority of human history, people have lived in such a way… As Professor Robin Wall Kimmerer (Citizen of the Potawatomi Nation) has put it, *'For much of human's time on the planet, before the great delusion, we lived in cultures that understood the covenant of reciprocity, that for the Earth to stay in balance, for the gifts to continue to flow, we must give back in equal measure for what we take*' (Kimmerer, 2013)… Reciprocity is as focused on the needs of the natural world as it is on human needs. Every gift received from the natural world, requires giving back in equal or greater measure…. If we turn to the teachings of tribal communities, we will find a path out of the crisis we face: in the shorter term, a capacity for adaptation and restoration rooted in the millennia of Indigenous presence on the land, and in the longer term, what Professor Krakoff has called '*a deep version of sustainability…a way of living on the earth… that allows each of us, in the company of nature, to thrive, but that proscribes any of us from living beyond our ecological means'.* This is the greatest hope offered by the example of native nations.

Séliš and Qlispé elders—Felicite McDonald, Pete Beaverhead, and Mitch Smallsalmon—reminded us that human life is only possible because of the sacrifice and generosity of the animals, plants, birds, and fish. This is the foundation of the covenant of reciprocity. It is why, before digging bitterroots or camas, or picking berries, or cutting up animals that have been hunted for food, the people always offer a gift--kinnickinnick leaves, berries, or something else to show gratitude--and pray that the plants and animals will continue to provide. As Pat Pierre said many times*, 'people must give before they take. And they must never waste'. 'If you kill an animal for nothing,'* Michael Louis Durglo, Sr. said*, 'the animals will turn against you.'* Many elders emphasize that when hunters bring animals into camp, the people always try to waste nothing, and to respectfully take care of whatever is not used. This honors the one who gave its life so that the people might live. The ethic of not wasting anything also holds true for plants and for berries, as Pete Beaverhead said*, 'for anything else they gathered or killed'.* Those personal acts of respect were woven into the whole structure of traditional society."

Over the last fifty years, the rise of Tribal departments to manage natural and cultural resources has been shaped to some extent by Western practices in science, management and bureaucracy. Until recently, this influence has been an unavoidable part of self-governance, but this is beginning to shift. Firstly, it is shifting because of the vast scope and extent of climate change, which, as a problem, does not fit nicely into the divisions and categories that are so central to Western methods. Climate change impacts all aspects of our shared environment simultaneously. We are all in this together. Secondly, it is shifting because the problem of climate change is increasingly seen as a problem of unintended consequences, which emerge when we fail to recognize that all things are connected.

This lesson of interconnection has been a part of traditional knowledge for thousands of years, and it doesn't take an advanced degree to understand it. It is taught by the simple image of a ripple. As V.F. Cordova, of the Jicarilla Apache, explains (Cordova, 2007):

"We are all familiar with the statement credited to Native Americans that we believe that 'all things are related.' We seldom hear about what that 'relatedness' entails. I suppose one could use the analogy of a stone thrown into a pond. Each 'thing'—stone, air molecule, plant, animal, or vegetable—causes a ripple to form in the pond. The singular, particular being is not merely itself tossed into the pond. It is also the ripple, the wave, that is formed by the action. Our 'waves' overlap and extend beyond what we can foresee. Wisdom is knowing the effects of those 'over-laps.' This is how 'relatedness' enters the picture: a statement that 'all things are related' reminds us that we are not separate from all other things and that our actions have far-reaching consequences."

The problem of climate change is not just an environmental problem of increased atmospheric carbon dioxide (CO_2), but also a problem that extends from the denial that individual actions have a collective force and effect. These collective effects defy individual attempts to control and confine them, and so they demand from us our collective recognition and responsibility in order to manage them. "The causes of the climate crisis are deeply embedded in every aspect of our society and economy, and it is already well underway. It has so much momentum behind it that slowing it down or reducing its severity—let alone stopping or reversing it—will challenge all of us in ways that are unprecedented in human history" (Smith, 2020).

Over the course of the planning sessions, participants recognized in various ways that overlapping impacts reveal overlapping interests. It is hoped that this kind of overlap will help build and organize communities that recognize areas of shared concern so that they can carry out coordinated responses that address these. Managers representing different departments even went so far as to say that "Natural resources and cultural resources are one and the same." It is only by this kind of thinking, grounded in traditional knowledge and culture, that we will truly address and overcome the root causes of climate change and avoid responses that merely treat its symptoms.



How to Use This Plan

First, our goal with this plan is to provide CSKT resource managers and the broader community with the most current information about potential climate change projections and impacts, to help guide climate-informed planning and decision-making. This will ensure the ongoing stewardship of natural and cultural resources, a central principle of our community since time immemorial. Guided by this plan, we encourage managers and decision-makers, whether working on a single ranch or across the entire tribal landscape, to develop management options that consider a range of possible future conditions, but most importantly, efforts that promote ecosystem resilience for desired functions and services. Adaptation management strategies that address impacts common to a range of possible future conditions are more robust than efforts to manage for a single desired outcome.

Second, this plan is intended as a living document, to be updated and added to as new information and understanding become available. Although climate change is already occurring and its impacts are already being felt, much of the future climate remains uncertain. Climate projections are inherently uncertain, and our understanding of future climate change will undoubtedly evolve. Future climate projections themselves are based on scenarios of how much atmospheric carbon (one type of greenhouse gas) we continue to emit, locally, nationally, and globally. These scenarios are built on plausible futures where industry, agriculture, and society either drastically reduce the amount of emissions of greenhouse gases or continue on under “business as usual”. Some scenarios even consider the climate consequences if our nation (and world) emits carbon at even faster rates. Global economies and policies will largely determine the scenario that unfolds, although local considerations of emissions are also important.

However, preparing for and adapting to climate change does not require absolute certainty. Nearly all climate models indicate that temperatures will continue to warm and that extreme events will likely become more frequent. Considering various futures will help us plan now, even as our understanding of climate change and adaptation continues to evolve. It is best to continue investing in the communities and environment of the Flathead Reservation, regardless of how quickly these changes are felt.

CSKT CCSP Story Map Series

Third, one of the most important ways this plan has been designed to be a living document is through the addition of a new interactive ESRI Storymap series, where new accomplishments of climate action can be easily added and explored at: https://cskt.org/climate/ under the "Climate Story Map" button. We encourage the community to check this page for updates.

Finally, we hope that all community members will actively participate at local, regional, and national levels with other communities, tribal nations, and the environment. They should also take individual action and responsibility, and encourage others to consider and respect our relatives, Lifeways, and environment. The future is in our hands.

Characteristics and History of the Tribe

The Confederated Salish and Kootenai Tribes (CSKT) consist of the Séliš, Q̓ispé, and Ksanka peoples. As the first to organize a tribal government with a Constitution and a Corporate Charter 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 or Chairwoman, Vice Chairman/Chairwoman, Secretary, and Treasurer. The Tribal Council represents the Arlee, Dixon, Elmo, Hot Springs, Pablo, Polson, Ronan, and St. Ignatius districts of the Reservation (CSKT Government, 2020a). The district member elections are staggered, with 5 of the 10 districts are up for election every 2 years.

As of May 2020, there were 8,059 enrolled Tribal members, with 5,360 living on the Reservation and 2,699 living off the Reservation (CSKT Government, 2020b). The total population of the Reservation was 31,394 in 2019 (IMPLAN), with American Indians accounting for approximately 32% of the entire Reservation population (U.S. Census Bureau, 2012).

The Tribes' mission is guided by traditional principles and values. As stated in the 2011 Confederated Salish & Kootenai Tribes' Annual Report (CSKT Government, 2020b), "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."

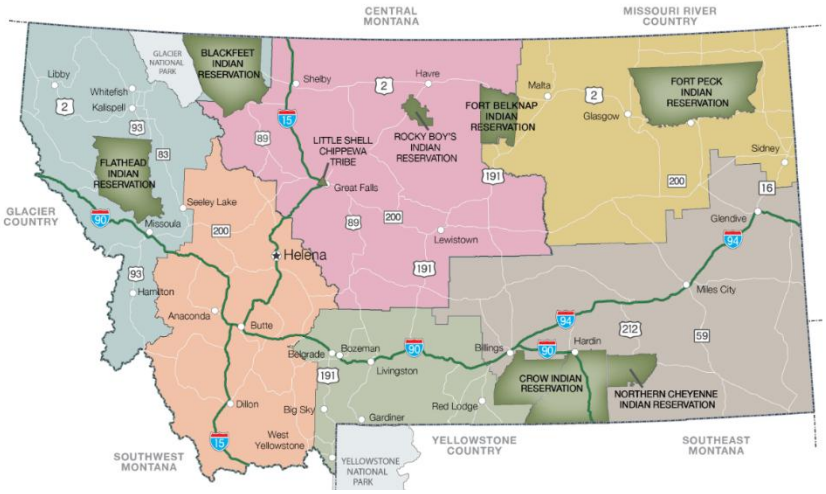


Figure 5: Montana Reservation Lands. Map by the State of Montana.

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 homeland 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 (CSKT Government, 2020b). 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.

Location and Definition of Tribal Lands

The territories of the Séliš (Salish or "Flathead"), Q̓ispé (Kalispel or "Pend Oreille"), and Ksanka (Kootenai) Nations encompass much of what is now western and central Montana, northern Idaho, northeastern Washington, and parts of southern Canada. The ancestors travelled much farther for hunting, fishing, gathering, trade, and other purposes. Under terms of the 1855 Treaty of Hellgate, the Confederated Tribes ceded title to the United States for most of our lands west of the Continental Divide, while reserving from cession both the present-day Flathead Reservation and the Bitterroot Valley, which was set aside as a separate reservation for the Séliš. (There were considerable translation problems during the treaty negotiations, so our leaders misunderstood many of the treaty's details, including the boundaries of the Flathead Reservation, which we thought were far larger.) Through the Hellgate Treaty, we also reserved the right to continue hunting, fishing, gathering plants, and grazing livestock

in open and unclaimed parts of our ceded lands. Today's Flathead Reservation encompasses the south half of Flathead Lake, the Mission and Jocko Valleys including all of their tributary systems, the Lower Flathead River and its tributaries downstream past Seepay Creek, and the Little Bitterroot River drainage system from the point where it enters the reservation. The Flathead Reservation includes portions of Lake, Sanders, Missoula, and Flathead Counties. The largest community on the Reservation is the city of Polson, Montana, which is also the county seat of Lake County.

The Flathead Reservation is 1.317 million acres in size, of which the Tribes own 815,669 acres as a whole, and 29,956 acres are owned in trust by Native American individuals (CSKT Government, 2020a). Additional lands are owned in fee status by Tribal members and non-members, and some lands are owned by the State of Montana and the federal government.

Reservation land ownership has a checkerboard pattern due to the Flathead Allotment Act, which illegally opened the Reservation up to non-Tribal member settlement in 1910. Since that time, the CSKT have been repurchasing land at fair market value to restore Tribal ownership of the Reservation. The Flathead Nation's land ownership is depicted in the following 2025 Land Status Map.

History of the Tribes

Climate Action: Grounded in Tribal Culture and History by the **Séliš-Q̓ispé Culture Committee**

In the stories and teachings of our elders—in the deep currents of our culture and history— we find hope for our capacity as human beings to take care of our only home. We find hope even for a challenge as daunting as the climate crisis.

The history given to us by the elders helps us understand how we got to this point in our history: how a different way of life was imposed upon our homelands and across the whole world, and it has pushed everything out of balance. The stories from the elders also help us understand what we can and must do to address the climate crisis. We must return, in every possible way, to relationships of respect with the world around us—respect for our fellow human beings, and respect for the lands and waters and air, the plants and animals, whose fates are intertwined with our own.

In 2019, the Director of the Séliš-Q̓ispé Culture Committee, Antoine Incashola, Sr., spoke at a meeting of the Climate Change Advisory Council of the Confederated Salish and Kootenai Tribes. He reminded us that "at the beginning of time, the animals that were here before us left us a near-perfect world….And the elders always say that if you don't take care of what you've got, those gifts are going to leave."

From time immemorial, this perspective has stood at the heart of the ways of life of our people, the Séliš (pronounced SEH-leesh, known to English speakers as Salish or "Flathead"), Q̓ispé (pronounced Kah-lee-SPEH, known to English speakers as Kalispel or "Pend d'Oreille"), and Ksanka (Kootenai)] Nations. And for the past half-century, it has been the cultural foundation of CSKT efforts to protect our lands, waters, air, plants, and animals.

For thousands of years, the mountains and valleys of what is now western and central Montana and adjacent areas have been home to our people. For the vast majority of that time, we lived well as hunters, fishers, and gatherers, moving with the seasons, drawing from a profound ecological understanding of our vast homelands. Our relationship with the lands, the waters, the plants and animals was governed by a deep cultural and spiritual ethic of living within appropriate limits. We lived in close tribal communities, conducting most activities together for the well-being of the people as a whole.

This is the way of life shown in the beginning by Coyote: a way of respect for one another, and for the lands and waters we have been given. Our Creation stories teach us that our lives are only possible because of the sacrifice and generosity of the plants and animals. So before harvesting plants or animals, we offer a gift. We give thanks and pray that they will continue to provide for us. Upper Kalispel elder Pat Pierre reminded us many times that we must give before we take, and we must never waste.

During recent centuries, we have endured the invasion and transformation of our homelands. The fur trade came and stripped the land of beaver and other animals. The missionaries arrived at our invitation, but

then sought the elimination of our spiritual ways, even as many of our people added Christianity to our beliefs. And then, in 1855, US officials and tribal leaders "negotiated" the Treaty of Hellgate, which in many ways defined and shaped the subsequent political, legal—and environmental—landscape of western Montana. Poor translation limited how much the chiefs could understand, but according to the terms of the treaty, we ceded most of our territories to the United States. We reserved tribal rights to hunt, fish, and gather plants on those ceded lands, and also reserved from cession a small fraction of our vast homelands, including the Flathead Reservation, as sovereign homelands. The treaty guaranteed the reservation for "the exclusive use and benefit" of CSKT people.

Less than fifty years later, Congress broke that promise with passage of the Flathead Allotment Act, despite nearly unanimous tribal opposition and unrelenting efforts by tribal leaders to stop the bill. The 1904 law made large swaths of the Flathead Reservation available to non-Indian homesteaders, who quickly took control of much of the agriculturally and commercially valuable land. For the CSKT, allotment was the single most devastating policy ever implemented by the federal government, bringing the dispossession of over half a million acres, the radical weakening of our sovereignty, and the transformation of the reservation's economy and culture. The result was the complex, sometimes conflicting mix of land ownership and jurisdiction that characterizes the Flathead Reservation to this day.

In 1934, FDR's Indian Reorganization Act finally ended the disastrous allotment policy and gave us the opportunity to reconstitute as the Confederated Salish and Kootenai Tribes. We began rebuilding our governing capacity. We also started reacquiring land; today, the CSKT own over two-thirds of our 1.3-million-acre reservation.

We can see the broad contours of this history: our people resisted the invasion of our homelands and the assault on our ways of life. We survived all those many traumas—not only as a sovereign native nation, but also as unique and beautiful cultures. And over the past half-century, within our remaining sovereign territory—within the Flathead Reservation—we have pursued restoration and revitalization. For us, that has meant restoration and revitalization of our governing capacity; restoration and revitalization of our lands, waters, plants, and animals; and restoration and revitalization of our culture, our language, and the heart of who we are as Séliš, Qlispé, and Ksanka people.

In the mid-1970s, our Tribal Council took a crucial step by establishing Séliš-Qlispé and Ksanka Culture Committees. Arising from the concern of tribal elders over the loss of cultural knowledge in the community, the culture committees are charged with preserving, protecting, and perpetuating the cultures, languages, and history of the Salish, Kalispel, and Kootenai people.

With the guidance and direction of Elders Cultural Advisory Councils, the culture committees helped restore traditional cultural values—including respect for the environment—to the heart of CSKT operations. The elders have made it clear that for us, natural resources are cultural resources. There is no difference between them. The songs, dances, stories, and our understandings of the origins of human life—all are gifts from the animals, plants, lands, and waters. This basic understanding undergirds CSKT cultures. And it also undergirds the efforts and accomplishments of the CSKT to protect and restore our environment, including our efforts to address the climate crisis. This whole effort is rooted in our deepest cultural principles. The following decades saw the development of many CSKT departments and programs, including the Natural Resources Department, aided by new federal laws that supported tribal self-determination.

Séliš (Salish) and Qĺispė (Kalispel) Tribes

Culture, 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 the 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 advice 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 traveled long distances to collect raw materials not available locally. The Salish had a strong trade relationship with the Nez Perce 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....

Ksanka (Kootenai) Tribe

Culture, Economy, and Government

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.

"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, and 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."

Current Tribal Socio-Economic Characteristics

Today, the socioeconomic profile of the Salish, Qĺispė, and Kootenai Tribes has changed dramatically when compared to its historical status. The Flathead Reservation now has towns, farms, residences, businesses, roads and irrigation ditches spread across the landscape, and while it is predominantly a rural area, it is bordered on the south by Montana's second largest urban trade center, Missoula County, and on the north by one of Montana's fastest growing counties, Flathead County.

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. The Reservation is located on a major, transportation arterial--U.S. Highway 93--and is blessed with spectacular natural resources including Flathead Lake, the Ninepipe National Wildlife Refuge, the National Bison Range, and the Mission Mountains (CSKT, Economic Development 2014)."

While non-Indian growth outpaced Tribal growth 10 to 1 on the Reservation during much of the 20th century, more recent census data, shows that American Indians accounted for most of the population growth in the last few decades. From 1990 to 2000, the Indian population grew by 2,753, a rate of 54%, while the non-Indian population grew by 2,160 (13%). From 2000 to 2010, the Indian population rose by 1,255, a 16% growth rate, while the non-Indian population increased by 932 (5%). Today, the total Flathead Reservation population is 31,394. There are 12,381 households and 198 industries on the Reservation, with 14,880 employed individuals (IMPLAN, 2019).

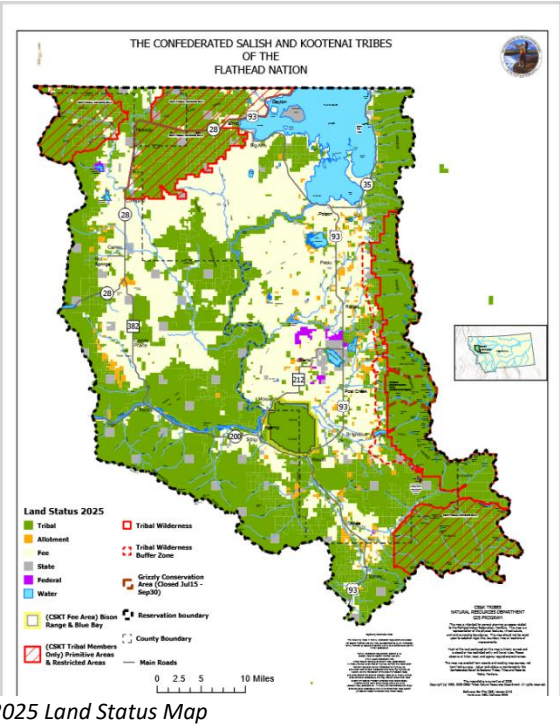


Figure 6: 2025 Land Status Map

The CSKT government is "the dominant employer on the Flathead Reservation, accounting for 35% of all employment and 55% of the employment in industries that bring money into the economy," as illustrated in the following graph (CSKT Economic Development, 2014).

The Tribal government has two chartered affiliate entities—Salish Kootenai Housing Authority and Salish Kootenai College—in addition to managing Mission Valley Power. The CSKT also owns several businesses that employ hundreds of additional individuals both on and off the Reservation.

Despite CSKT efforts to employ Tribal members, many members face unemployment and poverty challenges.

"Of Tribal members ages 18-60, 69% were employed at the time they completed [CSKT's] 2014 Job and Training Needs Survey, 11.2% were unemployed, and 19.7% were not currently in the labor force. The unemployment rate for Tribal members ages 18-60 was 13.9%. This rate was calculated using the U.S. Census Bureau and Montana Department of Labor and Industry definitions of labor force status …. Nearly 2 in 5 Tribal members ages 18-60 (36.1%) lived in a household at or below the poverty threshold (CSKT Economic Development, 2014)."

Efforts continue to train and employ as many Tribal members as possible, while simultaneously reducing barriers to employment. New training programs in the health and hospitality professions have been developed at Salish Kootenai College with support from CSKT's Economic Development Office, and a new building trades program is being considered, based on training interests identified by the membership in the 2014 survey.

The Environment, Tribal Cultures, and the CSKT Economy

The stories that have been handed down from the ancestors teach us that in the beginning, Coyote rid our homelands of the monsters, and established a good and bountiful place for the human-beings-yet-to-come. He showed a way of respect for one another, and for the lands and waters we have been given. Our Creation stories teach us that our lives are only possible because of the sacrifice and generosity of the plants and animals.

This is why, for us, natural resources are cultural resources. There is no difference between them. Our songs, dances, stories, spirituality—all are gifts from the animals, plants, lands, and waters. This basic understanding undergirds CSKT cultures. And it also undergirds the CSKT approach to economic policy and providing opportunity to CSKT people. We continue to seek ways to provide our people good jobs while also protecting and restoring our cultural-environmental resources.

In addition to the most important Tribal asset, the people, the Tribes have protected Tribal lands and resources by establishing wilderness, primitive, wildlife conservation, and Flathead River Corridor protection areas, and have developed regulations and resource management plans to conserve and enhance those resources. During its comprehensive planning process, the CSKT membership set goals that emphasized the maintenance of a healthy and productive linkage between the Tribal land and resource base and the Reservation economy. In an ideal future, the membership would prefer to see Reservation lands and resources used in a sustainable manner compatible with environmental and cultural resource protection.

There are other kinds of economic benefits, as well as many non-economic benefits, that come from CSKT's prudent use and management of Reservation natural resources. A healthy natural environment is essential if CSKT is to maintain Tribal culture and spirituality. A clean environment is also important to the physical and mental well-being of Tribal members as well as all Reservation residents.

In economic terms, a high-quality natural environment is an important stimulus to economic development. By attracting and holding new businesses, it provides a powerful force for growth. The goal is the development of sustainable, non-polluting businesses, housing, and natural resource restoration versus other types of development. CSKT has invested considerable effort in protecting and enhancing the natural and cultural environment of the Reservation. To name only a few examples, CSKT (CSKT Government, 2020a):

- Sought and obtained a Class I Air Quality designation for the Reservation, the most demanding air quality status under federal law
- Created and then expanded the Mission Mountains Tribal Wilderness and the South Fork and Mill Pocket Kitqwanukxu'l (Lozeau) Primitive Areas, and have created a buffer zone to protect the wilderness area
- Adopted and implemented a Shoreline Protection Ordinance
- Adopted and implemented an Aquatic Lands Conservation Ordinance to protect wetlands and other aquatic lands
- Adopted a Fisheries Management Plan and a Water Quality Management Ordinance
- Drafted and adopted the Lower Flathead River Resource Management Plan to protect that area of the Reservation
- Developed Programmatic and site-specific environmental assessments for residential and commercial development

CSKT carries out interdisciplinary reviews on natural resource management and development activities occurring on the Reservation to ensure that the activities cause minimal environmental damage. Cultural clearances are required for all changes in land use or development of vacant parcels. CSKT is also working with the Environmental Protection Agency regarding enforcement of federal and Tribal air and water quality, and solid and hazardous waste regulations on the Reservation. Protection and enhancement of the natural landscapes and ecosystems

of the Reservation is one of the Tribes' highest priorities.

We are living in a time like no other, in which all life on our planet is facing a variety of natural and unnatural stresses that can lead to our possible extinction. We are faced with many uncertainties and many questions about what needs to be done to preserve life. One thing that is certain is that we cannot continue to engage in the same economic and industrial activities that have brought us into this current crisis and expect things to change to a different result, or magically turn in a different direction. We cannot continue to produce and consume any industrial product that comes to our desire or make decisions about industrial and economic activity based only on whether or not it will make us money (the profit motive). We need to figure out what we actually really need to produce and consume, based on the needs of our children and future generations, and even more on the needs of all of our interconnected relations in the circle of life.

CSKT Confederated Salish and Kootenai Tribes Federal Reserved Water Rights Compact

"The Confederated Salish and Kootenai Tribes Federal Reserved Water Rights Compact (FRWRC), officially known as the Montana Water Rights Protection Act (MWRPA), "was created when the U.S. Supreme Court made the decision in the 1908 Winters v. United States case about a Fort Belknap Indian Reservation water claim. In the Winters decision, the Supreme Court ruled that when the U.S. Congress or the president sets aside land out of the public domain for a specific purpose, such as an Indian reservation, national park or national forest, a quantity of water is reserved based on the amount necessary to fulfill the specific federal purpose.

Prior to that, leaders of the Salish, Pend d'Oreille, and Kootenai people on July 16, 1855, signed the Treaty of Hellgate (S&K Technologies, Inc. 2014; Kappler, 1855). In the Treaty, the federally recognized Flathead Nation agreed to cede 12 million acres of their Aboriginal Homeland; however, the Homeland encompassed more than 22 million acres, and the Nation reserved 1.25 million acres, which is now the Flathead Indian Reservation. The Treaty of Hellgate was ratified on March 8, 1859.

Although the Confederated Tribes ceded a huge swath of land, they retained numerous preexisting rights to the land. The most important retention of the time-immemorial rights was articulated in Article 3 of the Treaty of Hellgate (Kappler, 1855). It proclaims: "The exclusive right of taking fish in all the streams running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land."

Article 3 is the bedrock foundation of the Flathead Nation's FRWRC claim, and opposition to it did not crack the foundation. In 1972, Montana adopted its rewritten constitution, and among the many forward-looking articles was Article IX, section 3(4) that related to the quantification and administration of water in Montana. It read, "The Legislature shall provide for the administration, control, and regulation of water rights and shall establish a system of centralized records, in addition to the present system of local records."

However, the local records were an inadequate, non-centralized quagmire of records, and not a good foundation to base a state-wide centralized system upon. As a result, in 1973, the Montana Legislature took its first steps in the direction of laying the groundwork for ways to comprehensively catalogue water rights in the state with the 1973 Water Use Act. To that end, in 1979, the Montana Legislature enacted Senate Bill 28 (Azure 2021a), which established the statewide proceedings for the adjudication of water rights in the state, including federal and Tribal Nations' federally reserved water rights. The bill established the Montana Legislature's nine-member Montana Reserved Water Rights Compact Commission (MRWRCC) as part of the state's general stream adjudication effort. The commission's charge was to negotiate federal reserved water rights claims rather than litigate in the court system. The federal lands include: the seven Tribal

Nation reservations; and the federal land holding agencies that include the National Park Service, US Forest Service, US Fish and Wildlife Service, US Department of Agriculture, and Bureau of Land Management.

The negotiations for the Flathead Nation's federal reserved water rights compact began in the mid-1980s but were soon put on hold while lawsuits that would have consequences for the compact made their way through the courts. After a protracted negotiation between the Tribes, the Montana Water Rights Protection Act was passed by Congress and signed into law by the President in December 2020. Included in this Act was the return of the nearly 19,000 acres of the CSKT (then, National) Bison Range from the U.S. Fish and Wildlife Service back to the Tribes. This enables the tribe to restore bison to their homelands and to manage the CSKT Bison Range. The CSKT Bison Range was taken from the Tribes by the U.S. Government in 1908, when President Theodore Roosevelt established it as a unit of the National Wildlife Refuge System (Azure, 2021a; Upton, 2015).

Why The Tribes are Planning for Climate Change

Protect Our People, Relatives, and Lifeways

The climate crisis poses immediate threats not only to the lands and waters of the Flathead Indian Reservation but also to the very existence and ways of life that have been at the core of the Salish and Kootenai peoples for generations. Climate change has already impacted the health of our lands and communities, and these trends are expected to worsen in the coming years and decades. The significance of these impacts requires action in order to protect Tribal sovereignty, our people, our ways of life, and all the plants, animals, and life that share this place with us.

Leaders in Responding to Climate Change

Since the publication of the original edition of this CSKT Climate Change Strategic Plan in 2013 ("CSKT Climate Change Strategic Plan", 2013) the global environmental circumstances related to impacts of global warming have become much worse. In 2012, the level of CO_2 in our atmosphere was about 385 parts per million (ppm), well above the maximum safe level of 350 ppm. Now, in 2025, we are at about 415 ppm, a point at which the damage to life on Earth may soon become irreversible, including the extinction of many species. As the leaders of the world's nations have failed to effectively reduce the output of CO_2 and halt the emissions of other harmful industrial bi-products (with the United States being recognized as one of the greatest producers of municipal solid waste, and generates tens of millions of tons of hazardous waste per year according to the EPA (EPA, 2025) and violator of environmental protection measures), we Indigenous peoples find ourselves as leaders in the movement to prepare for a changing climate, and even more importantly, leading by following the ways and values of our ancestors, demonstrating an alternative path from the destructive ways of colonialism and capitalism (U.S. EPA, 2025).

CSKT have continuously been at the forefront of indigenous rights and sovereignty initiatives and are determined to be prepared for the myriad of climate impacts, and ready to respond preemptively to improve the cultural and environmental landscape of the Nation in the face of a changing climate. In 2024, there was a landmark case in the Montana Supreme Court, which is now considered one of the most important court cases about climate to date. Held vs. Montana, where Montana Supreme Court ruled that state law restricting consideration of climate change in environmental reviews violated youth plaintiffs' right to a clean and healthful environment. One of the youths that was a plaintiff was a CSKT member. The youth are leading the way for climate change policy shifts in the state.

Honoring Our Values

The following plan reflects our value systems, which we use to inform the decisions and actions we will take in the future as the environment continues to change and impact the tribal lifeways that we know today. CSKT

completed a Comprehensive Resources Plan (volume II) (CSKT-CRP, 1996b) In that process, critical values and goals were outlined and defined. Today, in the most recent version of the Climate Change Resiliency Plan, we continue to adhere to these values, goals, and management actions as initially stated in the Comprehensive Resources Plan, and now reiterated below. These goals set forth long-term resource management goals that reflect our values. The goals represent the Tribes' vision of the future, and they form a foundation for basing future resource management objectives and policies. The Tribes established the goals in this chapter based upon the following criteria:

- Goals are value-driven. They reflect Tribal member values and beliefs.
- They are Tribal goals as opposed to goals imposed from the outside.
- Tribal Councilmen, Tribal members, and Tribal resource management professionals developed them based on Tribal values, needs, and rights.
- They are collaborative and future-focused. They strive to bring Tribal government, Tribal members, and other government agencies together to work toward protecting and enhancing resources.
- They project the Tribes into the future. They follow the traditional philosophy of looking seven generations ahead when Tribal government makes resource management decisions.
- They constitute a vision the Tribes can work toward.
- They consider both the quality of life and the quality of the Reservation environment. They are built on the underlying premise that the quality of the environment will drive the quality of life on the Reservation.
- They are dynamic. Goals change over time. These represent a starting point from which the Tribes can work to achieve desired future conditions.

The goal statements represent a synthesis of comments received from three different groups in three different settings:

- Community Meetings. During the spring of 1990, the Tribes conducted a series of eight of these meetings around the Reservation. The staff provided participants with area profiles to stimulate discussion of long-term goals and issues of concern.
- Technical Team Meetings. The Tribes conducted joint Tribal-Bureau of Indian Affairs Interdisciplinary Technical Team meetings to discuss long-term resource management goals.
- Tribal Council Sessions. These sessions with the Tribal Council focused on defining values and goals.

In both the Technical Team and Tribal Council sessions, the planning staff posed the following questions: If you were given the opportunity to visit the Flathead Reservation one hundred years from now, what should the quality of life be like? What natural and human resources should the Reservation produce one hundred years from now? What condition should the environment be in one hundred years from now?

The responses to these questions reflect Tribal values, values that have cultural and historical ties to the region that extend back thousands of years. In this respect, the Tribes are unlike other land managers. Tribal values are imbued with the Tribes 'long-held cultural attitudes toward the land and its historical use of resources by ancestors. They are based on the fundamental belief that humans and nature are one. Here is a link to **Living Landscapes: Culture, Climate Science & Education in Tribal and Native Communities**. A Comprehensive Set of Culture-based Climate Science Educational Resources for Native Communities by SKC that explore tribal values.

Tribal Values

- Learn to live in harmony. Live in harmony with each other and with the land.
- Our ancestors left this land, and we are only borrowing it from our children. As we make decisions that affect the land, we must consider the consequences those decisions will have, at least for the next seven generations.
- Respect the land. Replace what you take, take only what you need. By respecting the land, we respect ourselves.
- Preserve spirituality and culture. Act on a spiritual basis when dealing with the environment; always be aware of and appreciate what we have. Turn to the Creator when in need. Perpetuate the value of Indian culture.
- Protect Mother Earth. Repay the land for its gifts. Mother Earth was here before humans and has provided us with the needs of life.
- Preserve an abundance of animals, plants, and fish.
- Maintain hunting and fishing based on need and traditional use.

Tribal Goals: Quality of Life

- To ensure a high quality of life for future generations of Tribal members, the Tribes have set the following goals:
- Create an island where cultural resources, beliefs, and values are a vital and pervading part of the Tribal community; create a community characterized by a strong sense of cultural identity and awareness and an accurate knowledge of Tribal history.
- Create a strong and united Tribal membership characterized by strong families and friendships, honest government, and a desire to preserve and protect resources for all the people.
- Create a healthy family and community structure that cares for its elders, keeps its children in safe and loving environments, emphasizes self-worth and environmentally sensitive lifestyles, and encourages stable population levels on the Reservation.
- Promote Tribal sovereignty. Promote predominant Tribal ownership of Reservation lands and a community that is self-sustaining, that can wisely and creatively manage its resources, and that assumes an increasing share of the responsibility of government.
- Create a highly educated Tribal public characterized by a community with unlimited education opportunities, a community that supports individual initiative, and a strong environmental ethic.
- Develop an economy integrated with the larger regional economy that is characterized by full employment and that allows residents to find rewarding careers on the Reservation.

Tribal Goals: Quality of Environment

To ensure a quality physical environment for future generations of Tribal members, the Tribes have set the following goals:

- Manage the land and the community of life it supports in a manner consistent with traditional Tribal values. Strive to use resources in a sustainable way, to manage in harmony with nature, to waste nothing.
- Create an environmentally healthy landscape with clean air and water, stable population levels, protected scenic viewsheds, and the full realization of recreational opportunities.
- Maintain and enhance water quality by managing for a healthy river and tributary system, establishing a protective designation for the Lower Flathead River, protecting

groundwater, balancing water use with the goal of maintaining high water quality standards, managing irrigation systems efficiently, protecting Flathead Lake and its shoreline, protecting streams, riparian zones and wetlands, and using environmentally safe methods to control insects and noxious weeds.

- Provide a diversity and abundance of healthy fish and wildlife that includes: a diverse and productive fisheries resource, abundant big game populations, and healthy nongame wildlife populations. Establish and maintain wildlife protection areas, habitat enhancement programs, and programs that ensure the protection and recovery of threatened, endangered, and sensitive species.
- Provide a healthy and productive forest. Use harvest techniques that have minimal impacts on aesthetics, are sustainable, control disease and insects, and allow for roadless areas and a sustainable old growth component.
- Protect the Mission Mountains Wilderness and Buffer Zone, evaluate and add new primitive and wilderness areas, and identify and designate natural areas.
- Provide protected areas for Tribal use that include cultural resource areas, recreation areas, and wilderness and primitive areas.
- Create buffers along riparian corridors and wetlands and next to wilderness and scenic areas to protect natural values from potential development or degradation.
- Encourage stable population levels on the Reservation. Direct development is in harmony with the landscape. Plan for and encourage well-designed communities, clean industry, well-planned solid waste disposal sites, proper utility facility siting, sound development of Tribal resources, and centralized sewage treatment to protect Flathead Lake.

Planning In a Regional Context

The consequences of the climate crisis are most acutely felt at the local level. This adaptation plan serves as a first response to local climate vulnerabilities, working to build resilience and adaptive capacity within Reservation lands and communities. However, the actions of other authorities directly and indirectly affect our ability to respond to climate threats on our Reservation lands and aboriginal territories that CSKT does not currently have governing authority over.

The actions or inactions of other governments and agencies will affect our ability to respond to climate threats: just as wildfire smoke from forests burning in other states can settle in our valleys, CSKT recognizes that the health of our tribal lands and people are influenced by the actions and inaction of others near and far. Approaching climate action planning through a regional lens allows us to build upon existing information, identify potential partnerships and identify areas of inaction. This section summarizes some of the relevant climate change adaptation, mitigation, and information dissemination efforts in the region.

Montana Climate Assessment (2017)

The 2017 Montana Climate Assessment (Whitlock et al., 2017) is a collaborative effort to synthesize, evaluate and disseminate information about climate change in Montana by focusing on three sectors: water, forests, and agriculture. It explores historic trends, projected changes and provides information for planners within the region.

Montana Climate Solutions Council (2019)

Governor Steve Bullock convened this council to deliver a Montana Climate Solutions 2020 with actionable recommendations and strategies for achieving a reduction in GHG emissions, identifying needs and gaps in climate science and building community resilience within Montana (MT-DEQ, 2020).

Blackfeet Climate Change Adaptation Plan (2018)

The Blackfeet Climate Change Adaptation Plan (Blackfeet Nation, 2018) is the result of a holistic planning process which reflects all parts of tribal government, Blackfeet traditional values, and the collective community vision for the future. It offers specific strategies and actions for multiple sectors: agriculture, cultural resources, fish, forestry, human health, land and range, water, and wildlife.

Climate Ready Missoula (2020)

Climate Ready Missoula (Climate Ready Missoula, 2021) focuses on adaptation guided by twelve principles for prioritizing and implementing climate adaptation goals.

City of Whitefish Climate Action Plan (2018)

The City of Whitefish has created a roadmap to community climate resilience with a focus on three commitments: transition to a clean energy economy, preparation for future climate-related impacts, and reduction of GHG emissions to create a carbon neutral city by 2050 (Whitefish MT, 2018).

Affiliated Tribes of Northwest Indians

The Affiliated Tribes of Northwest Indians climate change program offers a wide range of regionally relevant climate adaptation planning tools including an up-to-date and searchable database of grants, tribal adaptation plans, guidelines for incorporating Traditional Knowledge, and resources for tribal vulnerability assessments (ATNI 2020).

Climate Change and Impacts

The global climate is changing. Global emissions of greenhouse gasses, particularly associated with the burning of fossil fuels, pushed the amount of atmospheric carbon (carbon dioxide, or CO_2, that is in the air and that acts as a strong "greenhouse gas" that causes increased temperatures on average across the entire globe) over 410 parts per million in 2019. Although the Earth naturally cycles through higher and lower atmospheric carbon levels, the rate of increase of atmospheric carbon over the past 60 years is about 100 times faster than any known previous natural increases (Friedlingstein et al., 2019). The last time atmospheric carbon levels were as high as they are currently was 2-5 million years ago, when trees grew in Antarctica (Martínez-Botí et al., 2015).

The climate will always have "natural variability", but increased greenhouse gasses cause average global temperatures to rise. The Fourth National Climate Assessment (NCA) (USGCRP, 2018) finds that global average temperatures have already increased about 1.8°F from 1901-2016 and global temperatures could increase by a total of 3.6°F by mid-century with substantial climate mitigation action, up to 9°F without. Focusing on the United States, temperatures have increased similarly to global temperatures, and there have been “marked” changes in temperature extremes. For example, cold waves have decreased, and heat waves have increased in frequency since the 1900s. Annual average temperatures in the United States are projected to rise by about 2.5°F between 2021-2050, with substantially higher increases by later century; various scenarios suggest between 2.8° to 11.9°F.

The NCA makes clear that across the US, climate change will make stewardship of natural resources more complex and exacerbate already existing vulnerabilities to communities. The report summarizes that there is substantial evidence that climate change is already causing more frequent extreme weather events, increased average temperatures, and resulting damages to infrastructure, ecosystems, and social systems (NOAA, 2021). These impacts are expected to worsen over the next century. Specific examples include reductions in the quality and quantity of water, impacts to agriculture such as challenges to livestock health and declining crop yields, and transformation of some ecosystems that will impact “ecosystem services” – the benefits to humans gifted from healthy ecosystems, with resulting impacts to communities.

The NCA (USGCRP, 2018) suggests two primary means to reduce risks from climate change: 1) adaptation actions and 2) mitigation. Adaptation actions are the focus of this plan. Individuals, communities, regions, and nations can reduce impacts by managing both short- and long-term risks through five general stages: 1) awareness, 2) assessment, 3) planning, 4) implementation, and 5) monitoring and evaluation. This plan seeks to respond to the first two stages to support stages 3-5.

Mitigation – the reduction of climate risks through reduction in the emissions of green-house gasses (primarily reduced atmospheric carbon) – is also critical and is touched on throughout this report. If emissions begin to fall by 2020, there would still be a possible pathway to meeting the goals of the Paris Climate Accord, established in 2015. The pandemic of 2020 was a tragedy for many. One silver lining may be that reduced emissions during the pandemic may provide longer-term opportunities to avert a climate tragedy.

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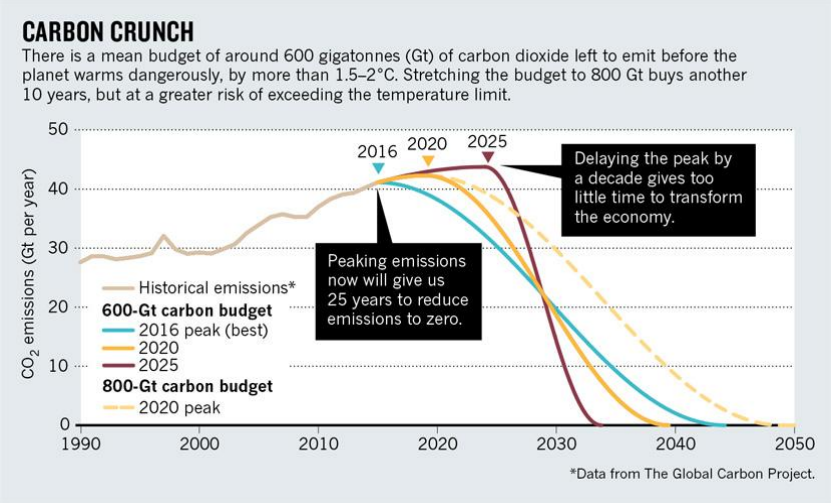


Figure 7: Figure from the Global Carbon Project.

Climate Change and Impacts Regionally

The Montana Climate Assessment (MCA) was completed in 2017 (Whitlock et al., 2017), assessed current and projected future climate change for all of Montana and for the western Montana region. Across the state, annual average temperatures have risen between 1950 and 2015 by 2.7°F. Winter and spring have experienced particularly rapid warming, with average temperatures rising by 3.0°F over the same time period. The decadal rate of increase (i.e., the temperature increase every 10 years since 1950) is approximately 0.42°F statewide in Montana, but has been slightly lower in western Montana, with a decadal rate of increase of 0.39°F. Western Montana has seen the greatest decadal rate of temperature increase in spring (0.49°F increase per decade from 1950 to 2015).

As reported by the MCA, projections for average annual warming in Montana range between 4.5° - 6.0°F by mid-century (lower range assuming atmospheric carbon emissions are stabilized, higher range assuming continued emissions along a "business as usual" scenario). By end of the century, average annual temperatures are projected to increase by anywhere between 5.6°-12.9°F, again depending on scenario and lower or higher ends of projected changes. These changes are projected to be relatively similar across the entire state, with the greatest warming occurring in the month of August. For the western portion of Montana, some of the most substantial projected changes are the reduction in the number of freeze-free days by mid- and end-of-century.

There have been no statewide historical changes in annual precipitation between 1950 and 2015; however, there have been seasonal changes in precipitation. Winter precipitation has decreased, while spring precipitation has increased in some parts of the state. The MCA analyses found that most climate projection models suggested that annual precipitation in Western Montana would slightly increase, with substantial increases in spring, although summers would likely be drier. Although all models considered in the MCA project increased temperatures, there is less agreement about the likely change in precipitation in the state.

Overall, the MCA found evidence for the following likely changes due to climate:

- Montana's growing season is increasing and is likely to continue to grow longer, however,

increased temperatures are likely to become disruptive for most crops. There will also likely be a reduction in range forage quality.

- Montana's snowpack has declined and is likely to continue to decline. There has been a historical shift toward earlier snowmelt and earlier peak spring runoff, which is likely to continue. This is likely to lead to reduced irrigation water, particularly in summer.
- Water temperatures are likely to increase in many parts of Montana, although streams in Western Montana may fare better than some other Rocky Mountain stream networks (Isaak et al. 2012).
- There is a projected likely increase in range weeds as well as crop and forest pests and pathogens.
- There is a projected increase in fire risk (probability of occurrence).

Climate Change and Impacts Locally

Many of the trends seen and expected in Western Montana are similar to those on the Flathead Reservation. On the Flathead Reservation, the total temperature increase has been 2.5° F, while the number of days above 90°F per year has, on average, tripled in the last century. Warming temperatures have caused widespread changes in fire regime vegetation compositions, structures, functions, and area extent, with increased wildland fire behavior. Additionally, rainfall is expected to stay near historic levels in the Flathead valley but increase on average 5% in the Mission Mountains. This will create a decline in winter snowpack. A shift in timing will be that precipitation falls less during summer months, and more during the winter as rain events. Part of this shift is the intensification of extreme storm events, accompanied by longer periods of dry weather in between.

The Native Waters on Arid Lands project is a collaboration among researchers, extension experts, educators, and tribal resource managers across the West. The Montana Climate Office and the CSKT have compiled place-based climate data sets, including temperature and precipitation data, using two scenarios for future greenhouse-gas emissions. Scenario one involves moderating emissions ("RCP 4.5"), and scenario two involves accelerating emissions ("RCP 8.5"). See the climate projections for the Flathead Reservation on page ( ). Appendix A presents a detailed description of projected climate impacts to the Flathead Reservation. The CSKT climate projection data provided are for two elevations on the Flathead Reservation – the lower elevation represents Mission Valley at 3,065 ft., and the higher elevation corresponds to the Mission Wilderness at 6,130 ft. General observations from these data include; 1) annual average temperatures are projected to be 5 to 10 ºF warmer than what has been experienced in the last half of the 20th century, 2) average annual precipitation is expected to stay near historic levels, 3) by 2100, the first snowfall will arrive 3–5 weeks later, 3) warming temperatures in the Mission Wilderness will lead to increased winter snowmelt, floods, and less spring/summer runoff, 4) Growing degree days will nearly double by 2100; however, the Mission Valley will likely see an average of 14 days annually with temperatures number at/above 100F, 5) Significant decreases are expected in winter precipitation that falls as snow vs. rain.

Climate Impacts on the Tribes

The National Climate Assessment specifically speaks to the challenges faced by Indigenous peoples, who are disproportionately affected as climate impacts culturally significant species and resources, leading to negative physical, spiritual, and mental health impacts.

Specific impacts of climate change on tribal communities are presented in the Fourth National Climate Assessment (NCA4) Chapter 15 (USGCRP, 2018): Tribes & Indigenous People. Key Findings from this chapter are 1) Indigenous livelihoods and economies are at risk, 2) Physical, mental, and Indigenous values-based health are at risk, and 3) Adaptation, disaster management, displacement, and community-led relocations are already happening. These findings underscore the critical nature of tribal-led and implemented climate adaptation actions. More details about NCA4 can be found at the US Global Change Research Program (USGCRP). URL: https://nca2018.globalchange.gov

Global warming is being driven primarily by anthropogenic emissions of greenhouse gases (GHG) from industrial nations, especially carbon dioxide (CO2) from the burning of fossil fuels in cars, transportation,

and heating and cooling, and methane (CH4) from agriculture, thawing tundra, and other sources. Factors driving the cycling of carbon on different land types including forests, grasslands, soils, and terrestrial wetlands are presented in the Second State of the Carbon Cycle Report (SOCCR2) released in 2018 by USGCRP in conjunction with (Cavallaro et al., 2018). An interactive version of this report is available at USGCRP at: https://carbon2018.globalchange.gov

Carbon cycling, resource extraction, and the importance of traditional practices in retaining carbon on Indigenous lands are illustrated in SOCCR2 Chapter 7: Tribal Lands (M. I. McCarthy et al., 2018). The CSKT Forest Management Plan and actions are presented as a case study of the role of the indigenous forest management approaches for sustaining forest health and reducing the impacts of climate change including the risk of catastrophic wildfires. *"Carbon stocks are affected by the distribution and health of both trees and culturally important understory plants. Although fire can release large amounts of carbon and carbon stocks and fluxes have not been explicitly measured on the Flathead Reservation, the reintroduction of these traditional practices is resulting in more sustainable and healthy forests that are more diverse and fire-resistant."*

Traditional Ecological Knowledge

Western science has brought many improvements, but at a cost. It has lost sight of the interconnectedness of all things. It has allowed societies to segregate the roles and different functions of each part of nature. The Tribe's aboriginal land is what has and continues to shape people. Native people to this land understand that these functions cannot be separated from each other. They understand that there is a direct relationship among everything in the natural environment. As such, Traditional Ecological Knowledge not only incorporates Tribal traditions and culture, but it also applies Salish, Qĺispė, and Kootenai world views into decision-making.

Tribal people have had a special relationship with the natural environment since time immemorial. They have used the plants for food and medicinal purposes, and to provide forage for grazing livestock, buffalo, and horses. They have used fire to help maintain the health and productivity of ecosystems. They have harvested traditional foods, such as roses for the rose hips, in this area for generations. This traditional knowledge brings a deep understanding of place, which brings a deep understanding of how climate change is affecting our lands.

When compared to traditional living over the last hundreds or thousands of years, practices have significantly changed. Maintaining ceremonies, traditions, languages, and spiritual ways of life is a choice. Climate change is happening within our lifetime. The impacts from this change can be positive and negative for the Tribes.

Traditional Ecological Knowledge has been passed down from generation to generation through stories and life experiences. This was and is a way of life. It will continue for generations to come.
– Kootenai Culture Committee

Although the Tribes are responsible for the natural resource management to meet multiple objectives, they recognize that the Tribal community have been active participants in shaping the landscape. The Tribe recognizes the importance of connection with cultural resources and understands that elders have a unique perspective and deep knowledge of the changing environment. Restoration of historic structures and functions of cultural-use plants, foods, habitat, and animals will remain a priority. Additionally, a continued understanding of place names will continue to be significant. Therefore, the Tribes will have continued Tribal Elder involvement in resource planning, because the importance of oral histories that convey the voice of ancestors is valued.



Tribal Elder Observations

Climate change observations have been made by Tribal elders whose ages are between 70 and 80 years old or more. However, the knowledge they gained from parents, grandparents, and great grandparents dates back from 150 to 250 years. As such, these Tribal elders have made important observations about climate change. To gather this knowledge, the Climate Change Planning Coordinator collaborated with the Salish/Pend d'Oreille Culture Committee, the Kootenai Culture Committee, and the Historic/Cultural Preservation Department to conduct elder interviews over months in 2021. Excerpts about personal experiences of climate change from interviews with Ignace Couture, Mike Durglo, Sr., Sadie Saloway, Stephen SmallSalmon, Patrick Pierre, and Louie Adams are included in this section.

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 used to ice skate from November to at least February ever year. [There was a] lot of ice out there. Nowadays 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 used 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 dad to driving cars. Some of them have seen guys going to the moon. So, that is the drastic change.

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 country 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 used 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.

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 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.

Sadie Saloway (Elmo, MT)

The huckleberries are just disappearing so fast. I have been away from there for 53 years, but the areas we used 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 used 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 SmallSalmon (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 snowpack. 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 climate] is changing. The life is changing. The world is changing. Everything is changing.

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

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

My elders used 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 are there bugs around, like those beetles? It's too dry. It's not cold enough to kill them and there is that question.

When I was young…my dog finds 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 used to say, "It's going to be cold." Yeah, sure enough, it was. We went by that, you know.

There. [lightning 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 chokecherries 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 Nkusm [students] to go out there. Some other people do go out there and study those medicine ways.

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 your hair grow. And things like that.

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 into a sweat and I prayed for the world. To me, I saw it is the people, you know. It is the people. 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 be undergoing 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.

Patrick Pierre (Camas Prairie, MT)

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 that 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.

I have seen a lot of these things that they talked about back then, and I witnessed it, and one of the thing 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 is

going to fill up, islands is going to flood and the earth here is going to be warm, summer time will be extremely hot, winter 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 it. 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 you're going to survive and today am witnessing forest fires burning thousands of acres right here on our Reservation. So these are 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 be observant all the time.

Louis Adams (Arlee, MT)

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 our 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 wintertime. 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 tress pop, it sounded like a rifle shot, then the coyote stories could come out, then in the spring when you hear the first thunder you put them away.

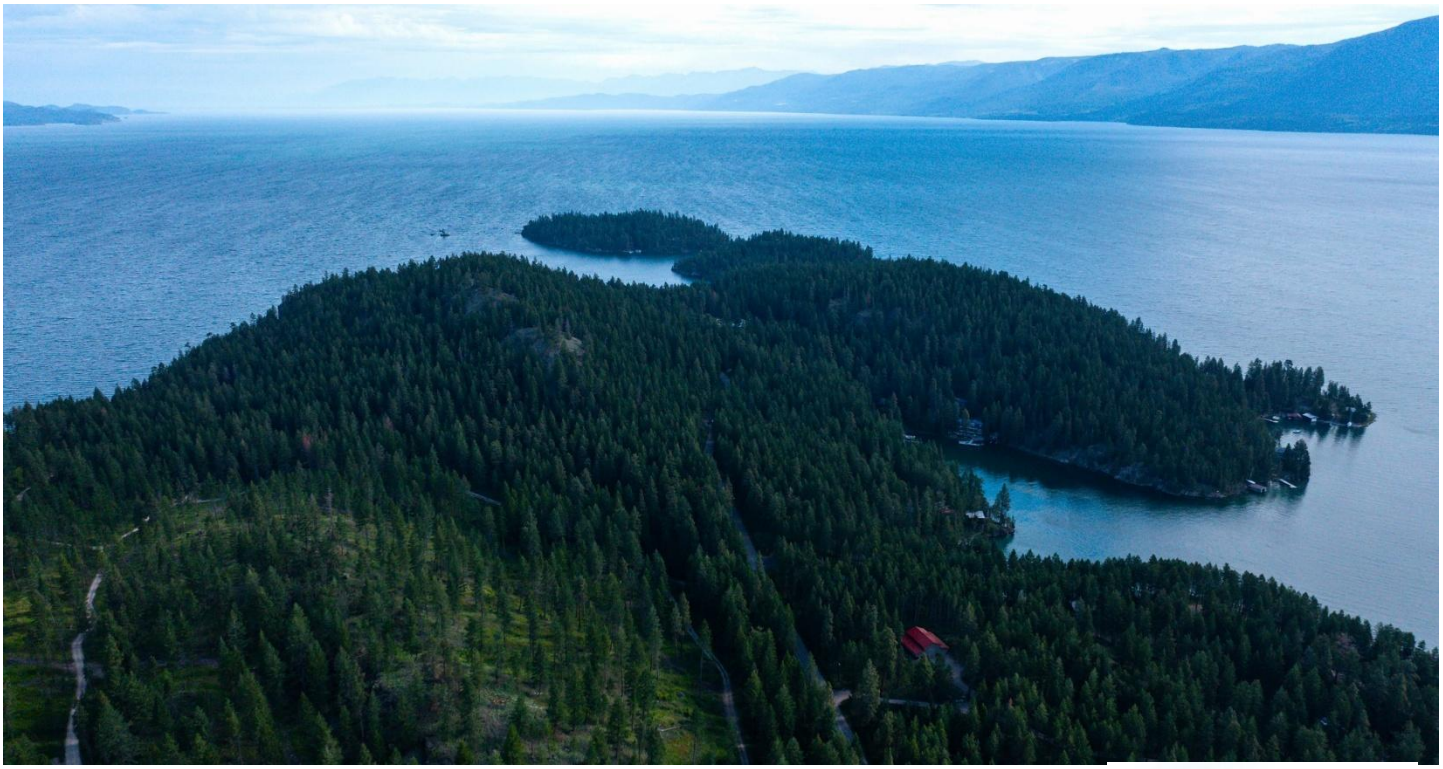
Up Valley Creek when I was young, we moved up there when I was nine years old, when the spring would break and the snow would start melting, Valley Creek would be just roaring, there would be brush going down the creek and stumps, now it's not like that. Yah, you get runoff and high water but nothing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

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 the 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.







Air Quality Sector



Clean air is vital to all living things, and the sky, wind, and air are foundational to tribal culture. As Pend d'Oreille poet, Heather Cahoon writes:

"Cold air flies wildly through the sky, the bare and frantic reaches of trees, and through the dying grasses on Camas Prairie. This wind knows me…"

(from "Blonde" in A Norton Anthology of Native Nations Poetry, 2020).

Introduction

Air quality often goes unnoticed until it has been compromised. Emissions from vehicles, boats, fireplaces, burning slash, and wildfire can pollute the air, harming the health of people, plants, and animals. Activities that lead to air pollution increase the concentration of particulate matter, reduce visibility, create foul odors, and can have severe health impacts on the communities of the Flathead Reservation. Poor air quality disproportionately affects tribes, as our cultural ways and livelihoods are closely tied to the environment. Additionally, historical and current inequities in how tribes have been treated have left some of the community more vulnerable to harmful exposure. Climate change will affect the air quality of the communities and locations across the reservation to varying degrees, as the complex geography and wind direction may maintain better air quality in some locations, and in others, like the Mission Valley, lead to frequent stagnation events when wildfires produce smoke that deteriorates air quality.

The Tribes have made continuous efforts over the last fifty years to protect and enhance the air quality on their lands. Established in 1979, the Tribal Air Quality

Program aims to monitor pollutants, provide essential data, and improve conditions. Through a strong effort by the CSKT, in 1980, Congress recognized the Flathead Reservation as a Class 1 airshed. This designation requires strict protection for air quality and is shared by national parks, wilderness areas, and several other reservations. (CSKT-Natural Resources, 2021).

The focus of the Air Quality Sector is to safeguard both the health of the CSKT community and the environment by monitoring airborne pollutants and implementing actions to preserve airshed quality. The tribe remains committed to advancing its air quality program, which maintains a database of air quality statistics and works to protect and improve air quality throughout the Reservation.

Climate Change and Air Quality

Climate change directly worsens air quality, as evidenced by the increasing occurrences of extremely high temperatures, prolonged droughts, shifts in seasonal precipitation patterns, and wildfires. Reductions of summer precipitation increase rates of allergens and higher ozone levels, as well as increase risks associated with dangerous fire behavior (Ebi et al., 2018). The report*, "Climate Change and Human Health in Montana"* (Adams et al., 2020) states that particulate matter (PM) is expected to increase as dust, pollen, and wildfire smoke become more common through more frequent drought conditions.

Wildfires are now the primary threat to clean air in Montana. Wildfires emit dangerous fine particles and gases that contribute to ozone formation and are also a significant source of PM pollution, particularly fine particulate matter known as PM2.5 (fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller). Wildfires that burn into residential areas release substantially more toxins, including aldehydes, benzene, and other emissions from the burning of plastics, insulation, and other manufactured products. Exposure to wildfire smoke carries public health implications as smoke increases the incidence of respiratory conditions such as asthma, pulmonary disease, bronchitis, pneumonia, and other illnesses such as heart attack and stroke. The effects of these particulates can be severe and lifelong (Nolte et al. 2018). The health effects of PM2.5 are often most significant for children, pregnant women, and the elderly (Liu et al., 2017; Blackfeet Nation, 2018; Ebi et al., 2018). These particulates pose the most significant risk to human health due to their extremely small sizes and ability to move from our lungs into our bloodstreams (U.S. EPA, 2021b). Wildfire smoke also affects mental health as folks, especially children, the elderly, and pregnant women, are encouraged to stay indoors until the smoke clears (Liu et al., 2017).

Smoke from wildfires in other states and Canada often blows into Montana due to the jet stream and regional wind patterns. The large-scale impacts of climate change on wildfires are therefore of great importance for air quality in Montana and on the Flathead Reservation. Since the 1970s, wildfires across the West have become significantly larger and more frequent, and this trend is expected to continue under a changing climate (Barbero et al., 2015; Halofsky, Peterson, & Harvey, 2020; Riley & Loehman, 2016; Pederson et al., 2010). On average, wildfire seasons start earlier in the year now and last longer: fire season is approximately 78 days longer each year than it was in the 1970's (USDA, 2015). The shifts in wildfire patterns due to hotter, drier climatic conditions are compounded by an increase in the number of people building homes in the "fire zone," and because of decades of wildfire suppression in the West (Westerling, 2016).



Figure 8: The Elmo Fire burns near Elmo and Dayton on the western shore of Flathead Lake on August 1, 2022. Photo Credit: Hunter D'Antuono.

In 2017, Montana had a historically bad fire season, with 1.2 million acres of its 94 million acres burning. 2020 marked another major year of fire activity, setting new records for the highest number of acres burned in the US. These fires filled the air with particulate matter (PM2.5). The trend of worsening fire seasons is going to continue in the future. Additionally, the spread of noxious weeds predicted under climate change models will worsen wildfires and cause more damage during the wildfire season through increased dry biomass (Adams et al., 2020). The impact of West Coast fires on air quality in Montana as the climate continues to change is very important, as most of the smoke is expected to flow straight to western Montana. Researchers suggest this adds a new health risk to the discussion of climate change. Between 2004 and 2009, wildfire smoke was the source for 71 percent of the pollution on hazardous air quality days identified by health officials (Liu et al., 2016). Scientists predict the number of hazardous air quality days will increase by almost two-thirds as the climate warms into the middle of the 21st century (Liu et al., 2016).

"Hazardous air quality during extreme forest fires has affected my lungs and breathing."-Member of CSKT

High temperatures and hazardous air quality can create a dangerous combination for people who do not have air conditioning or other effective means of cooling their homes. Households without cooling systems often shut windows and airflow to keep out smoke, causing indoor temperatures to become uncomfortable or potentially dangerous. Predictions of increased heatwaves suggest that there will be no relief from lower overnight temperatures; this can be a particularly hazardous situation for vulnerable populations. Air quality is also reduced when the heat index is high, which is the combination of the temperature and relative humidity that the human body experiences under the assumption of light wind and shady conditions, which are frequently more extreme in real-world conditions. With the number of days above 90 degrees F increasing, having tripled over the last century, heat stress and stroke will become an increasing issue.

Challenges

CSKT is a Class I airshed, with standards similar to national parks and the highest level of protection under the Clean Air Act (Swaney, 2005). An 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) (U.S. EPA, 2021a). An area may be an attainment area for one pollutant and a non-attainment area for others. Two areas within the Flathead Nation's boundaries are classified as non-attainment for PM10: Ronan and Polson (CSKT-Air, 2015). Planning priorities are to continue to address Polson's Non-attainment Particulate Matter for PM10, Ronan's Non-attainment Particulate Matter for PM10, and the Prevention of Significant Deterioration (PSD) of criteria pollutants within the exterior boundaries of the Reservation. The geographical impacts are localized health impacts in non-attainment areas and extend to widespread impacts in the PSD.

The non-attainment areas of Ronan, MT, and Polson, MT are likely to experience increases in dust due to projected drought conditions, human activity through daily community activities, and construction through the expansion of infrastructure. Finer particulates from smoke will occur during increased wildfire activity. Outside of the city limits of Ronan and Polson, the extent of dust impacts will be less acute due to decreased anthropogenic activity. However, unpaved roads are a consistent producer of dust, and human activity through agriculture produces many dust particulates that reduce air quality. A lack of cover cropping in agricultural fields creates worsened dust conditions, as the ground is exposed and the lack of soil moisture allows the soil to be carried away in windy conditions.

A water shortage due to drought could affect CSKT's ability to suppress dust. One of the tools used in the past to suppress dust was water. Recently, the use of magnesium chloride has become increasingly important in dust suppression, and continued use is expected for the future. The use of magnesium chloride on roads raises questions about potential effects on stream health, fish, and other aquatic wildlife, as chloride-based deicers and dust suppressors can increase the salinity of rivers, streams, lakes, and groundwater. Climate change will necessitate careful monitoring of

the potential for drought and the evaluation of the effectiveness and safety of magnesium chloride as a solution for dust suppression.

The community also faces challenges related to air quality at the ground level. Between wildlife, high vehicle usage, open burning without a permit, industrial production, and the burning of plastics and other waste, air quality is affected. Idling of vehicles negatively affects air quality. It will be a challenge to switch from gas-powered vehicles to electric vehicles, which is a potential solution, due to a lack of Infrastructure for EV charging, federal funding for EV programs, and the public's inability to afford buying an EV at a scale that would reduce emissions.

The tribe also faces numerous limitations that must be overcome to improve its conditions. The Environmental Protection Agency (EPA), which funds CSKT's Air Quality Program, has limited resources, and allocating funding to air quality projects is a costly and time-consuming endeavor. Another issue is the limited time for the CSKT Legal Department to work on the air quality ordinance. Additionally, the regulations to be removed from non-attainment status pose a challenge to continued policy implementation. A robust Air Quality Program will be key to addressing the challenges of air pollution on the Flathead Reservation. Creating a long-term plan for the program and hiring staff will help address these challenges.

Beyond The Physical

The natural environment in and around the Flathead Reservation is a beautiful and biologically rich place, and the CSKT hold a sacred relationship with this land. The landscape also serves as a stimulus for community and economic development on the Flathead Reservation for visitors. When tribal members or visitors are unable to witness or experience the beauty of the Reservation due to air pollution and smoke, this hinders economic and community growth. Protecting and enhancing the natural environment is crucial to improving the overall well-being of the Reservation. Poor air quality affects our non-human kin. The animals, rivers, and forests are also negatively impacted by harmful air pollution and the limited visibility from smoke and smog. Pollutants in the air are stressors on the natural environment. In combination with climate change, this stress can be damaging and cause deleterious effects on the flora and fauna of the area.

"Ever since I got older, the air really means something now. We take it for granted when we are young. We talk about air stuff that controls all your body. When the air is bad, you don't feel good." – 2016 Climate Change Strategic Plan

Problem Solving

The CSKT Air Quality Program is adopting an integrated management approach to address air quality concerns and long-term risks associated with climate change on the Flathead Reservation. A significant component of the approach is ongoing monitoring and assessments to guide decision-making and enable the development of warning systems, outreach, and enforcement of policies that protect air quality. Here are the ways CSKT is problem solving for Air Quality:

Monitoring and Assessment

- Monitoring air quality changes through inventories and assessments.
- Investing in the PurpleAir Quality Monitoring Network, with real-time public access to data.
- Utilizing data from the PurpleAir Quality Monitoring and Mesonet station to further tribal research and goals.
- Used the 3 EPA air quality monitoring stations until the end of their program.
- Continue and expand use through the guidance of the EPA's Interagency Method of Protecting Visual Environments (IMPROVE) monitoring.

Outreach and Enforcement

- Continuing to develop methods for educating people about air quality standards.
- Creating an understanding that the effects of air pollution go beyond the physical and affect mental health.
- Enforcing burn bans, ensuring the use of burn permits, regulating recreational fire usage, and

encouraging collaboration with the local fire department for burning slash on private property.
- Establishing initiatives for developing and enforcing stringent air quality standards within surrounding airsheds.

Community and School Engagement

- The CSKT Air Quality Program has worked with school sports programs to keep students inside during times of low air quality. The Program Manager works with the Tribal Communications Director to alert people to decide whether to stay inside during times of low air quality, or use systems to alert if indoor air quality is also bad. This can be used to inform future maintenance and HVAC improvements and investments.
- Expand the use of the notification system for poor air quality days due to wildfire smoke. CSKT Division of Fire uses CSKT.org for a live updates page that announces active fires, burn bans, and fire danger updates to share critical information with the public.

Dust Suppression and Land Use Planning

- Magnesium chloride, sand, and gravel are being used for dust abatement.
- In the Spring of 2018, the Lake County Commissioners agreed to keep their development density map as an advisory document when reviewing new, proposed land subdivisions. The CSKT uses this map in addition to a Tribal Land Suitability map to keep development densities lower in areas far from
- Establish a baseline for carbon emissions (CO).
- Establish a baseline for methane emissions. Missoula has a system in place that may serve as a model for implementation.
- Update the Emissions Inventory (0-10 years) to track sources and trends.
- Work with EPA in Denver to complete the Tribal Minor New Source Review assessment (0-10 years).
- Pave selected backroads (e.g., Lake County) to reduce dust pollution.

towns, thereby reducing the number of vehicle trips. These are not regulatory documents, but they are used as guidance. The density and land suitability maps encourage higher density development to occur closer to towns and lower density away from towns.
- Increase the number of filters and box fans, or HEPA filters. These need to be stock piled, maintained, and available for people to use.
- Tribal building and school HVAC's need to be managed properly with higher grade filters and turn off fresh air intakes during low air quality days.

Goals and Adaptation Strategies

The CSKT Air Quality Department is focusing on improving community resilience and preparing for future climate-related air quality Impacts. Adaptation efforts have been ongoing with continued efforts to maintain attainment and prevent significant air quality deterioration in other areas. The department seeks to conduct long-term adaptation and has identified several key strategies.

The Confederated Salish and Kootenai Tribes plan to maintain and extend current air quality programs. Preparing for a future that is influenced by the changing climate is a responsibility of the community and the tribal government. The CSKT Climate Change Strategic Plan outlines these goals for 2025 onwards. The list below outlines the tribe's goals for the future, focusing on improving air quality, health, and safety in your community. The Climate Change Action Committee lists ten goals to focus on in the coming years:

- Advance the development density map from advisory to regulatory status.
- Develop and pass a tribal burning ordinance to reduce harmful emissions.
- Provide and distribute air filters to schools during wildfires.
- Encourage single-family protection during periods of intense smoke (use box fans with air filters)
- Oppose the establishment of biomass facilities on the Reservation.

To support these actions, through existing authority, the Tribes have “Treatment as State” for management of the airshed within the exterior boundaries of the Reservation under the Tribal Authority Rule of the Clean Air Act. The Flathead Reservation is a Class I airshed 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). These tools allow CSKT to implement and enforce air quality management strategies across the Reservation.

It is critical to implement current and scientifically backed policy and processes that are in development to implement actions to mitigate poor indoor air in all Tribal buildings. It is good practice to add air quality alerts to the current RAVE system to notify responsible parties to act in response to air quality concerns.

Some of the successful goals and adaptation strategies have been accomplished in the last three years through the Native Drought Resilience Project, which CSKT used to create climate resilience programs and projects. The Lifeways model guides the Native Drought Resilience Project and has broad-reaching impacts across all eight sectors, as it drew from the 2020 draft and 2016 climate change strategic plan. This project has yielded numerous positive outcomes, enhancing all aspects of tribal readiness to climate impacts.

The communities of Ronan, Polson, and Lake County, MT, engage in mitigation efforts to reduce dust. One such activity is the use of state-of-the-art street sweepers that are employed at a minimum every Friday. Street sweeping has made a big difference in non-attainment. Other predicted pollutant increases due to climate change include increases in Ozone. However, the base emissions rate in these communities is well below the threshold levels set by the Environmental Protection Agency (EPA).

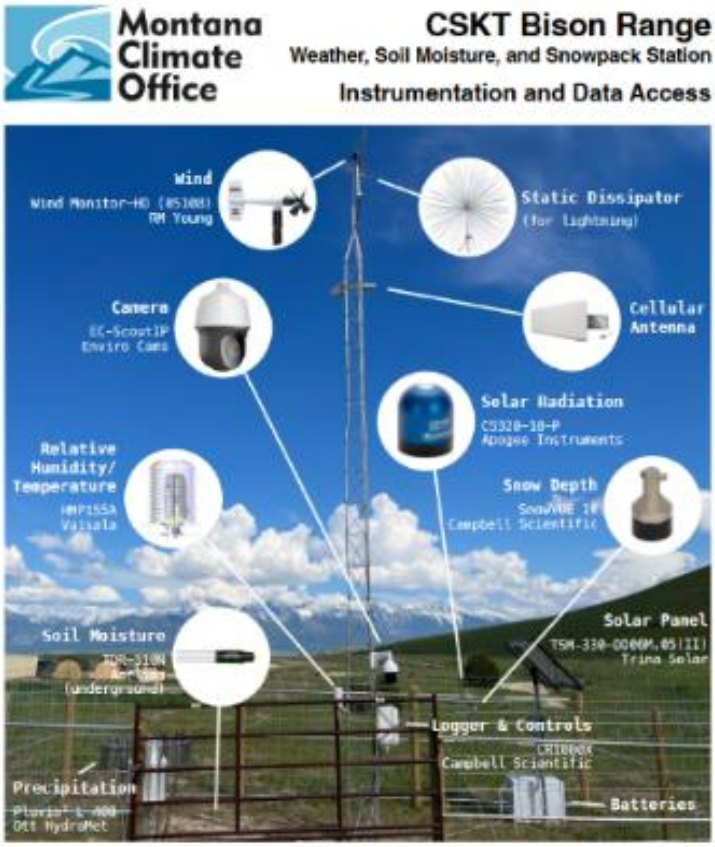


Figure 9: Instrumentation of the CSKT Bison Range Mesonet Station. Montana Climate Office.

Native Drought Resilience Project: Confederated Salish & Kootenai Tribes (CSKT) Actions for Climate-Drought Adaptation

CSKT partnered with NOAA, NIDIS, and the Montana Climate Office for a project that built tribal capacity to monitor, understand, and respond to climate and drought impacts on the Flathead Reservation. The project identified five primary goals from this Climate Change Strategic Plan to enhance climate resilience through collaborative projects over three years.

Key Accomplishments that were implemented to improve outcomes for the CSKT and the Flathead Reservation:

Deployed Mesonet weather Station and PurpleAir air Quality Monitoring networks

In May of 2023, CSKT and the Montana Climate Office installed the Bison Range Mesonet station, the western-most HydroMet weather Station in Montana, and the first one on the Flathead Reservation. HydroMet weather stations provide high-quality, real-time weather, snowpack, and soil moisture data. This creates a total water record for the Bison Range and the Flathead Reservation, a first for the region. The data is collected every 5 minutes and can be viewed at csktclimate.org or the Bison Range Mesonet Dashboard on the Montana Climate Office website. Alongside this, 44 PurpleAir PM2.5 sensors were deployed at schools, health clinics, and the Tribal Council building to provide localized air quality monitoring, improving responses to wildfire smoke both indoors and outdoors.

Designed eight Story Maps

The CSKT Climate Change Strategic Plan StoryMap Series highlights each of the eight sectors of the Climate Change Strategic Plan in a living document that can be easily and continually updated. These multimedia maps combine live data, videos, imagery, and links to make the challenges, goals, and achievements of the CSKT's work in the Climate Change Strategic Plan accessible to the community.

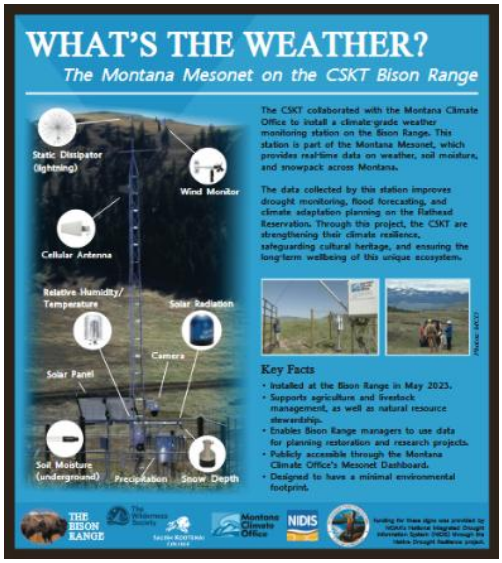
Updated the 2020 CSKT Climate Change Strategic Plan

The 2020 Climate Change Strategic Plan was revised into the 2025 version, integrating the lifeways model and reflecting the ongoing achievements of the CSKT in strengthening community resilience to climate change. This update shares all of the continued efforts the Tribe has made in the different sectors for overcoming challenges and problem solving the unique issues that each face. This builds on all of the previous work that the CSKT have done.

Enhanced the Upper Missouri River Basin Drought Monitoring & Indicators Dashboard

To support CSKT's drought and wildfire planning, new features were added, such as the local-scale zoom and the Forest Drought Response Index (ForDRI). This is a





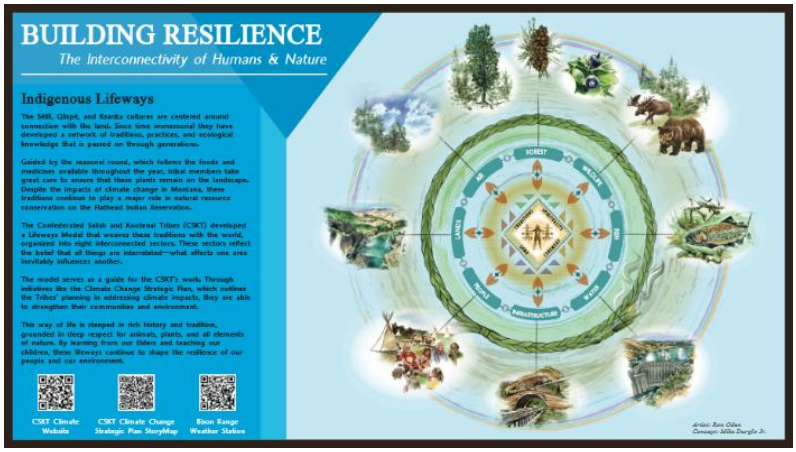


Figure 9: The three interpretive signs installed on the Grassland Trail at the CSKT Bison Range Visitor's Center. Signs designed by Christine Layeux, Emily Rorlach, and Stephanie Gillin.

monitoring tool for forest drought conditions. The ForDRI presents a weekly depiction of drought-related forest stress across the continental U.S. created by the National Drought Mitigation Center.

Created training tools and conducted Public Outreach and Communications

Online training modules and webinars were developed to help users learn how to use Mesonet and drought dashboard data. The series is hosted on the Montana Climate Office, where users can learn how to understand models for drought indices and precipitation models, and how they can provide input for drought designations across the reservation and state.

Designed and installed interpretive signs at the CSKT Bison Range Mesonet Station

Three interpretive signs were installed on the Grassland Trail behind the Bison Range Visitors Center to share information on the Mesonet station, climate and drought impacts on Bison Range ecosystems, and how the CSKT's way of interacting with the natural world has guided all of the resilience work within the Native Drought Resilience Project to build resilience for climate change impacts.

Impacts and Outcomes

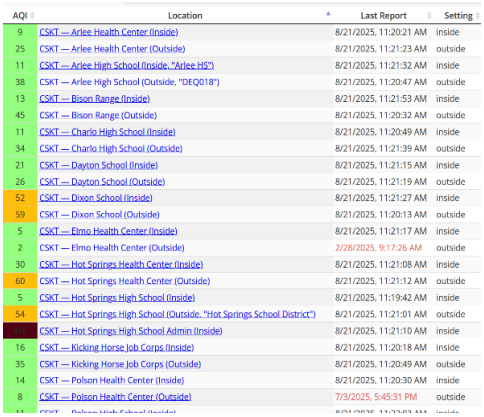
The Native Drought Resilience Project has expanded CSKT's monitoring capacity, strengthened local decision-making, and improved climate readiness across the Reservation. These accomplishments have created a blueprint for replicating this work in other tribal nations to strengthen their resilience efforts.

CSKT PurpleAir Monitoring Network

The PurpleAir Monitoring Project is a key initiative within the Native Drought Resilience Project, funded by NOAA's National Integrated Drought Information System (NIDIS) and implemented by Salish Kootenai College Extension (SKCE) and the Montana Climate Office (MCO). This project has deployed 44 PurpleAir PM2.5 air quality sensors throughout the Flathead Reservation, collocated indoors and outdoors at every elementary school, multiple tribal health clinics, the Tribal Council building, and fitness facilities. PurpleAir sensors are low-cost, high-precision monitors that measure fine particulate matter (PM2.5) using Wi-Fi for real-time air quality data. Their affordability enables the deployment of a high-density sensor network providing localized air quality monitoring for the Tribe.



Figure 11: PurpleAir Air Quality Sensor. Photo by Kyle Bocinsky.



AQI	Location	Last Report	Setting
9	CSKT — Arlee Health Center (Inside)	8/21/2025, 11:20:21 AM	inside
25	CSKT — Arlee Health Center (Outside)	8/21/2025, 11:21:23 AM	outside
11	CSKT — Arlee High School (Inside, "Arlee HS")	8/21/2025, 11:21:32 AM	inside
38	CSKT — Arlee High School (Outside, "DEQ018")	8/21/2025, 11:20:47 AM	outside
13	CSKT — Bison Range (Inside)	8/21/2025, 11:21:53 AM	inside
45	CSKT — Bison Range (Outside)	8/21/2025, 11:20:32 AM	outside
11	CSKT — Charlo High School (Inside)	8/21/2025, 11:20:49 AM	inside
34	CSKT — Charlo High School (Outside)	8/21/2025, 11:21:39 AM	outside
21	CSKT — Dayton School (Inside)	8/21/2025, 11:21:15 AM	inside
26	CSKT — Dayton School (Outside)	8/21/2025, 11:21:19 AM	outside
52	CSKT — Dixon School (Inside)	8/21/2025, 11:21:27 AM	inside
59	CSKT — Dixon School (Outside)	8/21/2025, 11:20:13 AM	outside
5	CSKT — Elmo Health Center (Inside)	8/21/2025, 11:21:17 AM	inside
2	CSKT — Elmo Health Center (Outside)	2/28/2025, 9:17:26 AM	outside
30	CSKT — Hot Springs Health Center (Inside)	8/21/2025, 11:21:08 AM	inside
60	CSKT — Hot Springs Health Center (Outside)	8/21/2025, 11:21:12 AM	outside
5	CSKT — Hot Springs High School (Inside)	8/21/2025, 11:19:42 AM	inside
54	CSKT — Hot Springs High School (Outside, "Hot Springs School District")	8/21/2025, 11:21:01 AM	outside
[illegible]	CSKT — Hot Springs High School Admin (Inside)	8/21/2025, 11:21:10 AM	inside
16	CSKT — Kicking Horse Job Corps (Inside)	8/21/2025, 11:20:18 AM	inside
35	CSKT — Kicking Horse Job Corps (Outside)	8/21/2025, 11:20:49 AM	outside
14	CSKT — Polson Health Center (Inside)	8/21/2025, 11:20:30 AM	inside
8	CSKT — Polson Health Center (Outside)	7/3/2025, 5:45:31 PM	outside

Figure 10: View of CSKT PurpleAir Sensor Data page.

This project responds to the CSKT's desire for greater sovereignty over environmental monitoring and improving the understanding of air quality across the reservation, mainly due to the increase in wildfire smoke exposure throughout Montana. The initial effort to create a network was made possible through the donation of seven air monitors by Dr. Lori Byron, a member of Montana Health Professionals for a Healthy Climate. The network expanded to focus on the most critical populations and locations across the Flathead Reservation, especially where vulnerable populations, children, and elders spend their time. Placing Purple Air monitors outside provides a baseline of the air quality in the area. By placing sensors both indoors and outdoors, the project enables comparisons that help assess the air quality at healthy and safe levels. Tribal members have utilized the data from these monitors to upgrade the heating system at Arlee Elementary School to all-electric, following the discovery that the school's coal-burning furnace was emitting high levels of PM2.5 particles.

SKCE created monitoring protocols to ensure that the sensor network can be continually maintained and troubleshooted if necessary. SKCE also led efforts for education, outreach, and community engagement. Staff co-designed classroom activities that use PurpleAir data to teach science concepts and empowered students as science communicators through in-class presentations, flag systems, and posters. SKC has also created webinars, community training, signs, and outreach materials to help the community engage with air quality and climate. Publicly available sensor data is available through the CSKT Climate website, PurpleAirNow.com, and a live sensor dashboard for the Flathead Reservation.

As part of the development of this project long term coordination and action needs to be taken by administrators, facility managers, and the air quality personnel during smoke events so this program can continue to benefit children and community members. This can ensure the burden of maintenance and alert does not fall on a few shoulders, but is implemented as a beneficial community endeavor. This can include the additional efforts during smoke events as mitigations in the form of bringing out box fan filters, HEPA filters, using high quality Merv 13-15 filters, and making the decision to turn off fresh air intakes. The proper actions and responses will take adjustment to get used to, but following protocols and directions developed from this project will continue to benefit the community and improve indoor air quality.

Partners and Potential Funding Sources

Continued air quality funding needs will be determined and prioritized for maintenance, monitoring, remediation, and to support the development and management of the Air Quality Program's projects, staffing, and funding opportunities. The Environmental Protection Agency Section 103 and 105 grants are potential funding sources to be utilized. Listed below are potential and current partners.

- Environmental Protection Agency
- Lake, Sanders, Missoula, and Flathead Counties
- Municipalities including Polson, Ronan, Hot Springs, St. Ignatius
- University of Montana
- Montana Climate Office
- Montana Health Professionals for a Healthy Climate



Figure 12: Flathead Lake on day when the air quality is good on the Flathead Reservation.



Photo Credit: Hunter D'Antuono

Forestry Sector



"These Mountains belong to our children, and when our children grow old, they will belong to their children. In this way and for this reason, these mountains are sacred" - Flathead Culture Committee, 1977

Introduction

For thousands of years, the Séliš, Ksanka, and Qlispé (Salish, Kootenai, and Pend d'Oreille) derived much of their living from forests: The forests provided food, medicine, shelter, and beauty (CSKT-Forestry, 2000). The Salish and Kootenai people practiced a cyclical way of life based on the harvest and seasonal abundance of the tremendous variety of plants and wildlife that live on the lands. This way of life was deeply rooted in a spiritual tradition in which people, both individually and collectively, respected and sought help from animals, plants, and other elements of the natural environment. In many aspects of their mode of subsistence, our ancestors sought to conserve resources for future generations. These tribal ways of life continue to this day, highlighting the importance of maintaining forests and open landscapes, as well as the wildlife that depend on them, for future generations.

The Forestry Department carries forward this responsibility with the mission:

"To promote perpetually productive ecosystems for future generations in accordance with goals of the Confederated Salish, Pend d'Oreille, and Kootenai Tribes. We will prescribe and implement sound silvicultural treatments to promote forest health and return forest lands to near pre-settlement, fire-maintained forest structures. Our decisions will be based on Tribal social and economic needs, as well as sound scientific and ecological principles."

The Forestry Department manages forestland timber, rangelands, and associated shrub and forb vegetation on Tribal and Individual Trust and Tribal Fee forested lands within the exterior boundary of the Flathead Reservation. The Forestry Department is organized into five divisions: The Timber Sales Program, which does sale planning and sale administration, the Forest Management and Inventory Program, which has the permit office and manages Allotment Forester, the Forest Development Program, which has TSI, greenhouses, and manages reforestation, and the Division of Fire, which handles fire prevention, prescribed fires, and fuels, and wildland fire operations. The Tribe's Disaster Emergency Services department has been in this department. In 2025, this department was moved to the Natural Resources Department. These divisions manage their activities through the Flathead Indian Reservation Forest Management Plan, created in 2000, amended in 2005, and plans for a new update are underway in 2025. The update will incorporate the guidance of this document. Fire management is a central responsibility of all of the divisions of the Forestry Department.



Figure 13: Flathead Fire Regimes, by David Rockwell. Data from CSKT Division of Forestry.

The Forestry Department uses four fire regime categories defined in the Forest Management Plan (CSKT-Forestry, 2000): Non-Lethal, Mixed, Lethal, and Timberline Fire Regimes. Each is characterized by frequency, intensity, size, seasonality, and severity.

Wildfire, though destructive at times, is a natural process that shapes ecosystems by creating mosaics of vegetation stands in different age classes and species. Wildfire holds the role of a natural disturbance that initiates change within most ecosystems in regular intervals. Controls to fire regimes include climate, topography, sources of ignition, frequency of ignition, fuel quantity/availability, age class, seral stages, scheduled fuel treatments, and size of the units (firebreaks), and whether the fire regime is self-regulating. One way to show how landscapes have changed over time is to compare recent fire regimes to past burns. Knowing historical conditions helps clarify the type, extent, and ecosystem changes resulting from recent and past burns.

In Montana, Ponderosa Pine (*Pinus ponderosa*) forests are the dominant forest vegetation in lower elevations. Low-intensity, high-frequency return intervals, or non-lethal or mixed fire regimes characterize historic Ponderosa pine forest fire regimes. Seedling establishment depends less on light than on soil moisture, and periodic regeneration typically produces clumped age distributions. These clumps create natural fuel breaks around younger cohorts, limiting the potential spread of high-intensity fires.

Douglas fir (Pseudotsuga menziesii) represents the other dominant forest type in the region. Douglas fir fire regimes have an average return interval of 30 to 100 years with significant variability in spatial extent (with no cyclic periodicity). This would be considered a lethal fire regime. The intensity is typically high and varies with the terrain of the stand. This leads to lengthy regeneration periods and a lack of seed sources, which increases fire susceptibility during regeneration.

At higher elevations, western subalpine forests, which are predominantly made up of subalpine fir, Whitebark pine, spruce, and larch, are highly susceptible to wildfire. The fire regime of western Subalpine forests is characterized by high intensity and low frequency. The return intervals can range from 50 to 1500 years. Most of the fires in this lethal forest regime are stand-

replacing. This results in a lengthy regeneration period, often exceeding 100 years.

The Confederated Salish and Kootenai Tribes (CSKT) own 488,269 acres of forested land across the Flathead Reservation, of which the Forestry department manages approximately 260,000 of those acres as available for commercial timber harvest. To ensure sustainability, the Forestry Management Plan stipulates that timber harvests are limited to a specific allowable cut (AC) maximum of 18.1 million board feet annually. In practice, the CSKT have cut only around 8.27 million board feet annually for the last decade, far under the maximum harvest limit. Timber harvest has been the second-largest revenue-generating practice on Tribal lands, although the job sector has been in decline. The tribe also manages the forests for fish, wildlife, recreation, cultural and scenic resources, and watershed protection (CSKT-CRP, 1996).

"The goal is to build resilient forests, looking at landscape level with fire as a part of the landscape. This is unique to CSKT: to have a forest plan that recognizes fire".

Climate Change and Forestry

Climate change will have both direct and indirect effects on forests and other vegetation. Direct effects are forest impacts that arise directly in response to changes in temperature and precipitation; indirect effects are secondary impacts, such as an increase in the number of fires. General summaries of these two types of impacts are taken from the Montana Climate Assessment (MCA) (Whitlock et al., 2017), highlighting the potential indirect impacts of fire on Tribal Lands based on the four fire regime categories.

Direct Impacts

Higher average daily temperatures during the summer months, coupled with decreased precipitation (i.e., longer seasonal droughts each summer) have resulted in direct impacts on trees and other vegetation from increased moisture stress and mortality in many species, although the severity of these impacts varies across species and geography (Whitlock et al., 2017; Vose et al., 2018). As summarized in the MCA (Whitlock et al., 2017), direct impacts to forests, as well as other land cover types, are likely to continue from climate change, particularly increased temperatures and atmospheric carbon. These shifts can have both positive and negative direct effects on vegetation establishment and regeneration, growth and productivity, and mortality. Overall, the MCA projects that adverse impacts will outweigh positive impacts, particularly in drier areas. For example, increased atmospheric carbon concentrations can improve vegetation establishment, growth, and productivity. However, hotter annual temperatures reduce growth and productivity due to stress, particularly in water-limited areas, and extreme temperatures can lead to direct mortality of trees and vegetation over time as impacts compound.

Indirect Impacts

Indirect impacts from climate change, particularly from disturbances caused by beetles and severe wildfires, are expected to be the major drivers of vegetation change under a warming climate. Over the past decades, the increased survival and expansion of mountain pine beetles have been due to a lack of extended cold periods in the winter. Cold winter temperatures typically keep populations at normal levels. The trend of warming in the western US has led to population explosions and caused the severe stress and death of thousands of acres of lodgepole pine forest. Mountain pine beetles lay their eggs within the bark of trees and introduce a fungus that prevents the tree from properly producing tree pitch to defend itself. Additionally, as beetles chew on the sapwood, they release pheromones that attract others to the host tree. This pattern is repeated throughout the forest, leaving trees stressed and weakened. Drought conditions, extreme temperatures, and weather events will lead to increased mortality in vulnerable stands over time.(Vose et al., 2018). Overall, throughout Montana, increases in bark beetle survival over winter, with accompanying increases in beetle-caused tree mortality, are likely to continue and worsen. It is unclear how climate-induced changes will affect other insects and forest pathogens.

Wildfire

A primary indirect impact of climate change on forestry is the increase in wildfire activity. Across Montana, wildfire activity is increasing as hotter and drier conditions, known as fire weather, become more common. Higher temperatures and drought conditions,

which lead to high fire risk (i.e., likelihood of occurrence), are happening every summer. These temperatures and the number of high heat days from climate change are causing widespread changes in vegetation and fuels, leading to concurrent increased frequency and extent of wildland fire (Abatzoglou & Williams, 2016). Shifts in precipitation patterns also increase fire hazards. Wetter springs can result in faster-growing vegetation and more fuels; however, those fuels are likely to be drier during the hottest months of late summer, when summer precipitation is reduced. Wildfire severity will increase as a result of decreased winter precipitation, such as snowpack, earlier snow melt, and dry fuels during critical fire months. (Abatzoglou & Williams, 2016; A. L. Westerling 2006; Anthony LeRoy & Westerling, 2016).

Combined, these factors have led to the fire season lengthening globally between 1979 and 2013. Fires have also increased in number and acres across the West, including Montana. Over the recent 20-year period from 1998 to 2017, 1,572 wildfires burned 139,956 acres of the Flathead Indian Reservation's forested lands. Fire activity in 2017 was pervasive (CSKT-Forestry, 2020). Current research projects continue projecting increases in fire frequency and size, and substantial increases in fire season length, throughout the western US (Halofsky, Peterson, & Harvey, 2020; Pederson et al. 2010; Barbero et al., n.d.; Riley and Loehman, 2016).

Compounding climate change impacts on fire regimes across the western US are fuel loads and tree densities that are magnified due to national fire suppression policy and practice, which began in the 1920s. Projections indicate an increase in fire risk (i.e., probability of occurrence) in the coming century, with the most significant increases in risk in lower-elevation forests. Natural climate cycles, characterized by the cycles of warmer, drier climate phases often follow cooler, wetter ones that occur through the El Niño Southern Oscillation (ENSO) or Pacific Decadal Oscillation (PDO); however, the factors mentioned above, compounded with the hazards of backlogged forest management, will increase the likelihood of severe, stand-replacing wildfires (NOAA, 2025).

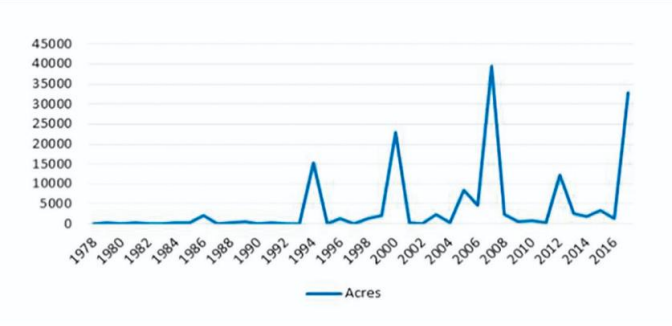


Figure 14: Trend of annual acres burned by wildfires on the Flathead Reservation between 1978 and 2017. Numbers in graph are from the CSKT Division of Fire Management, numbers from a field trip fire history handout. Graph made by Monique Wynecoop, USDA Colville National Forest.

Impacts to Fire Regimes on Tribal Lands

Specific to the Flathead Reservation lands, we review projected changes to the four fire regime types used by CSKT managers (CSKT-Forestry, 2000). In general, fire regimes are expected to shift up in elevation, increasing the upper and lower limits of each regime.

Non-Lethal Fire Regime areas are expected to shift upslope in elevation and increase in area to replace most of the Mixed Fire Regime, pushing the Mixed Fire Regime into the Lethal Fire Regime elevation. The Mixed Fire Regime will transform into Non-Lethal Fire Regime-like characteristics, which is expected to result in reduced productivity and forest fuel diversity. Seral species will be the predominant vegetation type in both fire regimes, with an overall decrease in Douglas-fir and Grand Fir timber and forbs. Grass and shrub rangeland will extend up in elevation, pushing the fire regimes of lower elevations higher into the landscape.

Lethal Fire Regime areas have the potential to shrink considerably in area and occupy only the highest elevation areas on the landscape, primarily on northerly aspects and in high mountain basins and plateaus. At lower elevations, Lethal Fire Regime riparian areas are predicted to 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 is not expected to change in area, but to experience a loss of timber composition, structure, and associated functions.

Fire regime changes will be slow, and environmental impacts will be minor over the near- and intermediate-term periods (decades from now). The most significant impacts will be experienced in the long term (centuries from now), with the earliest and most rapid changes and impacts affecting the Lethal and Timberline Fire Regimes, followed over a longer future time period by the Mixed and Non-Lethal Fire Regimes.
Of particular importance to the Tribe are impacts to Whitebark Pine (WBP) forests, a culturally important species for CSKT. WBP has been affected both directly and indirectly by climate change. These changes include increased drought stress and mortality, upward shifts of sub-alpine fir into Whitebark Pine forests; large-scale outbreaks of bark beetles; more favorable climatic conditions for blister rust (an invasive pathogen); and larger, more frequent, and severe fire regimes (Keane et al., 2017; Norton-Smith et al., 2016).

Whitebark Pine: A Critical Forest Species

Whitebark Pine (*sc̓iɬpalqʷ)* is a keystone species for the high alpine environments in the American West. Whitebark Pine has also been woven into our tribal people's cultural way of life (CSKT-Forestry, 2020; Robert E. Keane et al., 2017). As we know, animals have taken care of this landscape, which allows us to thrive as people. We have watched and learned throughout time how to protect fluctuating populations of plants and techniques for gathering First Foods. Many species of animals are tied to the Whitebark Pine (WBP) matrix for the use of its pine seed (*sc̓eyɬp*) as a food source, including CSKT peoples. The tribes would take annual trips to the tops of the mountains to gather the seeds from Whitebark Pine stands. The seeds from this tree species are rich in fiber and high in energy; the tribes would use this source during travel to replenish their energy and as a source of food, while other sources were scarce. We have learned the significance of this tree and the immediate need to help replenish its now dwindling population not only on the Reservation but throughout the region.

In 2017, the Liberty fire burned through 9,111 acres of tribal timberland, including around 400 acres of Whitebark Pine habitat, within the Jocko Primitive Area located in the Southeastern portion of the Flathead Indian Reservation. The Jocko Primitive Area is composed of multiple habitat types, fire regimes, and undisturbed stands, including pristine high-elevation



Figure 15: "Whitebark Pine (Pinus albicaulis)" by Glacier NPS is marked with Public Domain Mark 1.0.

forest and Whitebark Pine stands, making the loss significant.

Fire, while destructive, can also renew. The picture is one of those benefits; it is a Whitebark Pine seedling that was planted in late June 2019. This seedling was the first Whitebark Pine to be planted on the reservation. CSKT and the Flathead National Forest planted 1,920 Whitebark Pine seedlings within a 9-acre burned area of the Liberty Fire. This effort marked the first step towards restoring high elevation ecosystems by replenishing keystone species such as Whitebark Pine seedlings.

Since 2019, CSKT has expanded the program to grow Whitebark Pine Seedlings at the CSKT Greenhouses, using cones gathered from pine rust-resistant trees across the reservation. This program produces thousands of Whitebark pine seedlings to be planted throughout targeted areas on the reservation and in partnership with other groups who wish to do WBP restoration in their area. Looking forward, the goal of CSKT is to become the central hub for Whitebark Pine Restoration to support tribal nations across the West through a biocultural approach that facilitates tribes creating their own restoration programs to protect and replant this culturally and ecologically vital species.



Figure 16: First Whitebark Pine planted from Liberty planting in Jocko, 2019. Photo credit: ShiNaasha Pete.

"I am out here helping restore this species and the ecology to help restore and preserve a culture."- ShiNaasha Pete

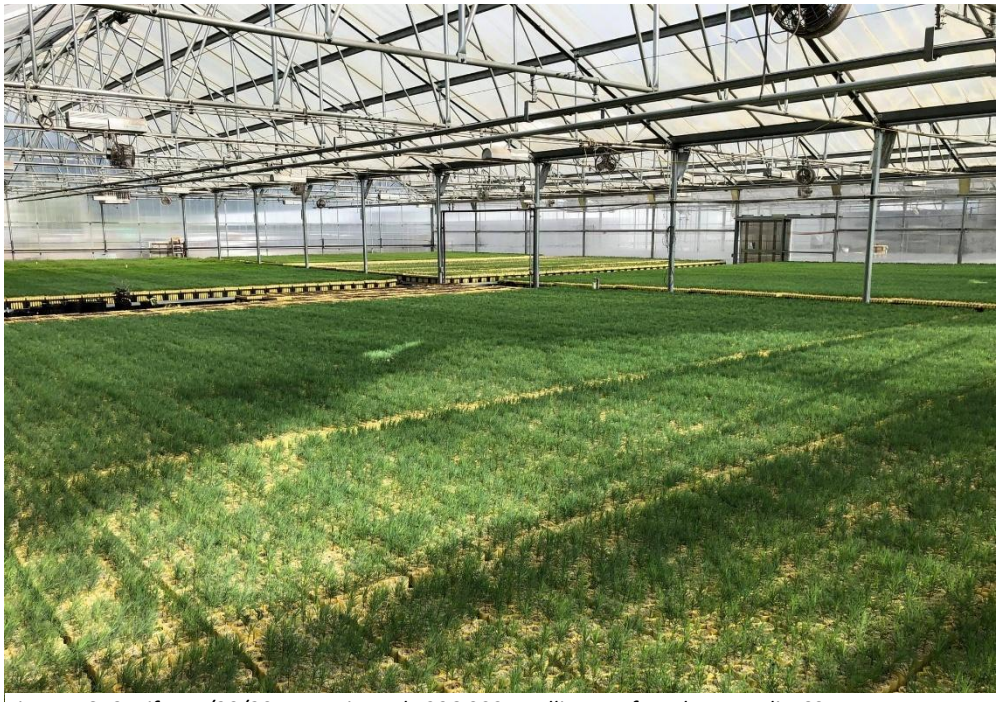


Figure 16: Conifers 5/20/20 approximately 396,900 seedlings so far. Photo credit: CSKT Forestry Greenhouse.

Challenges

Forests on the Flathead Reservation face multiple climate challenges, including warming temperatures, reduced snowpack, more frequent and intense wind events, and biodiversity loss. The combination of increased development and increased fire risk due to warming temperatures and drier summers creates additional challenges for areas in lower-elevation forests in wildland-urban interface (WUI) zones on the Flathead Reservation. Changing climate conditions also create opportunities for invasive species and noxious weeds to spread after fire, logging, or drought in cleared or degraded forests. These invasives reduce native plant diversity, which have adapted with the fire regimes, and added fine, fast-burning fuels to the forest floor or duff. Managing them requires sustained monitoring, physical and financial resources, which are often limited.

At lower elevations, the expansion of human development has increased risks within the wildland-urban interface. Homes and infrastructure in these zones are highly vulnerable to wildfire, and once ignited, they intensify fire behavior. Structural materials cause hotter, more destructive burns that can spread and increase the risk of further infrastructure loss, as well as the occurrence of stand-replacing fires that spread to higher elevations and into sensitive WBP forests.

In addition to ecological threats, the Forestry Department must navigate economic and structural constraints. Maintaining sustainable timber harvest is increasingly difficult with a limited workforce and a reduction in active timber mills. Many timber mills have closed over the last decade, making it cost-prohibitive to sell timber successfully and at a sustainable or profitable margin. Together. These pressures make it challenging to meet the goals outlined in the Forest Management Plan while ensuring long-term forest health.

Problem Solving

The Forestry Department is implementing a range of management strategies to enhance the resilience of the forested lands of the Flathead Reservation in the context of climate change. Current management actions include mechanical thinning, slash piling, and prescribed burning to manage and reduce fuel loads, thereby improving forest structure. The long term goals is to create a historic forest complex, while incorporating modern understanding of forest dynamics, and incorporating climate impacts into management decisions. The Forestry Department is encouraging their younger community members to invest in forestry education, and to grow their tribal workforce to take care of the forests and departmental needs. Planned timber sales are an ongoing effort to maintain forest health and ensure sustainable amounts of harvestable timber on the Flathead Reservation (Charkoosta, 2025).



Figure 17: Salish tree climber Kelan Couture prepares to ascend a Whitebark pine tree on the Flathead Indian Reservation. Photo credit: Sarah Mosquera.

Whitebark Pine restoration was included in the 2000 CSKT Forestry Management Plan in light of national recognition of the widespread threats to this species in an era of shifting climate; including significant population declines due to the invasive pathogen blister rust, expansion of native mountain bark beetles up into high-elevation forests where cold temperatures have

served to exclude them historically; increased intensity and severity of drought; and of wildfire. Currently, maps of current Whitebark Pine populations on the Flathead Indian Reservation are being generated, and a restoration strategy is underway, collaborating with the Crown of the Continent Managers Partnership. This effort involves mapping potential and lost sites, as well as prioritizing new restoration sites. In the early 1950's aerial photo surveys showed roughly 35,000 acres (2.6% of the reservation). Since then, CSKT Forestry, along with the Crown of the Continent, has mapped an estimated 105,100 acres (13%) of suitable and/or potential WBP habitat on the Reservation and ground-verified nearly 20% in the last 2 years. CSKT Forestry is working on developing a Fire History Reconstruction map with the help of SKC staff and students, where WBP is dominant and can flourish. The CSKT is considering the incorporation of high-elevation nurseries in specific areas of the Reservation (CSKT-Forestry, 2000).

Forest resilience actions as part of the 2000 Forest Management Plan include:

1. Over the course of the past five years, the CSKT Forestry Sector has worked in partnership with The Wilderness Society and Dreaming Tree Foundation, SKC, high school student interns, and the Preservation Department to tie in the significance of Whitebark Pine to the tribe through training and mentorship opportunities for tribal youth.
2. Dreaming Tree funds have also supported CSKT's multi-year efforts to involve youth in Whitebark Pine restoration. In 2018, students participated in valuable reconnaissance work, which was a tremendous aid to Forestry staff. Our inventory of "plus" trees and suitable habitat is starting to grow, making the CSKT Forestry Department a leader in the Crown of the Continent.
3. CSKT has certified climbers to climb and cage the cones. Whitebark Pine is a very sensitive population, where the cone must be collected using a cage because over 40 different species eat the cone and seeds. In 2019, CSKT Forestry, along with SKC interns, helped locate and cage 25 "plus" trees and put up roughly 200 cages.
4. Post-fire restoration was completed in June of 2019. CSKT Forestry teamed up with the Flathead National Forest and planted 1,920 Whitebark Pine seedlings. Planting occurred within a nine-acre section of the Liberty Fire area and had a 90% survival rate.
5. The Forestry Department is also a leader in managing high-elevation forests. Our Forestry Management Plan, which is a unique blend of TEK shared by the elders with the forestry program and western science silviculture, grew from a basis of Traditional Ecological Knowledge shared by elders, and is used and applied to western science techniques.
6. CSKT Forestry follows best practices for ecosystem management. Maintaining the ecosystem around even and uneven age stand treatments is a priority. Mechanical treatments and "daylighting" are being used to help reduce competition amongst trees. CSKT Forestry also monitors WBP plantings annually and reports survival rates.
7. Collaborations are underway with neighboring agencies to expand WBP conservation, including Glacier National Park, Lolo National Forest, Flathead National Forest, Bureau of Land Management, and other partners in the Crown.

Goals and Adaptation Strategies

Forestry sector's preparedness goals include:

1. Update and revise the Forest and Fire Management Plan to reflect current science and evolving management needs.
2. Develop and implement a Forest and Rangeland Monitoring Plan to track ecological conditions, forest health, and climate-related changes.
3. Conduct a Forestry Sector Climate Adaptation Needs Assessment for planning, monitoring,

operations, greenhouse capacity, research, communication, staff education, and funding.
4. Expand greenhouse capacity for the propagation of native and culturally significant plant species, including high-elevation species.
5. Design and employ strategies for aggressive tree mortality salvage systems.
6. Create and employ strategies for the use of appropriate silvicultural systems to provide resilient landscape ecological conditions.
7. Create and employ strategies to manage invasive species across the landscape.
8. Increase coordination of interagency and inter-departmental climate change adaptation education, research, and communications.
9. 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.
10. A better understanding of the impacts of climate change on CSKT culture is needed, with a focus on the direct impacts on forest types and impacts on wildlife species that call these ancient forests home. For example, Whitebark Pine forests are culturally significant to CSKT and many other tribes/First Nations in the region. They are home to many species of birds, small and large mammals – including the grizzly bear.
11. Enhance WBP habitat by using a combination of a fire-management response strategy: fire use for resource benefit, timber harvest activities, mechanical treatments, and planned ignitions (Flathead Indian Reservation Forest Management Plan). To help aid WBP restoration efforts, CSKT Tribal Forestry will reintroduce periodic fire to 6,500 to 8,600 acres of WBP habitats by the year 2029.

Fire Regime-specific goals:

Lethal Fire Regime

1. 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).

Mixed Fire Regime

1. 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).
2. Increase the reintroduction of periodic prescribed fire to non-lethal stand types.
3. Increase and maintain hazardous fuel mitigation activities.

Timberline Fire Regime

1. Employ appropriate projects, prescribed fire, and wildland fire response actions to sustain viable Whitebark Pine habitats (i.e., early to late seral condition).
2. Develop and implement a Whitebark Pine Habitat Management Plan.
3. Coordinate and collaborate with academic and research institutions to develop Whitebark Pine Restoration Strategies.

Non-Lethal Fire Regime

1. Create and implement strategies that employ appropriate silvicultural systems to maintain mature and park-like forest conditions (i.e., mid and late seral conditions).
2. Increase the reintroduction of periodic prescribed fire.
3. Increase and maintain hazardous fuel mitigation activities.

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 Culture Committees
- Flathead 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
- MT Dept of Natural Resources 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)



Figure 18: A dead Whitebark pine in the Two Medicine area of Glacier National Park on July 28, 2023. Photo credit: Hunter D'Antuono.



Figure 19: Native Fish Keepers Inc. processing fish on Flathead Lake. Photo Credit: NFKI.

Fish Sector



Introduction

The Pend d'Oreille Band, who lived in the Flathead Lake area, were known in the Salish language as the Sl̓q̓tkʷmsčiṅt — the People of the Wide Water, after the name of the lake, Cl̓q̓é(tkʷ), meaning Wide Water. Water has been at the foundation of the Salish and Kootenai people; indeed, it is one of the four basic elements, vital for life and energy. Cold, clean water is also of critical importance to native fishes, and the Confederated Salish and Tribes have close cultural ties to native fish and have long relied on them for subsistence.

Many native fish species were important in the traditional diet of the tribes; however, none are arguably as crucial and essential to livelihood as the Bull Trout (Smith, 2010). Historically, Bull Trout were very abundant. They were easy to harvest and were a food rich in protein (Smith, 2010). Fish helped ensure that the tribal mode of subsistence in western Montana, far from being a desperate "challenge to survive," was exceptionally dependable over a very long period of time. The importance of fish in the tribal way of life is reflected, in fact, in the oldest purely historical oral tradition of the Pend d'Oreille (Qĺispė) people — the story of the dispersion of the Salish. The impact of Bull Trout on its people is also reflected in the traditional

place-names within Aboriginal territory; Western Montana has more Salish place-names describing Bull Trout than any other plant or animal (Smith, 2010).

In this section, we focus on climate impacts on fish habitat and fish. This planning area considers aquatic habitats required for fish spawning, breeding, feeding, and growth, which are located on and near the Flathead Indian Reservation. However, much of the information is relevant to areas throughout western Montana. We focus on stream habitats with a particular emphasis on habitats important to Bull Trout, although climate will also have impacts on lake bodies and associated fish species.

Bull Trout's Gift

The children's book "Bull Trout's Gift", written by the Salish and Kootenai Tribe and beautifully illustrated by Sashay Camel, tells the story of children on a field trip learning about the tribal efforts to restore the Jocko River and the history and culture of the river and its meaning for tribal life, tradition, and religion (CSKT 2011). The book covers the importance of clean, cold, clear water and complex and connected habitat for Bull Trout, as well as telling the elders' stories of how the People lost and then found Water again, and how, because of the People's reciprocity and care for Water, Bull Trout return every year to the Jocko River to spawn. The Bull Trout is a gift, and the People continue to return the gift through their efforts to restore the Jocko River to keep it cold, connected, and complex.

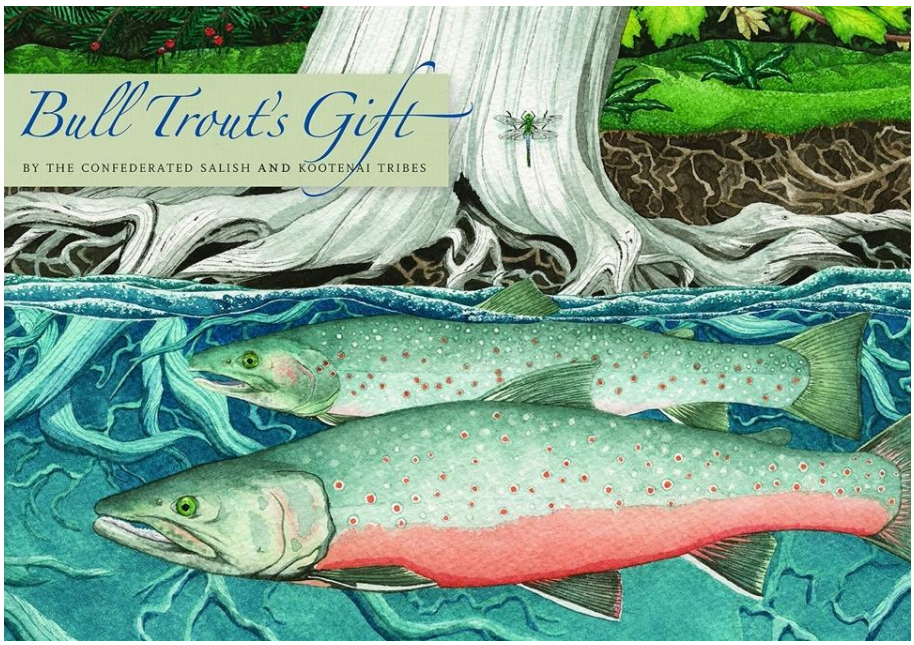


Figure 20: Cover of Bull Trout's Gift. Illustration by Sashay Camel.

Climate Change and Impacts on Aquatic Habitats

Climate change poses significant risks to both water quality and quantity, which directly impact fish. As summarized in the 2017 Montana Climate Assessment (MCA; Whitlock et al., 2017) warming temperatures have already affected Montana's water resources. Montana's snowpack has declined, and snowmelt has been shifting earlier, resulting in an earlier peak in spring runoff. There is high agreement among future climate projections and models that snowpack will continue to decline, particularly at mid- and low-elevations, and that there will be a continued shift toward earlier snowmelt, with a corresponding earlier peak in spring runoff. The earlier onset of snowmelt is likely to reduce water availability in the Flathead region later in the summer (see Appendix A for more details on climate impacts on the Flathead Reservation). It may also influence the reproductive success of native Westslope Cutthroat Trout, which spawn on the descending limb of the hydrograph.

As a result of warming air temperatures and declining summer flows, stream temperatures have increased on average throughout the state of Montana at the rate of about 0.18-0.36°F/decade (Isaak et al., 2012). Although Montana has some of the coldest waters in the western US, future projections suggest that stream temperatures will increase substantially. Recent work specific to the Crown of the Continent region surrounding tribal lands suggests that moderate warming scenarios will result in warmer stream temperatures in spring, summer, and fall, with summer temperatures increasing between 2.5-3.2°F by mid-

century and 4.0-4.7°C by the end of the century (Jones et al., 2017). These changes will profoundly influence the distribution and abundance of native coldwater salmonids. Indeed, climate change may already be responsible for range contractions in Bull Trout (Eby et al., 2014) and may be contributing to accelerated rates of invasive hybridization between native cutthroat trout and introduced rainbow trout (Muhlfeld et al., 2014).

Challenges

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

Water quantity and quality, and particularly temperature, have significant impacts on fish. As cold-blooded aquatic animals, fish cannot avoid overheating when water temperatures increase (McKelvey & Buotte, 2018). This makes fish especially sensitive to temperature changes, as their metabolic rate is determined by the temperature of the water they inhabit. Trout in particular depend on cold water. Most species of trout are adapted to live in water temperatures that range from 50-63ºF and begin to experience stress when water temperatures reach the high 60s. Most fish do not survive long in temperatures above the mid-70s (Kinsella et al., 2008). Warmer water temperatures create stressful conditions, leaving fish more vulnerable to a variety of diseases, such as whirling disease, a parasitic infection that thrives in warm and low-flow water conditions (Hedrick et al., 1998). Cutthroat trout and rainbow trout are especially vulnerable to this parasite (Hedrick et al., 1999).

Bull Trout are particularly sensitive to changes in water quantity and quality. Native to mountain streams throughout the Pacific Northwest, Bull Trout require cold, clean water and connected, complex habitat. As the salmonid with the most demanding habitat requirements – including some of the coldest water requirements -- Bull Trout serve as excellent indicators of stream health. Unfortunately, in a 1992 review of Bull Trout status, the US Fish and Wildlife Service found the fish had been extirpated from over 50% of their historical range. As a result, Bull Trout have been listed throughout their range as “threatened” under the Endangered Species Act since 1999. (Wade et al., 2016).

Changes in water quantity, particularly reduced summer streamflow, can lead to elevated stream temperatures or, in more severe instances, intermittent flows, both of which can effectively lead to disconnected river networks. Habitat connectivity is recognized as a critical element for population viability for salmonids like Bull Trout and is likely even more critical for metapopulation dynamics in fish species. Studies suggest patch-scale persistence of Bull Trout is influenced by stream connectivity; fluvial Bull Trout rely on connected tributary habitats. Restoring longitudinal connectivity may be one of the best bang-for-buck options for fish conservation, especially under a changing climate. Even if reduced streamflows do not lead to disconnected rivers, they can reduce the likelihood that water from the stream will spill onto its floodplains, thereby reducing floodplain connectivity and the seasonal storage and subsequent release of water from shallow alluvial aquifers. This “lateral” river connectivity is as crucial as “longitudinal” stream connectivity. Due to their water temperature sensitivity, the presence of Bull Trout may be associated with alluvial valleys that provide cold upwelling water. (Wade et al., 2016).

Climate has other effects on aquatic habitats beyond higher temperatures and reduced streamflow. High temperature days (above 90º F) also pose risks to fish as warmer water temperatures reduce the amount of dissolved oxygen in the water (Kinsella et al., 2008). Wildfires and other climate-driven disturbances also affect the quality of stream habitats through temperature increases and changing stream chemistry through the addition of ash and sediment flows into rivers and streams (Leppi et al., 2012; Isaak et al., 2012). Poorly managed or season-long grazing can also reduce or eliminate woody riparian species that provide shade and cover. Shading provided by riparian vegetation moderates stream temperatures. Livestock grazing was strongly related to summer stream temperatures regimes in Pacific Northwest salmonid habitats (Kovach et al. 2018). Beyond influencing summer thermal

regimes, livestock grazing can lead to hoof shear, pugging, and other stream channel modifications (i.e., through the loss of riparian vegetation) that increase sedimentation. Further, sedimentation can have lethal consequences for spawning fish, particularly Bull Trout, through direct mortality, reduced fry survival, and loss of spawning habitat when the gravel needed to spawn becomes buried in fine sediments. There are other sub-lethal impacts from sediment as well, such as reduced growth rates and increased disease (Wade et al., 2016).

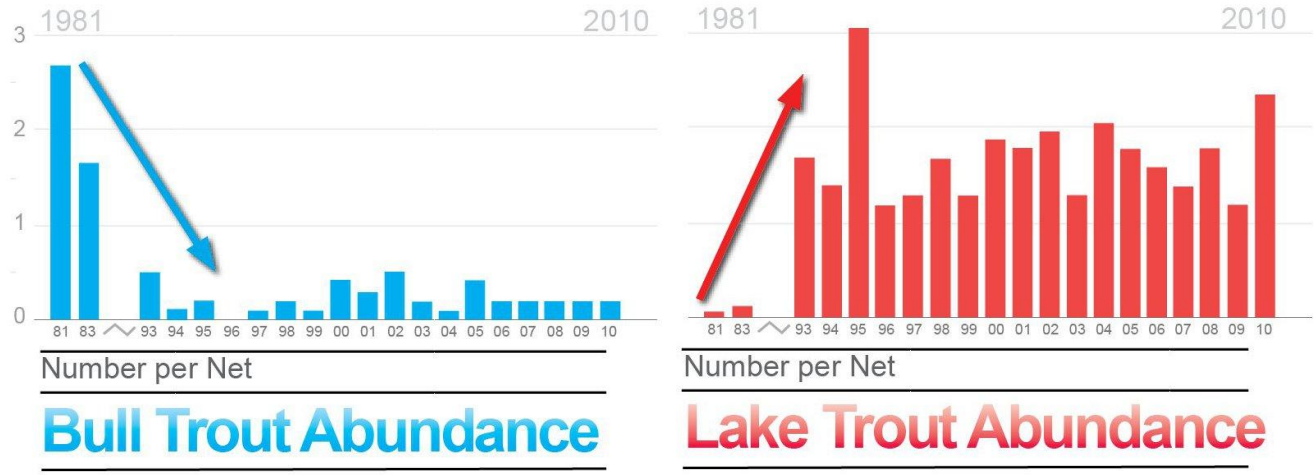


Figure 21: The relative abundances of bull trout and lake trout have reversed. Bull trout have dropped off precipitously while lake trout have increased just as dramatically (data from MFWP). (Sloped lines represent trends and are not regression lines. Credit: NFKI.

Native trout, such as the Westslope Cutthroat Trout, are also at risk of population decline due to hybridization, or the crossbreeding of different species. Cutthroat trout inhabit cooler waters, but as stream temperatures rise, the habitats of cutthroat trout and introduced rainbow trout, which generally inhabit warmer waters than cutthroat, begin to overlap (Isaak et al., 2012; Muhlfeld et al., 2014; Wenger et al., 2011). Fire is also of concern for trout, as fires can change water temperatures and stream chemistry, and also remove woody riparian vegetation that provides shade and thermal refugia in the summer (Kinsella et al., 2008). Native fish populations are also limited by invasive species and introduced non-native species, such as lake trout, which eliminates the buffering effects of robust populations and reduces their resilience to habitat changes brought about by a changing climate. Lake trout were introduced to Flathead Lake around 1905, and populations have grown significantly, leading to dramatic declines in native fish species such as bull and cutthroat trout (Frissell, 2018). Tribal access to Bull Trout as a First Food has already been substantially reduced due to water diversions and pollution. Climate change is likely to continue to reduce the numbers of Bull Trout, as well as other culturally important fish.

Efforts have been made by multiple departments to restore riparian habitat by removing cattle access to rivers. This effort restores critical riparian vegetation and reduces erosion caused by cattle along streambeds. After cattle have been removed, native species have been planted to improve bank edge stability and improve the floodplain. This will be an ongoing effort to improve trout habitat and water quality.

Problem Solving

The Division of Fish, Wildlife, Recreation, and Conservation work to carry out the traditions of the Confederated Salish and Kootenai Tribes by achieving good stewardship through their excellent Fisheries, Wildlife, Recreation, and Conservation Programs. The Tribal Conservation Program enforces fish and wildlife laws. Tribal conservation wardens are cross deputized as state wardens and tasked with enforcing Tribal, state, and federal fish, wildlife, and recreation laws and

regulations throughout the Reservation. Wardens patrol all parts of the Reservation from highways to wilderness trails, lakes, and streams. The Fisheries, Wildlife, Information, and Education programs collaborate with their state, federal, and Canadian counterparts within the Flathead Basin, as biological resources know no political boundaries (CSKT-Fish and Game, 2020).

CSKT monitors stream temperatures on the reservation and has stream restoration programs aimed at re-establishing vegetative cover in riparian habitats to help shade and cool streams and maintain other natural processes and functions. The Fisheries Program's habitat restoration/protection efforts are prioritized to benefit native trout. Millions of dollars are spent yearly to protect habitat through outright purchases or conservation easements in critical areas. The priority is to protect the best habitats that existed before human-caused impacts. After lands that require restoration are purchased, CSKT program staff apply their extensive experience and budgets to active restoration efforts, aiming to reset the ecology as close to its pre-colonization condition as possible. An excellent example of this approach is the restoration efforts conducted in the Jocko Watershed (Evarts, 2000). The CSKT also maintains an aggressive program to reduce the spread of aquatic invasive species (AIS). Climate-driven changes in hydrologic flow patterns and warming waters, along with increased tourism to Flathead Lake, are likely to exacerbate the impact of AIS in the region. The AIS program collaborates with other states in the region to inspect all watercraft prior to launch at Flathead Lake for invasive mussels (CSKT-Fish, 2021), in conjunction with intensive water sampling and prevention programs that target invasive mussels. The AIS program includes community outreach and education, as well as school programming.

While lake trout prey on most species present in Flathead Lake, they have negatively impacted cutthroat and Bull Trout populations the hardest, which are important both culturally and spiritually to the people of CSKT (Montana FWP & CSKT, 2000). The Fisheries Program initiated a multifaceted lake trout suppression effort in Flathead Lake to aid in restoring populations of native Westslope cutthroat trout and Bull Trout. This effort was initiated with the adoption of the Flathead Lake and River Fisheries Co-management Plan, released in 2000 (Montana FWP & CSKT, 2000). In 2002, the tribes created fishing contests called Mack Days to rally anglers to help manage the population. These contests are run twice a year (spring and fall) and have increased harvest by approximately 65% by 2019. From the beginning, tribal officials held to the value of sustainability, adamant that all fish harvested from the lake be put to good use by supporting food banks within the reservation and the surrounding area with donations (Montana FWP & CSKT, 2000). After peaking and several years of stable but insufficient harvest using the Mack Days contests, the tribes proposed netting fish. Netting began in 2014, resulting in increased harvest levels. To address the additional harvest, in the spring of 2017, the tribes established the nonprofit Native Fish Keepers, Inc. (NFKI 2021) to help offset the costs of suppressing lake trout populations (Backus, 2017).



Figure 22: A Lake Trout. Flickr/USFWS Headquarters.

Native Fish Keepers, Inc

Native Fish Keepers, Inc. (NFKI) is a tribally owned and operated nonprofit organization on the Flathead Reservation, dedicated to protecting and promoting the growth of native fish populations in Flathead Lake. One of the most significant threats to native populations of westslope cutthroat trout and bull trout is non-native lake trout.

NFKI also helps offset the high cost of a netting program that currently seems necessary in perpetuity due to the Invasive population of lake trout by selling lake trout and whitefish fillets to distributors in the region. NFKI capitalizes on the economic value of lake trout while providing other substantial benefits to the community, including conservation education, employment

opportunities, and support for recreational angling. NFKI harvests and sells lake trout throughout the Pacific Northwest, in support of native fish species conservation. While this is a costly operation, and the revenue generated from selling lake trout may never completely offset the costs, the value of protecting such necessary cultural resources makes it all

Goals and Actions

CSKT initiatives to address climate change include:

- Increase resiliency and resistance to climate change by managing for robust native fish populations and their associated river and lake habitats.
- Improve integration of ecological principles into other tribal programs (e.g., grazing, timber harvest) that may oversee land uses that can negatively affect native trout.
- Increase awareness of threats to native fishes. Promote ways to reduce non-climatic stressors such as riparian clearing, water withdrawals, and negative interactions with non-native species.

Examples of management actions for Bull Trout conservation by mode of action include (Wade et al. 2016):

Assess

- Verify temperature, streamflow, and other climatic projections with monitoring
- Continue active monitoring of Bull Trout presence and abundance, redd counts
- Continue coordination with RMRS re: eDNA monitoring
- Maintain GIS layers of Bull Trout presence and abundance
- Monitor for genetic and demographic trends

Engage

- Continue support for interpretive efforts, interacting with schools and other programs re: Bull Trout awareness
- Continue coordination with FWP and MDT re: surveys, identification and eradication of non-natives, and Large Woody Debris (LWD) replacement at bridges initiatives
- Coordinate with FWP to increase monitoring
- Engage ditch and water managers re: drought planning and reducing summer diversions

Manage

- Manage for resilience (reduce stressors in high-sensitivity areas, protect refugia in low-exposure areas, manage proactively in high-exposure areas)
    - Increase/maintain riparian shading, encourage species diversity in plantings,



Figure 23: Unidentified Salish-Pend d'Oreille people fishing at Flathead Lake, c. 1915. Photo credit: Salish-Pend d'Oreille Culture Committee, Confederated Salish and Kootenai Tribes.

reduce or eliminate livestock grazing impacts on riparian habitats.
    - Manage to reduce peak flows that increase Bull Trout mortality, including consideration of timber harvest impacts (Tonina et al. 2008)
    - Continue to remove unnatural barriers and improve habitat connectivity
- Work to reduce sediment
    - Restore/maintain channel complexity via rehabilitation pilots (e.g., LWD reintroduction), particularly at over-wintering habitat or areas of high summer thermal stress
    - Evaluate and manage road system in strategic locations such that modifications (relocation, removal, etc.) facilitate stream, floodplain, and riparian processes (wood delivery, complexity, thermal buffering, etc.)
    - Manage or restrict grazing on agricultural leases and range units to improve stream and riparian habitats. Monitor conditions (e.g., greenline-based approaches)
    - Develop a plan to manage/remove invasives
- Remove genetic and population bottlenecks

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

- Montana Fish, Wildlife, and Parks
- US Fish and Wildlife Service
- US Geological Survey

Potential funding sources for addressing the estimated impacts include:

Funding needs and sources for addressing the estimated impacts to fish are to be continuously determined and implemented as needs arise for conservation, projects, research, and implementation.

- Water Compact damage claim funds
- Hydropower mitigation funding
- Grant funding

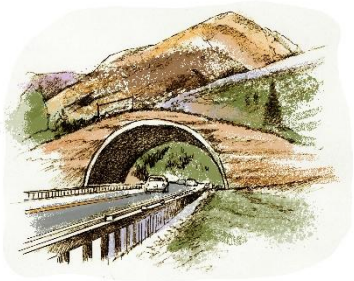


Figure 24: Native Fish Keeper's Inc. on Flathead Lake. Photo credit: NFKI.



Figure 25: A sign near the sky bridge in Pablo on Sept 12, 2019. Photo credit: Hunter D'Antuono.

Infrastructure Sector



Introduction

The focus of the Infrastructure Sector is on improving the energy efficiency of housing, creating renewable, tribally independent power sources, and maintaining the infrastructure of the Flathead Reservation. Climate change poses a risk to the reservation's infrastructure as shifting weather patterns and severe weather events cause damage and strain existing systems. This challenge has spurred initiatives to improve community outcomes by investing in local infrastructure to secure a sustainable future within the reservation. The Confederated Salish and Kootenai Tribes (CSKT), like many Indigenous communities in rural areas, work hard

to improve their local and regional infrastructure. This challenge has led to initiatives to enhance community outcomes by investing in self-sufficiency and ensuring a secure, sustainable future.

The systems of infrastructure on the Flathead Reservation comprise a diverse range of resources essential for supporting human life. Infrastructure systems comprise roads, buildings, energy production facilities, and spaces for people to live and work. These systems need continuous investment and care to be maintained and improved. Coordinating infrastructure adaptation to climate change impacts is complicated because of the varied types of infrastructure and the multiple entities that manage infrastructure resources on the Flathead Reservation. With the mixed land ownership situation created by land allotments, homesteading, and fee patents, the management and delivery of infrastructure services is not centrally controlled. There is no single utility managing the delivery of potable water or the recycling of wastewater, for example. This complexity lends itself to the complications that exist in creating and maintaining infrastructure that is resilient to the changes occurring on the Flathead Reservation due to climate change impacts.

To better understand the complexity of infrastructure management on the Flathead Reservation, the following excerpt from CSKT's 2021 Comprehensive Economic Development Strategy (CSKT-Economics, 2021) Is provided below.

"The rapid and sustained growth of the region has put a serious strain on infrastructure, including transportation and public facilities, most notably as the growth relates to public safety. Upgrades [are occurring to] … accommodate an increased volume of traffic and make travel safe for pedestrians and non-motorized transport. In most cases, upgrades to water and wastewater systems are needed to ensure a safe and ample water supply…. [Finding the] funding to pay for the necessary upgrades and new facilities is a constant struggle."

Water and Wastewater

Water resources on the Flathead Reservation are extensive. They include both surface water and groundwater. Municipalities and developments depend on groundwater for domestic use. Most surface water is used to provide habitat for fisheries and for irrigation. Warming temperatures and reduced snowpack, caused by climate change, are already affecting the availability of some surface and shallow groundwater resources during the increasingly longer dry season. The ability of infrastructure to hold and move water efficiently and effectively is critical when temperatures increase and precipitation levels decrease throughout the year, especially during the summer months. Climate impacts on water supplies can potentially reduce the amount of water available and alter the timing of precipitation events and spring runoff, which may increase the risks of damage to water supply infrastructure during flood events and drought. This will potentially have negative impacts on the Flathead Reservation.



Figure 26: Kicking Horse Water and Wastewater Lines Replacement Project, 2020. Photo credit: CSKT.

CSKT, the State of Montana, and the United States have been working for decades to develop a water rights settlement that defines the water rights of the Confederated Salish & Kootenai Tribes both on and off the Flathead Reservation, along with provisions for the administration of water rights on the Reservation. In 2015, the Montana Legislature approved the compact, and in December 2020, it was passed by the United States Congress and signed into law by the President as the Montana Water Rights Protection Act. CSKT ratified the compact in January 2021. As of 2023, the Office of the Water Engineer, staff, and the Flathead Reservation Water Management Board have approved more than 300 domestic well permits and issued multiple water rights. This represents a significant improvement in infrastructure for the tribe and the Flathead Reservation (CSKT Water Compact, 2023).

The Confederated Salish and Kootenai Tribes have collected water quality data for many Reservation surface waters and have established surface water quality standards that are more stringent than those of the state of Montana. Regarding groundwater, the Reservation has observed elevated nitrate levels in certain areas. All new drinking water wells are tested before use to ensure they meet the standards for safe drinking water. Community water systems are tested monthly for fecal coliform contaminants, and regularly for other potential contaminants, according to a testing schedule required by the U.S. Environmental Protection Agency.

The Flathead Reservation is served by multiple community water systems, managed by a variety of organizations and communities. The CSKT's Salish and Kootenai Housing Authority oversees 32 public water systems, including 23 larger Public Water Systems and 10 very small community systems. The CSKT Maintenance Department manages one very small community system. Additionally, nine public water and/or sewer districts operate under Lake or Sanders Counties, including systems managed by the Reservation's four incorporated towns of Polson, Ronan, St. Ignatius, and Hot Springs. Other systems on the Reservation are managed by private water user organizations, reflecting a diverse mix of tribal, local, and private management.

Some community wastewater systems, as well as most rural homes on the Reservation, rely on individual septic tanks or drain fields for sewage disposal. CSKT's Housing Authority oversees 10 community wastewater treatment systems, of which two are currently permitted and the remaining eight are either lagoon systems or utilize septic tanks and drain fields. In addition, there are 10 other treatment systems on the Reservation. The Tribal Maintenance Department operates one permitted lagoon system, while the remaining nine are operated by public sewer districts, including those managed by the Reservation's four incorporated towns of Polson, Ronan, St. Ignatius, and Hot Springs.

Irrigation Water

The Bureau of Indian Affairs operates the Flathead Indian Irrigation Project (FIIP), the central surface water delivery system for agriculture on the Reservation. Originally designed to promote economic development for the Tribes and individual Tribal members, it now serves many non-Indian farms as well as Tribal farms. Other surface water sources for agriculture are supplied through small ditches and canals, many of which were developed for Tribal lands and allotments before the construction of the FIIP. Over the last five years, many projects have been underway to improve the infrastructure under the FIIP. This will be critical for better water retention and quality within these systems.

Solid Waste Disposal

Lake County operates the only licensed county landfills on the Reservation. One landfill is located southwest of Polson and accepts compost (grass trimmings and leaves) and most construction and demolition materials. The other landfill, situated between Polson and Pablo next to the County Transfer Station, accepts tree trimmings and untreated wood waste only. The adjacent Transfer Station serves as the main collection point for other waste types, such as municipal waste, appliances, and recyclables.

Residents living in the Lake County part of the Reservation either take their waste directly to the Transfer Station, have it collected by Republic Services (a private waste collection and disposal company), or

use roll-off waste containers near Charlo, Ravalli, and Rollins. Sanders County residents who do not pay an annual solid waste fee to the county can use a roll-off site near Hot Springs for a fee. Residents in the Dixon district of Sanders County may dump their waste at the Charlo or Ravalli roll-off sites because of semi-annual fees paid to Lake County. Missoula and Flathead Counties lack solid waste disposal facilities on the Reservation; however, Republic Services handles the waste for the Missoula County section of the Reservation. All of the municipal waste generated on the Reservation is ultimately transported to the company's private landfill in Missoula.

The Lake County Transfer Station also accepts recyclables, including newspapers, cardboard, aluminum cans, office paper, assorted plastics, magazines and catalogues, phone books, scrap metal, and tin/steel cans. The County also has bins for some recyclables in Polson, at SKC in Pablo, and at Harvest Foods in Ronan. The County hosts an annual "electronic" waste recycling weekend. Glass can be recycled at Target stores in Missoula and Kalispell.

Electricity and Energy

The Flathead Reservation is served by Mission Valley Power (MVP), a federally owned nonprofit electric utility managed by the Confederated Salish and Kootenai Tribes pursuant to a Public Law 93-638 contract. The power planning area covers customers on and near the Reservation, from Evaro at its southern end to Dayton at its northern end, and includes Dog Lake and Hot Springs to the west, with many systems in between.

According to a 2011 article from the Char-Koosta News, "Mission Valley Power purchases 78% of its electricity from Bonneville Power Administration. The … Séliš Ksanka Qlispé (SKQ) Dam provides 21%, and one small hydroelectric dam on the Flathead Reservation, along with other small alternative energy producers, account for the remaining 1%." MVP offers several energy conservation incentives. Electricity costs on the Reservation are some of the lowest in the United States due to the availability of hydropower resources in the Northwest and the subsidized block of power provided by CSKT's Energy Keepers, Inc., as authorized by the Tribal Council. There are no natural gas companies on the Reservation; however, propane and fuel oil are available. Small solar energy systems have been installed at a few residential and business properties.

Communication

Flathead Reservation communications services include internet, telephone, television, and radio. These are used for emergency service communication and everyday communication for people and residents across the Flathead Reservation.

Broadband Internet and Telephone:

Several different telephone and wireless communication companies provide services on the Reservation. In recent years, phone companies have been upgrading lines to fiber optics or microwave transmission. Ronan and Polson have access to relatively fast internet speeds, but most other communities on the Reservation only have moderate speeds at higher costs. As reported in CSKT's 2014 Job and Training Needs Survey, one-third of Tribal members aged 18-60 lived in households with no working internet access. The CSKT has installed four new wireless communication towers and is in the process of installing micropops in various Reservation communities to serve Tribal Law and Order mobile communication and Tribal member internet needs. This effort will increase resiliency and improve the ability of Tribal employees, entrepreneurs, and students to work and study from home during the COVID-19 pandemic and beyond.

CSKT is in the process of creating a Fiber-to-the-Premises Project scheduled for 2025. This will expand the fiber network to improve broadband internet access across communities on the Flathead Reservation. It is part of the CSKT Broadband Internet Program (BIP). The goal of the BIP is to provide broadband service to all households, businesses, and anchor institutions on the Flathead Reservation. Additionally, the project includes repurposing the People's Center into a new Broadband Network Operations Center. This modernization will redefine CSKT's technological infrastructure by establishing a hub for cybersecurity operations, fiber optic housing systems, and network management teams. The building is expected to be completed in 2026 (Charkoosta News, 2025).

Television:

Some western Montana television stations cover the Reservation. These stations are located in Kalispell and Missoula. The Public Broadcasting System has two towers on the Reservation (Jette and Moiese Hill) and broadcasts from Bozeman, Montana.

Radio:

AM and FM radio stations in Missoula, Kalispell, Whitefish, and Polson cover the Reservation.

Emergency Services and Safety

Fire Protection:

According to the MissionWest Community Development Partners' Comprehensive Economic Development Strategy 2018 – 2022, "Lake County supports one fire department per 1,844 people, with one fire department per 93 square miles", where Sanders County oversees "one fire department per 713 people, and one fire department per 172 square miles". Furthermore, "[w]ithin Lake County, there are [18] volunteer fire protection districts (VFDs), supported primarily through taxes to provide fire protection throughout the county. The CSKT Division of Fire also provides protection in wildland areas" (2022, pg. 57) Meanwhile, Sanders County contains 16 fire departments, spread from Dixon to Thompson Falls, Montana (pg. 59) Most of the designated fire districts have 12 to 15 volunteers; however, districts located in Polson and Ronan have approximately 30 to 40 volunteers.

Moreover, "Additional support for volunteer fire organizations comes through grants administered by the State Forester, Mill levies, loans administered by USDA Rural Development, and local fundraising efforts, including donations from the Confederated Salish and Kootenai Tribes. All of the fire districts and the wildland fire protection agencies belong to the Lake County Rural Fire Association, which purchases joint insurance for the VFDs and reinvests the savings into the local departments. The county also has a Fire Action Plan that identifies firefighting resources and lists contacts in the event of a fire. Most units are dispatched through the Lake County 911 office, although Arlee does receive some calls dispatched through Missoula, and Hot Springs [and Dixon] are dispatched through Lake and Sanders Counties…." (MissionWest Community Development, 2022). As funding permits, the Confederated Salish and Kootenai Tribes have been assisting landowners to create "defensible space" around homes in the wildland urban interface to create safety against wildfires. Firewise design has saved thousands of homes from destruction through "simple, effective steps to help communities reduce the risk of destruction from wildfire" (National Fire Protection Association, n.d.).



Figure 27: Downed power lines snake through an alley in Kalispell after a powerful thunderstorm swept across the Flathead Valley on May 31, 2020, causing widespread power outages. Photo credit: Hunter D'Antuono. Caption: Flathead Beacon.

Ambulance:

The Polson and Ronan Ambulance Services the area through privately-owned companies, primarily serving Polson, Ronan, and Pablo, "offering 911 emergency responses, inter-facility transfers, and arranged care. Their services "specialize in: critical care, advanced life support, and basic life support[, …] service[ing] hospitals, convalescents, physicians, fire departments, and private/public events" transport (Polson & Ronan Ambulance, n.d.). The Mission Valley Ambulance Service covers the St. Ignatius area, the Arlee Ambulance Service serves Arlee, and the Hot Springs Ambulance covers Hot Springs and Camas Prairie. Missoula and Kalispell hospitals offer life-flight air ambulance helicopter service for the Reservation.

Police Protection and Law Enforcement:

The Tribal Police Department and jail, located in Pablo, maintain jurisdiction over misdemeanor, juvenile, and felony offenses involving Tribal members. Summarized within the Mission West Community Development

Partners' Comprehensive Economic Development Strategy (CEDS) 2022 – 2027, "The CSKT Tribal Police respond to calls for service, investigate crimes, enforce traffic laws, execute arrest warrants, serve process, provide court security, and conduct search and rescue operations" (2022, pg. 56). The department has two investigators: one criminal investigator and two narcotics investigators. The department has 20 full-time officers and 20 patrol cars, and it maintains a separate dispatch center from the County. The Tribal jail has a capacity for 49 inmates, but Polson, Ronan, and St. Ignatius also have contracts for additional jail space with Lake County. According to the Tribal Police Department, as of December 2025, there are eight detention officers. The Tribal Juvenile Probation Department has three juvenile probation officers and two adult probation officers. Juvenile offenders are housed at facilities in Kalispell or Missoula. The counties, however, are included in criminal jurisdiction alongside CSKT law enforcement, due to Public Law 280, which gives the state of Montana more direct authority than federal authorities. According to the CEDS report, "CSKT is the only tribe in Montana that has authorized Public Law 280" (2022, pg. 56).

The Tribal Fish and Game Conservation Program enforces regulations governing fish, wildlife, and recreation on the Reservation. The program employs ten full-time game wardens, who are largely stationed at the Bison Range, but regularly monitor all corners of the Reservation. The game wardens also have a cross-deputization agreement with Montana Fish, Wildlife, and Parks (Tom McDonaldDan McClure e-mail correspondence, 1-06-2112-07-25).

The Lake County Sheriff's Department is made up of the Sheriff, Undersheriff, Detention Captain, Patrol Lieutenant, Detention Sergeants, Patrol Sergeants, two full-time support staff, and one part-time support staff (Lake County Montana, n.d.). currently has 24 office positions, all of which are filled. As of January 2021, the department employs a total of 48 staff members, including jail, detention, and administrative personnel. The Western Rural Development Region's CEDS reports that the department includes three school resource officers and one domestic violence investigator. Funding comes from various sources, such as mill levies and grants. Additionally, the Sheriff's Office operates a boat patrol funded through a mill levy, along with two volunteer search and rescue groups: One in Lake County and one off-reservation in Swan Valley, and a volunteer reserve group of approximately 25 members. The current ratio of paid officers to the population is about 1:1200, which is below the national average of 1:1000.

The County or State has jurisdiction in the unincorporated areas for felony crimes and non-Tribal misdemeanors. Patrol units are dispatched via the Lake County 911 center, overseen by the county's Office of Emergency Management, and calls for Polson, Ronan, and St. Ignatius are also routed through the same call center. According to the CED, law enforcement and detention facilities are the costliest items in the Lake County budget, and they "are funded by the county's general fund, along with mill levy funds that have increased the budget by 5% and account for approximately 30% of that fund. The Lake County jail was built in 1975 and underwent an upgrade and expansion in 2000 to accommodate up to 42 adult inmates and two juveniles " (2022, pg. 56). Juveniles are detained for no more than 24 hours.

The Polson Police Department employs 15 full-time officers, one reserve police chaplain, and one civilian police clerk/crime scene technician, two reserve officers, one animal control officer (Chief George Simpson e-mail correspondence, Dec, 10, 2025).. Ronan has a Chief of Police, five officers, a K9, a special service officer and a reserve officer (City of Ronan, n.d.). St. Ignatius has two full-time officers, one part-time officer, two reserve officers, and four active patrol units (Chief Jason Acheson e-mail correspondence, 12-10-25).

The Montana State Highway Patrol enforces regulations on state highways and has an office in Polson, staffed by six seven officers in between Polson and Ronan and a total of 25 officers in the district 6 region. Montana Fish, Wildlife, and Parks and the U.S. Forest Service provide wardens and law enforcement officers who enforce regulations on non-Tribal/public lands.

Disaster Services:

The Confederated Salish and Kootenai Tribes' Disaster and Emergency Services (DES) Program collaborates with county, state, and federal authorities to support Reservation residents during natural or man-made disasters. CSKT's 2017 Pre-Disaster Mitigation Plan states that "historically, CSKT residents have dealt with floods, wildfire, harsh winter storms with extreme cold and blizzards, severe summer storms with damaging thunderstorms, drought, and hazardous material incidents [spills]. While most hazards cannot be eliminated, their effects can be mitigated" (CSKT-Disaster Services, 2016, p. 1-1). The Plan profiles significant hazards to the community. Identifying mitigation projects that can reduce those impacts and minimize potential damage. In 2022 to 2023, CSKT built off of the 2016 and 2017 Hazard Mitigation Plans and authored Annex D of the Western MT Regional Hazard Mitigation Plan, which was facilitated by Montana Disaster and Emergency Services ("MT DES") and approved by FEMA in 2025 as the recognized Hazard Mitigation Plan in effect until 2029. The updated plan strengthens collaboration across jurisdictions while taking greater consideration of climate changes in regional natural hazards and how to better prepare resilient communities to adapt to the "*new normal*". (CSKT-Disaster Services, 2024)

CSKT also has a 2010 Emergency Operations Plan (EOP) that designates "disaster responsibilities to Tribal personnel in the mitigation of, preparation for, response to, and recovery from natural and/or man-made disasters. The EOP applies to all Tribal government departments and agencies tasked with assisting in disasters or emergencies. It outlines the fundamental policies, strategies, and general procedures to control the emergency from its onset through the post-disaster phase." The EOP typically differentiates from hazard-specific emergencies, like a wildfire, to functional emergencies, such as setting up an evacuation shelter, and each individualized plan identifies in advance, where possible, the respective authorities who can best fulfill officer roles and duties within an Incident Command System (ICS) structure. The EOP further "defines disaster-specific procedures and describes the range of Tribal response, recovery, and mitigation resources available to save lives, reduce human suffering, and protect public health, safety, property, wildlife, natural resources, the environment, and the local economy from the harmful effects of natural and man-made disaster emergencies." Ultimately, "The CSKT EOP addresses the full scope of complex and ever-changing requirements needed in anticipation of or response to threats or acts of terrorism, major disasters, and other emergencies" while recognizing the key players, critical timelines, and crucial resources (i.e. mutual aid) significant to response and recovery efforts (CSKT-Disaster Services, 20172010, p. 1). The 2026 EOP is under review for updates and is projected to be approved by tribal council before being republished in early spring 2026 online via the Natural Resources Department's website, under the Division of Environmental Protection.
(CSKT-Disaster Services, 2017).



Figure 28: A downed power line obstructs 4th Street W near Elrod Elementary School in Kalispell after a powerful thunderstorm swept across the Flathead Valley on May 31, 2020, causing widespread power outages. Photo credit: Hunter D'Antuono. Caption: Flathead Beacon.



Figure 29: Ronan Tribal Health Center. Photo credit: June McDonald

Health Services

Two major hospitals, St. Luke Community Hospital in Ronan and St. Joseph Hospital in Polson, offer emergency, outpatient, and inpatient services on the Reservation. Private clinics are also found in these two towns, as well as in Hot Springs and St. Ignatius. Dental clinics are located in Polson, Ronan, and St. Ignatius. The Tribal Health Department (THD) operates medical clinics for Native American patients in St. Ignatius, Ronan, Polson, and Elmo, and recently opened a new clinic in Pablo at Salish Kootenai College to serve college students and staff. The THD provides dental and optical services at the clinics in St. Ignatius and Polson. Over the past decade, the Tribal Health Department has created 70 jobs, and expenditures for Indian healthcare exceed $10 million annually, excluding Medicaid or private insurance payments. THD's annual payroll is $9 million (Johnathan Owens interview, 1-6-21). The Tribal Health Department employs 248 individuals, including 158 CSKT members, 18 members of other tribes, 7 CSKT 1st descendants, and 65 nonmembers.

Transportation

Roads:

Nearly 4,197 miles (6,754 km) of Tribal, BIA, other Federal, state, city, and county roads exist on the Flathead Reservation, including:

- Tribal Forest Roads -- 2,580 miles (4,152 km) of which approximately 33 miles (53 km) are on the Indian Reservation Road System [IRR][1]
- Bureau of Indian Affairs (BIA) Roads[2] – 372.5 miles (600 km) – all of which are on the IRR.
- National Highway System (U.S. Highway 93) -- 89 miles (143 km)
- State Road System -- 165 miles (266 km) of State roads are in two categories: 99 miles (159

[1] Indian Reservation Roads (IRR) are defined as "public roads, including roads on the Federal-Aid System, that are located within, or provide access to, an Indian reservation or Indian trust land…" (23 U.S.C. 101[a]). There are approximately 1,650 miles (2,655 km) of Flathead Reservation roads on the IRR; most of the remaining road mileage consists of private roads.

[2] The BIA Road System "includes all public roads within the official BIA Inventory database for which approval has been obtained by the Assistant Secretary or his designee. These roads must have public right-of-way before expenditure of Highway Trust Funds (HTF) on construction projects." (57 BIAM 1.3B [1]). The BIA System serves both residential areas and forested areas. Forest roads provide access for timber sales, recreation, fire control, and cultural activities. The BIA system cannot include single purpose roads, such as a road that solely serves a utility facility or agricultural land, i.e. administrative roads.

km) of State Primary Highways (Highways 35 and 200) and 66 miles (106 km) of State Secondary Highways.

- City Streets -- 70.5 miles (113 km) of city streets are in the incorporated towns of Polson, Ronan, St. Ignatius, and Hot Springs.
- County Road System -- approximately 920 miles (1,481 km) are county roads:
    - 685 miles (1,102 km) in Lake County
    - 202 miles (325 km) in Sanders County
    - 17 miles (27 km) in Flathead County
    - 16 miles (26 km) in Missoula County

Bicycle and Pedestrian Paths:

In addition to pedestrian sidewalks constructed in many Reservation communities, the Tribes, cities, counties, Montana Department of Transportation, and the Federal Highway Administration have built several bicycle and pedestrian pathways on the Reservation. These pathways are located in the following areas:

- Along Highway 35, south of Flathead Lake.
- In Polson, Pablo, Ronan, and St. Ignatius.
- Along U.S. Highway 93 from Big Arm to Big Arm State Park, from Polson to Ronan, and from Arlee south to Coldwater Lane.
- Along a portion of Round Butte Road west of Ronan.

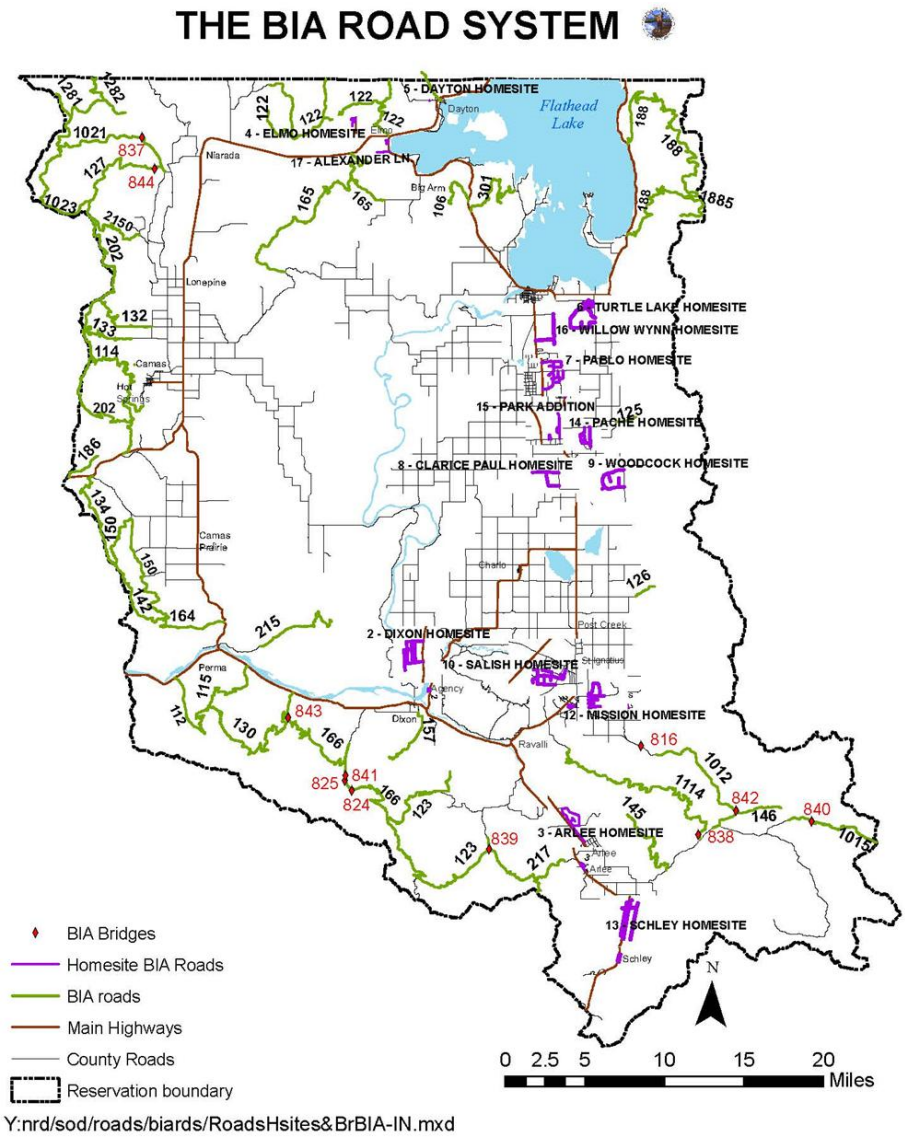


Figure 30: BIA Road System of the Flathead Reservation. Credit: CSKT.

Several new projects are scheduled for the next five years. These are listed in the Action Plan section of CSKT's Comprehensive Economic Development Strategy (CSKT-Economics 2021).

Airports:

Four public airports are located on the Reservation near Polson, Ronan, St. Ignatius, and Hot Springs. The data below comes from the 2020 Montana Airport Directory (MDT, 2021):

- ***Hot Springs:*** Owned by Sanders County, is located east of Hot Springs at an elevation of 2,763 feet. Its asphalt runway measures 3,880 feet by 50 feet. It features a lighted beacon, and there are no fuel or repair services available.
- ***Polson:*** Located across the Lower Flathead River from downtown Polson, this city- and Lake County-owned airport sits at an elevation of 2,936 feet. Its asphalt runway measures 4,200 feet by 75 feet, with part of it on Tribally owned land. The airport features a lighted beacon, and 100LL and Jet A fuels are available, along with major repair services.
- ***Ronan:*** Located north of Ronan, this Town of Ronan/Lake County-owned airport sits at an elevation of 3,089 feet. Its asphalt runway measures 4,800 feet by 75 feet. The airport features a lighted beacon, and 100LL and Jet A

fuel are available. Tribal Fire Control is situated next to the airport and uses it for fire suppression aircraft. Agricultural aerial spraying services also operate here.

- ***St. Ignatius:*** This Lake County-owned airport is also owned by the Town of St. Ignatius. At an elevation of 3,006 feet, its asphalt runway measures 2,610 feet by 60 feet. It also has a lighted beacon. 100LL fuel and repair services are available.

There are no major commercial airlines or air freight services on the Reservation. Air ambulance helicopters provide life-flight services to Missoula and Kalispell. They serve hospitals in Polson and Ronan and make emergency landings nearly everywhere. The Tribes also use helicopters to monitor and manage natural resources, conduct fire reconnaissance and suppression, and maintain a heliport at Ronan for operational purposes.

Rail:

In 1883, the Northern Pacific Company built a railroad across the southern end of the Reservation. They completed a spur line from Dixon to Polson in the early 1900s. Today, BNSF owns both lines, having acquired Montana Rail Link in 2024. They use the main line approximately three days a week to haul inter- and intrastate freight. They haven't used the spur line to Polson since 2012, but negotiations may be possible (Montana Rail Link, 2024).

Taxi cabs:

There are three taxicab services on the Reservation. These are Annie's Taxi, a Tribal-member owned company in Polson, Polson Taxi Service, and South Lake Taxi, also located in Polson.

Tribal Transit

The CSKT Transit Program provides low-cost bus transportation for Reservation residents and employees throughout the Reservation, and from Missoula to Whitefish, Montana. CSKT Transit has several regularly scheduled routes and drop-off/pick-up points. The Transit Program also provides individualized transportation upon request, with a minimum of 24 hours' notice for on-reservation transport and 48 hours' notice for off-reservation transportation.

Educational Facilities

Education is essential for the economic health of Tribal members and for building a strong workforce capable of adapting to climate change. The CSKT runs various educational programs and schools to promote understanding of Tribal culture, incentivize education, and create employment opportunities. These programs include:

- Early Childhood Services (Early Head Start and Head Start)
- Nk̓ʷusm (a Salish language immersion school)
- Two Eagle River High School (which also includes 8th grade)
- Salish Kootenai College

Additionally, the Tribal Education Program offers college scholarships and collaborates with Tribal and non-Tribal Reservation schools and Indian Parent Committees to promote high school graduation and post-secondary education. Financial incentives are given to Tribal high school students for good attendance and grades.

Public schools are located in 10 Reservation Communities, including:

- Arlee – Elementary, Middle, and High School
- Charlo – Elementary, Middle, and High School
- Dayton – Elementary School
- Dixon – Elementary School
- Hot Springs – Elementary, Middle, and High School
- Pablo – Elementary School, Two Eagle River School
- Polson – Elementary, Middle, and High School
- Ronan – Elementary, Middle, and High School
- St. Ignatius – Elementary, Middle, and High School
- Valley View – Elementary School

Private schools include:

- Glacier View School – located between Ronan and Pablo, off of Highway 93
- Mission Valley Christian Academy – east of Polson, on Highway 35
- Mountain Heights Mennonite School in Ronan

Housing

According to the Western Rural Development Region CEDS (2018), "more than 75% of all housing units in Lake County [much of which lies within the Reservation] are single-family, detached [homes], and the majority of homes (63.9 percent) have been built since 1970. Just over 74% of the housing stock is occupied, and of the occupied units, one-third are renter-occupied, while two-thirds are owner-occupied. However, these figures do not account for seasonal homes, the majority of which are located in the Swan Valley [off-Reservation] and Flathead Lake areas. When seasonal homes were not counted as vacant, Lake County had a 5.4% vacancy rate in 2010."

With a recent influx of out-of-state residents buying up homes and property on the Reservation due to the pandemic and forest fires in California and Colorado, the vacancy rate has closed, and many renters have been displaced because the homes they were renting have been sold. Housing values have increased while wages have remained constant. The average Reservation family struggles to find affordable housing, much less energy-efficient housing that can protect residents from extreme temperatures.

The Confederated Salish and Kootenai Tribes founded the Salish and Kootenai Housing Authority in 1963. With a mission to provide "the highest quality, affordable housing to the people of the Flathead Reservation, utilizing all resources to ensure that services are provided in an efficient, economical, and timely manner" (skha.org) According to the Housing Authority's Housing Needs Assessment, nearly 700 units are under management which include rental, homeownership, 50 units of Tenant Based Assistance and an 80 lot trailer park. Most units are income-based. The Low Rent program has a waiting list consisting of 276 low-income tribal households. However, estimates from several Tribal programs indicate that there could be as many as 200 Tribal individuals and families experiencing housing insecurity (SKHA, 2023). Since 2019, SKHA has developed 65 housing units, ranging from single-family homes and duplexes to supportive apartment-style housing. In 2020, the CSKT established a Homelessness Task Force, which is currently developing a long-range Homelessness Response Plan. In the face of climate change, it is critical to ensure all tribal members have access to housing and associated resources.

Climate Change and Infrastructure in Montana

Under every scenario developed thus far, Montana's climate is expected to continue the trend toward warmer and drier conditions, with a significant increase in the number of very hot days being a particular concern. The expected impact of these temperature increases on the energy sector, power grid, and people in their homes is significant. (Jantarasami et al., 2018; Conant et. al., 2018; Ebi et al., 2018; Whitlock et al., 2017).

Climate change poses several risks to critical infrastructure that supplies and delivers energy. For example, heat waves and very high summer temperatures are expected to reduce thermoelectric power plant and transmission line capacity, though estimates of the likelihood, time frame, or magnitude of such impacts are limited (Conant et al., 2018). Extreme weather events, such as severe winter storms or flooding, can bring down power lines, resulting in power outages that are difficult and costly to repair, leaving people without electricity for extended periods. Extreme weather events damage homes and roads needed to access them. Climate change has significant implications for energy consumers, as it may lead to increased costs of energy production and/or distribution being passed on to them. Additionally,

growing demands for electricity in response to rising temperatures are expected to strain aging power grids further (Conant et. al., 2018).

Climate change also affects the supply of water to consumers. Extreme weather conditions can impact the water and wastewater system through contamination of the water source, freezing of the water tank, wildfires burning pump houses and controls, and flooding of the lagoon, which could allow effluents to enter water sources. Additionally, outdated infrastructure has higher rates of water loss through evaporation or leakage.

Climate change influences the behavior of people and wildlife. During hot days, both humans and wildlife tend to seek shelter and water. This results in more animals crossing the main roads throughout the reservation. People also rely more on vehicles during hot days instead of walking or waiting in the sun for public transportation. This increases the risk of accidents involving wildlife and vehicles. As climate change causes more high-heat days, both people and animals will alter their behavior in search of relief from the heat. To reduce the risk of collisions, the CSKT installed a wildlife crossing bridge, known as the "Animals Bridge." This bridge is illustrated at the beginning of this chapter and explored in depth in the Wildlife chapter. This infrastructure has significantly improved conditions for wildlife in the area and reaffirms the importance of wildlife to the Tribes.

Challenges

“Indigenous peoples are vulnerable to infrastructure disruptions that can occur at the level of an individual household (for example, housing and sanitary water supply); within larger, regional integrated systems (such as for power and transportation) or within human systems that rely on such infrastructure to provide other essential services (such as emergency medical response). This vulnerability is partly due to long-standing, unmet infrastructure needs and deferred maintenance challenges” (summed up in the figure on the next page) (Jantarasami et al., 2018).

The challenges of creating new or upgrading infrastructure are various and complex. Budgetary restrictions are a serious limiting factor, and a lack of available grants for infrastructure implementation can create a significant barrier to projects being started and completed. Since northern Montana is a rural area, there is a limited pool of qualified workers with qualified skills and a lower number of tribal labor to build these projects. There are successful and investments in tribal labor development, but the projects are outpacing the number of qualified individuals. It is a constant endeavor to continue to increase skilled tribal labor. Due to many factors, lagging and drawn out timelines resulting from these deficits all impact the investments that are needed for new infrastructure development.

Climate change puts strains on the economic aspects of infrastructure investment, and governmental agencies can withdraw funding if the administration will not invest in infrastructure projects if they do not align with administrative goals. This poses as both a challenge and serious barrier to critical infrastructure projects on the Flathead Reservation.

Outdated infrastructure is more vulnerable to the impacts of climate change. Flooding, drought, windstorms, snowstorms, and dust can all degrade and damage buildings, roads, powerlines, cellular networks, homes, and cause broad impacts across communities and individuals across the reservation. This makes it critical to consider the challenges of dealing with climate impacts on infrastructure.

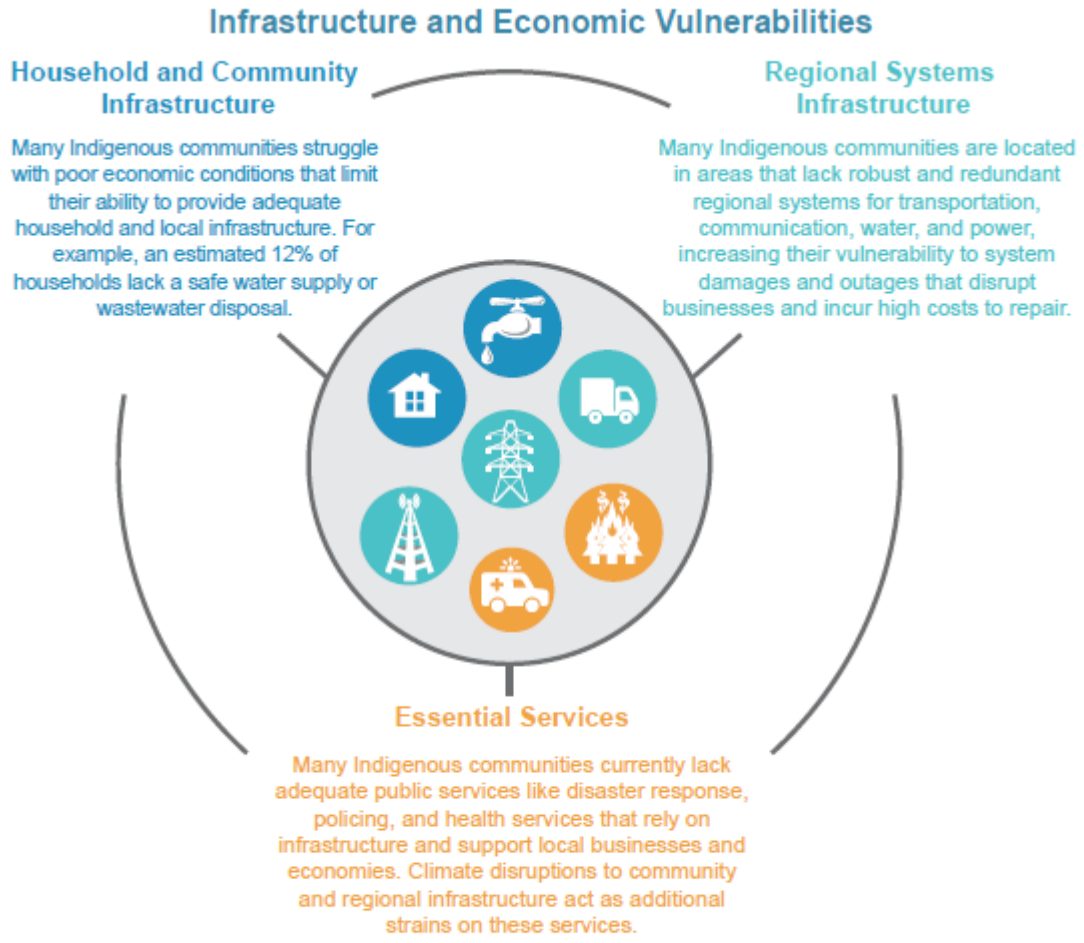


Figure 15.2: Communities' economic potential and livelihoods rely on infrastructure and the essential services it delivers, and many tribes and Indigenous communities already face acute infrastructure challenges that make them highly vulnerable to climate impacts.[22] Indigenous peoples along the coasts and in the islands, the Southwest, and Alaska have experienced the most extensive infrastructure-related impacts thus far (Ch. 8: Coastal; Ch. 20: U.S. Caribbean; Ch. 25: Southwest; Ch. 26: Alaska; Ch. 27: Hawai'i & Pacific Islands). Source: USGCRP.

Figure 31: Diagram of Infrastructure and Economic Vulnerabilities. Credit: NCA.

Problem Solving

As each infrastructure management entity continues routine maintenance and operations planning, unique plans will be developed to adapt to climate change impacts that are specific to the location and type of infrastructure. All of these solutions are dependent on the availability of infrastructure funding.

- Deeper wells, aquifer carrying capacity studies, and development of new road materials with greater resistance to heat damage are a few examples of adaptation methods.
- Aquifer recharge assessments and increased water storage will be critical as precipitation patterns change with more rain and less snow in the Mission Mountains.
- The CSKT are currently assessing, planning, and implementing improvements to the Flathead Indian Irrigation Project to make water delivery more efficient, thereby saving water.

- Cooling centers at Tribal community centers have been identified to provide respite from extreme heat events similar to those experienced during the summer of 2021.
- The Flathead Reservation/Lake County Emergency Response Teams continue to work together to address impacts from extreme events, including floods, wildfires, extreme heatwaves, and the remaining impacts of the

COVID-19 pandemic.

- The Salish and Kootenai Housing Authority is actively working to prepare for climate change. Areas of focus include evaluating the adequacy of factors to improve environmental health & increasing energy efficiency in such ways as: adding insulation to achieve maximum R-value; installing energy efficient windows, high efficiency water heaters, low flow showerheads, aerators, low-flow toilets, and LED lighting.
- All connections within the water/sewer service area are now required to be metered. Water meters record the amount of water being consumed at the service location, allowing staff to track consumption. In an additional effort to conserve water usage, the Housing Authority has put watering restrictions in place during the summer months while consistently monitoring and adjusting the restrictions as needed to ensure that an adequate supply of water is available.
- The Housing Authority's Weatherization program works on homes to increase the home's energy efficiency, safety, and comfort by eliminating drafts. This program's work includes installing weather-stripping, repairing broken exterior doors, patching small holes in walls and roofs, and replacing or repairing damaged windows, performing minor furnace maintenance and repair, blowing in insulation to attics, walls, floors, and perimeters, and insulating water heaters, pipes, or furnace ducts to minimize energy loss.
- Mission Valley Power has created many programs and initiatives designed to help customers respond to some of the current and expected challenges of climate change, including money and energy-saving tips for windows, lighting, insulation and weatherization, appliances, landscaping, water heating, heating, and cooling.
- Mission Valley Power has expanded programs that reduce energy demand during heatwaves.
- Continue efforts to acquire funding for highway improvements that continue to increase safer transportation, and encourage wildlife movement across the landscape.

Goals and Strategies

The CSKT are investing in their infrastructure by applying for grant funding and allocating resources to improve housing, water treatment, energy efficiency, and increase self-reliant energy production on the reservation. The goals and strategies for infrastructure resilience on the Flathead Reservation are listed below.

- Improve the integrity of housing and access to power through enhanced investigation.
- Investigate the use of different building methods for housing in case traditional wood products become scarce due to climate change impacts.
- Investigate new methods for providing water and wastewater systems, with an emphasis on addressing those systems vulnerable to the impacts of climate change.
- Investigate and adopt new power delivery methods. SKHA has been trying to secure funding to install solar power systems at the SKHA building, TLC, and Elderly centers.
- Installation of an EPA-approved treatment plant for wastewater systems.
- Conduct an energy audit on tribal buildings and implement efficiency improvements accordingly.
- Assess renewable energy opportunities – more local power production, independence, and economic opportunities.
- Consider energy storage options.
- Improve highways by looking for funding and active members of state, tribal, federal transportation teams.
- Improving connectivity of communities without driving vehicles (biking, walking, horseback, ect.)
- Seek ways to fund rooftop and community solar energy throughout the CSKT community and government, as well as training for CSKT members in the design and installation of solar systems.
- we will seek ways to fund energy-efficient appliances (e.g., heat-pump water heaters) and heating/cooling systems (e.g., air-source and ground-source heat pumps) for the CSKT community and government, as well as training CSKT members in design and installation.

- Explore the possibility of the CSKT developing and modeling a new Indigenous LEED standard which would exceed the criteria of even LEED Platinum.

Achievements

Meat Processing Facility

CSKT have broken ground in May of 2025 for SQK Quality Meats, a tribally owned meat processing facility that will provide a local hub for culturally oriented and respectful processing of local cattle and culturally significant wild game such as elk, bison, deer, and other harvested animals. This is a way for CSKT to improve economic opportunity for the people of the Flathead Reservation and increase the availability of sustainably harvested foods. Plans are to open a storefront where people can purchase meat processed at the facility. The facility is designed modularly and is funded through the Growth Through Agriculture Grant (Charkoosta, 2025).

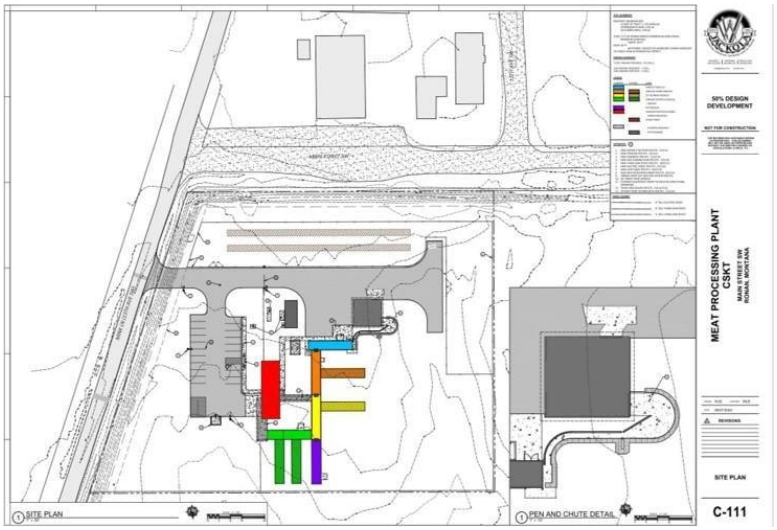


Figure 32: Meat Processing Plant site plan. Photo credit: Charkoosta News.

Infrastructure achievements completed over the last few years are shared below:

- The school in Arlee reduced yearly energy usage by changing light bulbs and ensuring lights were not left on, saving several thousand dollars a year.
- The Housing Authority provides safe and sanitary drinking water service to 30 community systems, while maintaining EPA standards.
- There has been progress on making homes more energy efficient.
- The Housing Authority's water/sewer department recently installed water meters at all service locations on the reservation and has upgraded water meter reading equipment and software to help efficiently read meters at least once a month if not more. They are also able to track water consumption by community or customer.
- The Weatherization Program assists approximately thirty families per year in reducing energy burden by maximizing the home's air infiltration, ensuring the heating apparatus is functioning at its fullest capability, and insulating homes to current standards.
- The Home Rehabilitation Program mirrors the Weatherization Program, in addition to addressing all health and safety concerns in the home. This program ensures Energy Star appliances are installed, that dilapidated windows are replaced (with Energy Star materials), and that water saving measures are addressed when/where necessary, in addition to retrofitting homes for handicap accessibility.
- Both the Weatherization and Home Rehabilitation Programs are closely monitored by inspectors certified through the International Building Codes curriculum, ensuring the most up to date energy saving measures are adhered to.
- Housing Authority's main office has changed all lighting to LED, saving an estimated 82,342 KWH per year.
- The Housing Authority installed 16 ground source heat pumps and 16 ductless heat pumps in an effort to conserve energy.
- The wildlife bridge has reduced the number of animal and vehicular collisions on the highway and provided critical infrastructure for wildlife migration, which is vital under changing climate conditions.

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 who design new products and methods for building housing.
- Municipalities in Montana, the Indian Health Service, the Environmental Protection Agency, Montana Rural Water, the American Water Association, and the inter-Tribal Council of Arizona that provide water and wastewater
- Healthy Homes Program.
- services, such as training/certification. Design/development, funding, etc.
- Utilities in the Northwest
- Federal funding to Tribes from the American Rescue Plan, Infrastructure Bill, and future spending bill that address societal needs and climate change.
- Section 184 Indian Home Loan Guarantee Program



Figure 33: The Sélíš Ksanka Qĺispė (SKQ) Dam near Polson. Credit: Flathead Beacon file photo.



Figure 34: Looking over the Bison Range. Photo credit: Flathead Beacon.

Lands Sector



Introduction

This strategic plan is a living framework for collective action and accountability. It reflects the Confederated Salish and Kootenai Tribes' commitment to stewarding land, water, and community well-being in the face of intensifying climate change. While acknowledging challenges and capacity constraints, its purpose is not to dwell on limitations, but to chart a path forward toward adaptation that is practical, principled, and place-based. This is a living guide rooted in Tribal values and self-determination. This guide is designed to align departments, strengthen partnerships, and help us communicate clearly both internally and externally about what it will take to restore balance between people, land, and resources.

Flathead Reservation lands have a rich history as described in both the History and Culture Chapter of CSKT's 1996 Flathead Reservation Comprehensive Resources Plan (CSKT-CRP, 1996) and the Introduction to the CSKT 2021 Comprehensive Economic

Development Plan/Strategy (CEDS) (CSKT-Economics, 2021). These documents and other relevant resources are available at www.cskteconomics.org and are excerpted in the sidebar here. The impacts of climate change on ancestral reservation lands of the Séliš, Qlispé, and Ksanka peoples have been shaped by this history.

This brief history of the lands of the Flathead Reservation was excerpted from the CSKT 2021 CEDS(CSKT-Economics, 2021).

> "For many thousands of years, since time immemorial, the people gained subsistence from a system of hunting, fishing, plant harvest, and trade, moving seasonally over a large territory that reached throughout, and beyond, the vast Columbia River Basin. Yet in less than 1/300th of the time of the Tribes' existence in the Northwest, the Tribal economy changed dramatically.
>
> With the signing of the Hellgate Treaty in 1855, the Bitterroot Salish, Pend d'Oreilles, and one band of Kootenai people were linked together as residents of what they believed to be the Bitterroot and Flathead Valleys into Canada, The chiefs ceded millions of acres of aboriginal territory to retain the Bitterroot and Flathead Valleys for the Tribes' exclusive use and benefit, along with the right to hunt, fish, and harvest within uninhabited areas of Tribal aboriginal lands.
>
> But promises were not kept, and the three tribes were eventually forced to live within the boundaries of the 1.3 million acres of the Jocko Reserve, known today as the Flathead Reservation. Aside from a few small parcels, the Bitterroot Valley was taken from the Salish over time, and by 1891, the Bitterroot Salish were forced to move up to the Flathead Reservation. Some natives were killed when they hunted on uninhabited Aboriginal land outside of the Reservation. Over the next century, many thousands of acres have been bought and taken by non-tribal members. Homesteading, land subdivision, and land sales to non-Tribal people shifted the population and natural resource balance of the Reservation.
>
> Today, the CSKT population has grown to over 8,000 members, the majority of whom reside on the Reservation. The total Flathead Reservation population is approximately 31,000; there are 12,381 households and 198 industries on the Reservation, with 14,880 employed individuals. The CSKT now owns and manages more than 64% of the 1.3-million-acre Reservation, and is governed by a ten-member, elected Tribal Council that represents Tribal members from eight geographical districts on the Reservation—Arlee, Dixon, St. Ignatius, Ronan, Pablo, Polson, Elmo, and Hot Springs. The CSKT employs 1400 people (including 200 seasonal employees), 80% of whom are CSKT members.

The contemporary Flathead Reservation features a diverse range of landforms that support a variety of ecosystems. There are low, broad valleys, some nourished by abundant rainfall, which are fertile and green; others, like the Camas Prairie, are much drier and have only sparse vegetation. There are high and low elevation forested hills and montane wilderness areas with both wet and dry vegetation types. There are rocky buttes that support shrub and grass communities. There are dozens of rivers, streams, lakes, and ponds, all with their companion wetlands and riparian habitats. Glaciers have formed on the highest peaks, surrounded by rock and alpine tundra. All of these land types are found within a Reservation roughly 60 miles long and 40 miles wide, an area that is but a fragment of the Salish and Kootenai Tribes' aboriginal territory (CSKT-CRP, 1996; CSKT-Economics, 2021). Two CSKT departments, Lands and Natural Resources, manage over 400,000 acres of intermountain grasslands throughout the foothill, riverine, and prairie areas, as well as approximately 120,000 acres of irrigated and dry cropland pasture lands throughout the valley areas.

Climate Change and Lands in Montana

Climate change is already affecting the landscapes of Montana, with trends that are projected to intensify over the coming decades. *The Montana Climate Assessment* (Whitlock et al., 2017) identifies several key risks, including key consequences to land systems, including increased disturbances from drought, fire, and flooding; expanded ranges of invasive species and noxious weeds, as well as substantial impacts on crops and livestock.

Across Montana, noxious weeds now cover approximately 8.3 million acres, or 9 percent of the state's total area, and climate change is expected to accelerate the speed of spread (Whitlock et al., 2017). Invasive grasses such as cheat grass and annual bromes alter fire regimes by increasing the frequency and intensity of wildfires, while reducing native plant communities that support pollinators and biodiversity (D'Antonio & Vitousek, 1992; Brooks et al., 2004). This includes shrubs that are not tolerant of shortened fire intervals, which provide pollen, nectar, and nesting sites for solitary bees. These ecological changes disrupt nutrient cycling (Wedin & Pastor, 1993; Wedin & Tilman, 1996; Hendrickson et al., 2001), reduce forage quality and quantity (Mangold, 2019), and thicken layers of invasive grasses, altering soil conditions to favor invasive plants (Evans & Young, 1970). The economic burden of noxious weeds is also significant : Leafy spurge infestations across Montana, South Dakota, North Dakota, and Wyoming are estimated at $129.5 million annually, while knapweed costs Montana approximately $42 million each year (Lacey, 1989). Montana agriculture faces a mix of opportunities and challenges under projected climate data. Longer growing seasons and shifts in precipitation timing may initially benefit some crop and forage production. However, the MCA (2017) warns that these benefits are likely to be outweighed by increased stress from extreme heat events, drought, and pest pressures, as the effects of global warming become increasingly disruptive, conditions accelerating beyond adaptation thresholds. As illustrated in the Montana Climate Assessment (Whitlock et al., 2017) Rising greenhouse gas (GHG) concentrations are expected to:

- Increase the number of extreme temperature events (e.g., high daytime highs or nighttime lows) during critical pollination timing, grain-fill periods, likely reducing crop yields (Whitlock et al., 2017).
- Increase the range and fecundity of crop pests (Conant et al., 2018; Whitlock et al., 2017)
- Alter plant phenology – for example, earlier onset of Spring and earlier flowering of plants (Conant et al., 2018).
- Lead to "a shift from spring wheat toward winter wheat production, due largely to warmer winter temperatures that facilitate greater winter wheat survival, and warmer summer temperatures that impair spring wheat production by inhibiting seed formation, germination, and early growth (Whitlock et al., 2017)."

Climate Change and Lands on The Flathead Reservation

The Lands Sector focuses on the impacts climate change has on the lands of the Flathead Reservation. The history of how the land on the reservation has been used influences how climate shifts will affect many aspects of the natural and urbanized landscape. Localized projections for the Flathead reservation created for the Confederated Salish and Kootenai Tribes in collaboration with the Desert Research Institute's Native Waters on Arid Lands Project, the CSKT Climate Data Appendix (Bocinsky, 2023), which is explorable on a page, highlight the accelerating pace of climate change on the Reservation. In the Mission Valley (30,65 ft), summers are projected to become much hotter, with up to 30 days per year above 38°C (100°F) by the late century, compared to almost none historically (Bocinsky, 2023). Warming temperatures will extend the growing season significantly: 3-6 weeks earlier in the spring and 2-4 weeks later in the fall, while winters shorten and snowpack declines, altering water availability for crops, rangeland, and wildlife (Bocinsky, 2023).

At higher elevations in the Mission Mountains (6,130 ft), the total annual precipitation may increase as much as 5%. However, more of it will fall as rain rather than snow, further reducing the snowpack and disrupting water storage cycles (Bocinsky, 2023). These shifts pose a threat to forests, alpine ecosystems, and culturally significant plants.

These projections are based on two greenhouse gas scenarios (GHG): a moderating emissions pathway (RCP 4.5) in which the growth of emissions slows and stabilizes midcentury, and an accelerating emissions pathway (RCP 8.5), which assumes business as usual and unchecked emissions growth. Under the latter scenario, extreme heat days, drought severity, and ecological disruptions intensify dramatically.

Tribal elders confirm these changes through lived experience and TEK. For example, in CSKT's "Braids of Truth" video (U.S. Climate Resilience Toolkit, 2021),

Sadie Saloway said, *"The huckleberries are just disappearing so fast. I have been away from there for 53 years, but the areas we used to go to …were good places. They are all gone."*

While Mike Durglo, Senior, said, *"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."*

Learning from the knowledge of tribal elders and practitioners may enable landowners and managers to develop more robust and complex management of agriculture and forestry systems that encourage resilience and emphasize the use of native plants and biodiversity suited to the local landscape and climate (CSKT-Climate, 2016).

Comparing the statewide trends to the projected impacts on the Flathead Reservation enables the CSKT to prioritize different aspects of management and resilience. The MCA's projections and the CSKT's both confirm similar impacts, and clarify that the Flathead Reservation will experience sharper extremes: More hot days, a longer frost-free season, reduced snow and snowpack on the Mission Mountain range, which amplify risks for the rangelands, agriculture, and culturally significant plant communities in ways that are not fully captured in the MCA.

This sector's goals focus on how the tribe can adapt to the changes outlined in these two projections, including reviving the native plant community for traditional first foods, restoring local ecological functions, and supporting agriculture through adaptive land management.

Challenges

Reservation Grasslands

Grasslands of the Flathead Indian Reservation in Montana comprise the easternmost extent of the Palouse Prairie, a grassland that has been 85% extirpated from its former range and is considered a critically endangered ecosystem and globally threatened resource (Noss, 1995). This land is considered arid to semi-arid, with 12-25 inches of precipitation annually, falling as snow or rain during the winter. Temperatures are milder than the Great Basin or desert Southwest, with summers rarely over 95°F. These inter-mountain Montane grasslands are heavily impacted by land use change, grazing, and invasive plants, leading to the decline of native grasses and forbs that sustain pollinators and provide important ecological and cultural functions.

For thousands of years since the last ice age, grassland dynamics were shaped by summer drought, periodic fires, including those intentionally set by Native Tribes, to promote first foods and medicinal plants, and seasonal grazing by deer, elk, and small mammals. Herds of bison were a significant force in the evolution of the short grass and tall grass prairies here, and on the Great Plains. The removal of most of the population of these species from grasslands has significantly altered the landscape, as has the encroachment of human settlement, industry, and cattle grazing.

Today, invasive annual grass has transformed the natural patterns of fire regimes, increasing frequency and severity while reducing native plant diversity. These changes accelerate the loss and degradation of habitat.



Figure 35: Old photo of the Bison Range. Credit: U.S. FWS.

Soil and Vegetation Decline

On the Flathead Reservation, native soils have been depleted by erosion of the soil A horizon (Pimentel, 1994), the loss of microbial crusts (Ferrenberg, 2015), and soil compaction by grazing animals. These processes reduce water holding capacity, increase runoff and erosion, and limit diverse perennial vegetative cover with few remnant native ”wolf” plants with an increase in invasive plants that further reduce vegetative conditions (Chambers et al., 2016; Dregne, 1992). The cumulative outcome is increasing desertification, which impairs carbon sequestration. Under warming and drought, degraded soils may transition from carbon sinks to net emitters of CO_2, intensifying climate feedbacks(Fierer et al., 2003; Manzoni et al., 2014). The degradation of soils on the Reservation poses a challenge for the CSKT. As soils lose fertility and water-holding capacity, rangelands and croplands become less productive, threatening tribal food security, grazing livelihoods, and the ecological health of culturally important landscapes.

Pollinator Decline

The Flathead Reservation is home to many pollinator species, including bumblebees, flies, and other insects, as well as birds and bats. All these species play critical roles in maintaining ecosystem functions. Unfortunately, these species are experiencing measurable declines with cascading effects on both agricultural and native ecosystems. More than 70 pollinator species are currently recognized as threatened at regional or national scales, including two bumble bees, *Bombus,* and seven other bees in the genus *Hylaeus,* twenty-six birds, three bats, and thirty-eight butterflies, moths, and other insects on the Federal Endangered Species List (USFWS 2021, Xerces Society, 2021).

The drivers of pollinator decline are multifaceted and connected (IPBES, 2016). Habitat loss and fragmentation reduce the availability of flowering plants and nesting sites and create gaps in forb communities that pollinators depend on for seasonal nutrition. Introduced bees, while providing important pollination services, do increase competition for limited resources within the established ecosystem and can transmit pathogens, further stressing populations of native species that occupy niche ecosystems that domesticated bees cannot replicate. Climate disruption increases these pressures with differing phenology and drought (Alston, 2007).

The CSKT are concerned about the use of neonicotinoid insecticides, which persist in soils and plant tissues and volatilize at temperatures above 27°C (80°F). This can cause them to drift along wind currents and potentially contribute to the decline of pollinator populations. This is a challenging problem due to the resilient nature of noxious and invasive weeds and the common practice of using insecticides for agriculture and commercial use (Brittain et al., 2010).

Land Ownership and Jurisdiction:

As of 2023, the CSKT owned approximately 59%, or 768,560 acres of trust and fee land, 76,849 acres of water areas under Tribal jurisdiction, and individual Tribal Members own approximately 29,106 acres of trust land. Approximately 31%, or 402,574 acres of fee land, are owned by non-Tribal and Tribal members, 37,487 acres are owned by the State of Montana, 4,043 acres of federal lands, and 76,849 acres of water (CSKT-CRP, 1996). The CSKT owns and controls approximately 67% of reservation land and water areas. The counties maintain land use and zoning authorities on fee simple lands that can conflict with Tribal perspectives and priorities. The Tribes have water quality and air quality jurisdictional programs that rely largely on volunteer efforts and incentives for adoption of climate related mitigation measures (CSKT-Economics, 2021).

A challenge for CSKT landownership is the checkerboard of these different lands and the stipulations that exist for ownership, management, and the legal framework for each property type. The tribe is working to buy back land, and the challenge of that is funding for land purchase, erratic funding cycles, and grants. As part of this, the time it takes to make land purchases is substantial and requires departmental oversight, which is a costly investment on top of the current market value of lands on the Flathead Reservation.

Conservation of culturally important landscapes is an important tool. This will improve the management of local resources, helping to buffer some of the pressures that are felt in a changing climate. The challenge is that the sale of critical pieces of land often depends on the will of other entities, can happen on short notice, or without notice, and involves large sums of money. Navigating this in a very active market can be difficult, as other parties can highly value such land.



Figure 36: 2025 CSKT Land Status Map.

Rangeland Management

The Bureau of Indian Affairs (BIA) requires that rangeland inventories and assessments be conducted at least every ten years to support informed grazing management decisions. However, current staff capacity, technical infrastructure, and long-term funding are insufficient to fully meet this federal expectation across the full extent of rangelands on the Flathead Reservation.

To care for and restore our lands effectively, the Tribes need to be able to exercise greater autonomy in rangeland management. Federal red tape and lengthy regulatory processes often complicate and delay timely action, creating barriers to implementing the adaptive and culturally grounded practices our lands and people need. Streamlining these processes, while still honoring environmental safeguards, is essential to restoring balance on the land and ensuring that Tribal stewardship can be fully realized.

When the Tribes are responsible for millions of acres of land but are not empowered to act as true landowners, it creates a serious disconnect. Instead of swift, place-based decision-making, we're often met with layers of red tape that delay action—even in urgent cases of land degradation. This lack of authority undermines our ability to protect and restore the land. We need the freedom to respond to threats, steward our rangelands, and hold land users accountable—without unnecessary bureaucratic barriers. With good ecological practice, economic value follows.

Problem Solving

The Confederated Salish and Kootenai Tribe's Lands Department works with different tribal departments, programs, and agencies to utilize the resources and knowledge available to improve the management and quality of the lands on the Flathead Reservation in various aspects of the environment, agriculture, economy, and culture of the Tribes. This requires a continuous understanding of resources at the local, tribal, state, and federal levels. The lands department is focusing on ways to improve rangeland management, protecting pollinator species, managing noxious weeds, and considering ways to protect land.

Land Buy-Back

The landscape of the Flathead Reservation is very dynamic, and the CSKT are utilizing unique ways to reintegrate lands back into their care. Due to the Flathead Allotment Act, a fee patent policy exists, where many people own a small percentage of interest in the land, either through land rights or mineral rights, which limits the ability of landowners to manage their land.

The Flathead Reservation has identified almost 3000 tribal members who share ownership of about 700 tracts of land. Two thousand of those members only have shares of less than 5% interest in a tract. The number of parties involved in each tract of land makes management decisions almost impossible.

CSKT has made an effort to buy back reservation land at fair market value to restore tribal homelands. This is being done under the Cobell Settlement Agreement, in which the government allocated $7.4 million to purchase about 38,400 acres worth of fractionated land interests on behalf of the CSKT. This approach aims to enhance continuity in property management, simplify the decision-making process for land use, and empower landowners to make informed decisions on their land that align with the objectives of the Climate Change Strategic Plan.

Creating Conservation Easements

Conservation easements restrict residential and commercial development of environmentally sensitive areas like the wilderness buffer zone, the river corridor, and sensitive wetlands. A conservation easement can be placed on most land parcels. The CSKT views conservation easements as valuable designations for preserving ecosystems, enabling public access to lands that were once private, stabilizing wildlife populations, and creating migratory corridors when enough connectivity exists. Many conservation easements can be open to the public to visit; this allows people to develop a connection to these special places.

The CSKT has partnered with organizations to protect land within the area of the Flathead Reservation, and their homelands that are no longer within that boundary. This is done with the knowledge that protecting the land surrounding the reservation improves the conditions on it. In the Swan Valley, a

protected parcel named the Elk Creek Conservation Area is a habitat for bull trout spawning. North of the reservation, the Lost Trail Conservation Area is a 38,000-acre conservation easement that has become part of the National Wildlife Refuge Network through a partnership with CSKT, Swan Valley Connections (SVC), and the Trust for Public Land in 2022. This area is a key migration area for elk (SVC, 2025). The Bonneville Power Administration provided the funding. This approach to collaborating with other agencies to improve the outcomes for all parties is a model for other land parcels of interest.

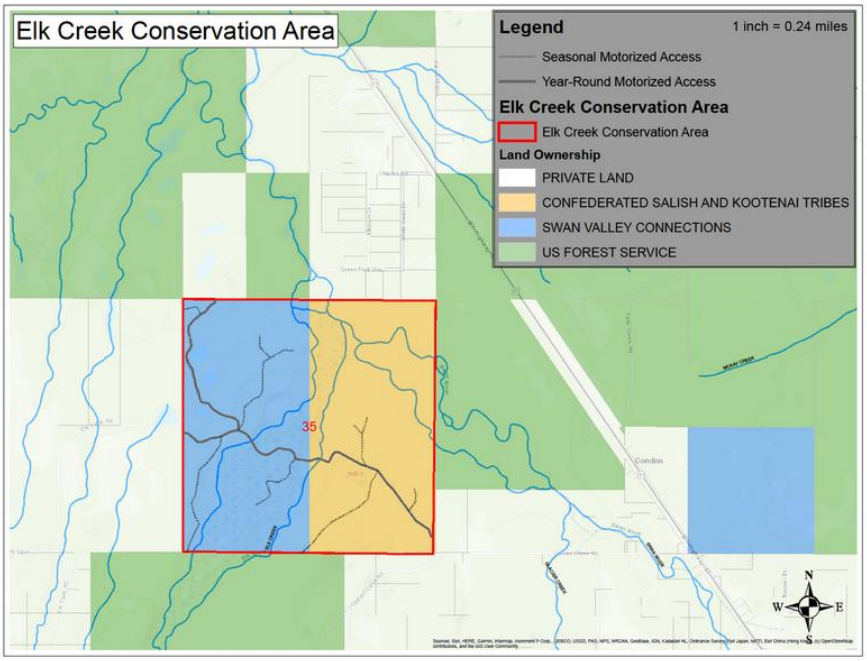


Figure 37: Map of the Elk Creek Conservation Area. Map by Swan Valley Connections.

Pollinator Health:

The CSKT Natural Resource Department has been working to improve the health of pollinators across the Reservation. The NRD has developed baselines for pollinators present and lost historical populations (bees, butterflies, insects, bats). They have been focused on increasing habitat through planting native plant species into mitigation and restoration sites across the reservation. These include native plant gardens that the public can visit. Many groups and agencies collaborate with CSKT to share native plant seed packets during events to encourage the public to plant pollinator gardens themselves. This creates mosaics of pollinator friendly areas across the Reservation and beyond.

Efforts by the Natural Resources Conservation Service is testing no-till radish, turnip, sunflower, triticale, barley, rye, oat, and pea cover crops with area producers, that creates habitat for pollinators, breaks insect and weed cycles, host beneficial insects, reduces bare ground, improve nutrient cycling, capture carbon in the soil, reduce erosion, and produce increased feed for livestock and build healthier soils."(Lake County Leader, 2021). Education, demonstrations, and incentives for producers can facilitate the adoption of such practices among Tribal members and non-member farmers.

The use and sale of pesticides on all lands within the reservation is based on the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through a Memorandum of Understanding between the CSKT and the US Environmental Protection Agency.

Salish Kootenai College Collaborations

Salish Kootenai College (SKC) is the CSKT's four-year land-grant institution and a charter member of the American Indian Higher Education Consortium (AIHEC), which provides education curriculum and opportunities in line with tribal values and goals. SKC Extension is the arm of the college with a mission to:

"Improve the quality of life of our Tribal community with culturally appropriate, scientifically based education, demonstration, and research that sustains environmental resources and promotes healthy lifestyles for the Séliš, Ksanka, and Qĺispé people."

SKC Extension has many projects that are in line with the goals of the Climate Change Strategic Plan. SKC researches to restore degraded grasslands with no-seeding native grasses, favorably introduced grasses, and native pollinator plants, and establishes restoration islands with plug plantings, while evaluating herbicides for suppressing annual invasive grasses and forbs. Outreach elements include mapping noxious weeds to delineate the known infestation range, implementing

education programs, establishing weed management areas, and implementing control measures. Control projects have been conducted on hawkweed, yellow flag iris, and flowering rush. SKC facilitated the release of biological control agents against yellow toadflax, conducted rearing and release of spotted knapweed biological agents, and collaborated with multiple entities on biological control agents for flowering rush, with one candidate for release.

Noxious Weed Management

The CSKT Lands Department (TLD) uses science-based integrated pest management (IPM) methods to control terrestrial noxious weeds on Tribal agricultural lands and forest roads. The CSKT Natural Resource Department manages noxious weeds on The Bison Range and wildlife and fisheries mitigation properties, implementing IPM tools, including chemical, biological, controlled burning, and reseeding. TLD has completed treatments on thousands of acres of noxious weeds since 1990. While chemical controls are used when necessary to meet project objectives, a variety of non-chemical approaches must be applied to offset environmental, cultural, and human health concerns. These methods are an essential component of an integrated control program, encompassing prevention and community education, biological and cultural controls, and prescribed grazing. Additionally, as part of most large-scale control projects, management adjustments, such as deferred or rest rotational grazing systems, were made to promote recovery of desirable vegetation. These projects are also monitored to determine project success, the need for management adjustments, and the next steps in our weed control effort.

Aquatic invaders are also becoming more prevalent, clogging irrigation infrastructure and undermining water quality. These escalating challenges demand rapid response and non-reactive control, and they require comprehensive, adaptive, and culturally grounded management approaches. The spread of invasive species, combined with overgrazing and the loss of native forage plants, has reduced the nutritional quality of rangelands; accordingly, it forces producers to rely on more acreage to support the same number of livestock, making the restoration of native species critical to reversing this trend.

TLD places a high priority on eliminating new invaders within native grassland and aquatic locations. The management goal for large weed infestations must be achievable and realistic. Accordingly, the goal for these projects is generally to contain existing infestations and reduce biomass and density of invasive species to acceptable thresholds. Invasive species management projects undergo extensive planning and environmental review. Several sources of cost share funds sought to implement these projects. As technical and funding resources are available, TLD performs grassland inventories to provide stocking rates and evaluate ecological trends. These inventories provide baseline information for noxious weed planning processes and will help managers to develop control strategies. TLD works extensively with Tribal, federal, and state resource specialists to develop comprehensive weed control plans and ensure NEPA compliance, thereby addressing multiple resource concerns and providing adequate mitigations to protect resource values. The TLD competes for cost-share funds from the NRCS, BIA, Montana DNRC, and other sources to obtain additional funding for these projects that would otherwise be unaffordable. CSKT also secures funds from the NRCS EQIP Program to support producers in implementing practices that enhance range health, reduce chemical treatments, restore native plants such as bitterroot, and improve nutrient cycling.

The CSKT are committed to continuing this success and are exploring new pathways and opportunities for managing invasive species. TLD will continue to collaborate with SKC Extension and other research institutions to develop and implement research projects that identify new, environmentally safe, and cost-effective control methods. We will continue working with producers to demonstrate the effectiveness of biological controls and explore opportunities for alternative forage and cover crop options, as well as transitional and intentional grazing to improve range health.

Across the reservation, rangeland conditions are inconsistent; some pastures remain healthy while others are severely degraded. This patchwork outcome stems from both ecological variability and a broader challenge: a mindset that resists regulation and avoids hard decisions around stocking rates. While resource managers often make requests to reduce herd pressure,

they are not consistently enforced or followed. Without a cultural and political shift toward long-term stewardship, even well-managed areas are vulnerable to decline. Changing this mindset means recognizing that sustainable stocking is not just a technical or economic issue, and it is a commitment to the land, future generations, and the survival of both traditional livelihoods and ecosystems.

Invasive weed pressure is not just a human or management issue; it triggers a cascade of ecological effects. As climate change worsens these pressures, degraded forage quality pushes livestock to concentrate around remaining native plants and critical water sources. This leads to overgrazing, soil compaction, and further weed invasion, creating a cycle that damages not only the land's productivity but the broader ecological health of rangeland systems (CSKT-Lands, 2020).

Rangeland Management and Monitoring

When funding and technical resources are available, TLD conducts range inventories to evaluate range conditions, identify trends and conservation needs, and recommend adjustments to stocking rates as necessary. More research and demonstrations are needed to evaluate range conditions, develop efficient monitoring methods, identify climate-smart grazing systems, grassland restoration practices, manure management, and crop-livestock integration. Research on rotational grazing and intensive short-duration grazing, which mimics the grazing pattern of bison, is needed to determine the effects on the highly altered, intermountain Montane grasslands of the reservation (FAO, 2013).

Climate-smart Grazing

The outcomes of high-intensity rotational grazing are still debated. Research and grazing demonstrations are also necessary to test alternative grazing methods, such as high-frequency, short-duration grazing; transitional or target grazing; rotational grazing; and integrating grazing practices with crop and rangeland management to enhance range health, increase vegetative cover, reduce grazing pressures, and improve soil carbon storage.

Raising domestic livestock is the most common agricultural operation for Tribal Members and most non-members on the reservation. Tribal operations are primarily based on grazing leases and permits issued by the Tribes, with hay land leases on tribal lands or operator-owned land. Tribal members typically have cow-calf operations with little crop or livestock diversification that can be described as "low-cost operations," relying more on rangeland grazing and dry pasture and hay land, with some irrigated hay land. Non-member operations utilize more irrigated pasture, hay, and cropland than those operated by tribal operators. Global trends in livestock production are expected to double over the next thirty years, and milk production is projected to increase by 80% (FAO, 2006). Livestock production contributes to food security by utilizing forages that humans cannot convert into energy on lands unsuited for cultivated crops (FAO, 2013). Climate Smart Agriculture practices for livestock include grassland restoration, grazing management, manure management, and crop-livestock integration (FAO, 2013). Manure management options for extensive grazing and pasture systems are limited to managing manure on winter feeding grounds, which typically involve harrowing to break it up and encourage decomposition, allowing it to work into the soil profile. Confinement feeding operations should be designed with climate-smart livestock practices to capture waste and compost it in covered piles with rapid soil incorporation or utilize anaerobic digestion to produce biogas for on-farm use (FAO, 2013). Confinement operations are more efficient when smaller operations are distributed across the landscape, including manure collection systems with concrete slotted sloping floors and shaded areas to ease stress on livestock, rather than extensive confinement operations (FAO, 2013).

Climate-smart livestock practices can be enhanced by optimizing grazing practices, improving feed production efficiency, enhancing feed quality, and implementing effective management strategies to increase vegetative cover. Reducing grazing pressure on rangelands promotes land rehab and soil carbon capture. Ripple et al. (2013) argue that reducing ruminant numbers helps mitigate climate change and offers social benefits, while others note that grazing ruminants helps mitigate climate impacts (Teague, 2015). Rehabilitating degraded rangelands enhances vegetative cover, soil microbial activity, and water retention (Rolfe, 2010). Crop-livestock practices, such as maintaining residues, using cover crops, adopting no-till farming, and utilizing low-

emission feed crops, can reduce grazing pressure, enhance soil health, and increase carbon sequestration. Using native plants, improved grass, and legumes in pastures further supports climate goals.

There are several grazing systems practiced worldwide, with varying scientific opinions on whether any grazing system involving ruminant animals can mitigate climate change through carbon sequestration (Garnett et al., 2017). Conversely, some scientists believe that grazing systems play a key role in mitigating climate change (FAO, 2013a; Teague, 2015). High-intensity, low-frequency grazing, also known as the Savory grazing system, aims to mimic the grazing patterns of wildlife, such as those exhibited by bison on the Great Plains and wildlife on the African plains. According to Savory, this system will increase livestock numbers, improve soil carbon storage, boost vegetative productivity, reverse desertification, and combat climate change (Savory TED Talk, 2013). However, these claims are not supported by mainstream research; many scientists dispute that high-intensity, low-frequency grazing alone can significantly increase soil carbon or reduce climate change impacts (Briske, 2013; Norberg, 2016; Petersen, 2019). Grazing intensity affects soil carbon differently based on climate, precipitation, and whether cool-season or warm-season plants dominate the community. Warm, moist grasslands tend to store more soil carbon under high-intensity grazing, whereas cool, dry grasslands may lose soil carbon under similar conditions. High-intensity grazing generally lowers soil carbon in grasslands dominated by cool-season plants, where soil carbon is higher under grazing that stimulates plant growth—such as increasing root development—thereby boosting soil carbon (McSherry & Ritchie, 2013). Additionally, cool-season grass populations can even increase within exclosures over decades of rest (Augustine et al., 2017; Vermeire et al., 2018).

Cool-season grasses (C_3) may be particularly vulnerable to the effects of climate change. Climate models project a widespread decrease in C_3 grass habitat and an increase in warm-season grass (C_4) habitat (Bailey et al.; Havrilla et al, 2023; Loka et al., 201). Bluebunch wheatgrass, a C_3 grass, has shown a sensitivity to drought, and several studies on the Southern Great Plains have shown a decrease in native grasses and C_3 grasses due to climate stressors (Ganskopp & Bedell, 1979; Raz-Yaseef et al., 2015; Malinowski & Pinkchak, 2015). Some grasses that are more drought-resistant or summer-dormant could replace native C_3 grasses (Malinowski & Pinkchak, 2015; Taleb et al., 2023). Although other studies have shown C_3 grasses maintain their populations during long-term precipitation variations, while C_4 grasses populations can decrease (Witwicki et al., 2016; Chamaille-Jammes & Bond, 2010).

Selecting a grazing system to improve climate change mitigation outcomes should be based on scientific principles, regularly monitored through inventories, vegetation trend analysis, carbon sequestration measurements, and invasive species monitoring and management.

Youth Engagement

There are several ongoing activities by multiple entities delivering youth orientated educational events around agriculture, natural resources, Tribal management processes, and culture. SKC Extension conducts a two week “Safeguarding Natural Heritage Agriculture and Natural Resource Youth Experience” for high school age students to increase interest in natural resource careers. Extension conducted an “All Climate is Local” program involving Tribal College students from across the country in climate science activities. In both camp settings, students prepare projects that focus on the impacts of climate change on their tribe and region. Extension is implementing a “Tribal Youth Garden Network” engaging eight area schools, including Two Eagle River School, in youth school gardening experiences. Extension is participating with “Gardens for Life” a fifteen-week long garden training at eight locations across the Reservation. In the first year, approximately 50 adults and youth grew organic vegetables for their families and donated thousands of pounds of produce to senior citizen centers and area food banks. In the second year, we project to reach over 100 community members growing food for personal use, donation, and sales. The CSKT has sponsored the “River Honoring,” an all day gathering of 4th and 5th graders learning about natural resources for over 35 years. SKCE is implementing a research project working with the Boys’ and Girls’ Club, developing “Healthy and Sustainable Diets for All” educational activity kits featuring health, nutrition, and sustainable food systems.

Clean-up Efforts and Land care:

To continue caring for the lands of the Flathead Reservation, the tribe has been mitigating damage caused by historical and current industrial, commercial, and private alterations to the landscape. Two ways the tribes are doing this are through the CSKT Brownfield Program, which involves cleaning up sites, remediating them, and making some locations usable again. As an example, this is being accomplished through asbestos abatement projects on three burned residences through the EPA Brownfields Program (Charkoosta, 2024). Another way the tribes are doing a remediation project is by planning a project to clean up the Revais Creek mine tailings and restore the area.

Goals and Actions

The Tribal Council has recently implemented three initiatives that directly affect the Lands Sector. Council directed Tribal departments and entities to implement climate change mitigation, food sovereignty, and Tribal member employment strategies. A list of goals and actions, as part of the CSKT Climate Change Strategic Plan, that the Lands Department is focused on is presented and explored below.

Land Sector's Preparedness Goals

- Evaluate soil health, crop requirements, native crops, and irrigation water sources to support shifting to alternative crops.
- Use prescribed burning to improve land health. Implement monitoring protocols to document and evaluate the long-term impact of burning on noxious weed encroachment and effects on native and desirable plant communities.
- Continue noxious weed management, prioritizing new invaders, protecting remaining intact native vegetation, and restoring grazing for livestock and wildlife.
- Managed grazing systems to maintain vegetation health, restore range conditions, and improve soil health.
- Identify alternative crops, educate producers, and implement strategies and incentives for implementation.
- Implement research, demonstrations, and incentives for alternative crops such as cover crops, alternative grazing crops, and minimum till and no tillage for field and garden crops.
- Implement research, demonstrations, and incentives to promote more vigorous native plant communities and maintain traditional plant gathering sites.
- Implement research, demonstrations, and incentives to promote rangeland restoration.
- Facilitate access to land, water, and marketing alternatives for new agricultural opportunities for Tribal Members.
- Connecting youth to the land: Helping younger generations engage in traditions.
- Identify tools to evaluate soil health, determine cropping requirements, and develop irrigation water sources to support shifting to alternative crops.
- Restrict residential and commercial development of prime and other irrigated farmlands, environmentally sensitive areas like the Buffer Zone, River Corridor, and wetlands.
- Tribal Council adopted a food sovereignty initiative. The Tribal Food Sovereignty Group was initially formed to implement a food security plan for distributing food to Tribal families during the COVID-19 pandemic.
- Educational Awareness Campaign
    - Hazardous waste/site
    - Illegal dumping
    - Brownfields
    - Outreach
    - Development
- Recycling
- Work on Tribal Land Ordinance Update.

Partners and Funding Sources

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

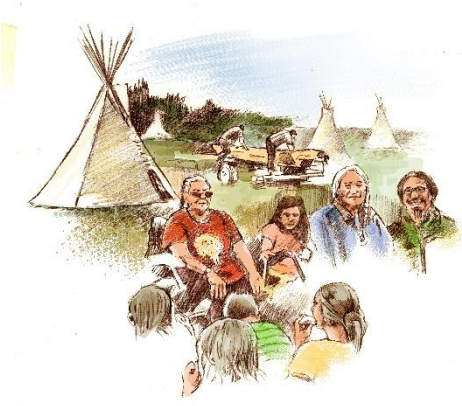
- Tribal Forestry Department
- Tribal Natural Resources Department
- Tribal Economic Development Office
- BIA

- U.S. Fish and Wildlife Service
- U.S. Department of Agriculture Farm Service Agency-Natural Resource Conservation Service-National Institute of Food and Agriculture, Agriculture Research Service, Agricultural Marketing Service, National Science Foundation
- Native American Agriculture Fund, First Nations, Indian Agriculture Council
- Flathead Reservation Extension, SKC Extension, and Lake County Extension, Lake County Community Development-Mission West, Montana State University, University of Montana, Desert Research Institute
- Lake and Missoula County departments





People Sector



"The 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." - 2023 Voices of The People Annual Report

Introduction

The People's sector incorporates parts of other tribal resources to improve the well-being of the tribal members and community. Just as current generations draw on prior generations for knowledge, the CSKT Climate Change Strategic Plan draws on past plans as sources of inspiration, wisdom, and cultural continuity. The paragraphs that follow are taken directly from the CSKT Comprehensive Resources Plan.

Tribal values are imbued with the Tribes' long-held cultural attitudes toward the land and its historical use of resources by their ancestors. They are based on the fundamental belief that humans and nature are one (CSKT-CRP 1996). These values include:

- ***Learn to live in harmony. Live in harmony with each other and with the land.***
- ***Our ancestors left this land, and we are only borrowing it from our children. As we make decisions that affect the land, we must consider the consequences those decisions will have, at least for the next seven generations.***
- ***Respect the land. Replace what you take, take only what you need. By respecting the land, we respect ourselves.***
- ***Preserve spirituality and culture. Act on a spiritual basis when dealing with the environment; always be aware of and appreciate what we have. Turn to the Creator when in need. Perpetuate the value of Indian culture.***
- ***Preserve an abundance of animals, plants, and fish.***
- ***Maintain hunting and fishing based on need and traditional use.***

Tribal Services: Overview

The focus of the People Sector includes the resources available in different departments across the reservation to protect people and their health against climate-related challenges and risks. The social services (behavioral health, food programs such as Women, Infants, and Children (WIC), safety (first responders, law enforcement including security issues such as land disputes and disputes over resources including food, property, water), tribal health (medical practitioners, environmental health, public health), and human resources (employment, workforce availability). These programs, services, and departments are distinct yet interrelated aspects that affect the health, well-being, and quality of life of people on the Flathead Reservation. Combined, these categories provide a more complete picture of the expected impacts of climate change and the resources that CSKT have available for individuals, families, and communities on the Reservation.

Social Services

The focus of the social services section includes the emergency welfare services for Tribal people, as related to climate change. Tribal Social Services Department clients are some of the most vulnerable populations on the Flathead Reservation. They include Elders, parents, foster children, foster parents, guardians, children in our group home, low-income individuals and families, 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. Much of the Social Service Division's mission is to protect tribal children and their future. Climate change is expected to increase demand for these services and create more challenges for all community members. Due to this, measures must be taken to ensure that a system is in place to deliver services quickly and efficiently. The burden has been laid on the people due to the impact of climate change. Access to social service resources is critical for maintaining a healthy community on the Flathead Reservation. The Tribal Social Services Division provides referrals for mental health resources, housing needs, and substance use resources. A changing climate will negatively impact the social, cognitive, economic, and physical well-being of tribal members. It is crucial to ensure that the public understands the available resources and programs and utilizes them in times of need.

In recognition of the sensitivity of these vulnerable populations to climate impacts, it will be beneficial to develop programs that directly educate and empower them. Early exposure to climate impacts may translate into grassroots actions that can influence the decisive action by political representatives. To do this, their voices must be heard. Educational events, check-ins,

and community gatherings may provide opportunities to listen to these vulnerable populations and create plans to improve social services for communities across the Flathead Reservation.

Safety Services

The focus of the safety section includes work environments, tribal facilities, tribal food services, and domestic animal control. Services provided by safety programs address suicides, drowning, motor vehicle accidents, fire prevention, poisoning, and more.

Due to the size of the Flathead Reservation and its numerous rural areas, there is a risk that people may not be able to access emergency services during extreme weather events, resulting in individuals becoming isolated in their homes. Another hazard during extreme weather is that safety services are overwhelmed by emergencies and are unable to respond appropriately to needs. Transportation on the Flathead Reservation is a crucial component of the infrastructure, given the area's vast size and diverse topography. Roads and driving are essential to maintaining the flow of the social and local economies of the region. The CSKT has several goals to improve the infrastructure surrounding public transit. This is crucial because some community members lack access to personal vehicles. For more information on how climate change impacts infrastructure and other services, please refer to the Infrastructure Sector.

Health and Human Resources

The Health and Human Resources section focuses on community healthcare and transportation. Climate change impacts weather patterns, leading to increased environmental health and emergency issues. These impacts may also create transportation barriers affecting access to healthcare and other critical services and resources.

The CSKT's response to COVID-19 exposed gaps in the healthcare delivery system. A collaborative team approach was used, incorporating representatives from various departments and agencies, including the Division of Emergency Services, Law Enforcement, and Tribal Health. These agencies coordinated their efforts to organize the tribal response to the COVID-19 pandemic. However, this collaboration highlighted the absence of a central office for Public Health. Establishing a separate Public Health Office for the tribes may be worth exploring, given the possibility that climate change could affect the distribution of disease vectors and pathogens, further straining existing public health resources and infrastructure (Charkoosta, 2020).

Salish Kootenai College

Salish Kootenai College (SKC) is the CSKT's four-year land-grant institution and a charter member of the American Indian Higher Education Consortium (AIHEC), which provides an education curriculum and opportunities aligned with tribal values and goals. Salish Kootenai College offers resources to the CSKT in multiple ways. The Core Themes of SKC are centered on providing high-quality education to Tribal individuals that promotes community well-being and health, as well as civic participation on the Flathead Reservation. This ensures that people who receive an education at SKC can share their skills and knowledge to serve their communities and generate greater resilience. Some of the degrees offered at SKC include professional and workforce development degrees, as well as programs in Natural Resource and Science, Native American Studies, and Education. This enables the next generation to have a greater impact on the community (SKC, n.d.)



Figure 38: A nurse directs a driver as hundreds of people line up to receive drive-through COVID-19 testing at Polson High School on June 19, 2020. Photo credit: Hunter D'Antuono. Caption: Flathead Beacon.

SKC's role in helping the tribes respond to climate change is vast. Through community outreach events, SKC hosts numerous local, state, and national conferences, forums, and gatherings aimed at creating, sharing, and expanding projects related to climate change and sustainability that positively impact communities, both on the Flathead Reservation and nationwide.

Climate Change and People

A changing and warming climate means a changing environment. The health and safety of people and communities are intimately tied to the well-being of the places they call home. As a result, climate change poses several risks to the health of individuals, families, and communities (Gupta et al., 2019; Khumalo and Stonecipher, 2018). Climate change can be expected to worsen chronic illnesses and mental health issues, cause injuries and deaths during extreme weather events, spread infectious diseases through mosquitoes, ticks, and invasive species, and increase the likelihood of illnesses from contaminated food and water (Sarfaty, Gould, & Maiback, 2017). A longer growing season and hotter summer temperatures may extend the pollen and dust season and the likelihood of dehydration and heat-related illness (Sarfaty, Gould, & Maiback, 2017). Longer fire seasons increase exposure to wildfire smoke, which then increases the risk of respiratory illness, heart attack, and stroke, especially in individuals aged 65 and older (American Heart Association, 2018; Wettstein et al., 2018). Global health researchers say that "climate change is the biggest global health threat of the 21st century". This means that acting now to prevent more health-related losses from climate change provides a significant opportunity to improve global health (Watts et al., 2018). In fact, the 2015 Lancet Commission on Health and Climate Change concluded that "tackling climate change could be the greatest global health opportunity of the 21st century" (Wang and Horton, 2015). Given that tribal communities are especially social, the potential for widespread impact from climate change is a real possibility that could result in the loss of life, social ties, as well as tribal knowledge, cultural history, and language. Tribal youth and elders are particularly vulnerable to the impacts of climate change, as they hold the past and the future in their care (Char-Koosta, 2020).

"In Hot Springs, heat is sustained over there. We don't get a break from it. It becomes about how to survive it." -CCSP

In addition to direct impacts on health, climate change affects people's safety and well-being in many ways. Climate change is expected to negatively impact tribal facilities and infrastructure as extreme weather events such as fire, flooding, and severe winter storms will damage buildings and roads, resulting in the need for additional maintenance and improvements. These events and costs will also impact the Tribe's ability to provide adequate essential transportation services, which in turn will affect people's access to healthcare and other critical services. As climate change alters global temperatures and causes widespread ecosystem changes, people seeking a more hospitable and enjoyable climate may look to the Reservation or its surrounding area for refuge. These "climate refugees" may impact resource availability and community infrastructure in ways that we do not yet understand. It is important to consider the influx of people from other locations and prepare to minimize any potential negative impacts.

Nutrition

Climate change is also expected to reduce the nutritional value of key crops. Rising atmospheric carbon dioxide (CO_2) concentrations stimulate plant growth; however, this can reduce the availability of essential nutrients, protein, and minerals. Concentrations of zinc, iron, and protein are also expected to decrease in staple crops, including potatoes, rice, wheat, maize, and soybeans (except protein in soybeans) (Myers et al., 2014). Combined with other factors, climate change poses a significant threat to food sovereignty and the nutritional health of the population. As climate change disrupts food systems worldwide, people may have to pay more for nutritious whole foods, creating inequities for those who are underserved and lack financial security, thereby limiting their access to food resources.

Food Sovereignty

The food sovereignty movement has experienced a resurgence in North America over the past decade, primarily among Indigenous peoples, and has also influenced non-Indigenous individuals. As the name suggests, "food sovereignty" refers to the power to create and maintain food systems that can operate locally and independently of the failed, toxic industrial commercial food system currently dominating the industrialized world and imperiling all of humanity. The definition from the United States Food Sovereignty Alliance (USFSA) states that *"Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute, and consume food at the heart of food systems and policies rather than the demands of markets and corporations"* (USFSA, 2025). The system has critically and continuously harmed indigenous peoples and removed the ability for tribal peoples to have access to culturally healthy foods and maintain an intact, sustainable environment. Industrial agriculture is chemically dependent; this has led to the destruction of soils and pollution of waters throughout the U.S. and the world, resulting from unsustainable practices that excessively generate soil and fertilizer runoff.

This system relies on various forms of fossil fuel-powered machines and equipment. The global food transport and distribution system also relies heavily on fossil fuel-powered trucks, trains, ships, airplanes, and other vehicles to transport its products to international markets. Processed food distributors rely upon chemical preservatives and genetic modification to keep food appearing fresh during its weeks of transport and shelf time, until it is either consumed or discarded. If a disaster occurs that shuts down food distribution to local supermarkets for a period longer than three days, many stores will run out of food. These systems are inherently expensive and unsustainable in the long term for most communities. Food sovereignty can empower tribal (and other) local communities to create systems that enable access to healthy food for their people, without reliance on the commercial processed food industry.

The food sovereignty movement is enabling us to restore tribal traditions of gathering and using traditional food gifts from our homelands properly and respectfully, which has kept our people robust and healthy for thousands of years. Tribes that cultivated a variety of food crops from seeds are also reviving and utilizing that knowledge to feed and strengthen their people, while also restoring culture, ceremonies, and language. The Indigenous food sovereignty movement is also bringing together people from many tribes to share traditional knowledge and exchange gifts of food and seeds. In a new way, this movement is restoring the old intertribal trade networks that once extended through all four directions on Turtle Island, from coast to coast and from the Arctic to what is now the Panama Canal. These are truly exciting times!



Figure 39: CSKT Food Sovereignty Sign. Photo Credit: CSKT.

SKC Extension Food Sovereignty

SKC Extension is the arm of the college with a mission to:

"Improve the quality of life of our Tribal community with culturally appropriate, scientifically based education, demonstration, and research that sustains environmental resources and promotes healthy lifestyles for the Séliš, Ksanka, and Qĺispé people."

SKC Extension demonstrates and trains community members in organic garden techniques through the "Garden for Life Project." Participants attend a fifteen-week, hands-on, intensive gardening experience learning about mulching, soil health, composting, drip irrigation, and food safety. Gardeners can keep all the produce they grow and donate excess to the local food-insecure community. The skills and techniques taught are applicable for both personal and family use, as well as potential commercial operations. SKC Extension research publications document the local food insecurity conditions within our Tribal community, the importance of wild foods in supplementing diets, the low levels of food knowledge and dietary diversity in the community, and the high effectiveness of nutrition and education interventions in improving basic health metrics. The increasing number of people gardening on the reservation increases food availability and diversity for those individuals, as well as their neighbors, ultimately improving community well-being overall (Ahmed et al., 2023).



Figure 40: Garden For Life Program. Photo credit: SKCE.



Figure 41: SKC Greenhouse. Photo credit: M.I. McCarthy.

Challenges

Climate change poses direct and indirect threats to the health, safety, and well-being of the Bitterroot Salish, Q̓lispe (Upper Pend d'Oreilles), and Ksanka (Kootenai) peoples, as well as others who call the Flathead Reservation home. The ability of families to bounce back from climate impacts varies significantly across the Reservation. The elderly, pregnant women, and children, especially those struggling with poverty, are more sensitive to climate impacts and will be more likely to experience negative consequences.

These vulnerable groups were exposed to high levels of particulates in the air that lasted weeks during the 2017 fire season. The smoke was not solely from fires in the immediate area. Eastward winds brought smoke from wildfires burning in regions across the western U.S., including California, Oregon, Washington, and Idaho. Smoke-filled air then stalled over the area, resulting in prolonged periods of exposure to airborne smoke and particulates. To read more about air quality and climate change, see the Air Quality sector.

On just one day, Sept 6, 2017, the hourly average of particulate air density reached 162 µg/m³, a "very unhealthy level" according to NOAA's air quality monitoring stations for the Flathead Valley. That same day, NOAA's monitoring station in nearby Seeley Lake was blown off the chart, averaging 636.8 µg/m³, a "dangerously unhealthy level."

To protect the well-being of the people of the CSKT, there are multifaceted challenges that need to be overcome and addressed. The impacts will be cascading, as the rurality of some parts of the reservation means that people rely heavily on the infrastructure established by the tribe to meet their needs. Climate change impacts tribal facilities and poses risks to highway safety and fire prevention. Some of the impacts will include increased flooding that washes out roads and bridges. This will make service delivery and emergency response more difficult when the need for services is high. It is expected that the more isolated communities will be affected more by climate change, given these impacts. Other aging tribal infrastructure is vulnerable to extreme weather conditions and other climate impacts. Longer and hotter summers may increase demand for air conditioners and other cooling units. In personal homes, this may create an additional financial burden for families, as well as increased costs for tribal buildings and offices that install and operate cooling units. People are already experiencing the impacts of climate change, and these impacts are expected to continue and intensify in the future.

Expected future health impacts from climate change:

Air quality may decrease due to wildfire smoke, dust, more potent and widespread pollen, and indoor mold, which can be exacerbated by dampness, posing serious risks to respiratory health.

Extreme weather events, such as heatwaves, flooding, wildfires, droughts, cold waves, and heavy snowfall, are expected to continue intensifying. Extreme weather events like these can result in injury, illness, and death (USGCRP, 2016).

Food insecurity may increase as more frequent and intense droughts reduce crop yields, leading to higher and more unstable food prices and ultimately having adverse effects on consumer health and producers' livelihoods. Weather changes and extreme events may increasingly disrupt food production, delivery, and supply. Accessing First Foods may become more difficult as the ranges of plant, fish, and wildlife species shift and change in numbers. Food contamination from aflatoxin-producing mold may increase with more drought. More crop pests and weeds may demand increased applications of herbicides, fungicides, and insecticides, increasing human exposure to these chemicals. As water temperatures increase, fish and mammals may have higher concentrations of methylmercury, exposing people to increasing levels of mercury with diets containing fish (USGCRP, 2016; Centers for Disease Control (CDC), 2010).

Vector-borne diseases may increase, with West Nile virus, tick-borne diseases, and hantavirus of particular concern in this region (USGCRP, 2016; Sarfaty, Gould, & Maiback, 2017).

Water-related illnesses may increase with more heavy precipitation events, run-off, and flooding, exposing people to pathogens, heavy metals, herbicides, and pesticides**.** Drier and hotter summers are expected to increase and intensify droughts, which can

impact surface water by reducing stream flows and concentrating pollutant levels. By increasing wildfire risk, drought can also introduce sediment, ash, and other debris into surface water (USGCRP, 2016; Sarfaty, Gould, & Maiback, 2017; Centers for Disease Control (CDC), 2010).

Behavioral health challenges may increasingly include stress, grief, depression, anxiety, post-traumatic stress disorder, and suicidal behaviors. For example, drought has been linked to farmer suicides in the 1980s when drought harmed livelihoods. *Solastalgia* is a term that is being used to describe "the homesickness we have when we are still at home" that results from changes to the landscapes we cherish" (Centers for Disease Control (CDC), 2010; Eisenman et al., 2015).

Problem Solving

The CSKT has several programs aimed at protecting the health and well-being of the community. For example, Tribal Health has drafted a sustainability plan and opened a new Tribal Health Clinic in Ronan, which provides family and pediatric care, behavioral health services, WIC, and healthcare resources, as well as a fitness center, physical therapy unit, and a drive-through pharmacy. The CSKT Department of Human Resources Development (DHRD) works to support family stability and family self-sufficiency. The Department works to build resilience with individuals in crisis and ensure that they receive what they need, serving Tribal communities as far away as Hamilton and Big Fork.

DHRD also operates a community garden through the Field Home Community Garden Project, which aims to promote healthy diets and physical fitness. There are four gardens: one in Pablo on the SKC campus, Elmo at the community center, St. Ignatius next to the Community store, and Arlee near the Indian Senior Citizens Center. The food is distributed to individuals who qualify for the Food Distribution Program and the Women, Infants, and Children Program, and any excess produce is given to the local senior center. A USDA Nutrition Education Grant Program funds this project for the Food Distribution Program on Indian Reservations (Charkoosta, 2024).

The Housing Authority is already undertaking significant efforts to prepare for climate change. Areas of focus include evaluating the adequacy of factors to improve environmental health, such as insulation, energy-efficient windows, high-efficiency water heaters, and LED lighting. The Housing Authority manages nearly 700 units on the Flathead Reservation and provides clean drinking water through the management of 30 community water systems, ensuring compliance with EPA standards (CSKT-Housing, 2025).



Figure 42: Salish elder Johnny Arlee folds his hands over his hat and cane during a prayer at the Bison Range Restoration Celebration on the Flathead Indian Reservation on May 20, 2022. Photo credit: Hunter D'Antuono. Caption: Flathead Beacon.

There are also several community programs and school-based initiatives, such as the EAGLES program, that promote action on climate change and increased resilience. Multiple schools have students who participate in EAGLES projects.

The EAGLES (Environmental Advocates for Global and Local Ecological Sustainability) is a youth-led group that empowers tribal and local youth to become Informed

and engaged citizens regarding environmental and climate change issues from the reservation to global levels. Students select projects that interest them, which are directly related to their communities, schools, and elders, to explore and address these Issues. The EAGLES youth groups have been working on projects since 2015. A few projects that the EAGLES groups worked on include a school-wide recycling effort, which has since expanded to include other CSKT departments. These groups present their work to other schools and events in the area, sharing their accomplishments with others. To sustain this effort, there is a need for additional Climate Change School Coordinators who will lead youth in these projects across the Reservation. Additional funding can help expand this effort and enable students to take on leadership roles in the program (CSKT, 2022).

The Séliš-Qlispé Culture Committee has been working continuously on projects to ensure the history of the tribes is kept alive and lives in the present. The SQCC works to create and maintain many language resources, maps of place names and places of significance, which is critical for maintaining the health of the community in a way that keeps the spiritual foundations of this place strong, this is important to all members of the tribe as the effects of climate change alter the landscape in ways that are beyond the physical (CSKT- Culture, 2025).

Goals and Actions

To ensure a high quality of life for future generations of Tribal members, the Tribes have set the following goals:

- Create an island where cultural resources, beliefs, and values are a vital and pervading part of the Tribal community; create a community characterized by a strong sense of cultural identity and awareness and an accurate knowledge of Tribal history.
- Create a strong and united Tribal membership characterized by strong families and friendships, honest government, and a desire to preserve and protect resources for all the people.
- Create a healthy family and community structure that cares for its elders, keeps its children in safe and loving environments, emphasizes self-worth and environmentally sensitive lifestyles, and encourages stable population levels on the Reservation.
- Promote Tribal sovereignty. Promote predominant Tribal ownership of Reservation lands and a self-sustaining community that can wisely and creatively manage its resources and assume an increasing share of the government's responsibilities.
- Create a highly educated Tribal public characterized by a community with unlimited education opportunities, a community that supports individual initiative, and a strong environmental ethic.
- Develop an economy integrated with the larger regional economy that is characterized by full employment and that allows residents to find rewarding careers on the Reservation.

To ensure a quality physical environment for future generations of Tribal members, the Tribes have set the following goals:

- Manage the land and the community of life it supports in a manner consistent with traditional Tribal values. Strive to use resources sustainably, to manage in harmony with nature, to waste nothing.
- Create an environmentally healthy landscape with clean air and water, stable population levels, protected scenic viewsheds, and the full realization of recreational opportunities.
- Maintain and enhance water quality by managing for a healthy river and tributary system, establishing a protective designation for the Lower Flathead River, protecting ground- water, balancing water use maintaining high water quality standards, managing irrigation systems efficiently, protecting Flathead Lake and its shoreline, protecting streams, riparian zones and wetlands, and using environmentally safe methods to control insects and noxious weeds.
- Provide a diversity and abundance of healthy fish and wildlife that includes: a diverse and productive fisheries resource, abundant big game populations, and healthy non-game wildlife populations. Establish and maintain wildlife protection areas, habitat enhancement

programs, and programs that ensure the protection and recovery of threatened, endangered, and sensitive species.

- Provide a healthy and productive forest. Use harvest techniques that have minimal impacts on aesthetics, are sustainable, control disease and insects, and allow for the preservation of roadless areas and a sustainable old-growth component.
- Protect the Mission Mountains Wilderness and Buffer Zone, evaluate and add new primitive and wilderness areas, and identify and designate natural areas.
- Provide protected areas for Tribal use that include cultural resource areas, recreation areas, and wilderness and primitive areas.
- Create buffers along riparian corridors, wetlands, and next to wilderness and scenic areas to protect natural values from potential development or degradation.
- Encourage stable population levels on the Reservation. Direct development is to be in harmony with the landscape. Plan for and encourage well-designed communities, clean industry, well-planned solid waste disposal sites, proper utility facility siting, sound development of Tribal resources, and centralized sewage treatment to protect Flathead Lake.

People and Air Quality

People, especially children, those with medical conditions, and elders, are affected by poor air quality. Exposure to poor air quality can have severe negative effects on physical, mental, and emotional health. The CSKT wants to ensure that their community members have places to take refuge on days with poor air quality. The CSKT has two primary goals that focus on air quality and people. See the Air Quality sector chapter for detailed information.

- Continue to maintain the PurpleAir Network
- Ensure vulnerable populations and communities have air quality education.

People and Drought

Creating resilience for the communities of the CSKT against drought is a critical mission, as climate change is increasing the frequency of droughts in the Flathead. Ensuring that the community has access to drought education and resources is an important goal. Salish Kootenai College, the Montana Climate Office, and the National Integrated Drought Information System NOAA/NIDIS through the Native Resilience Project have created drought dashboards and installed a high-quality weather station at the CSKT Bison Range that measures soil moisture and snowpack.

- Educate communities on sustainable water preservation measures.
- Analyze the most vulnerable populations' water sources and the impacts of flooding and drought on resources and communities.

People and Wildfire

People will be affected by fire in many ways. Creating stronger policy and education about fire regimes and management on the reservation is imperative to ensure the community remains safe when wildfires impact the area. In the future, there is a high likelihood of an increase in the occurrence of wildfires in the West.

- Analyze buffer zone and fire closure areas and increase, if needed.
- Develop education and policies to decrease catastrophic fire incidence.
- Teach people about Firewise practices.

Social services preparedness goals include:

Diseases and people

Long-term shifts in temperature affect the distribution of disease-carrying insects. Ticks and mosquitoes are two examples of species that have expanded their ranges due to climate warming, which does not facilitate freezing cycles that kill off populations and confine them to their normal range. Below is a map of tick-related illnesses by county.

- To enhance or develop a system to address people's risk of disease vectors.
- Ensure disease vector monitoring and reporting are robust and resilient.

Vulnerable Populations and Climate

Different populations and groups of people will be affected by climate change in various ways. These three goals help address the challenges faced by vulnerable communities on the Flathead Reservation.

- Develop a collaborative plan that addresses the most vulnerable populations' needs.
- Identify and map the geographical location of the most vulnerable populations.
- Increase medical response to those most vulnerable.

Heating and Cooling

Access to places and homes with comfortable temperatures is key to the well-being of people. Over the next decade, temperatures are expected to rise across the reservation during the summer months. A lack of proper cooling systems will be a serious stressor and a potential health threat during extended periods of severe heat that affect the reservation. On the other hand, it is also crucial to have adequate, accessible, and sustainable sources of heating for homes. Below are the goals of the People Sector for heating and cooling.

- Develop a cooling plan for increased temperatures for each community, especially for those populations most vulnerable to heat-related illnesses.
- Implement strategies for burning protocols and home heating policies.
- Ensure building codes include adequate provisions for cooling.
- Ensure most vulnerable populations have heat and cooling sources.
- Provide emergency cooling centers and develop plans to retrofit community centers (CSKT opened four Tribal fitness and community centers throughout the Reservation as cooling centers during the summer of 2021.)
- Decreased use of wood for heating.

Potable Water

Access to clean water is a fundamental principle for the well-being of all people. The goals of the people's section for potable water are listed below.

- Maintain access to potable water for each community and address the needs of those at risk of not having access to clean water.
- Ensure households have ways to purify water. Salish Kootenai Housing Authority (SKHA) manages approximately 30 community wastewater treatment and/or water systems. In 2020, SKHA teamed up with the Inter-Tribal Council of Arizona to develop an in-depth emergency response plan for our potable water systems. The plan covers natural disasters, man-caused disasters, cyber-attacks, and pandemics, to name a few. For more, see https://skha.org/water-reports/

Safety services preparedness goals include:

Improving community access to safety and social services is crucial, as demand is expected to increase due to the impacts of drought, wildfire, poor air quality, and excessive heat.

- Improve social services through collaboration, planning, and resource development.
- Develop proactive committees to address future climate change events.
- Update shelf plans that should address current needs.
- Direct more funding to Tribal infrastructure.

Health and human resources preparedness goals include:

Ensuring the health and well-being of tribal members is crucial in a changing climate, as individual and community health outcomes will be challenged. Here are the goals for health and human resource preparedness to improve health, connectivity, and resources.

- Promote the healthy lifestyles of Tribal members.
- Improve the use of the Tribal transportation system and promote telework to reduce fossil fuel consumption and carbon emissions created by vehicles.
- Expand the community gardens and recruit more participants.
- Expand the bus fleet to accommodate more riders and purchase more electric buses.

- Provide practical knowledge about growing gardens and how to preserve the vegetables through community gardening.

Partners and funding

Many programs and departments throughout the reservation are dedicated to protecting the health and well-being of the tribal people and others who call the Flathead Reservation home. The departments that provide these resources are essential for improving lives. [See the Infrastructure Sector chapter in this report for more information on the importance of maintaining these structures.]

CSKT services include:

- Disaster Emergency Services
- Economic Development
- Department of Human Resource Development & Social Service
- Tribal Education
- Salish Kootenai Housing Authority
- Mission Valley Power
- DHRD Transportation
- CSKT Family Resources
- Early Childhood Services
- Tribal Credit
- Law and Order
- Tribal Health



Figure 43: Flathead encampment near Saint Ignatius, Montana. Three tipis can be seen in a pasture in the foreground. The Mission Mountains rise in the background. Archival Photographs from the University of Montana. Photo number: 82.0102. Local Identifier: umt011382.



Figure 44: Flathead Lake. Photo credit: Hunter D'Antuano.

Water Sector

Introduction

Clean and plentiful water is an essential component of life – all things rely on it for survival. The Flathead Indian Reservation is home to an incredibly diverse and complex environmental landscape containing wetlands, riparian corridors, forested mountains, semi-arid sagebrush steppe, and alpine tundra. Water resources on the Flathead Indian Reservation are extensive, including all or part of the Flathead, Jocko, and Little Bitterroot drainages and approximately 65,086 acres of the south half of Flathead Lake (CSKT-Water, 2020). Additionally, the Reservation encompasses another 45,000 acres of wetland habitat and over 4,000 miles of seasonal and ephemeral streams. Our ancestors have taken care of this landscape since time immemorial. Our current efforts to manage local water resources are a natural extension of this generational responsibility.



The focus of the Water Sector includes both quality and quantity of groundwater and surface water. The geographic extent of water resources that relate to the Tribes' lands extends beyond the boundaries of the Flathead Reservation and encompasses the entire Flathead River drainage. This planning area includes most of Western Montana west of the Continental Divide, north to the Flathead River headwater streams in Canada, and west to the Columbia River Basin. Also included within the Tribes' ancestral territories is the Clark Fork River drainage, which encompasses the area from Butte, Montana, downstream to the Idaho boundary.

Climate Change and Water

As summarized in the introduction to this report, air temperatures in Montana and on the Reservation are rising. Additionally, the pattern of precipitation is changing across seasons. While the total average annual precipitation in Montana has not changed significantly between 1950 and 2015, the seasonality of precipitation has changed. Average winter precipitation has decreased by 0.9 inches since 1950, while average annual spring precipitation has increased by 1.3-2.0 inches (Whitlock et al., 2017). In Montana, much of the surface water flow depends on snowpack; as snow melts, it provides streamflows during the drier summer months. The Flathead Reservation, and most of Montana, has what is called a "snowmelt-dominated hydrograph", meaning that the highest flows occur in spring when the snowpack melts. Snow records indicate that annual snowpack has declined across much of the US West since 1955 (Mote et al., 2018), and recent studies attribute these changes to climate warming from increased greenhouse gases (Pierce et al., 2008). These patterns hold for Montana as well, with measures of Snow Water Equivalent (SWE) declining about 20% over the past 80 years, with the greatest impacts observed at lower elevations (Whitlock et al., 2017). Additionally, there has been a shift in the timing of snow accumulation and melt; observations indicate that the accumulation of snow pack now begins later in the fall, and spring melt occurs earlier and faster (Mote et al., 2018).

Changes in snowpack are also expected to have substantial impacts on groundwater and streamflow. Snow melts and recharges aquifers, which in turn returns to the rivers during late summer and autumn, providing an important "base flow" of cold, clean water. Groundwater is also important for agriculture and other water needs. Any impacts to groundwater will be compounded by the likely increase in groundwater demand as the climate warms (Whitlock et al., 2017). There has been no observed reduction in total annual streamflow, likely because spring precipitation has increased (Pederson et al., 2011). However, reductions in streamflows have been observed when considering only the driest years (Luce & Holden, 2009), and summer streamflows have declined in the Rocky Mountains (Luce & Holden, 2009). Projections suggest that when totaled over the entire year, streamflows may increase slightly for Montana rivers (because of increased rain in spring and winter); combined with earlier and faster snowmelt, this may lead to increased flooding (Whitlock et al., 2017). This runs the risk of low streamflows during late summer when all the snowpack has melted, and there is low summer precipitation. On the other hand, although there is not strong evidence that droughts are likely to increase in frequency, there is evidence that when they do occur as part of natural climate variation, they are likely to last longer and be more intense (Whitlock et al., 2017). That said, recent droughts, including the 2017 Flash Drought and the extreme heat and drought of 2021, have impacted CSKT communities with destructive wildfires and health impacts. The 2017 Blue Bay Fire and the 2021 Boulder 2700 Fire both resulted in the loss of homes and businesses. More intense and longer droughts, as well as wildfires, may also lead to secondary impacts on water supplies, including ash deposition in surface waters, which threatens water quality, and a reduced groundwater supply.

Challenges

Climate change poses serious risks to both water quality and water quantity on the Flathead Reservation. Here are some of the challenges the Tribes are facing in maintaining healthy water and watersheds.

Water Quantity

Water quantity is directly affected by climate change in three primary ways: 1) the *supply* of water coming into the system, 2) which *form* the water becomes available (rain versus snow), and 3) *when* the water becomes available (winter versus spring/summer). Climate trends indicate a decrease in water availability for irrigation, municipal systems, and industrial purposes in late summer and fall, as well as reduced water levels and healthy streamflow for native fish, other aquatic species, and ecosystems. This is accompanied by decreased groundwater recharge and dictates the way water is managed for hydroelectric purposes that are beneficial to the community.

Spring runoff is now occurring on average about two weeks earlier than historical averages. Earlier spring runoff will decrease water availability in late summer

and early fall, which may trigger economic stress and increase costs for local consumers. This change will likely affect local agricultural users, as they rely on irrigation deliveries to meet their crop water use requirements, particularly during August and September. A decrease in fall precipitation further exacerbates these stresses.

As streams are developed and disconnected from their floodplains for agricultural purposes, they become less resilient to extreme water discharge events. Many once-natural channels now flow into the Flathead Indian Irrigation Project [FIIP] canal network, which is not designed to convey the volumes of water typical during extreme flooding events. FIIP canal failures often send large volumes of sediment to downstream Tribal waters, causing water quality and sedimentation issues. Recent severe weather events have damaged Tribal and County transportation infrastructure, such as the 2019 washout of Dublin Gulch Road. There is a need to upgrade the infrastructure of many canals, which, although being addressed through multiple projects, will continue to require maintenance and Improvement. With hundreds of miles of canals, this is a challenge for management and timely Implementation.

Increasingly arid summers put wetlands and aquatic ecosystems at greater risk. Fisheries, wildlife, and riparian vegetation are highly sensitive to changes in water availability (see Fish and Wildlife Sectors). Furthermore, changes to the timing of water availability reduce the ability of streams and other riparian habitats to remain in stable, healthy conditions that enable the reproduction and life cycles of all species to unfold within them.

The Flathead Reservation's non-Tribal member population has increased significantly since 2020, partially due to the abundant land, water, and overall access to natural resources. Expanding urban areas will increase water demand and exacerbate streamflow issues. Additionally, the loss of historic wetlands from land development increases extreme flooding risks, reduces the areas of critical habitat for many species, increases the recreational usage of increasingly limited areas, and contributes more GHG emissions to the atmosphere.

Water Quality

Water quality on the Flathead Reservation is particularly vulnerable to climate change, as it is already under stress from stormwater runoff and wastewater treatment inputs from multiple municipalities. As resident populations increase, rural areas are being subdivided and developed for residential, commercial, and light industrial use. Additionally, waste from aging infrastructure and runoff from surrounding areas such as Kalispell, Whitefish, and Polson eventually end up in Flathead Lake, the primary recreational and economic driver of the Reservation. Flathead Lake is one of the clearest lakes in the United States due to its oligotrophic status. There have been reports of increasing primary productivity over the past few decades, which is an indicator of reduced water quality (Flathead Lake Biological Station, n.d).

Agriculture threatens water quality by introducing sediment, bacteria, and pesticides into water resources (Ribaudo & Johansson, 2007). Climate change exacerbates these effects as earlier spring runoff and rainfall increase the risk of contamination in surface water sources and shallow wells. This higher overland runoff during the spring season results in more pollutants entering waterways than by normal, slow, snowmelt runoff. Furthermore, warmer summer temperatures mean drier streams, with less water to flush contaminants downstream. We end up with higher rates of pollutants in streams, lakes, and wetlands, which are habitats for native species, used for municipal drinking water, as well as agricultural and industrial uses. A decrease in water quality puts all these beneficial uses at risk.

Climate change is also contributing to longer and more severe fire seasons across the Western United States. As discussed in the Forestry Sector, wildfire seasons start earlier in the year, last longer, and burn more acres. More wildfire activity can significantly affect water quality. After fires, rates of erosion and sedimentation increase dramatically (Westerling, 2016). Streams become warmer due to the loss of shading vegetation, and wildfire ash has a negative impact on stream chemistry (Isaak et al., 2012). Large wildfires change forest conditions at a landscape scale, including the timing and magnitude of runoff, which subsequently reduces late-season baseflows and diminishes aquatic

habitat.

Drier summers will decrease the availability of clean and cold water, while warming air temperatures directly raise water temperatures and further decrease water quality. These factors, paired with excess nutrients from point and non-point source pollution, have contributed to an increase in Harmful Algal Blooms (HABs) across Montana. HABs can produce extremely dangerous toxins that may cause mass die-offs in aquatic environments and sicken or kill people and wildlife. Warming streams threaten sensitive species such as bull trout (see Fish Sector) – some of these species have well-documented retreats in their spawning territory as rivers and streams warm beyond individual species threshold temperatures. Tribal members and community members rely on subsistence hunting and fishing. Keeping these areas and species preserved and intact for future generations is vitally significant to the Tribes.



Figure 46: AIS sampling in Flathead Lake - Blue Bay 2022. Photo credit: Erin Clinkenbeard.

Aquatic invasive species (AIS) also pose risks to water quality across and beyond the Reservation. Some species - like zebra or quagga mussels can drastically alter or even collapse entire ecosystems. As temperatures rise each year, AIS threats are expected to increase as more people choose to participate in water-based recreation in Western Montana's Flathead Basin. This added pressure on water resources from increased watercraft use or other related uses is a concern for exposure to aquatic invasive species from infected waters outside of Montana.



Figure 45: Monitoring water quality in Summer, 2022. Photo credit: Melissa LaCroix.

Problem Solving

The CSKT Water Quality Program has been collecting surface water data since 1997, when CSKT became the first Tribe to receive Treatment as a State (TAS) status by the US Congress, allowing the Tribe to monitor changes over time and enforce water quality standards. The Non-Point Source Program also collaborates on restoration efforts with other departments such as forestry, fish, and wildlife. In 2019, the CSKT, Montana DNRC, and Bureau of Reclamation installed four new automatic agricultural weather stations, known as AgriMet stations, on the Flathead Indian Reservation in Moiese, Ronan, and two in Hot Springs. These stations will enhance crop water use modeling and other agricultural applications, as well as improve local weather forecasting. Additionally, the Montana Climate Office and the CSKT installed a HydroMet station in May 2023, capable of year-round precipitation and groundwater monitoring, at the CSKT Bison Range to continue building higher-resolution weather, water, and climate data for the Flathead Reservation (MCO, 2025). CSKT's robust AIS program includes a 24-hour screening facility, monitoring stations, and the use of a mussel detection dog (CSKT-Fish, 2021).

The Wetland Conservation Program has monitored and assessed nearly 300 individual wetlands since 1999. The Wetlands Conservation Program updated their CSKT Wetlands Conservation Plan in 2025. The update was funded through two Wetland Program Development Grants awarded by the U.S. EPA, Region 8 in 2021. The Shoreline Protection Office administers CSKT's 1987 Aquatic Lands Conservation Ordinance, which regulates dredging, filling, and other impacts to Reservation wetlands, while mandating an average compensatory mitigation ratio of 3:1 (e.g., for one acre of wetland impacts, three more acres of wetlands are restored, enhanced, or created). The preservation and restoration of wetland habitat is intended to promote wildlife habitat, increase carbon sequestration, and protect these areas of major cultural significance.

On December 29, 2020, the CSKT Water Rights Compact was officially ratified by the CSKT Tribal Council, after receiving approval from the State of Montana and the United States of America. The Water Compact allocates a total of $1.9 billion to rehabilitate and modernize the Flathead Indian Irrigation Project, repair natural resource damages, and enhance Tribal water resources. Many of its carefully negotiated terms include additional protections for Tribal water resources, such as increased instream flows for fisheries. The Water Compact also incorporates adaptive management with regard to the Flathead Indian Irrigation Project, enabling real-time adjustments to instream flow and irrigation project allocations to be adjusted in real time in response to changing meteorological and hydrologic conditions, thereby improving climate resilience for the irrigation system amid anticipated climate change effects. Multiple projects are underway in 2025 to improve the irrigation system, and more are in earlier stages of planning (Montana Department of Natural Resources and Conservation, 2025).

"For the first time in 80 years, we have control over our own resources. Flathead Lake and Flathead River are the lifeblood of our people." – Brian Lipscomb, 2015.



Figure 47: SKQ Dam. Beacon file photo.

Séliš Ksanka Qlispé Dam

The Séliš Ksanka Qlispé Dam located five miles southwest of Polson, on the Flathead River has the capacity to generate 208 megawatts of electricity. This dam measures 205ft high, and 751 ft wide. Holding a reservoir catchment area of 8,587 sq miles, Flathead Lake is the largest natural lake west of the Mississippi, and holds a total water capacity of 1,217,000-acre ft. This dam's architecture hosts the hydroelectric powerplant that is a sustainable resource for water management and low-carbon electricity generation (EKI, 2025). The plant averages 1.1 million megawatt-hours, enough to power over 100,000 homes with clean energy, as outsourced energy production revenue for the Tribe.

Managed by the Tribally owned business Energy Keepers Inc., as of 2015, CSKT became the first Tribe in the nation to own a major hydroelectric facility. The SKQ Dam is operated with both excellence in power generation and a commitment to honor and respect the sacred nature of the resource they are asked to manage (EKI, 2025). Energy Keepers Inc. is a key partner in developing plans to address climate impacts on Flathead Lake and the lower Flathead River resources. Due to the size of Flathead Lake, and the Lower Flathead River as reservation water resources, EKI aims to continue collaboration for the development and management of Hydroelectric, Drought, Reservoir Storage, and Flood management plans. (EKI, 2025).

Goals and Actions

Programs related to CSKT water quality and quantity share a common goal: namely, to support natural ecosystems and build human infrastructure that are resilient to climate change and adapt to those changes in the interest of the Reservation community.

Water Quality:

The Water Quality and Non-Point Source programs aim to:

- Continue to sample core sites and Flathead Lake sites
- Continue reviewing and inspecting 401 Certification and stormwater pollution prevention plans on the Reservation
- Update the Tribes' Water Quality Standards with wetland beneficial use standards
- Create a septic tank permitting and management program on the Reservation
- Work with Flathead Lake Biological Station on AIS sampling on the Flathead Lake
- Public education; River Honoring, local wastewater treatment committee meetings, or Region 8 WQS state meetings.

The Wetlands Conservation Program will:

- Update the Wetland Conservation Plan (WCP), which was written in 1999, with specific language and goals related to climate change mitigation and adaptation
- Begin an extensive wetland soil carbon analysis of historic and created wetlands
- Assess successes/shortcomings of past mitigation, and discuss updating compensatory mitigation ratios for the Reservation
- Analyze each watershed's trends using monitoring data from 2004 to the present.
- Update online wetland program infrastructure, including educational resources and permitting information.
- Identify and prioritize areas for wetland conservation, especially cattle exclusion fencing
- Drought management plan
- Hydroelectric management plan
- Reservoir storage plan
- Flood management plan

Water Quantity:

The overarching goal for water quantity is to improve water resources management through research, planning, and mapping. This goal will be of critical importance given the 2021 ratification of the Water Compact. Priorities include:

- Continue CSKT's comprehensive measurement program of snowpack, surface water, and groundwater resources.
- Continue to monitor and maintain early warning systems on all BIA dam sites.
- Expand real-time reservoir level and storage monitoring network to include all 14 primary irrigation reservoirs that impound water to serve the Flathead Indian Irrigation Project.
- Develop and implement locally-focused water supply forecasting procedures.
- Increase the frequency of indirect measurements of large flood events.
- Incorporate the anticipated effects of climate change into hydrologic modeling for bridge, culvert, and dam safety design.
- Collect additional data on cumulative effects from groundwater withdrawal.
- Study the effects to groundwater and stream networks from high levels of flow modifications that have occurred over the last 120 years.
- Study the effects on valley water budgets from the conversion of natural vegetative covers to agricultural land covers.

Another key action is to explicitly include the impacts of climate change in the development of future water resource plans, including:

- Groundwater management plan
- Irrigation efficiency plan
- Municipalities' drinking water management plans

Partners and Potential Funding Sources

- Bureau of Indian Affairs
- Bureau of Reclamation
- Counties
    - Lake County
    - Missoula County
    - Sanders County
- Energy Keepers, Inc.
- Environmental Protection Agency
- Flathead Indian Irrigation Project
- Flathead Lakers
- Montana Association of Conservation Districts
- Montana Department of Environmental Quality
- Montana Department of Natural Resources
- Montana Fish, Wildlife & Parks
- Montana Groundwater Information Center
- Montana University System
- Montana Water Center
- Salish Kootenai College
- Soil & Water Conservation Districts of Montana
- U.S. Army Corps of Engineers
- U.S. Fish & Wildlife Service
- U.S. Geological Survey
- USDA Natural Resources Conservation Service - Montana



Figure 48: Moiese wetland cells and Mission Creek restoration site, with the CSKT Bison Range in the background. Photo credit: Erin Clinkenbeard.



Figure 49: Bison. Photo credit: Hunter D'Antuono.

Wildlife Sector



Introduction

Tribal interest in and concern about wildlife has existed as long as the individual tribes have existed. From time immemorial, the Tribes relied on their homeland and the fish and wildlife it produced (CSKT-Fish and Game, 2020). Wildlife was one of the most important resources for the provision of food, clothing, tools, and raw materials used to fill a variety of basic needs (McDonald et al., 2005; Rockwell, 2021). Under provisions of the Hellgate Treaty of 1855, Article Three, the Tribes retained the exclusive right to hunt and fish

on the Reservation, as well as the right to hunt, fish, and gather on traditional open and unclaimed lands outside the Reservation (McDonald et al., 2005). In January 2021, as part of the CSKT Water Compact, the National Bison Range was transferred back to CSKT to operate and care for the bison and other wildlife (Bison Range, 2021). CSKT Tribal Council Resolution 21-022 provides clear direction for the continuing management of the Bison Range's land, bison, and natural resources under the 2019 US Fish & Wildlife Service's Comprehensive Conservation Plan during the period that CSKT is generating a successor plan (USFWS & CSKT Nat Res Dept, 2019).

It is the mission of the Tribal Wildlife Management Program (Wildlife Program) to protect, enhance, and manage wildlife species and habitats to provide viable populations of all native wildlife species on the Flathead Indian Reservation for use by generations of today and tomorrow. The Tribes of the Reservation are closely tied to our natural environment and believe everything in nature is embodied with a spirit. These spirits are woven tightly together to form a sacred whole (the Earth). Changes, even subtle ones, affecting one part of this web also impact other parts, making it essential for the Wildlife Program to protect these cultural resources if the Tribes are to sustain Tribal values and cultures.

As funding becomes available for projects, the Wildlife Program conducts population baseline data collection and monitoring. By restoring native diversity to plant communities across different habitat types, the Wildlife Program restores and enhances habitat for native wildlife species. Best management practices are used for terrestrial wildlife and habitat resources while also honoring the importance of traditional and cultural factors. Wildlife issues are integrated into resource management decisions to prevent degradation or depletion of wildlife populations, habitats, and human safety.



Figure 50: Bison at the Bison Range. CSKT

Climate Change and Wildlife

The Reservation is home to a diverse composition of wildlife species. It is a diverse landscape featuring agricultural lands, prairie pothole wetlands, high-elevation alpine habitats, grasslands, arid sagebrush communities, and extensive riparian corridors. Located within Northwestern Montana's Rocky Mountain range, the Reservation provides 91,000 acres of protected habitat in the Mission Mountains Tribal Wilderness (Kappler, 1855). Other protected areas include the Confederated Salish Kootenai Tribes Grizzly Bear Management Zone; Ferry Basin elk conservation area; Hog Heaven and Little Money bighorn sheep conservation areas; National Bison Range; and the Kicking Horse, Ninepipe, and Pablo reservoirs, as well as numerous Wildlife habitat management areas scattered across the Reservation.

The changing climate has impacted the Flathead Indian Reservation in several ways. Wildlife species tied to specific habitat types are at risk, as impacts continue to increase in frequency and severity. As winter precipitation shifts from snow to rain, loss of winter and spring snowpack affects high elevation species like the American pika (*Ochotona princeps*), wolverine (*Gulo gulo*), Canada Lynx (*Lynx canadensis*), mountain goat (*Oreamnos americanus*), and Clark's nutcracker (*Nucifraga columbiana*). Dependent on moist, cool summer conditions and winter snowpack, Pikas have little ability to disperse or recolonize (McDonald et al., 2005). Deep, persistent snowpack in late spring is crucial for wolverine den site selection (McKelvey & Buotte,

2018). Snowpack loss in the Mission Wilderness is predicted to decline by 30% of current levels by mid-century, up to 60% by the end of the century. Earlier and increased spring run-off and more frequent flooding have led to biological mismatches for fish and other wildlife (McKelvey & Buotte, 2018). High run-off and flooding wash out fish spawning areas, which affects food availability for bears and other carnivores (McKelvey & Buotte, 2018). Riparian plants emerge earlier in the spring and become vulnerable to erosion in earlier runoff (George et al., 2015). This reduces cover and forage for wildlife species, and leaves banks exposed to further erosion.

There are a few unique habitats found on the Reservation that may be affected by precipitation changes, including "fens," wetlands permanently surrounded by groundwater that typically take thousands of years to form (Dwire, 2018). This creates a soil thermal buffer effect that allows plant species to escape frost temperatures in the winter and high temperatures in warm regions (The Nature Conservancy, 2016). Also known as 'frost pockets', these cool upwellings provide refuge for cold-adapted amphibians during the hot summer months. However, these micro-habitats may become threatened by the increase in rainwater precipitation and are therefore of concern.

Warmer than average air temperatures have led to more viruses and pests that cause disease in wildlife (McKelvey & Buotte, 2018). Examples include white-nose syndrome in bats, ticks in moose, and West Nile virus, hemorrhagic disease in deer and elk, among others. Cool temperatures are crucial for bat hibernacula (winter hibernation refuges) and roosting sites; temperature increases may cause them to abandon existing hibernacula sites (Armarego-Marriott, 2020). Increased temperatures may also reduce the effectiveness of bat echolocation calls (McKelvey & Buotte, 2018). Townsend's big-eared bats (*Corynorhinus townsendii*) are a species of regional, state, and national concern. Important Townsend's hibernacula sites have been identified on the Reservation.

Extreme temperatures can lead to plants and animals shifting elevations, causing competition among native species against invasive species that can survive in more extreme temperatures (McKelvey & Buotte, 2018). As habitat types change, the distribution and phenology (seasonal patterns and timing) of important food resources, such as huckleberry, will also shift (McDonnell et al., 2014; Stenseth et al., 2015). Huckleberries are culturally important and serve as an essential food resource for black bears (*Ursus americanus*), grizzly bears (*Ursus arctos*), and many bird species. Lower summer stream baseflows and warmer stream temperatures have resulted in fewer wetlands and backwater habitats, reduced wetland recharge, and the loss of intermittent streams (Prevey et al., 2020). These effects impact fish migration, which negatively affects wildlife, such as birds and bears, that rely on fish for food. It is also a concern for cold-adapted amphibian species, such as tailed frogs (*Ascaphus*) and long-toed salamanders (*Ambystoma macrodactylum*).

More frequent and severe droughts have led to habitat change and loss in wetland habitats (Erwin, 2009). Drought also affects sub-surface water levels and wetland recharge. Drier wetlands negatively affect amphibians and waterfowl by increased water temperatures, increased water salinity through evaporation, invasive vegetation, and loss of wetlands (Dwire, 2018). Species specifically impacted by wetland loss include tailed frogs, long-toed salamanders, trumpeter swans (*Cygnus buccinator*), lesser scaup (*Aythya affinis*), northern pintails (*Anas acuta*), canvasbacks (*Aythya valisineria*), and blue-winged teals (*Anas discors*) (Withey & van Kooten, 2011; Niemuth et al., 2014). Opportunistic, easily adaptable, and invasive species, pests, and diseases are likely to take advantage of these changes and increase (Erwin, 2009).

More frequent and intense wildfires have been projected across the Western United States (Barbero et al., 2015; Halofsky et al., 2020). Over the recent 20-year period from 1998 to 2017, 1,572 wildfires burned 139,956 acres of the Flathead Indian Reservation's forested lands. This number may seem high; however, the acres burned may still be less than would have occurred under natural conditions before the current status of fire suppression. Fire intensity and fire return interval have changed in western Montana. Increased fire frequency would mean less fuel to burn and more vigorous wildlife habitat. The most significant effect fire has on wildlife is the change in their habitats. Wildlife habitats, such as forests, are not static; they evolve and respond to disturbances, just like other natural systems.

Fire changes the proportion, arrangement, and characteristics of habitats across the landscape. Each Indian tribe in the U.S. has its own fire traditions. The Bitterroot Salish, Pend d'Oreille (Qĺispė), and Kootenai tribes have been burning forests and grasslands for more than 7,000 years in areas that encompass modern-day Idaho, Montana, Wyoming, and British Columbia. Today, these tribes reside on the Flathead reservation in western Montana and are collectively known as the CSKT. The CSKT are working to improve fire management across the reservation. (CSKT-Forestry, 2000).

Immediately after a fire, there is typically a temporary loss of food and shelter due to the burning of herbaceous and shrubby brush. This exposure may cause animal populations to shift from species that prefer cool, moist conditions to those that prefer warm, dry conditions. Unburned areas adjacent to burned areas supply a mosaic of habitats with a range of vegetative conditions from which wildlife can find food and cover. Wetlands are less likely to burn, and when they do, the fires tend to burn less severely than those in upland sites. Wetlands provide a refuge from fires for many species of wildlife, and activities such as breeding by aquatic species may be carried out with little interruption. Fire in wetlands usually increases areas of open water and stimulates an increase in forage (Wisconsin Wetlands Association, 2018). Additionally, there are negative impacts with an increased fire intensity and frequency. Smoke and air quality can affect native pollinators and bird migration (Barkley, 2019). Army cutworm moths (*Euxoa auxiliaris*) are an important source of food for grizzly bears during summer (Brown et al., 2017). The effect of extreme smoke conditions from wildfires on these moths is unknown, but a population decline could prove problematic for the grizzly bear. Animal behavior can also be affected during prolonged periods of smoke, which may disrupt breeding seasons and other behaviors that enhance the health of wildlife populations.

The disturbance from fires also opens plant communities to invasive plant species (French et al., 1994). Increased invasive plant species can exacerbate wildfire severity (Coates et al., 2016). Increased yearly temperatures give these non-native plant species the ability to climb in elevation, to areas where they previously could not grow (Curran et al., 2017). A reduction in cover due to wildfires reduces the protective cover for prey species. Ungulates and large mammals may abandon burned areas if fire removes many of the habitat features they need. Thus, stand-replacing fires and understory burns that are severe enough to top-kill shrubs and young trees seem more likely to trigger high rates of emigration than patchy or low-severity fires (Pollnac et al., 2014). Smaller mammals such as snowshoe hares (*Lepus americanus*) are more inclined to leave areas with less canopy cover and prefer areas that are 10-40 years post-fire. Exposure to increased predation and die-offs caused by extreme winter elements is one of the factors. More generalist small mammals, deer mice (*Peromyscus maniculatus),* will colonize a burned area, even severely burned, within the next year (Smith, 2000). A mosaic of fire regimes in an area can lead to an increase in secure patches for smaller mammals to thrive during forest succession (Roberts et al., 2015).

Habitats important to avian species, such as the pygmy nuthatch (*Sitta pygmaea*) and the flammulated owl *(Otus flammeolus*), are being influenced by wildfires. These species are cavity nesters. Although not specific to any particular tree species, flammulated owls need large-diameter mature trees (Smith, 2000). Pygmy nuthatches are found most often in ponderosa pine forests (McKelvey & Buotte, 2018). As open ponderosa forests transition to more closed-canopy Douglas-fir forests, nuthatch populations may become even more stressed. The adaptive capacity (the inherent ability to respond successfully to environmental changes) of these two species is uncertain.

The earlier arrival of spring has led to the earlier arrival of some short-distance migrating avian species (McKelvey & Buotte, 2018). Under the various scenarios for future climatic conditions, many birds are predicted to shift their ranges, primarily northward, but also higher in elevation, as they attempt to track climate, food, and habitat conditions (Miller-Rushing et al., 2008). This could have consequences for nesting and foraging success. The nesting chronology of trumpeter swans has also shifted over the past 10 years. Nesting, hatching, and fledging dates are approximately 10 - 12 days later than previously observed on the Reservation.

Black swifts (*Cypseloides niger*), known to nest behind Elizabeth Falls in the Mission Range, may also be at risk. Mountain nest sites are often on cliff faces behind waterfalls, inaccessible spots where nests are continuously damp from spray (Cilimburg, 2015). The birds have no trouble weaving behind watery curtains where their nests and chicks remain out of reach for most terrestrial predators. Over the past four decades, scientists have observed a slow but steady decline in the number of Black Swifts throughout North America (down about 6% each year). Scientists speculate that the species' declining numbers are partly caused by climate change. Permanent snowy mountaintops have served as a vital water source, lasting late into the summer when swifts are still nesting. However, in Montana and throughout the Rocky Mountains, the annual snowpack is shrinking due to warmer, drier winters. Furthermore, as water disappears from mountains, so might Black Swifts. More accurate information is needed about the current condition of the species, and monitoring of them is a dangerous activity (Audubon, 2014).

If severe weather events increase (i.e., high windstorms, extreme cold snaps, flooding, drought), there could be adverse effects on wildlife. Bats roosting in trees can be disturbed by high windstorms. The CSKT Wildlife Management Program has received reports of dead bats following extreme wind events in recent years. Extreme cold snaps can affect ungulates exposed in the open, causing die-offs. Cold snaps can also affect American pika (if there is insufficient snowpack, there will not be enough snow to protect them from low temperatures thermally). Raptor species, such as the red-tailed hawk, American kestrel, bald eagle, and great horned owl, can become weakened and unable to catch prey following these cold periods. Over the last few years, CSKT Wildlife Program and Conservation Officers have responded to many calls of weak, grounded birds following one of these events. The birds are malnourished and weak, requiring time in raptor rehabilitation centers to recover effectively. Extreme heat also contributes to similar stressors. The population of Lake County is increasing at a rate of approximately 2-3% each year (Audubon, 2014). In the potential scenario where more people move to the Flathead Indian Reservation due to displacement from their own states or towns fleeing the effects of climate change, one can anticipate an increase in conflicts between humans and wildlife (i.e., negative interactions caused by habitat loss, human activity, and agricultural



Figure 51: Old photo of the Bison Range. Photo credit: USFW.

depredation). An increase in disaster displacement (climate refugees) can lead to an increase in pressures on destinations that have not prepared for an increase in population, through infrastructure and housing density planning. These concerns became a reality during 2020-2021, when the Flathead Indian Reservation and surrounding areas in the region experienced an unprecedented influx of new residents moving to less populated areas to avoid COVID-19 outbreaks and civil unrest within large urban areas across the US. It was estimated that over 10,000 new vehicles were registered in Lake County during 2021. Encounters between carnivores, livestock, and humans can result in conflict and livestock depredation (U.S. Census Bureau, 2019). This depredation affects the safety of both wildlife and humans and can lead to the removal of depredating carnivores (Halfpenny et al., 1991; Woodroffe, 2018). Elk (*Cervus canadensis*) and white-tailed deer (*Odocoileus virginianus*) also cause agricultural depredation to crops and fence damage. An increase in climate refugee residents has led to an increase in these and other types of conflicts between humans and wildlife. Non-native plant and pest species associated with increased road and trail use are linked to growing human populations. These increases can result in an invasion of plants further away from the road or trail, and can result in direct competition with native plants, where the non-natives will be broadly adapted and capable of surviving in many different microclimates, occurring from low to high elevations along the corridor of introduction, leading to degraded natural habitat for wildlife (Morehouse & Boyce, 2017; McLellan et al., 1999).



Figure 52: A white-tailed deer wanders. Sept. 22, 2021. Photo credit: Hunter D'Antuono.

Challenges

Baseline Data Gaps: There are species residing on the reservation that can be impacted by climate change. However, we do not have current or historical Information on their population numbers, demographics, or distribution.

Staffing Capacity: Currently staffing is sufficient, and exceeded, to address pollinator invertebrates and habitats, or generate baseline Inventory, monitoring, or climate change adaptation plans for species impacted by climate change. While essential to effective climate adaptation, external funding for baseline data collection and management activities related to climate change is often difficult to obtain.

Human-Wildlife Conflicts: Increased effects of climate change (mismatched pollinator arrival with foliage bloom, late-winter storms, significant wind events, drought, Increased temperature stress) have already begun to impact wildlife species behavior in ways that cause direct conflict with humans. Reducing many human-wildlife conflicts requires the effort and compliance of residents and landowners to minimize the risk of wildlife conflicts on their properties (E.g., bear-resistant garbage cans, electric fences around gardens, small livestock, and poultry, and fladry around calving fields).

Pollinator Conservation: No federally dedicated funding source for agencies to expand capacity to address pollinator Invertebrate Inventories or habitat restoration projects. Many pollinator species are slated to be listed on the Federally Threatened and Endangered Species List in the coming years.

Wildlife Disease: An increase In parasites and diseases within wildlife populations is a reality that wildlife managers must deal with to conserve wildlife species effectively, Chronic Wasting Disease, Highly Pathogenic Avian Influenza, COVID-19, and other diseases monitored by the CDC have begun to transition from host species to other wildlife species (I.e., HPAI from

waterfowl and raptors into skunks, coyotes, and grizzly bears) (Algeo et al., 2023).

Noxious Invasive Weed Management: Ongoing efforts to reduce the spread of noxious and Invasive weeds have been a problem for the wildlife management program. The cost of herbicide spraying / burning / seeding /cutting weeds in wildlife habitat grows each year. The efficacy of these efforts is often reduced by plentiful seed stock in private lands adjacent to lands where we implement noxious Invasive weed management.

Financial Support: We work hard to find additional funding to manage wildlife and monitor wildlife populations. It is a challenge to find and secure the necessary resources to hire staff to search for funds and complete the work. Limited access to consistent funding poses a significant challenge for sustaining Tribal fish and wildlife management programs.

Problem Solving

It has been a priority of the CSKT Wildlife Program to improve connectivity between landscapes. The CSKT have worked tirelessly to maintain connectivity across the Flathead Reservation and effectively across the region of western Montana. The Montana Department of Transportation and the Western Transportation Institute have collaborated with the CSKT to raise public awareness and support for wildlife crossing structures and mitigation measures along U.S. Highway 93. These crossing structures increase human and wildlife safety. They also allow for wildlife dispersal and gene flow from the Mission Mountains to surrounding ecosystems. This connectivity will become increasingly important as climate change impacts habitat types and wildlife ranges shift.

U.S. 93 Highway Project

Prior to reconstruction, U.S. Highway 93 was one of the most dangerous stretches of highway in Montana for animal-vehicle collisions (Pollnac et al., 2014). A stretch of U.S. 93 on the Flathead Indian Reservation, known as the Peoples Way, was reconstructed from Evaro to Polson in 2015 (Montana Outdoors, 2020). The U.S. Highway 93 North reconstruction project on the Flathead Indian Reservation in northwest Montana represents one of the most extensive wildlife-sensitive highway design efforts in North America to date. The reconstruction of the 56-mile (90 km) long road section included the installation of wildlife crossing structures at 39 locations and approximately 8.71 miles (14.01 km) of road with wildlife exclusion fences on both sides. The mitigation measures were aimed at improving safety for the traveling public by reducing wildlife-vehicle collisions and allowing wildlife to continue moving across the road. The CSKT summarized research conducted between 2002 and 2015 along U.S 93. The research focused on the effectiveness of mitigation measures in reducing collisions with large mammals and the use of the crossing structures (specifically by white-tailed deer, mule deer, and black bear). Additionally, the effectiveness of wildlife guards (similar to cattle guards), wildlife jump-outs, and a human access point was assessed. Finally, the researchers conducted cost-benefit analyses and formulated recommendations (Huijser et al., 2016).



Figure 53: The Animals' Way wildlife crossing over U.S. Hwy 93 near Evaro on the Flathead Indian Reservation on Dec. 22, 2023. Photo credit: Hunter D'Antuono.

The CSKT Wildlife program, with a commitment to connectivity, partnered with the Montana Department of Transportation, Federal Highway Administration, and the Western Transportation Institute to create and set a new standard for movement migration opportunities

for wildlife near highways. Using motion-sensing cameras and animal tracking beds, a study was conducted on wildlife crossings and the animals that use them.

After extensive research was conducted on the migration of animals and the study of various crossings throughout Canada, 41 wildlife crossing structures were installed along the People's Way, ranging from small concrete culverts to larger metal culverts and an arched overpass.

It is essential to remember that part of the success of wildlife crossing structures stems from animals feeling secure while approaching or crossing through them. The CSKT Wildlife program would like to remind all that while the wildlife crossing features are accessible to people, please avoid entering them to ensure that species feel safe and secure while crossing.

The CSKT Wildlife Program also actively works to restore wetlands on previously de-watered properties. This enhances wildlife habitat and restores connectivity across the Reservation. Habitat restoration also occurs across the Reservation on wildlife mitigation properties. This restoration reestablishes native plant biodiversity in habitats to enhance their wildlife value. Invasive weed species are identified, and measures are taken to reduce affected areas. Aerial surveys of high-elevation species, such as moose (*Alces alces*), Rocky Mountain Goats (*Oreamnos americanus*), wolverine, and Canada Lynx, are conducted annually to monitor population trends and identify habitat management issues. Aerial surveys also occur every winter for waterfowl and bald eagles. Brood surveys occur every July to monitor waterfowl production and trends in species composition. Grassland and songbird breeding bird surveys are conducted each year.

The CSKT Wildlife Program also collaborates with the Montana Audubon Society in monitoring long-billed curlews (*Numenius americanus*) on the Reservation. Curlews are a national Species of Concern, as they are highly vulnerable to climate change. As temperatures increase, curlews will endure extensive habitat loss across North America.

Outreach and education are important components of creating resiliency in wildlife management. The loss of culture and historical knowledge, coupled with increased social media and tech usage, has created a social disconnect with the environment and its natural resources. The Wildlife Program works with elementary and middle schools across the Flathead Indian Reservation to provide wildlife presentations as needed. Climate change and its effects on wildlife are introduced in these programs. The CSKT Information and Education Program has produced a free Animal Field Guide to Flathead Reservation app for handheld devices. In addition, a CSKT Bison Range app has been created to highlight wildlife living on that landscape. This app supports outreach by providing materials for classrooms, students, and the general public to use in identifying wildlife and understanding the cultural significance and climate sensitivities of the Reservation's wildlife species. Educational public meetings addressing the conflict between humans and carnivores are held throughout the year to increase education and awareness about living with carnivores on the Reservation. Methods and tools to identify attractants and deter conflict are also emphasized.

Prior to 1995, Trumpeter swans had been locally extirpated from the Reservation and surrounding regions. The CSKT Wildlife Program, along with Montana Fish, Wildlife, and Parks, the U.S. Fish and Wildlife Service, and other partners, reintroduced Trumpeter Swans on the Reservation. This program has been successful in restoring resident populations. Another native species that is being reintroduced on the Reservation is the Northern Leopard Frog (*Lithobates pipiens*). Populations have begun to reproduce and expand their range, but are potentially at risk from an invasive species. The American Bullfrog (*Lithobates catesbeianus*) is a non-native species introduced into the Flathead River system during the 1960s. They are a generalist species that will consume other frogs, fish, and birds.

Goals and Adaptation Strategies

Managing for wildlife as effects of a changing climate continue to alter the landscape will require coordination and cooperation between all Sectors and Departments within CSKT, as well as regional agencies. To address conditions such as extreme drought, integrated management strategies that span multiple

sectors, including private landowners and county programs, would be beneficial. These plans could resemble instream flow agreements, similar to those within the Clark Fork Coalition. These could partner with private landowners, irrigation districts, and water user groups to keep water in chronically dewatered tributaries during extreme drought conditions. These strategies would not be limited to water, but could also extend into rangeland management, air quality, and the duration of extreme temperatures.

The Wildlife Management Program would also like to examine predicted climate scenarios and model the effects of climate change on habitat types and species distribution. This work would allow for the identification of future refugia and identify important areas for connectivity.

Partners and Potential funding sources

Regional Non-profit organizations

- The Wilderness Society
- Heart of the Rockies Initiative
- Sierra Club Montana
- Audubon
- Blackfoot Challenge
- Clark Fork Coalition
- 5 Valleys Land Trust
- Climate Smart Missoula
- Flathead Lakers
- Montana Native Plant Society
- Trout Unlimited
- Montana Wildlife Federation
- National Parks Conservation Association
- The Nature Conservancy
- Alliance of the Wild Rockies
- Yellowstone to Yukon
- Backcountry Hunters and Anglers
- Vital Ground Foundation
- Whitebark Pine Ecosystem Foundation
- Owl Research Institute
- Partners for Fish and Wildlife

Federal Agencies:

- US Department of the Interior
- Bureau of Indian Affairs
- US Fish and Wildlife Service
- US Forest Service
- US Department of Agriculture
    - Wildlife Services
    - NRCS
- US Geological Survey

State Agencies:

- Montana Fish, Wildlife, and Parks
- Montana Department of Natural Resources and Conservation
- Montana Department of Transportation
- University of Montana



Figure 54: Bison grazing on the CSKT Bison Range. Photo: CSKT.



Climate Projections for the Flathead Reservation

Native Waters on Arid Lands (NWAL) is a collaborative project that partners researchers, educators, and extension experts with tribal resource managers from reservations in the Southwest, Great Basin and Northern Rockies to understand the impacts of climate change on tribal water resources and agriculture. See NWAL website for more details: NWAL website. The NWAL project is funded through a grant from USDA/NIFA Water for Agriculture Challenge Area (Grant No: Grant 2015-69007-23190). NWAL researchers and 1862 and 1994 Extension faculty work with tribal community partners to understand climate impacts on tribal farming and ranching and to enhance climate-agricultural resilience through the weaving of western science and native wisdom. Climate-agricultural resilience is defined as the capacity of communities to adapt local agricultural practices in response to warming temperatures and changes in precipitation form, timing, and intensity.

NWAL researchers, in partnership with the Montana Climate Office based at the U. Montana (Montana Climate Office), have extracted place-based climate data sets for tribal reservations throughout the Western US. Climate projections of temperature and precipitation data related to agriculture (crop, livestock and forestry) on the Flathead Reservation of the Confederated Salish and Kootenai Tribes (CSKT) are shown in the accompanying graphs. The projections are constructed using 15 different climate models chosen because they accurately simulate global and western-US climate statistics during the historical period 1950–2005. They include projections for two different scenarios for future greenhouse-gas (GHG) emissions — moderating emissions scenario ("RCP 4.5") are shown in green. This scenario assumes that mitigation measures are implemented so that GHG emissions peak around the year 2040 and then decline for the rest of the century. The accelerating emissions scenario ("RCP 8.5") is shown in brown. This assumes human societies implement little to no mitigation measures resulting in emissions continuing to rise through the end of the century at their current rate.

The CSKT climate projection data provided are for two elevations on the Flathead Reservation – the lower elevation represents Mission Valley at 3,065 ft, and the higher elevation corresponds to the Mission Wilderness at 6,130 ft. Mission Valley is where crops are grown, livestock are grazed, and most of the human population lives. The higher elevation (6,130 ft. or 1868 m) corresponds to a mid-point in the Mission Mountains, a range of the Northern Rockies located east of the valley, where snowpack accumulates and CSKT manages the forests of the Mission Wilderness. The highest peak in the Mission Range is 9,820 ft. (2994 m). Average annual historical temperatures for the period 1950 to 2000 in the Mission Valley were around 46°F (7.8° °C), similarly, in Mission Mountains, average temperatures were around 32° F (0° °C) at the mid-point. Average annual precipitation during this period was around 12 inches (30 cm) in the valley and approximately 60 inches (152 cm) in the mountains, with the latter falling primarily as snow.

Data shown in the accompanying graphs are representative for the two elevations. Projections at specific locations may vary due to microclimates in particular areas on the Flathead Reservation. Note that some

of these graphs are reported in Water Years (1 October to 30 September). Other graphs are in Calendar Years (1 January to 31 December). The ensemble projections shown in the attached graphs are include historical emissions (shown in blue) for the period 1950-2005 and 15 different climate models for the two emission scenarios "moderating" (RCP 4.5 shown in green) and "accelerating" (RCP 8.5 shown in brown for the period 2005-2100.

General observations from these data are:

- By the end of the century, annual average temperatures are projected to be 5 to 10°F warmer than what has been experienced in the last half of the 20th century, depending on future greenhouse-gas emissions. Average annual temperatures in the Mission Valley will rise to 52–62 ºF (from a baseline around 46 ºF) and to 37–42 ºF in the Mission Wilderness (from a baseline around 31 ºF).
- Average annual precipitation is expected to stay near historic levels in the Mission Valley with a 5% increase (on average) in the Mission Mountains. At both elevations, summer precipitation decreases slightly and winter precipitation increases accordingly.
- The frequency and intensity of extreme storms are expected to increase, especially in the Mission Mountains. Annual precipitation (snow and rain) will increasingly result from more intense storms punctuated by dry periods. Precipitation in the winter will increasingly fall as rain rather than snow, leading to significant declines in spring runoff.
- Increased temperatures will lead to shorter winters and longer growing seasons in the Mission Valley. By 2100, the first snowfall in the fall will arrive 3-5 weeks later, with growing seasons in the Mission Valley beginning 3–6 weeks earlier by the end of the century than the historical period and ending 2–4 weeks later.
- Annual growing degree days — a measure of the amount of heat available to crops and defined as days over 50°F — nearly double from under 40 in 1950 to around 80 by 2100 under the accelerating GHG emissions projection and increase to 60 under the moderating GHG projection.
- Significant warming temperatures in the mountains result in a doubling in frost-free days from ~75 historically to over 150 annually.
- Warming temperatures in Mission Wilderness will also likely lead to accelerated snowmelt during winter and early spring due to an increase in the number of "rain-on-snow" events that can cause winter floods and decreasing snow storage in the high country resulting in less water for irrigation in summer.
- The Flathead Reservation doesn't currently experience many very hot days during a typical year, defined as days when the high temperature exceeds 100°F. Very hot days can have serious impacts in communities with little access to air conditioning and can be especially risky for young children and elders. In the "business as usual" scenario, the average number of very hot days reaches over 30 in the Mission Valley by 2100, over a baseline of near zero, historically.
- During the historical period the annual day of first snowfall (defined as first date with precipitation when the temperature is below 32 ºF) was around 15 October for the Mission Valley and 30 September for the Wilderness. Under the accelerating emissions first snowfall will be delayed to around 15 November for the Valley and 7 October for the Wilderness.
- The majority (close to 80%) of precipitation in the Wilderness has historically fallen as snow; this decreases to about 70–75% by 2100 under the accelerating emissions projection. In contrast only about 25% of precipitation in the Valley has historically come as snow; this decreases to around 15% by 2100 under the accelerating emissions.

Native Waters on Arid Lands

CSKT Climate Projections

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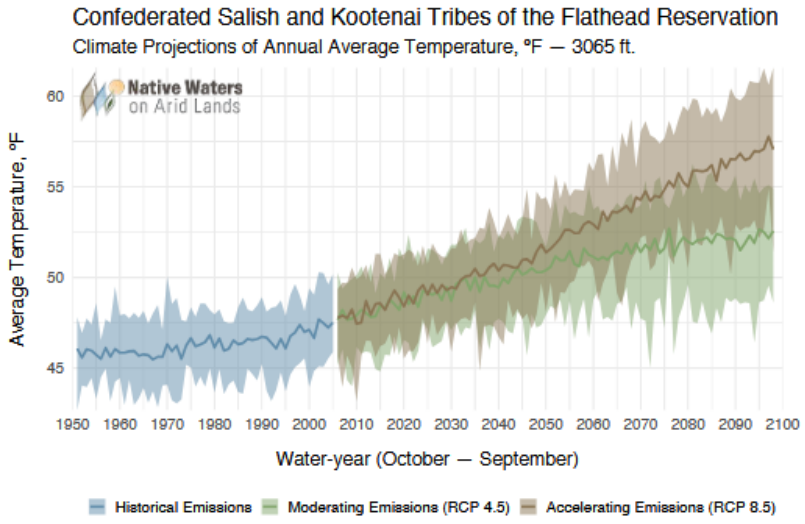
Email: maureen.mccarthy@dri.edu

Prepared for the CSKT Climate Adaptation Plan 2020

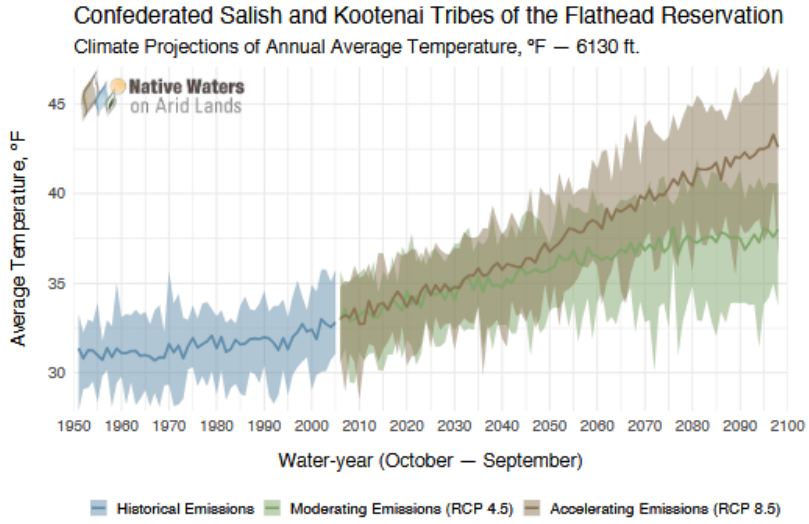
Temperature Projections

Average Temperatures (°F)

Mission Valley 3065’

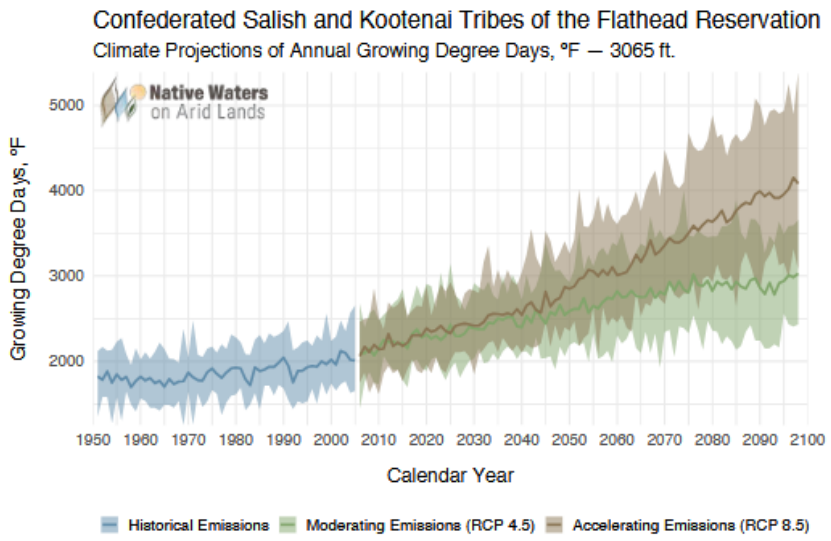


Mission Wilderness 6130’

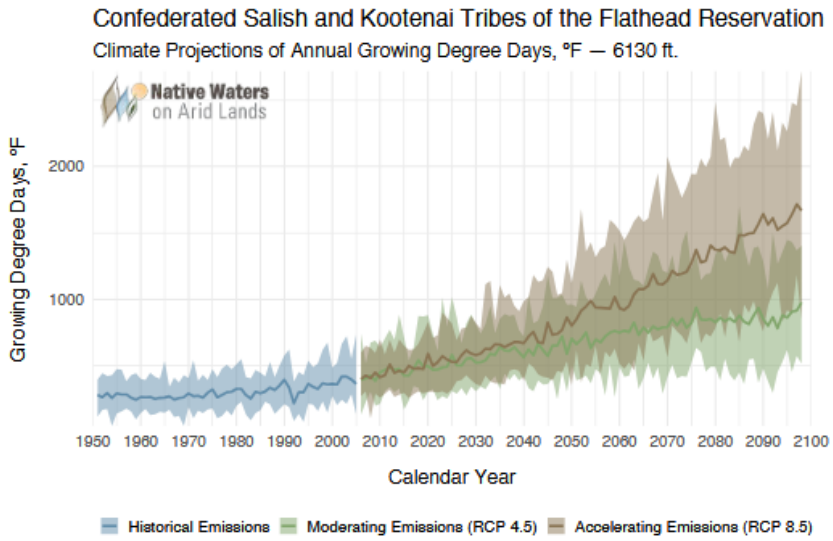


Growing Degree Days - an abstract cumulative heat index related to crop growth derived from the sum of daily temperatures above 50 ºF

Mission Valley 3065’

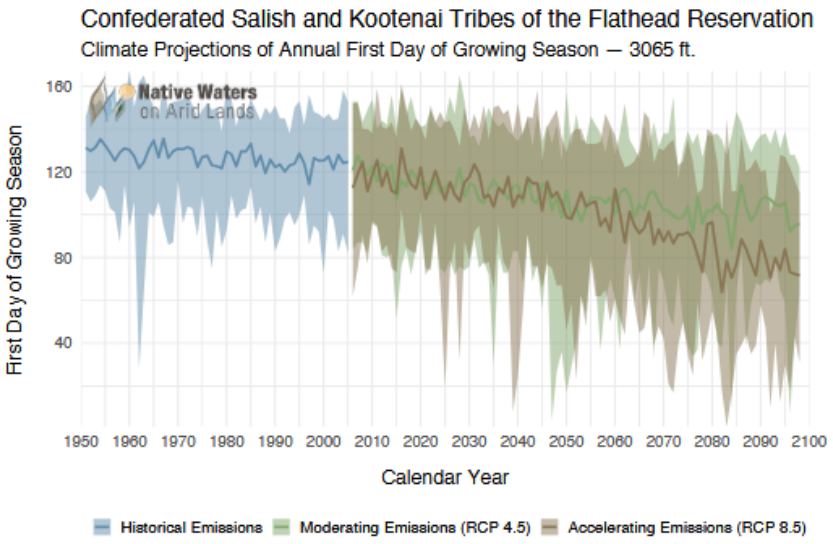


Mission Wilderness 6130’

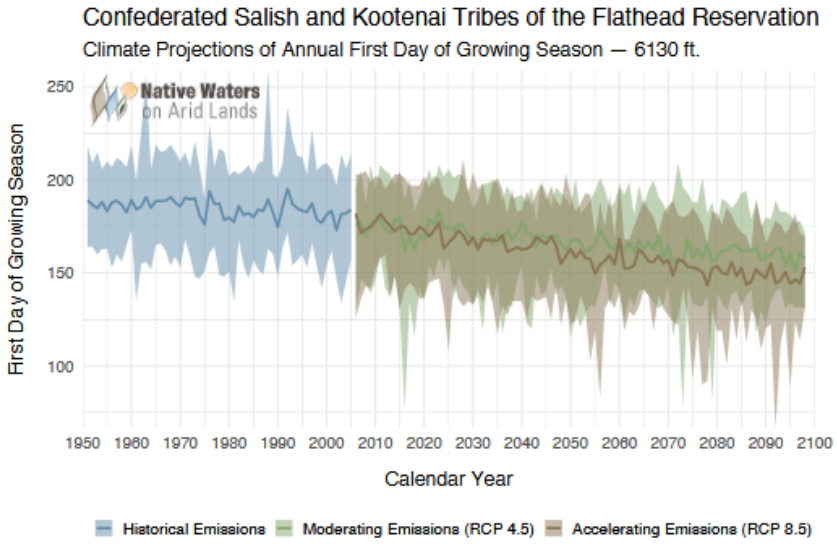


First Day of Growing Season - defined as the first of six consecutive days with average temperatures above 50 ºF

Mission Valley 3065’

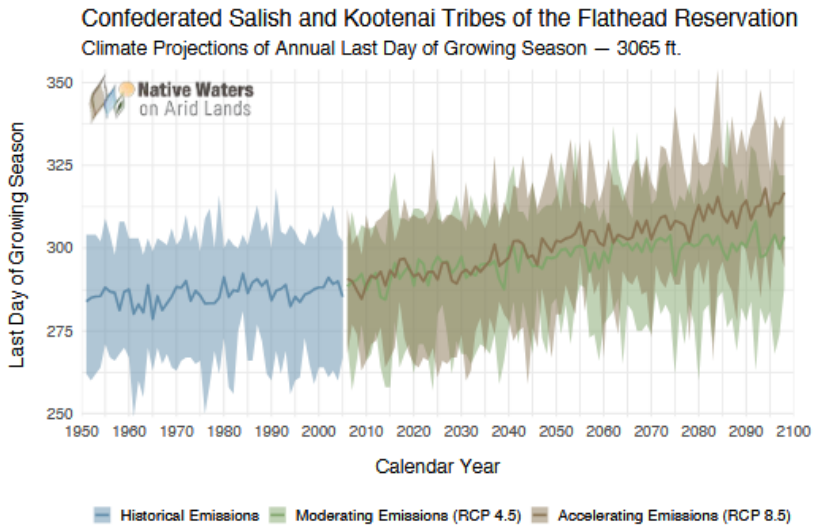


Mission Wilderness 6130’

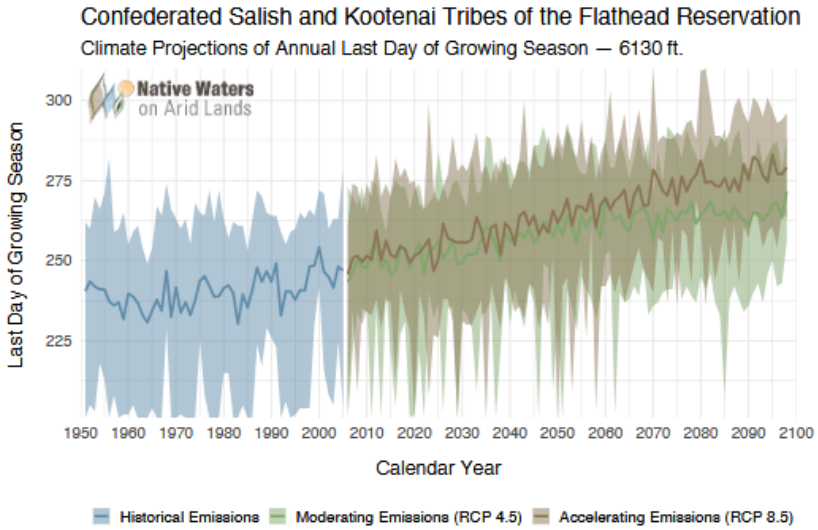


Last Day of Growing Season - defined as the last of six consecutive days with average temperatures below 50°F

Mission Valley 3065’

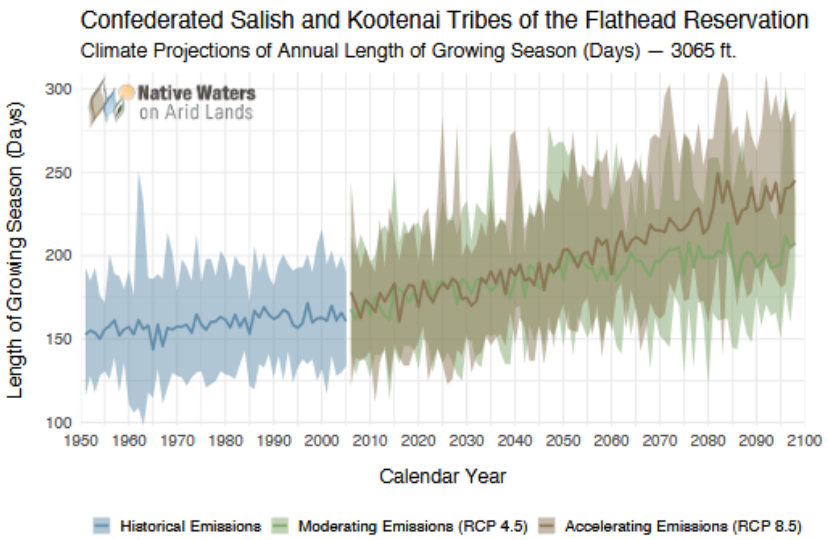


Mission Wilderness 6130’

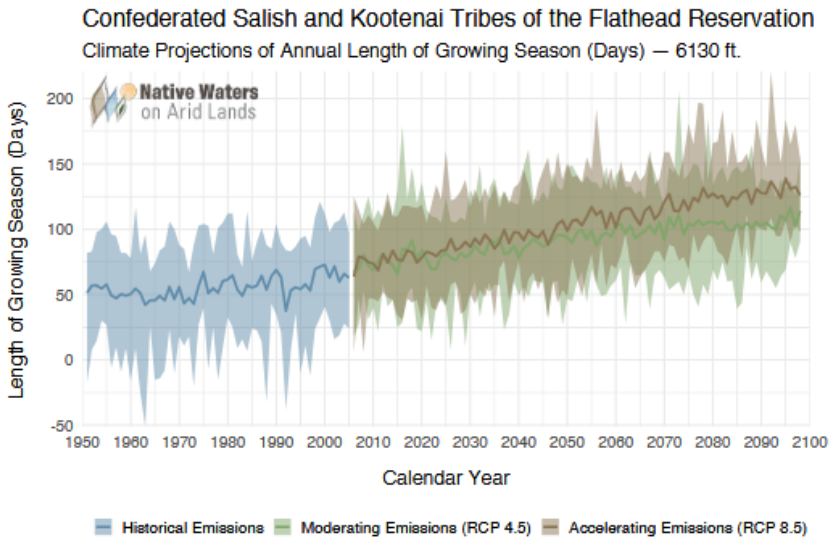


Length of growing season - number of days between start and end day of the annual growing season

Mission Valley 3065’

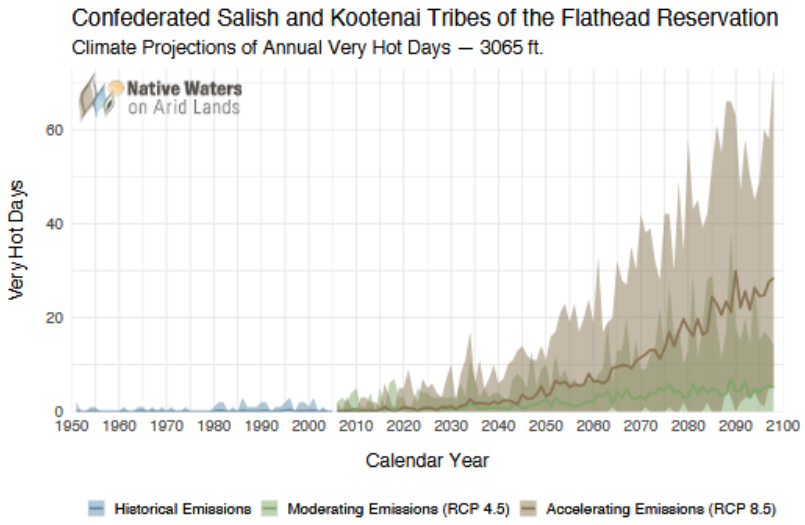


Mission Wilderness 6130’

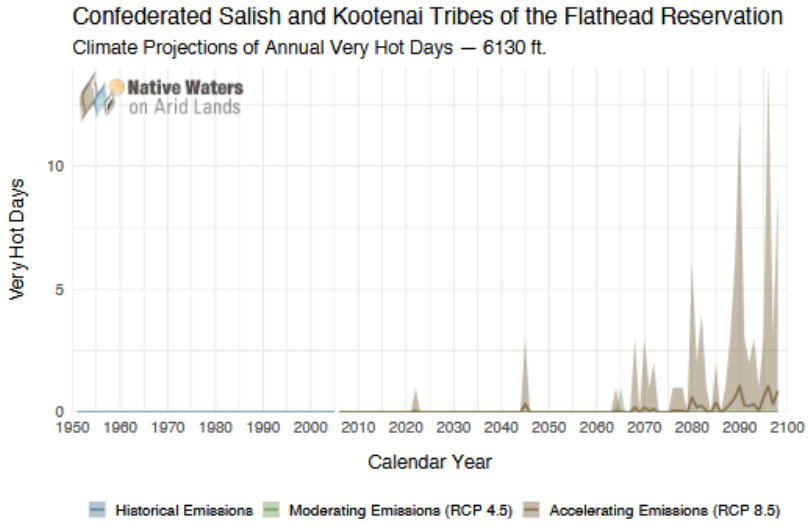


Very hot days - number of days with max temp over 100 ºF

Mission Valley 3065’

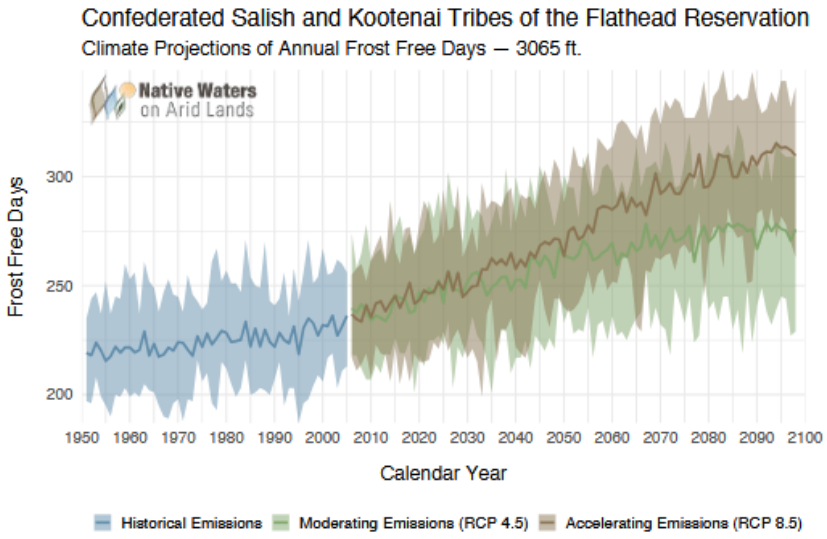


Mission Wilderness 6130’

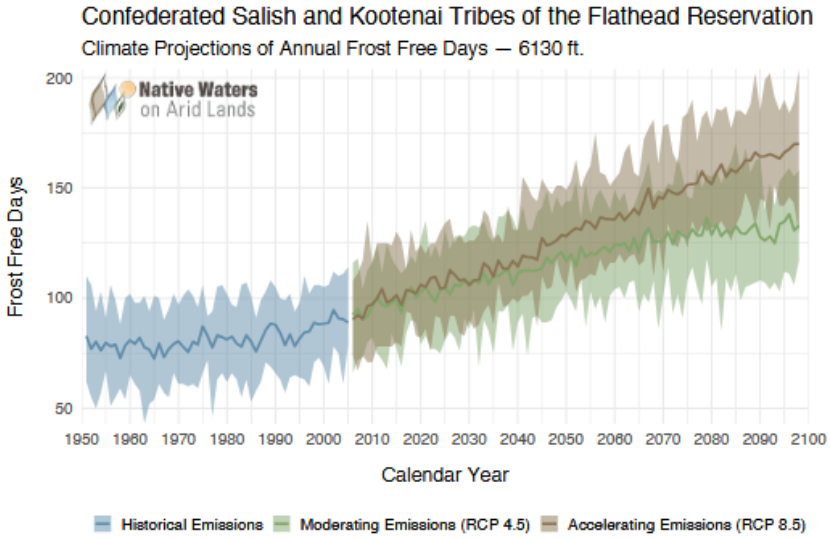


Frost Free Days – cumulative number of days with temperatures above 32 ºF

Mission Valley 3065’



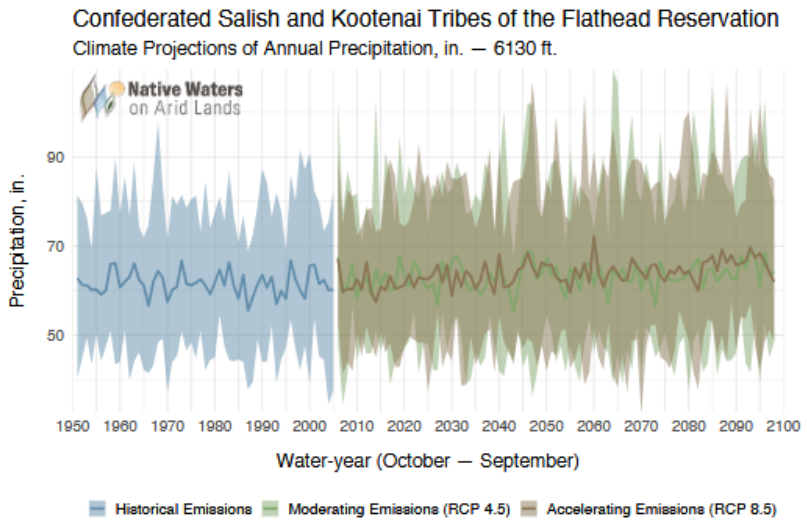
Mission Wilderness 6130’



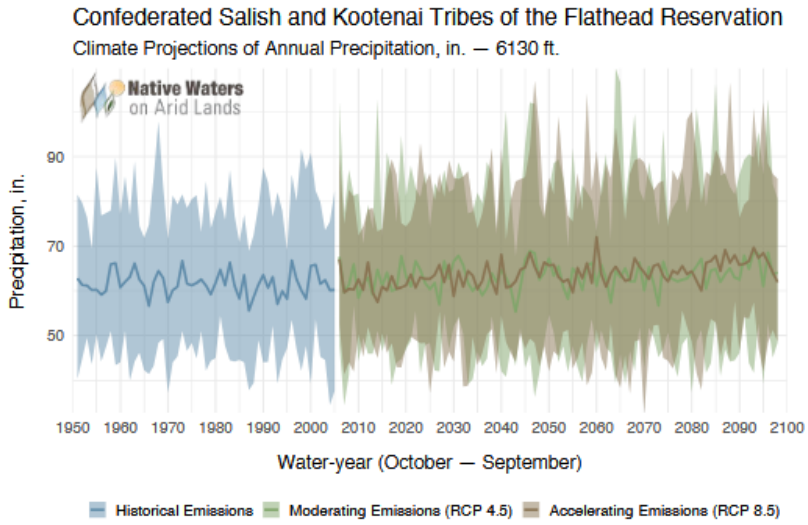
Precipitation Projections

Annual Precipitation – Cumulative in inches of rain and snow as snow-water equivalent (SWE)

Mission Valley 3065’

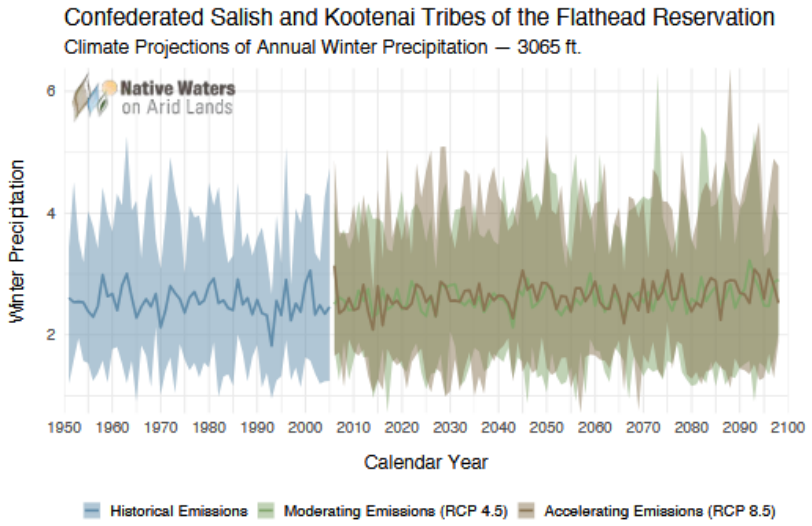


Mission Wilderness 6130’

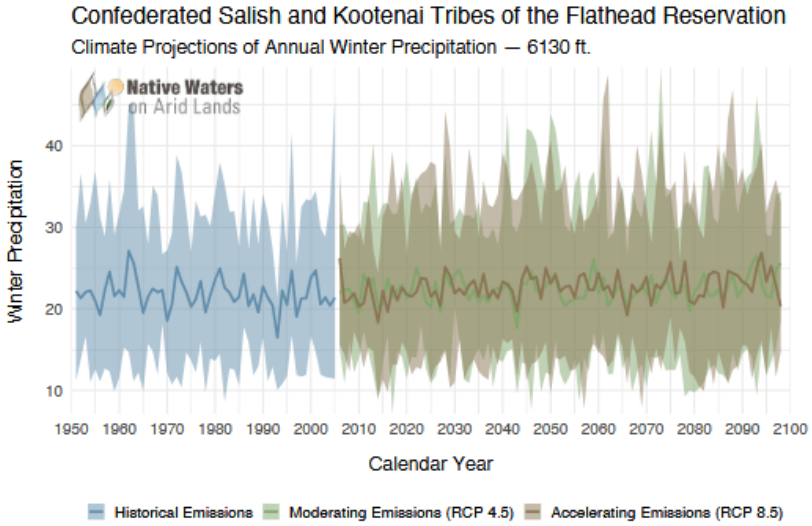


Winter Precipitation (Dec/Jan/Feb)

Mission Valley 3065’

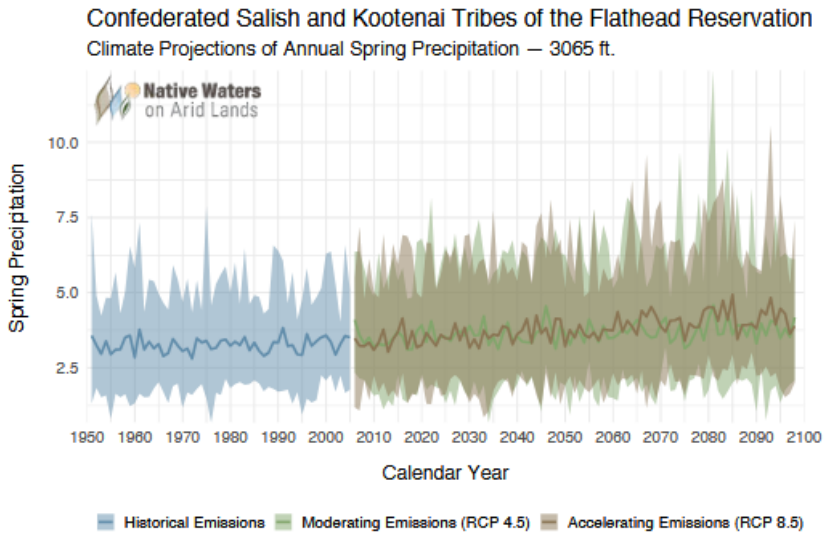


Mission Wilderness 6130’

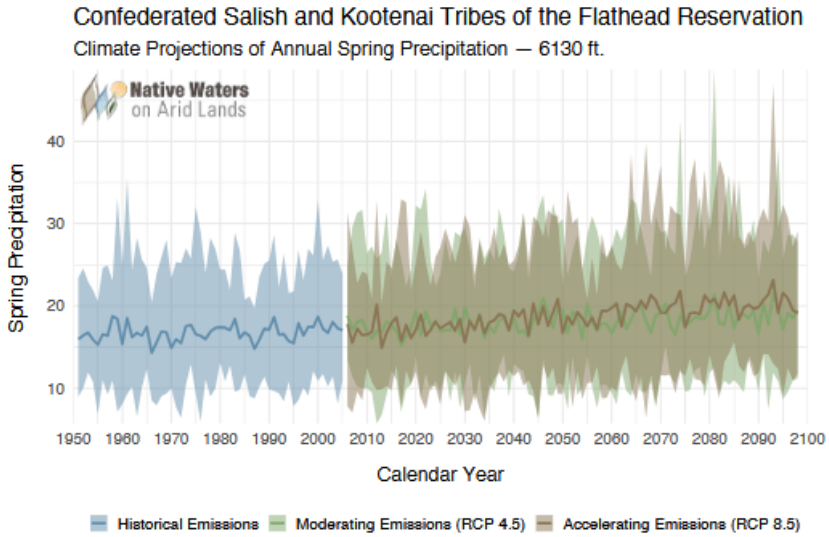


Spring Precipitation (Mar/Apr/May)

Mission Valley 3065’

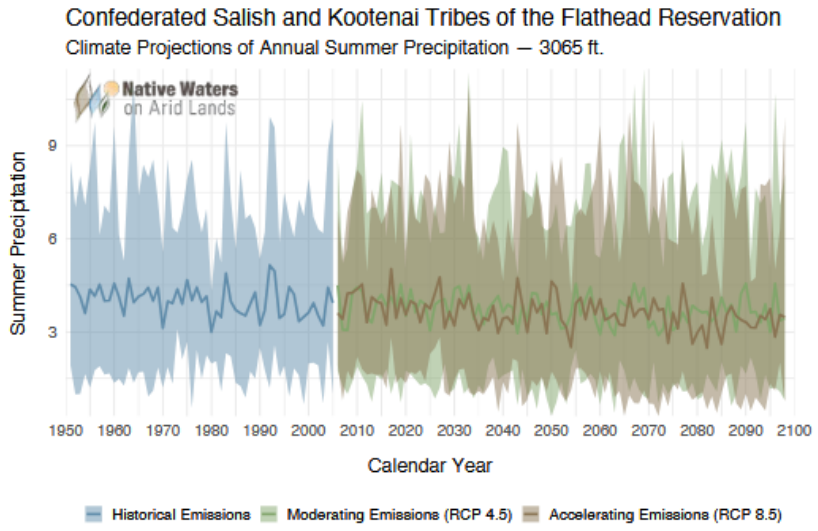


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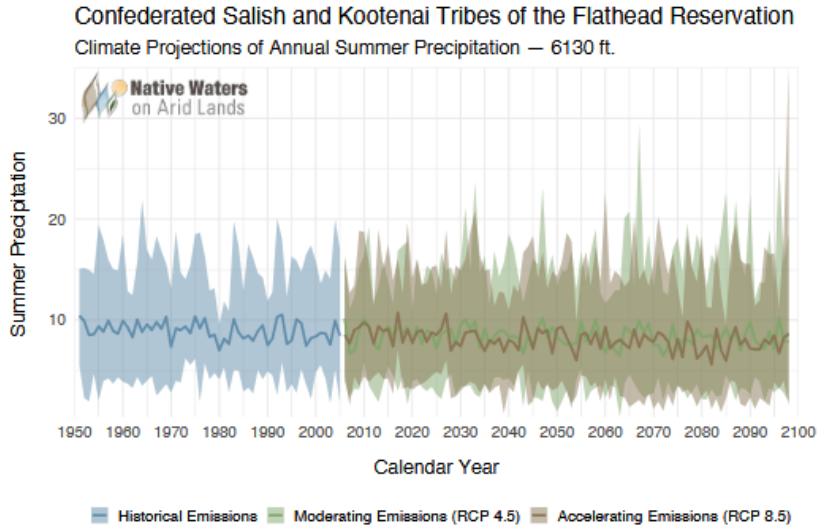


Summer precipitation (Jun/Jul/Aug)

Mission Valley 3065’

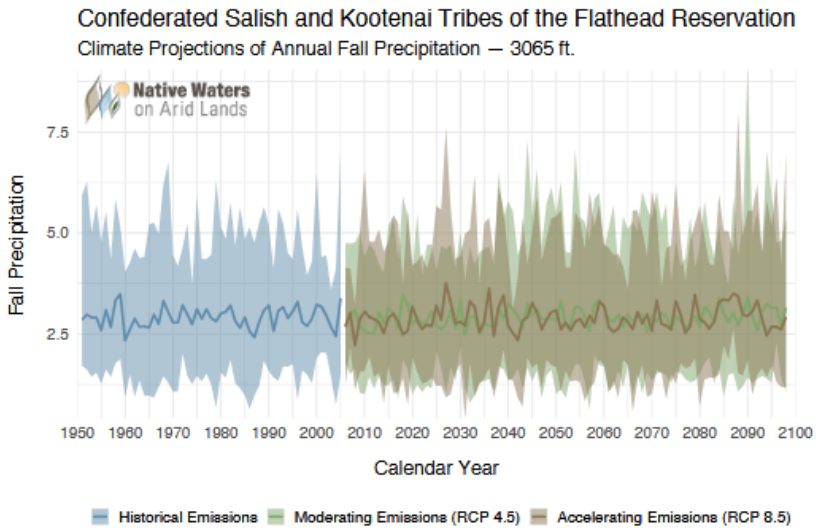


Mission Wilderness 6130’

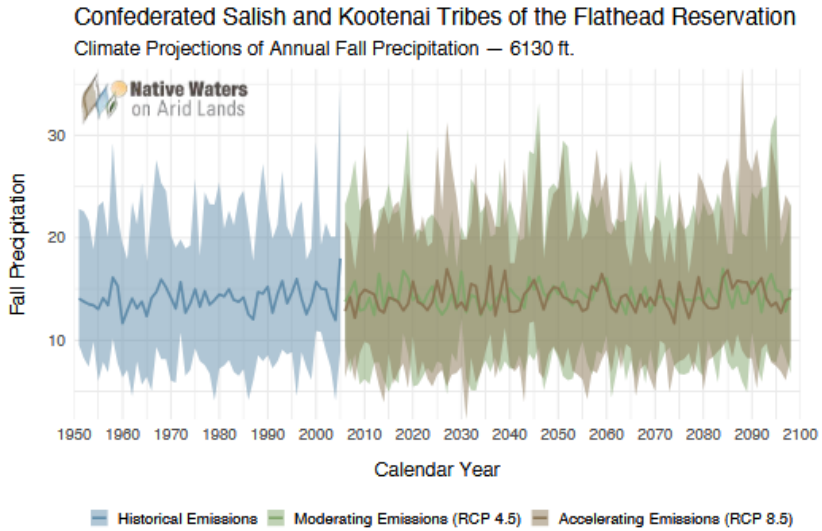


Fall Precipitation (Sep/Oct/Nov)

Mission Valley 3065’

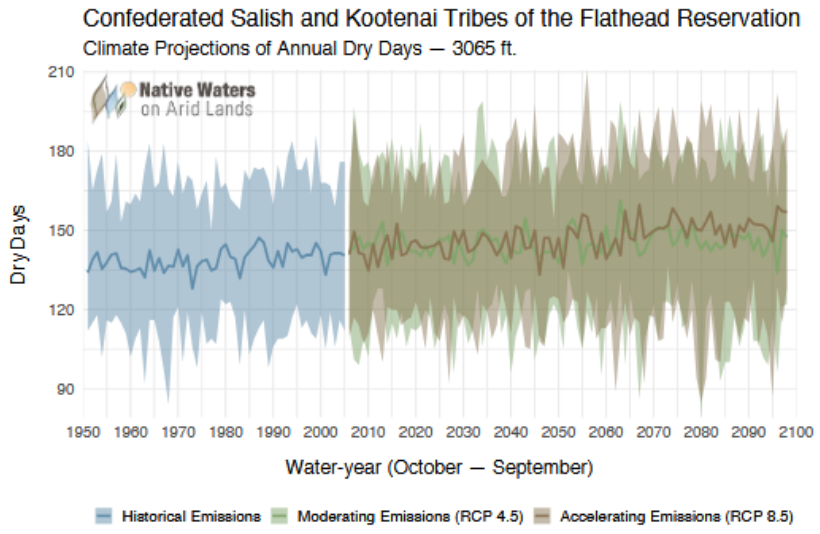


Mission Wilderness 6130’

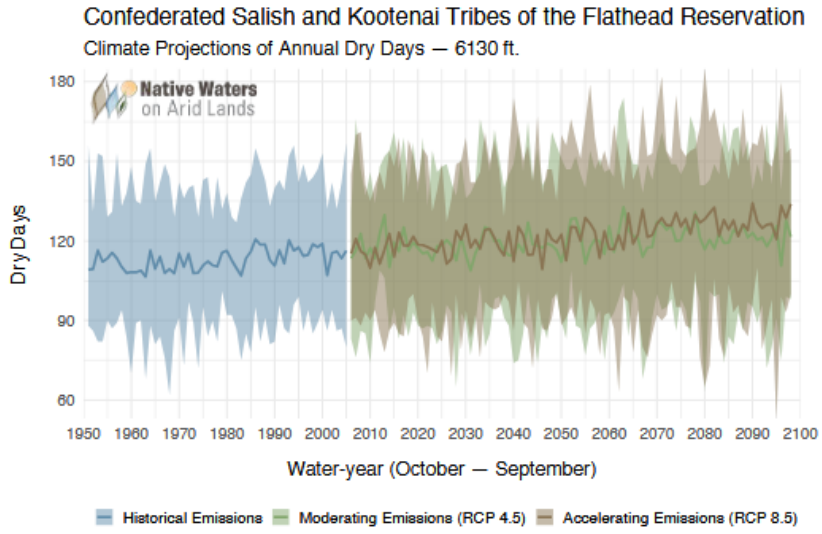


Dry Days – defined as zero daily precipitation

Mission Valley 3065’

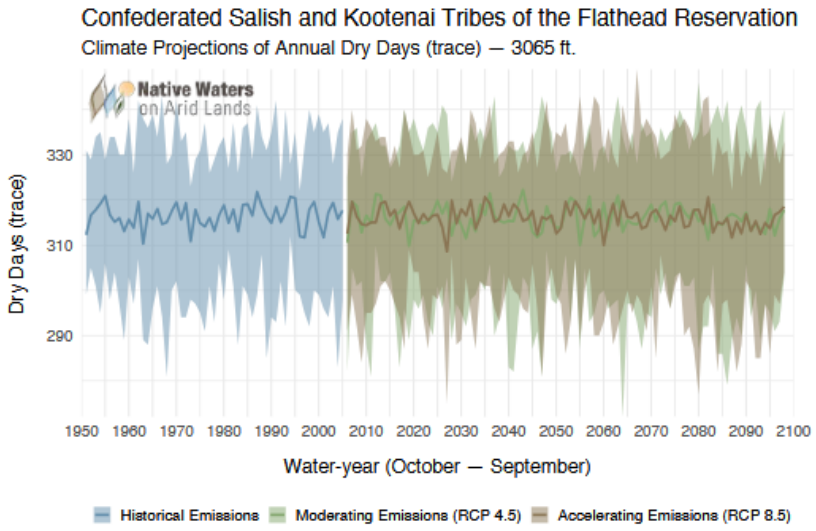


Mission Wilderness 6130’

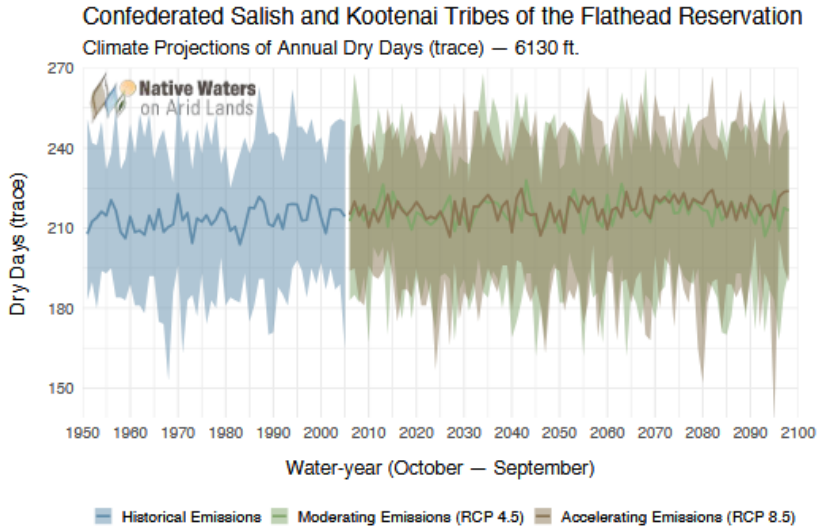


Dry Days (trace amount) – defined as the number of days of less than 2mm (0.08in) of daily precipitation

Mission Valley 3065’

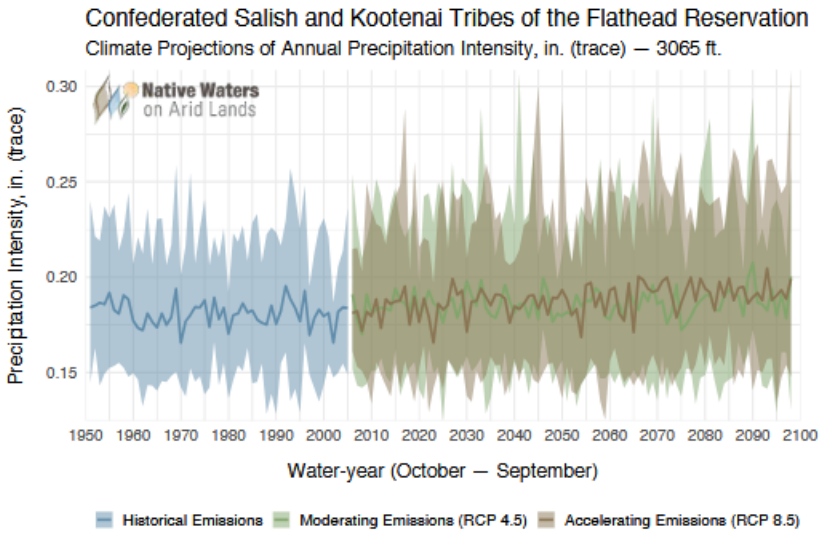


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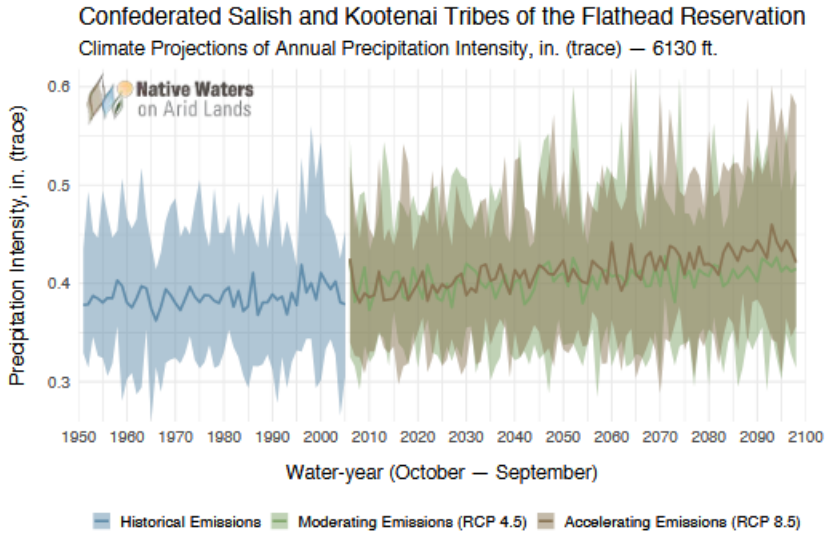


Precipitation intensity – average daily amount on days with a minimum of 2mm (0.08in) precipitation

Mission Valley 3065’

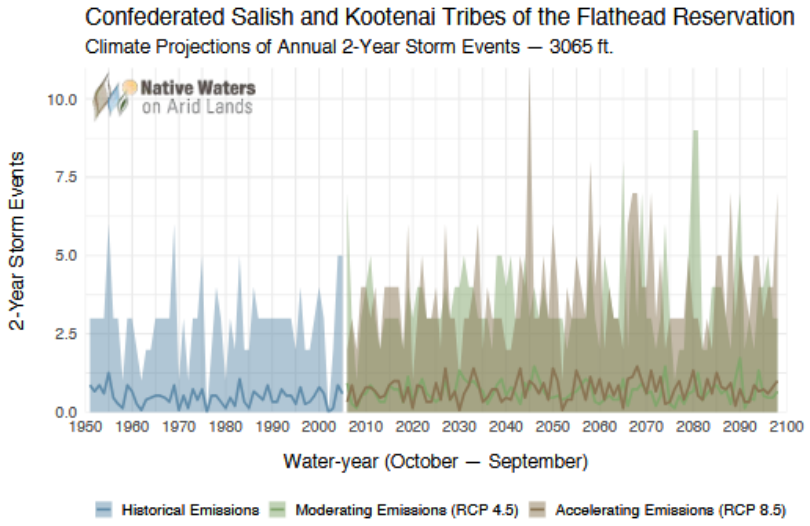


Mission Wilderness 6130’

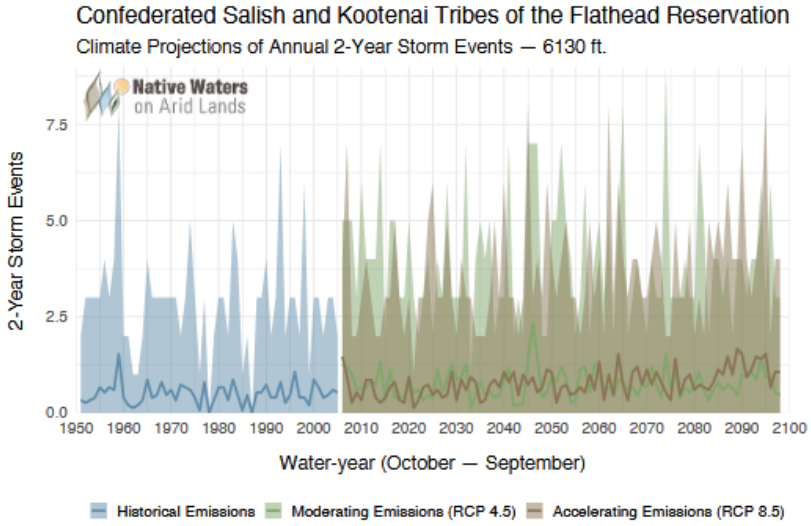


Annual 2-year Storm Events – events with a 50% likelihood of happening in a given year

Mission Valley 3065’

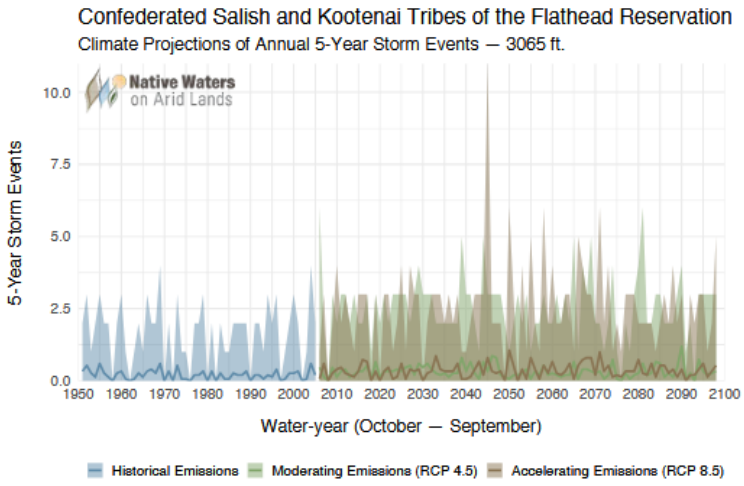


Mission Wilderness 6130’

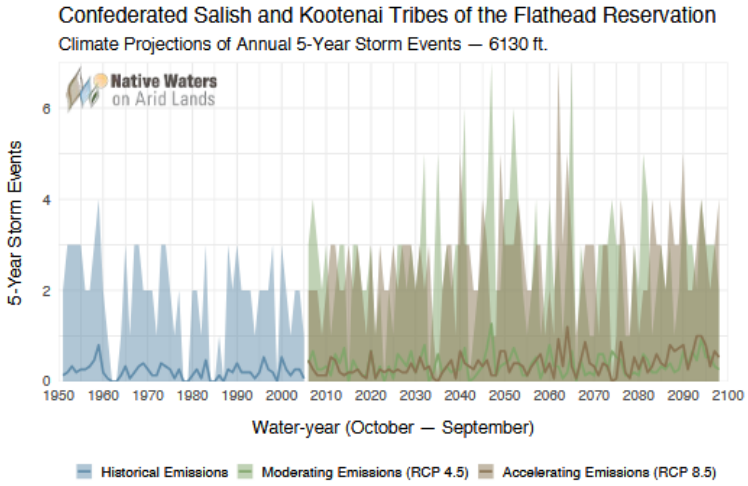


Annual 5-year Storm Events – events with a 20% likelihood of happening in a given year

Mission Valley 3065’

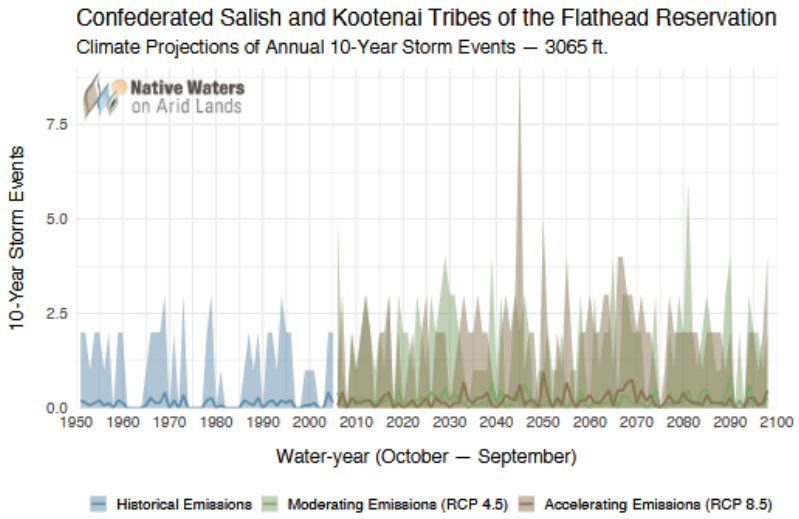


Mission Wilderness 6130’

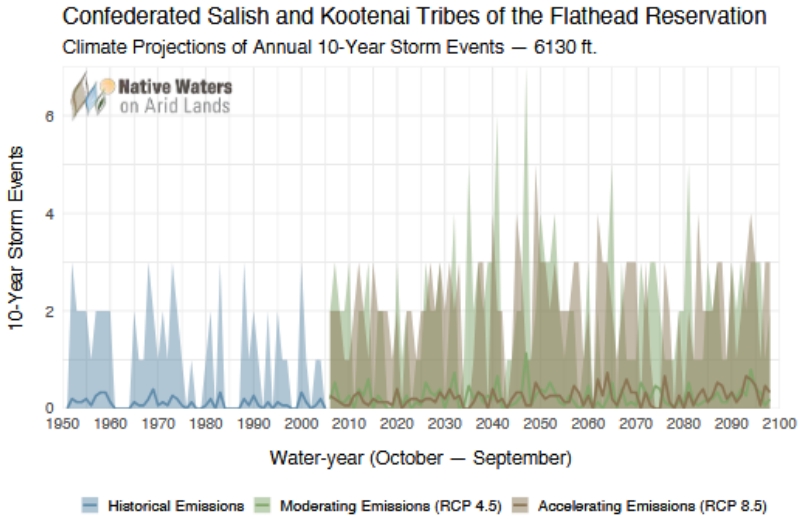


Annual 10-year Storm Events – events with a 10% likelihood of happening in a given year

Mission Valley 3065’

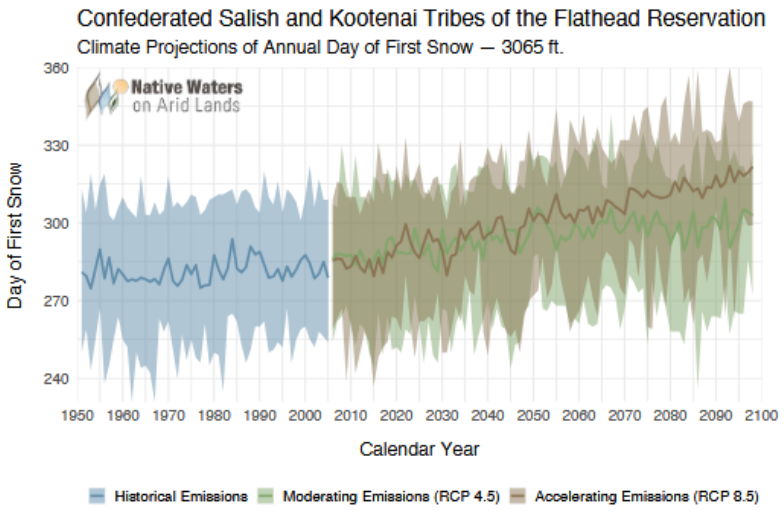


Mission Wilderness 6130’

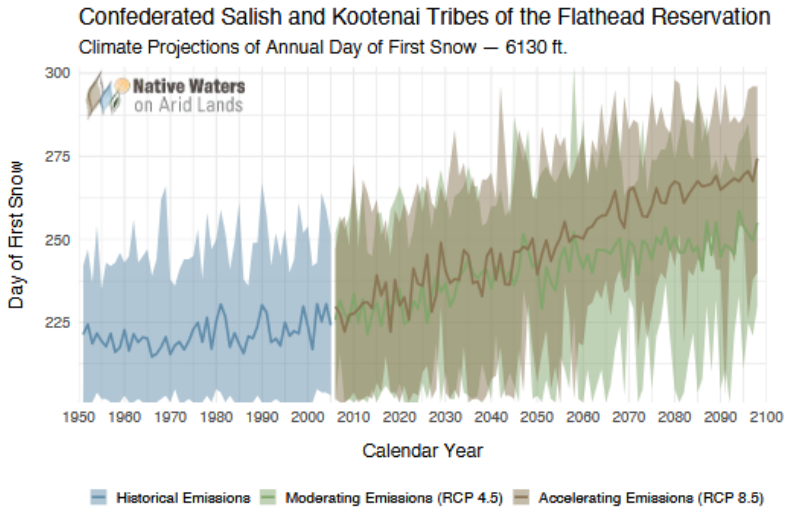


First Day of Snow – Counted from 01 Jan, 240 is approximately 1 Sep and 275 is approximately 1 Oct

Mission Valley 3065’

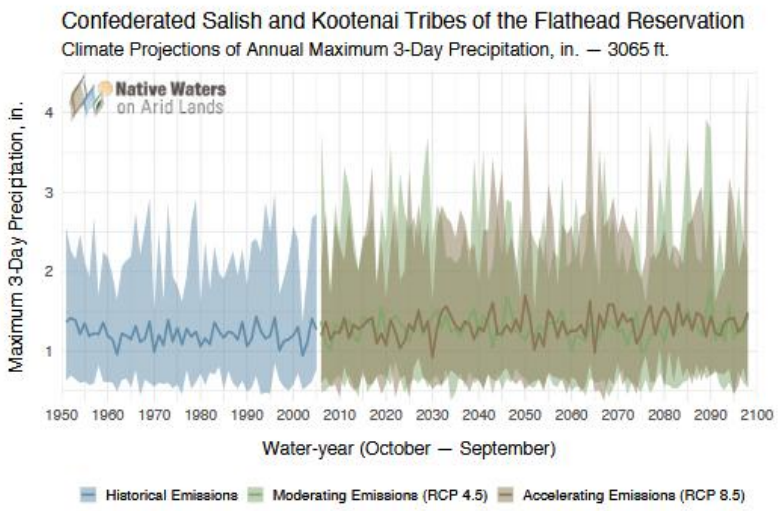


Mission Wilderness 6130’

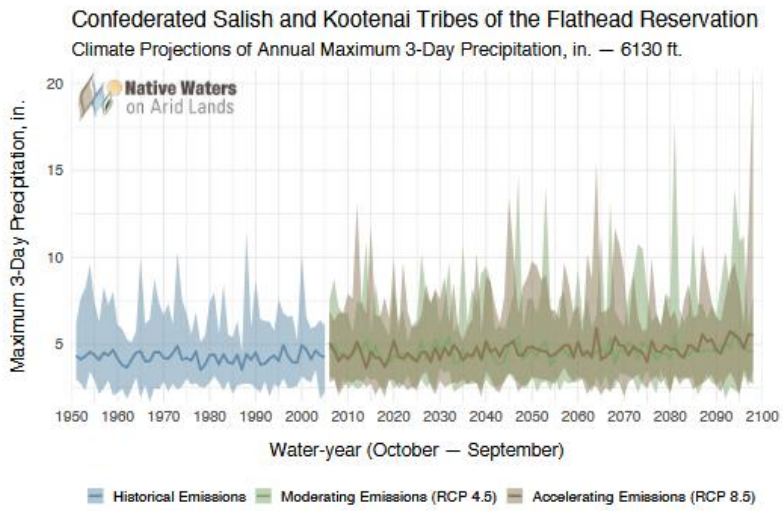


Maximum 3-day precipitation - cumulative precipitation (in inches) over 3-days, is a measure of the frequency of extreme precipitation events

Mission Valley 3065’

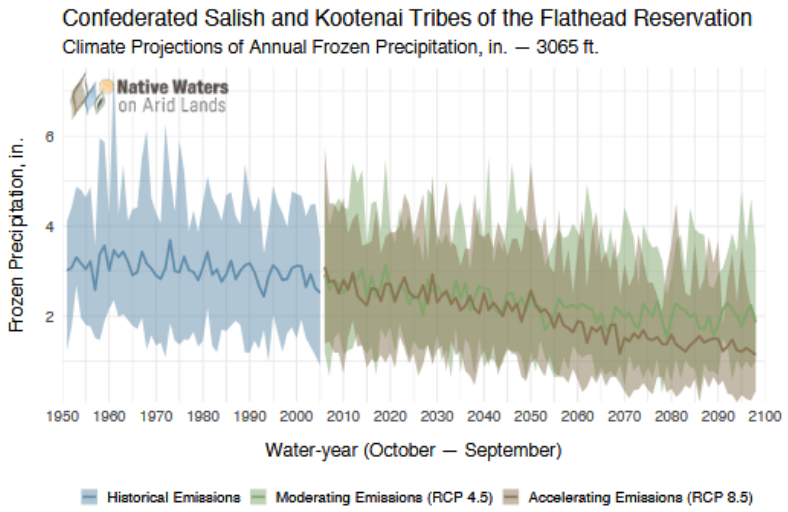


Mission Wilderness 6130’

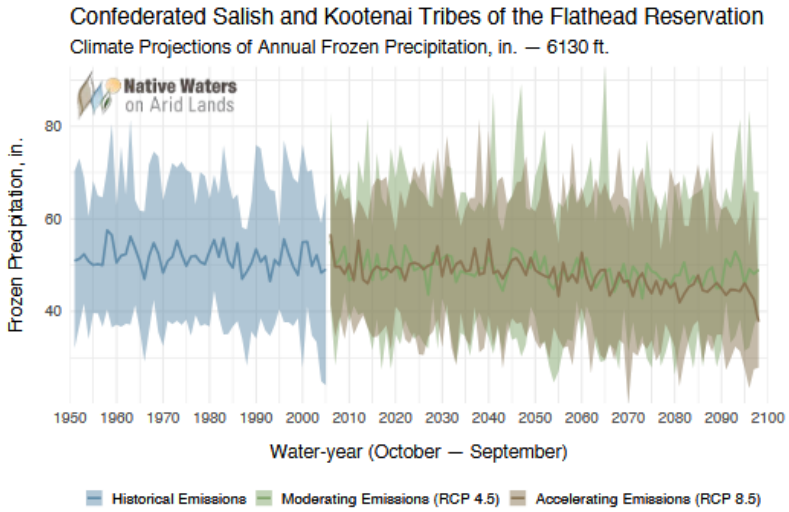


Frozen Precipitation - precipitation falling when minimum temp at 6ft above ground is below 32°F

Mission Valley 3065’

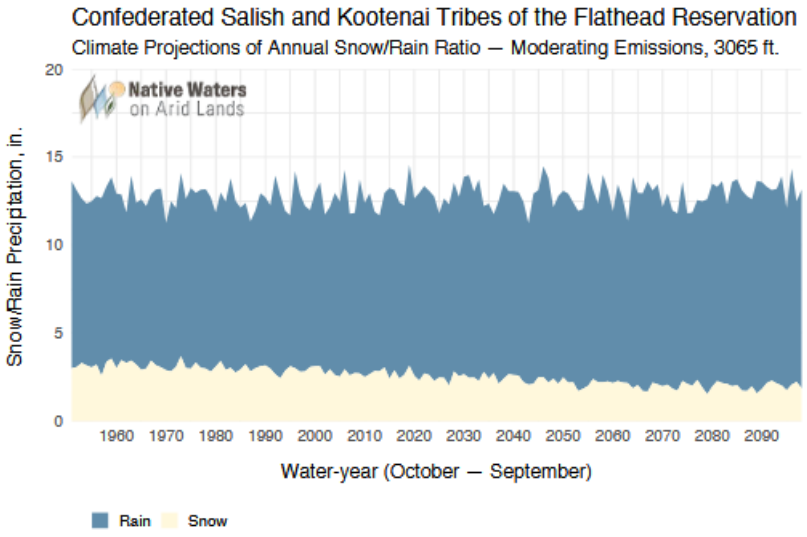


Mission Wilderness 6130’

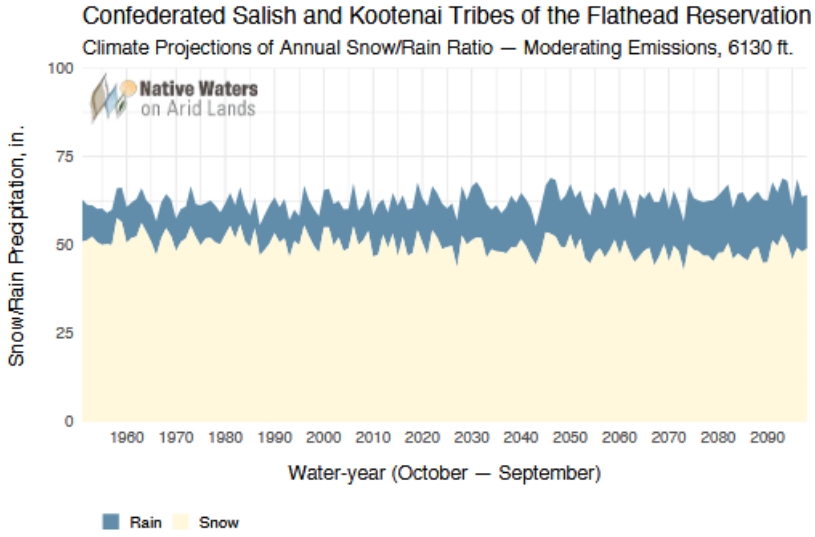


Rain vs Snow - moderating emissions scenario RCP 4.5

Mission Valley 3065’

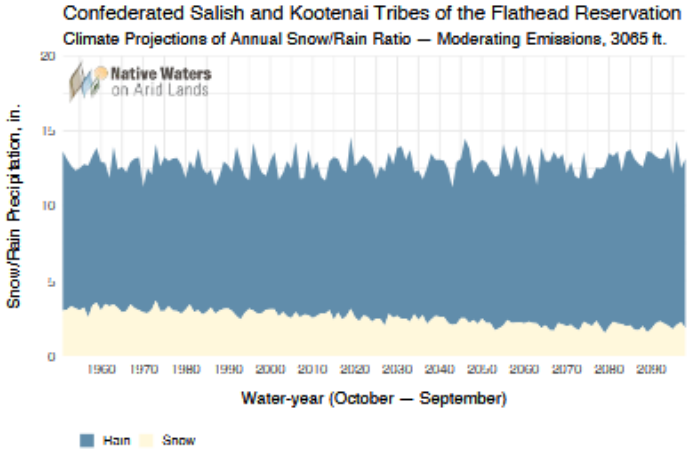


Mission Wilderness 6130’

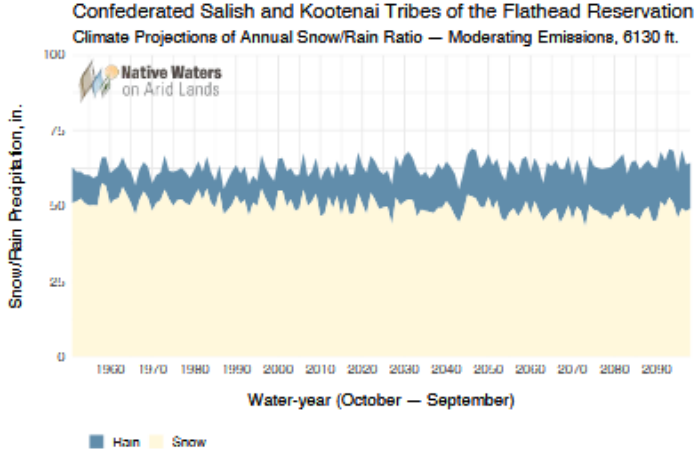


Rain vs Snow - moderating emissions scenario RCP 4.5

Mission Valley 3065’

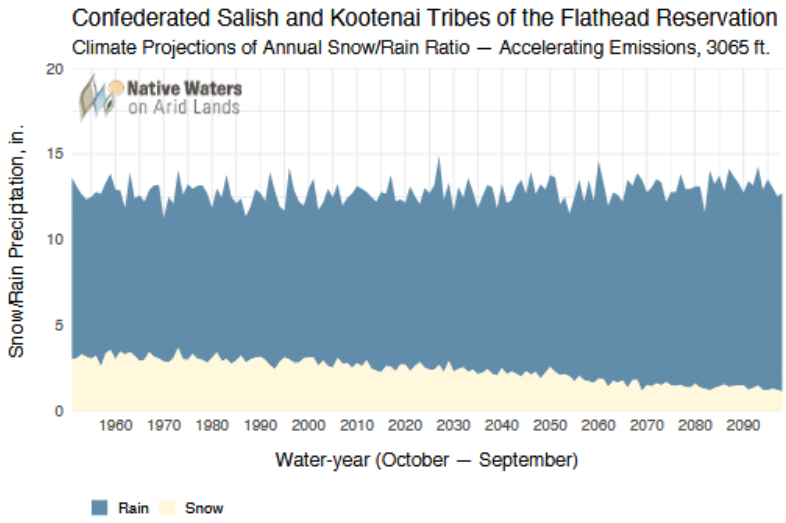


Mission Wilderness 6130’

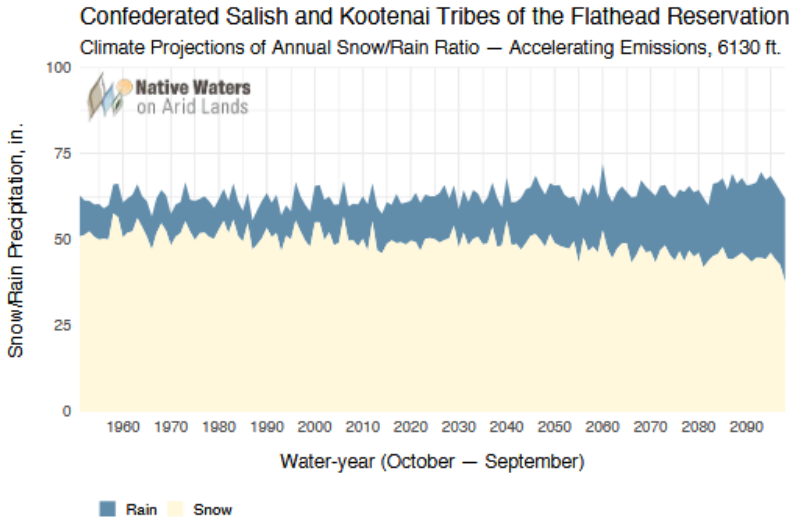


Rain vs Snow - accelerating emissions scenario RCP 4.5

Mission Valley 3065’



Mission Wilderness 6130’





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NOTES

[1] The section on "Séliš and Qlispé" is contributed to this Comprehensive Plan by the Séliš-Qlispé Culture Committee, drawing from materials created or contributed to by the SQCC, including but not limited to:

- *The Salish People and the Lewis and Clark Expedition*. 2005; rev. ed., 2018. Salish-Pend d'Oreille Culture Committee and Elders Cultural Advisory Council. Confederated Salish and Kootenai Tribes. University of Nebraska Press;
- *Seliš-Qlispé Timeline Since the Last Ice Age*. Rev. 2025. Poster. http://www.csktsalish.org/index.php/ethnogeography/timeline ;
- *Stltúlexʷ Séliš u Qlispé: Territories of the Salish, Kalispel and Related Nations*. 2019. Map. http://www.csktsalish.org/index.php/ethnogeography/territories
- "Stltúlixʷs Séliš u Qlispé: Territories of the Salish, Kalispel, and Related Indigenous Nations." Report. 2023. http://www.csktsalish.org/index.php/documents/download?path=2023%2BSelis%2Bu%2BQlispe%2B-%2BNations%2BNames%2BTerritories%2B6.pdf
- *Introduction for A Portfolio of Maps and Signs.* For *Skʷskʷstúlexʷ: Names Upon the Land / Ethnogeography of the Salish and Kalispel People.* 2019. Booklet. http://www.csktsalish.org/index.php/ethnogeography/ethnogeography-booklet
- "The Flathead Reservation," by staff members of the Confederated Salish and Kootenai Tribes, Chapter 14 in *Saving the Big Sky: A Chronicle of Land Conservation in Montana*, by Bruce A. Bugbee, Robert J. Kiesling, and John B. Wright (Corvallis, OR: Oregon State University Press, 2025);
- *Indigenous Peoples and Forests*. 2020. Booklet. Produced for the Montana Forest Action Plan, drawing from essays produced for the CSKT digital education project, Fire on the Land: Native People and Fire in the Northern Rockies. http://www.csktsalish.org/index.php/documents/download?path=2020-07-08%2BSQCC%2BIndigenous%2BPeoples%2BForests.pdf
- "Buffalo, the Séliš and Qlispé People and the Restoration of the Bison Range." Essay. 2023. www.pbs.org/kenburns /the-american-buffalo/ restoration-of-the-bison-range.
- *Saving the World that Coyote Made: The Climate Crisis and Native People of the Northern Rockies*. 2024. Booklet. Written by Thompson Smith for the CSKT digital education project, "Living Landscapes," co-directed by Germaine White, David Rockwell, and Adrian Leighton.
- *Aáy u Sqélixʷ: A History of Bull Trout and the Salish and Pend d'Oreille People*. 2011. Booklet. Written by Thompson Smith for the CSKT digital education project, Explore the River: Bull Trout, Tribal People, and the Jocko River, directed by Germaine White, with digital creation and scientific content by David Rockwell.

