

# Climate Change Needs Assessment Survey

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Prepared for:

Columbia River Inter-Tribal Fish  
Commission



Prepared by:



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## Appendices

### A Survey Questionnaire



## Acknowledgements

Twenty nine tribal members were contacted to complete this survey. Extended one-on-one interviews were conducted with all of them either personally or on the phone. They provided their valuable times through two seasons with widespread fires on the Reservations and other travel and ceremonial commitments. Several members participated in the interviews during meetings, conferences, or other events. Their replies provided a rich basis of information for this report. In many instances the details that they provided went well beyond the immediate bounds of the questions and included much additional information on background, tribal sensitivities, practical considerations, and political nuances. We acknowledge their participation and greatly value their viewpoints.



## Acronyms

ATNI	Affiliated Tribes of Northwest Indians
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CRB	Columbia River Basin
CRITFC	Columbia River Inter-Tribal Fish Commission
EPA	U.S. Environmental Protection Agency
GNLCC	Great Northern Landscape Conservation Council
IRMP	Integrated Resource Management Plan
ITEP	Institute for Tribal Environmental Professionals
LCC	Landscape Conservation Council
PIT	Project Inter-disciplinary Team
TEK	Traditional Ecological Knowledge



## Executive Summary

The Yakama, Umatilla, Nez Perce, and Warm Springs tribes rely on their natural resources for food supply, and cultural and economic activities. Personal observations and available scientific data have made them well aware of, and concerned with, impacts of climate change on their ecosystems. Through the Columbia River Inter Tribal Fish Commission (CRITFC), the tribes contracted to complete a survey of tribal members regarding their viewpoints on climate change, its impacts to the tribes, and measures needed to address the impacts. The survey information obtained from a select group of 29 well-placed members of the four tribes in 2015 and 2016 is summarized in this report.

The survey information indicates that the observations of climatic changes by tribal members are increasing. Many are surprised at the extent and high rate of change, occurring within their lifetimes. They are concerned that climate change will result in significant adverse impacts to tribal food security, cultural continuity, sovereignty, economic opportunities, ecosystem balance, human health, and environmental justice. Additionally, they are very concerned that climate change is compounding the adverse effects of other ecosystem stressors including dams, increased land development for urban, agriculture, forestry, and other uses, and associated pollution.

The interviewees expected that climate change impacts would occur faster than the rate at which the tribes can adapt. However, they were hopeful that the tribes would adapt “no matter what”, because they have to. They do recognize that adaptation will require changes in management of their natural resources and cultural expression, and in working together more effectively.

The Yakama and Umatilla tribes have begun to develop their vulnerability assessments and adaptation plans. As a result more extensive and focused discussions are occurring within these tribes. Information and thoughts put forward by the technical staff at all the tribes appear to be well informing the positions proposed by policy-makers.

The tribes’ current overall strategy to address climate change impacts reflects their internal decision-making processes to develop new policies, to secure funding and hire dedicated staff, and to better incorporate Traditional Ecological Knowledge (TEK) into their efforts, amongst other efforts. The tribes understand that, in the face of competition for funding, cooperation with each other, with other tribes, with federal, state, and local agencies, and with universities and other entities is essential to meeting their goals.

The interviewees expressed a wide range of needs in education and public information, policy and regulation, technical studies, and securing funding to assist them with their adaptation and mitigation goals. By far, the greatest need identified by the interviewees was for a knowledgeable staff to coordinate development of mitigation strategies and implementation



plans, coordinate conduct of studies, and seek funding. Additional and continued financial support was also deemed critical for the tribes to achieve their climate change adaptation goals. Although a baseline level of financial support has been provided (mostly from the Bureau of Indian Affairs), additional funding sources are needed to assist not only technical but the social, psychological, and human health needs of the tribes so they can fully address climate change impacts.

The tribes must work to have their ideas, positions, and views better heard at the federal, state, and regional/local levels, even to the extent of considering using the treaty rights in courts. However, they realize that as the vulnerability assessments and adaptation plans of action are developed by the tribes, their positions to request resources both internally and externally will be much strengthened.

CRITFC is widely perceived as the primary tribal organization to help the tribes with the climate change issues through to act as a focal organization on behalf of the tribes. There is an internal tribal role and an external role within the broader community (outside agencies and entities) in which CRITFC can assist the tribes.



## 1.0 Background and Objectives

The Yakama Nation (Yakama), the Confederated Tribes of the Warm Springs Reservation (Warm Springs), the Confederated Tribes of the Umatilla Reservation (Umatilla), and the Nez Perce Tribe (Nez Perce) are parts of a large network of indigenous peoples in the United States and Canada with reservation lands, ceded lands, fishing access rights, and other cultural and economic ties to the natural resources of the Columbia River Basin (CRB). The CRB covers 258,000 square miles and includes several jurisdictions and large portions of the states of Washington, Oregon, and Idaho, as well as British Columbia.

The four tribes formed the Columbia River Inter-Tribal Fish Commission (CRITFC) in 1977 to advance their collective goals to protect and enhance fisheries resources, and their access rights, in the lower CRB. Over 20,000 members of the CRITFC tribes live within the CRB. The ceded lands of the CRITFC tribes cover approximately 66,575 square miles.

The CRITFC tribes are predominantly land-based societies and rely on the natural resources within their reservation areas for their food supply and cultural and economic activities. These activities have evolved over historical times based on the tribes' responses to their ecosystems' known and generally predictable patterns in precipitation and temperature. Moreover, the tribes are uniquely reliant on "First Foods," medicinal plants, hunting, timber production, and small farming as cornerstones of their spiritual, economic, and nutritional sustenance. They harbor considerable knowledge about the best approaches to sustainable preservation and replenishment of these foods. This intimate connection with First Foods and knowledge of their physical and biological needs gives the tribes both a great interest and a great expertise in their restoration and protection.

Climate change is already having an impact on the First Foods. The tribes are concerned that the direct and indirect effects of changes in climate on the ecosystems may significantly disrupt and alter their economies, population health, and social norms and patterns. They are particularly worried about the effects of stressors associated with a changing climate, which compound the effects of existing human stressors such as dams, population increase, and agricultural inputs.

The tribes, individually and collectively through CRITFC, are preparing for climate change by developing, mitigating, and adapting natural resource programs and policies to manage current and future impacts. As part of this effort, CRITFC commissioned the completion of the attached survey of its member tribes. The findings of this survey will be used to help identify the policy, technical, and other capacity needs required for the CRITFC tribes to effectively address climate change impacts.

The remainder of this report consists of Sections 2.0 through 6.0. Section 2.0 includes a description of the overall methodology employed to solicit responses to the survey questions and limitations of the gathered information. Sections 3.0 through 5.0 include survey findings



based on interviewee statements. Section 3.0 includes findings regarding observations of climatic changes and understanding of the significance of the changes by tribal members interviewed. Section 4.0 includes the current tribal capacity to cope with and adapt to the changes. Finally, Section 5.0 includes a description of the needs that the interviewees expressed that must be addressed so the tribes can achieve their adaptation goals.



## 2.0 Methodology

A survey questionnaire was developed to solicit information from three groups of interviewees at the four tribes. The three groups included members with expertise, roles, or positions related to tribal government leadership, science, and culture. These groups were selected to cover a wide spectrum of tribal viewpoints regarding climate change impacts to the tribes and measures needed to address them. In general, the leadership and cultural members offered broader and more philosophical thoughts and ideas regarding climate change impacts compared to the technical or scientific members, who provided narrower ideas focused on the tribes' natural resources and processes. A total of 29 members were interviewed including 7 from Yakama, 8 from Warm Springs, 7 from Umatilla, and 7 from Nez Perce.

One-on-one verbal interviews were conducted with tribal members between May 2015 and February 2016. They received the survey questions ahead of time for review. The survey included 46 questions grouped around the following four main themes:

- + Understanding and awareness by the tribe's members of climate change and its impacts
- + Impacts of climate change on First Foods and the tribe's culture and sovereignty, and its compounding effects with other ongoing ecological stressors
- + Mitigation strategies, technical assessments, and project implementation
- + Tribal decision-making infrastructure and inter-tribal cooperation

The questions were designed to be general, open-ended, and overlapping, while focusing the interviews on the survey topics. Several questions were also asked quantitatively, with interviewees providing ranked responses between zero (none) and five (definitely). The survey questionnaire is enclosed in Appendix A.

Each interview was recorded as an audio file and notes were taken. The audio files were subsequently transcribed. Each transcript was spot-checked against the audio recording and the notes. Where the audio information was unclear or transcription was unintelligible, the context was reviewed to attempt to fill in the gaps. The final reviewed transcript information was used for analyses.

This survey is subject to the following limitations:

- + It is impossible to include all the ideas expressed in such open-ended surveys into a report. Therefore, only viewpoints that were repeatedly offered by the survey participants as well as novel or unique ideas were included.



- + Similarly, such a survey may not capture information regarding all the projects and initiatives which the tribes may have undertaken, be engaged in currently, or will be initiating in the near future. Only projects and programs discussed by the interviewees can be included.
- + The views expressed reflect the interviewees' ideas and not necessarily the tribe as a whole, the tribal government, or its committees or agencies.
- + The viewpoints expressed are included as given. Akana or CRITFC did not independently verify their accuracy or completeness.
- + The level of participation of the interviewees was very high. However, not all responded to all questions.



### 3.0 Findings—Climate Change Impacts

Many tribal members live “close to land.” They spend relatively long times in nature and know their environment well. They are familiar with the timing of natural events and their scales and magnitudes. There is a broad-based and strong understanding and belief that “we take care of our land, and the land takes care of us,” and that it is the “responsibility of Indian tribes to take care of nature.”

Recent observations while working with their natural resources have made the tribes generally well aware of changes in climate and in ecosystem responses. “It is a reality that we face sometimes in our daily lives” expresses how closely the tribes feel the impacts they perceive are associated with climate change. Although not universally accepted by all tribal members, it is widely agreed that human activity is the primary cause of climate change. Regardless of man-made or natural causes, some tribal members expressed that the changes are occurring at such fast rate as to make it difficult to keep up with them and their effects.

IS CLIMATE CHANGE IMPORTANT TO YOU?  
TO YOUR TRIBE?  
(No = 0, DEFINITELY = 5)

	<u>You</u>	<u>Your Tribe</u>
NP	4.6	4.4
UM	4.9	4.6
WS	4.6	4.4
YN	4.7	4.9

NP = Nez Perce  
UM = Umatilla  
WS = Warm Springs  
YN = Yakama

Specific observations of changes made by tribal members, and the statements made regarding the significance of changes, are presented below. This section also includes information regarding whether the interviewees believe that the tribe can adapt to the pace of climate change and what strategies they may pursue in this regard.

#### 3.1 Observations of Climate Change by the Tribes

Observations of climatic changes are increasing, and more tribal members are paying attention to the changes. The observations include changes in frequency, timing, and severity of weather events, occurrence and time of maturity of First Foods, and changes in location, range, and migration patterns of plant and animal species of interest on the reservations.

Tribal members are surprised at the level of environmental change occurring within their lifetimes. Members who are 70 years old or older have not seen weather patterns like those seen in recent years. Tribal members who live close to land such as food gatherers, hunters, farmers, and foresters have been observing these changes for some time now. Many believe that the changes are happening over a much shorter time period than commonly perceived (years and not decades). It appears that observations of climate change have accelerated in the last five years.

HAVE YOU NOTICED CLIMATIC CHANGES?  
(No = 0, DEFINITELY = 5)

NP	4.0
UM	4.3
WS	4.5
YN	4.5



Examples of changes observed by tribal members are noted below. Many other observations are presented in the subsequent sections.

- + Changes in patterns of precipitation and temperature, shifts of precipitation depths and temperature trends from long-term normal values, and more intense and more frequent summer time thunderstorms
- + Much reduced, and inadequate, snowpack, more rain and less snow, and earlier snow melts
- + Changes in water quality due to warming and its effects on recreational uses such as swimming and quality of drinking water: for example, a toxic algae bloom in the Warm Springs stream source of water to its treatment plant in 2015 caused a water supply emergency due to potential toxins in water
- + Shifts in timing of seasons and earlier occurrence and inferior quality of many First Foods such as roots, berries, wild game, and salmon, including “smaller berries,” “berries turning to raisins before they are harvested,” “frail wild game, diseased salmon and other fish,” and many other observations
- + Changes in prevalence and habitat ranges of plant species and wild games
- + More frequent occurrence and wider spread of invasive plant and fish species
- + More insect infestations of trees in tribal forests
- + Higher stream water temperatures, causing disease in fish species
- + Increased forest and range fires, and fire-induced animal death

### **3.2 Tribal Concerns Regarding Climate Change Impacts**

A wide range of concerns was expressed regarding the observed, expected, or perceived impacts of climate change on the tribes and their significance. The concerns can be primarily grouped in seven categories, including impacts to food security, cultural continuity, tribal sovereignty, economic opportunities, ecosystem balance, human health effects, and environmental justice. These are presented in more detail below.

#### **3.2.1 Food Security**

Large segments of the populations on the reservations rely on First Foods such as roots, berries, salmon, game animals, and other foods for a portion of their regular diet. Each of the First Foods has its own growth and maturity cycle, which in the past were known to the tribal members. Concerns regarding changes in First Foods’ availability and quality associated with changes in seasonal timing and in the locations where they are typically found continued to



come up during the interviews. Of primary concern is food supply continuity and seasonal abundance. It was stated that, “If we do not do something really soon, we are going to do damage that we can’t undo . . . fish dying off that cannot be brought back . . . will take more effort and cost more.”

This concern is accentuated by the fact that the tribes are limited to their reservations and ceded areas for access to these foods. “We can’t migrate out of our ceded lands, off the reservation, but [the foods] may end up being someplace else now.” Furthermore, adverse impacts on non-traditional foods and farming is a great source of concern, as well as impacts on timing and duration of crop growing seasons and tribal member livelihoods. Tribal members are also concerned about next generations and whether they will have the resources to survive, especially for those who depend on traditional foods. Finally, it was expressed that, while there is a generally robust structure in place to protect the salmon, there is no similar structure for other First Foods.

Specific concerns expressed are presented below regarding plants (roots, berries, etc.):

- + Whether the roots will survive if the climate change impacts continue long-term (20 years or more).
- + “People start harvest on the east of reservation and work westward . . . after several weeks, they will be at forest fringes, but changing precipitation patterns . . . changes the food distribution”
- + “areas that now become predominantly covered by grass crowd out other First Foods”
- + “affects . . . more the stationary ones such as currants or wild potato . . . also, they used to harvest moss and make a kind of porridge . . . we saw it more than 10 years ago”
- + “Harvest season was very short in 2015, and the length of time that roots were available for harvest was shorter than previous years. For example, huckleberries came much earlier, and their season was shorter. There wasn’t enough snow to get huckleberries on the . . . reservation, so . . . tribal members had to travel to Washington (Mt. Adams) to find berries. In addition, there wasn’t enough snow to water the land for the roots to be abundant. They were very early in 2015 due to heat in February. By the time tribal members had the first feast in the last weekend in March, the roots were already almost gone. People didn’t have sufficient time to gather as much because they didn’t get out early enough.”
- + “Increases in invasive species threatens food plants”

And the following concerns were expressed regarding salmon and other fish:



- + “Many of the salmon populations or several of the species that the tribe traditionally harvests for food will not be able to return or maintain . . . other fish will fill the void”
- + “Warming of the water and . . . onset of invasive species of fish that compete for salmon habitat.”
- + “Eel and lamprey . . . work on these species will be a volatile piece of the climate change efforts . . . these are very silent species”
- + “We’ve already seen that . . . water management, floodplain management . . . exacerbated the problems . . . my concern is a further reduction of summer rearing habitat” (due to climate changes)
- + “Increased water temperature and change in flow in the Columbia River and all tributaries causes fish to be cramped almost up to the headwaters this year (2015) because of low flows. I am worried that they are not going to be able to make it up in time to spawn.”
- + “Changes to the timing of the salmon feast, which is the first seasonal tribal feast. Spring fish was . . . weeks early. And high water temperatures results in increased mortality reducing the numbers available for harvest. Fish “was observed floating in creeks and rivers.” There was a fish die off in the 2015-2016 water year.

And interviewees expressed the following concerns regarding wild games:

- + “Game migration could remove one of our subsistence resources,” so will “Migration of birds, geese,” and impacts on “rabbits and their habitat.”
- + “The decline in food abundance and growth patterns will affect wild game mix and their migration patterns.”
- + “deer having chronic hair loss from fallow deer on the west side and there was one light winter and the lice migrated to east and decimated the deer population that the tribe depended on for a food staple. To Yakama the deer is very significant species, they are only coming back slowly now.”
- + “for instance elk—the bottleneck of productivity is due to the late summer forage quality impacting fertility and calf size; late summer forage quality is found in moist cool forest and it is already drier, higher degree of fire, fewer cool moist sites surviving. So, we are going see a loss in elk.”
- + “Fires burned really intense due to lack of moisture. This has affected the deer and elk population and changed their habitat and migration patterns. They have started to move to other areas outside the reservation,” “lots of animals died from the fire.”



### 3.2.2 Cultural Continuity and Longevity

The tribes' "culture and . . . traditions are based on environment." "Everything is tied to nature, we are responsible for it, it provides for us." The tribes are "supposed to be in harmony with nature, live according to nature's laws, connected to our environment. Climate change affects us not just physically but also does something to us spiritually." "We will cease to exist as a people if we don't address this. We are dependent upon this system." Universally, the tribes' "biggest concern is how climate change impacts will affect our relationship with the things upon which we depend for perpetuation of who we are."

WOULD CLIMATE CHANGE AFFECT TRIBAL  
CULTURE AND SOVEREIGNTY?  
(No = 0, DEFINITELY = 5)

NP	5.0
UM	4.0
WS	5.0
YN	4.0

It was widely expressed that the tribes are "already challenged at maintaining the cultures and traditions associated with the First Foods and the ability to access them." Climate change "will put extra stress on our cultural identity." As a tribal member stated, "our ties to the lands are the difference between western and indigenous or native management" and by extension, culture. It was stated multiple ways that the more the First Foods are affected, the higher the loss of generational transfer of knowledge. Loss of traditional plants and foods translate directly to a loss of culture.

The timelines for growth and maturity of First Foods had remained generally consistent and known to the tribal members over many years. These timelines partly formed the basis of the tribe's cultural traditions and rituals such as the many community gatherings known as "feasts." Changing patterns of availability of foods has affected the types, extent, and timing of these rituals, thereby creating a concern regarding loss of cultural focal points. For example, one interviewee stated, "The tribe had its feast a little different. It was more of a feast sampling."

There may be some reluctance to see the climatic changes as different from historic fluctuations in weather patterns. "Some elders don't see climate change as long-term change, since they are used to seeing some fluctuations in their past and things always came back." And some members expressed a general dissatisfaction with continuity and longevity of tribal spiritual connections to nature, such as that tribal members have "fallen away from our spirituality," that tribes are not "taking care of our land correctly," or "taking care of our foods correctly."

However, the predominant viewpoint was that climatic changes will change tribal cultures, but won't lead to their loss. Using salmon as an example, one interviewee stated, "many of the salmon populations or several of the species that the tribe traditionally harvests for both spiritual and food needs will not return or maintain . . . other fish will fill the void . . . the tribe will adapt, but it certainly will be a change in perspective . . . it may not be salmon that sustains First Foods anymore." It is clear that the interviewees believed in their cultural resilience in the face of climate change with statements such as "we know who we are, are always going to be who we are. It may change our habits . . . might be gathering roots early, like fishing earlier . . .



might have to curtail some of what we want to do, because those plants and animals were not in the abundance that they should be.” Or that “culturally, we are who we are, we will maintain that, we will remain.”

There is concern about the loss of medicinal plants, since they “are more dependent upon marshy areas. And lower water tables means less wetland areas.” But the interviewee concerns with cultural impacts of climate change were mostly focused on impacts to the significance of First Foods in maintaining tribes’ cultural identities. It is noteworthy that water has a special standing in this regard “as the giver of life” at the “base of nature’s health.” If the quantity and quality of water degrades (higher water temperatures, increased algae growth, influent contamination, etc.), it affects all life, “people, animals, plants, the water, life, everything.” The following additional specific statements were made regarding the cultural and natural roles of water:

- + “A drink of water before and after every meal is an important part of their [Warm Springs] spiritual well-being.”
- + “Water drives pretty much everything that we [Yakama] use, and ties a lot to who we are.”
- + “If we [Yakama] don’t have water in the ways we had traditionally, I don’t know how we are going to adapt.”
- + “Water is the first food [for Umatilla] so it’s the life blood of a watershed, driver for everything in the watershed is the water quality and quantity.

Specific statements about the cultural impacts of climate change on First Foods are presented below:

- + “Spring feasts [for Yakama] start with celery feast, the first salmon feast, the red feast, carrot feast, currants that grow wild, huckleberries, choke berries, fish, deer. There is a sequence in these, based on timing and location, which are all affected by climate change.”
- + “When we don’t have foods that grow here [as opposed to all store-bought items], start losing culture.”
- + “Culture will be affected” because of how we are connected to everything else; our First Foods are based on survival techniques for hundreds of years; there was a definite schedule when people could harvest food.”
- + “If have a religion that is identified based on First Foods, how does it persist if the First Foods are not available to you anymore.”



- + “Real potential to affect tribal culture as these things disappear or become difficult to secure.”
- + “Huckleberries came early this year; people missed out on it because they ripened so fast in summer heat; also other roots at the same elevation—mountain teas we boil for drinks and medicinal drinks; at higher elevations, some of our cultural plants, trees and shrubs are going away.”
- + “Not having salmon as part of the longhouse or not having any of the subsistence roots available would be a huge impact on the tribal culture and sovereignty.”
- + “Chokeberries died back, re-sprouted but they’ve all died back.”
- + “Celebrations are planned around when the food is ready, and it was ready two weeks, and in some areas three weeks, before normal.”
- + “Our treaties would not have been signed if we didn’t have access to our first foods. It’s the same thing now. We have to have access to our traditional foods . . . some people say you don’t need them all the time anyway, but that’s not the point, it’s still traditional foods and we still need access to them to practice our culture and carry on our history.”
- + “Yes, it [climate change] could [affect culture], e.g., root gathering, if they have to start going someplace different either private land or federal land which are not as accessible . . . elk are not migrating like they used to . . . methods of hunting and gathering are changing . . . affecting us now and the effects of climate are just going to exacerbate that even more.”
- + “There is going to be an effect on the tribe’s culture because the ability to fish either for subsistence or ceremony or commercial, is so tied to the tribe’s culture.”
- + There was concern about increases in invasive species threatening food and medicinal plants, affecting cultural aspects of the tribe’s relationship with nature.

Finally, the tribes’ ability to maintain their culture is critically dependent on transmission of the significance of plants, animals, and natural features to the next generations, as evidenced by the following statements:

- + “If things die off or go extinct or migrate away, then what do we do with kids besides take them to museums.”
- + “When people cannot do the cultural hunting-gathering, they will begin to lose their cultural identity—the children won’t go out to the traditional places to gather the traditional foods and hear the cultural histories/myths/information, and get the identity.”



- + “Our stories and legends tie to these lands, foods—all that stuff ties to places like landmarks, if those foods aren’t there on those landmarks, then who are we as Indian people?”
- + “It is sitting on Columbia River and being told about what that hillside meant, history is tied to these places.”

### 3.2.3 Tribal Sovereignty

Most interviewees stated that they expected a loss of tribal sovereignty with adverse impacts of climate change including loss of economic and political clout, loss of negotiating power for continued access to natural resources, and reduced ability to secure the resources to serve its members.

However, it was generally expressed that the tribes’ futures will be threatened if they do not protect their treaty rights for gathering and subsistence. Their concern about loss of sovereignty was predominantly an expression of concern with the gradual loss of the cultural and economic basis of sovereignty. Example statements are as follows:

- + “Dams and overharvesting in the oceans took my independence and now climate change; this makes me dependent on federal programs, very detrimental to my people’s health.”
- + “If a species doesn’t have a commercial driver the non-Indians don’t care—salmon and shellfish have commercial drivers so they get attention—non-Indians will push everything to support their own needs and interests.”
- + “In terms of sovereignty, impact on commercial forest land will impact our ability to look after people on reservation, to secure water, to maintain diets, health—so it will reach the government functions also, not how it functions, but what it does.”
- + “if don’t have your foods, your ability for that treaty, for access to them is diminished, how that plays out can have an impact on that relationship.”
- + “water will become increasingly more valuable, we have to know the ins and outs of water well.”
- + “Our sovereignty was built upon these species, and if you lose them there’s no substance to how the treaty rights were established, what gave us our sovereignty as a people.”
- + “Culture and sovereignty are tied together; huge potential for affecting both—culture is tied directly to the land and what it produces, lose their culture, lose their sovereignty.”



- + “Culturally we are who we are, we will maintain that, we will remain. But we may see some limitations on sovereignty in the future.”
- + “threat to sovereignty is that when resources become harder to access, a more viable political entity that does not relate to that resource in the same way may have a greater weight in the management of some of our resource than we do and we may be pushed out of some things. We are more empowered now than we were 100 years ago . . . we have to keep up that trajectory of being aware of these issues.”
- + “. . . everything we do is connected and a huge part of our culture . . . even our belief system has to do with our relationship with the environment . . . sovereignty is affected by reliance on manmade production (e.g., fish hatcheries) . . . you have to rely on other entities to speak on your behalf and that affects sovereignty.”
- + “It could affect the abundance and sustainability of First Foods and therefore, there would be an impact on exercising treaty harvest rights. The tribes still have a sovereign right, but the right isn’t worth much if they can’t exercise it due to the impacted resource.”
- + “Absolutely . . . impacts sovereignty if federal government enacts regulations in response to climate change, e.g., mandatory carbon tax, tribes will have to survive increased fuel prices.”
- + Loss of tribal culture, loss of language, may lead to loss of sovereignty because “we are no longer Indian.”
- + “food gatherers are the people that uphold the treaty, because it is a living document . . . they are the ones help create our say when we choose to say something.” Arguable, if climate change erodes their ability to be important to the tribe, they cannot fulfill such a role.
- + The Warm Springs understands that they have adequate water rights, and that it includes both surface and ground waters, stretching to the mouth of Columbia River. The concern expressed is that climate change impacts make the competition for these resources more intense and that protecting the water source, especially the groundwater sources, will become more important and challenging.
- + “Sovereignty really comes down to how much money you have.”

A few members expressed that sovereignty will not be affected since the treaty rights are inviolable such as:

- + “Tribe always keeps its sovereignty, Article 6 Section 2 of the U.S. Constitution, tribes are keepers of the land.”



- + "... sovereignty I don't think so because the treaty is sound regardless of the resources that you're accessing."
- + "I don't see our sovereignty changing with climate change. We will lose things that we practice in our culture, like gathering, which goes with our teachings and so if we lose one food or one resource definitely that will affect us. But we're resilient. We'll survive and maintain our sovereignty and culture. It will affect our culture, but not eliminate it."

An interesting viewpoint was expressed that loss of some natural resources may make the tribes more focused on strengthening their sovereignty and broadening the area in which they maintain that sovereignty.

### 3.2.4 Economic Opportunities

Climate change directly impacts the wealth of the tribes, since much of that wealth is generated through use and management of their natural resources, all of which can be severely affected by climate change. As was clearly stated, "Our financial structure is dependent on our [natural] resources."

The following views were widely expressed: "if we do not do something really soon, we are going to do damage that we can't undo, for example fish dying off that cannot be brought back . . . will take more effort and cost more" and: "millions of dollars are spent on salmon restoration, same is true for forests restoration and firefighting." And finally: "I do not think we have considered all eventual [economic] impacts at this point."

ARE THERE POTENTIAL ECONOMIC IMPACTS  
TO THE TRIBE FROM CLIMATE CHANGE?  
(No = 0, DEFINITELY = 5)

NP	4.0
UM	5.0
WS	5.0
YN	5.0

The economic effects are observed, and are expected to intensify, in forest productivity and timber production, more constrained salmonid availability and fisheries management, reduced availability and quality of water supplies, reduced extent of land development activities, more challenging farming conditions, lower availability of food items for sale, increased cost of ecosystem restoration, increased forest and range land fires, and reduced energy production capacities. It was further expressed that these changes will eventually result in a "change in lifestyle."

Specific concerns expressed regarding the economic impacts of climate change on the timber industry and forest health are as follows:

- + "fire in a lot of sub-alpine primitive areas . . . shut down the mill and lumber harvest for a month."
- + "Forests, forest lands impacted by invasive species, insects"



- + “Lack of cold winters recently has impacted forest health. Pine beetles have killed almost all pine trees, creating a logging problem and increasing fire hazard. There is real concern with worsening timber quality due to insect infestation, dryness, and fires.”
- + “Potential fires, affects value of timber, the way temperature is changing, summers getting hotter and making it drier.”
- + “Economic impact in terms of viability of our . . . timber, ensuring that we have marketable timber, providing species that can adapt to a warming environment.”
- + “The potential is there for it to be huge from the reduced harvest standpoint.”
- + “Ag, timber, grazing, it is all going to be affected. Yields will be down. Growth of the trees are going to slow down”
- + “Tribal members must become entrepreneurs to get out of hydro and use other energy sources.”

Concerns expressed regarding declining fish populations and loss of fish sale revenues as a source of economic loss to the tribes included the following:

- + “The loss of our fisheries would be huge.”
- + “Enormous, yes. Tribal economy is still based on salmon; that is going to be lost”
- + “Salmon is a commercial first for the Indians, reduction in the availability of salmon is a reduction in a direct food source.”
- + “If we do not do something really soon, we are going to do damage that we can’t undo.”
- + “Many of the salmon populations or several of the species that the tribe traditionally harvests . . . will not be able to return or maintain . . . other fish will fill the void . . . the tribe will adapt . . . it may not be salmon that sustains first foods anymore.”
- + “Increased temperature and change in flow in Columbia River and all tributaries causes fish to be cramped almost up to the headwaters this year because of low flows. Worried that they are not going to be able to make it up in time to spawn.”
- + “without fish, we don’t go fishing . . . Fishermen are going to have to plan better to figure out how they are going to survive with those short seasons or no seasons.”
- + “we have monitors and staff to monitor fish, but if you don’t have fish do you need that, probably not. . . . end up laying off our staff.”



A decrease in water supplies for human consumption, recreation, and tribal agricultural activities, and its effects on a variety of economic activities was clearly worrisome to several interviewees, as follows:

- + Greater need investigate “Exercise of water rights seniority if less water” when water resources starts to become less available
- + “Over-utilization of aquifers, too many wells” associated with drier and warmer climates
- + With regard to the Bureau of Indian Affairs (BIA) irrigation system on the Yakama reservation, “the irrigation project is antiquated and has a hard time delivering water in a good water year . . . in a dry year, it is next to impossible to provide water.”
- + “At the casino, water is very essential to everything that they do.”
- + “Potential impacts to expanding growth” when water is less available to support additional development
- + The Warm Springs is concerned with increasing water treatment cost due to greater potential for occurrence of toxic algae in Deschutes River.
- + The tribes are concerned that water wells will go dry in the more remote locations and rural areas of the reservations.

Declining water availability will decrease the economic incentive for tribal members to own and operate farm land on the reservations. Additionally, concern was expressed that loss of revenue from leasing of land by non-Indians for agricultural production will result in loss of land ownership by tribal members.

- + “Ag . . . going to be affected. Yields will be down “
- + “Some of our lands are leased, but if there is shortage of water there is less chance to lease land for crop production.”
- + “Lot of land on reservation that has been rented to non-Indians for agricultural production . . . if no water, they won’t rent . . . these are many millions of dollars to the tribe [Yakama] with its ripple effect in the economy”
- + “some of the most productive farming operations on [Nez Perce] reservation haven’t been as productive”
- + “impacts range land quality and foraging capacity for cattle and horses”



- + “Many tribal members rely on dry land so farming could be impacted.”

Food gathering provides an economic incentive and supplements diets for a segment of the tribal population.

- + “Many tribal members need berries to make jams and pies and sell them to make a living.”
- + “No rains, really dry, had to dig roots; some people depend on that to supplement their income.”
- + “If we have to travel distances for food, that is going to affect us economically.”

Impacts to ecosystem health would affect the tribes’ natural resources and therefore their economies.

- + “Biggest concerns from a forest and an environmental perspective—as plants and animals get more stressed they are more susceptible to whatever diseases that are there; that accelerates change on the landscape.”
- + “Increases in invasive plant species lead to increased cost for their control and/or eradication.”
- + “Fish like carp, walleye, chad and other species and invasive plants that like warm water are going to expand and survive and we will have to figure out how to deal with them.”

Concerns expressed on impacts to land development activities were as follows:

- + “Our own land enterprise . . . they had an idea of going and developing some acres, but now maybe they put that on hold and won’t invest that money.”
- + Flooding caused by less frequent but more intense rainfall events “impacts tribal infrastructure, power supplies, and pipes systems.”

Another example of revenue loss is the potential reduction in the Warm Spring’s hydropower revenue if winter water storage in the mountains and timing of flow is significantly changed. There was also a concern with “rising energy costs” because of climate warming.

There are concerns about increasing intensity and frequency of wild fires due to dryness of the environment, timber, and forest under-canopy. Some of the largest fires, which have led to losses of timbers and range pastures on reservations, have occurred within the last 20 years and are partially attributed to, and accentuated by, climate change. There is concern that as the fires increase in frequency and intensity, there is less “ability to respond to range fires or forest fires.”



While tribal members predominantly expressed concern, there is a level of expectation that changing patterns of climate may provide economic advantages. The interviewees noted several potentially positive impacts including “more money into resource adaptation,” and that “the tribe will be active in trying to implement management actions . . . and there will be federal funding to do those types of actions.” Finally, there was a viewpoint that “increase in population in the area [immigration from drier areas of the country] will probably benefit tribal gaming in the short term.” Examples of interviewee statements include the following:

- + Farmers may now be able to use a longer growing season to their benefits.
- + The climate change concerns within a wider economy may provide a great mechanism to push for more holistic ecosystem improvements.
- + Since dry and warm weather has become more prevalent, there is already insufficient rangeland to support wild horses in the numbers that currently exist, and their number will decrease.
- + Many fawns were born due to milder winter. However, their survival with less habitat and foraging opportunities is uncertain.
- + “Our fire crew and hotshots . . . becoming a bigger piece of business for us.”

### 3.2.5 Ecosystem Balance

The close tribal relationships with their natural resources gives much concern to the impact of climate change to ecosystems and their functions. Although intertwined, this concern goes well beyond changes in food systems, tribal economies, or cultural well-being. It stems from long-term observations that “all ecosystem components and functions are connected, that there are “signs that the historical balance is lost . . . Indian people are not taking care of something right . . . the land is talking back to you.” There is the general belief that “we need to take care of the land . . . it is letting us know that we need to make some changes.” There is also a sense of unfairness in having to address climate change effects. As one interviewee stated, “We have been trying to manage the impacts of a century of degradation, a century of non-Indian development of the system. Now climate change coming in on top of that—we already had a degraded system and now worse from climate change.”

DOES CLIMATE CHANGE AFFECT ECO-SYSTEMS IN  
YOUR TRIBE’S MANAGEMENT AREA?  
(No = 0, DEFINITELY = 5)

NP	4.3
UM	4.7
WS	4.9
YN	4.5

Specific viewpoints expressed are as follows:

- + Climate change is “impacting the resources that we are trying to restore.”



- + The effects of climate change are compounding already deteriorating environmental conditions, such as increased water temperature and nutrient loading causing algae blooms.
- + There is a grave concern that climate change impacts exacerbate the effects of land use on ecosystem functions.
- + “If you don’t have a cold enough winter, insect populations are affected, and plant species interaction with insects and animals are affected—another example is the invasive plant stargrass (think that’s what they are called) in waterways that are too thick for fish to migrate through.”
- + “Water use outside of the [Yakama] reservation on irrigation by others depleting ecosystems of water needed for tribe’s natural resources.”
- + “Forests with the snowpack and the water availability should see a real drastic change. Fire, lack of moisture in ground makes fires larger.”
- + “Tribes used small fires to enhance forest health since vegetation comes up stronger, but large forest fires destroy everything on a large scale, allowing invasive species to come in and lead to large scale displacement of wildlife and plants.”
- + “Other ecosystems affected by drought. Running out of water”
- + “Bears come down to the valley all the time because they follow all the choke trees in the fall, what happens if choke trees are gone. Bears are not First Foods but they are one of the resources.”
- + “Changing ecosystems has a cascading effect throughout nature, and on humans related to health issues and economy.”
- + “We are seeing landscape-level changes that are both subtle and dramatic, and outside the scope of our understood range of variability.”
- + “Some plants produce their leaves first and then flower; noticed some haven’t been able to progress to that flower point—leaves come out and then they dry back, they are not given the precipitation that they need.”
- + “Climate change would impact upland watersheds, impact in stream and floodplain habitat, the entire watershed would be impacted because it starts with snow pack . . . if these impacts are documented to be true and increasing and significant, going to have a major overall watershed ecosystem impact.”
- + “Concerned about species extinction, just an alteration of habitat is pretty scary.”



- + “Biggest concerns from a forest and an environmental perspective—species, including insects; as plants and animals get more stressed are more susceptible to whatever diseases that are there; that accelerates change on the landscape.”
- + “Loss of wetlands”
- + “Conifers will start transition, growing in higher elevations, not in lower areas because it’s too hot.”
- + “Definitely an impact, the severity of that impact is variable over the tribal area, but noticeable from the lowest elevation in water flows up to the ridge tops . . . if climate model projections play out you’ll see species shifts both in vegetation and animal composition even at the higher elevations.”
- + “Connectivity is going to be a huge issue. There will be adequate or livable habitat somewhere for most of those species but will they be able to get there . . . sockeye is a key example from last year and will be on the forefront of poor migration conditions.”
- + “Some of the medicinal and subsistence plants are more interdependent upon marshy areas. And lower water tables means less wetland areas.”
- + “Significant reduction in snow pack in the north Oregon Cascades, from the Columbia River Basin to the Deschutes Basin”, reduces water availability in the already over-appropriated water basins. “Snow fall happened 4.5 weeks early for Warm Springs and was perhaps a quarter of normal.”
- + Landscape-scale changes in the ecosystems are a concern. For example, spread of invasive plants such as knapweed into root crop fields and potential effects of allelopathy, change of forest lands to range and scrub brush vegetation cover where there was grass and forest before, in-migration of non-native tree species such as “madrone trees from California,” and other changes.
- + There is a concern with short- and long-term effects of more frequent and more intense fires with drier summer seasons, such as long-term (50 years) landscape changes in vegetation cover. “The National Climate Association predicted increases in burn area size from 4 to 500 percent” which will affect forest, streams, and mountains ecosystems. For example, the cheat grass cycle appears to be changing to every 5 years instead of the historical 40-year cycle due most likely to more frequent fire events.
- + There is additional concern that forested landscape is increasingly susceptible to catastrophic fires, especially if timber practices have resulted in loss of some fire resilience. And rangeland could be severely impacted through increased fire intensity and size. That



greater fire intensity may sterilize soils of seeds, tubers, roots, and other mechanisms for continued propagation and spread of native vegetation.

- + A drought was declared for the Warm Springs Reservation in 2015, leading to increased use of available water for people, agriculture, and industry. During the drought period, the conditions of many endangered species were observed to get worse, due to loss of water and changes in habitat suitability with increased out-of-stream uses.
- + It is believed that there are observations of many other changes in the natural system made by the tribal members that are not expressed in public, and that these changes are not accounted for in the known literature. However, no examples were provided.

### 3.2.6 Human Health Effects

The impact of climate change on the health of the tribal members was a very specific concern voiced by several interviewees. It was clearly stated that “all citizens will be affected, babies and elders and young, because of the health problems this will create.” Impacts range from increased cases of allergies from dust, fire smoke, and other allergens associated with a deteriorating air quality, to declines in psychological health from deteriorating economic conditions and the expected inability to maintain one’s culture and religion. Statements made by some of the interviewees are presented below:

ARE THERE DIRECT/INDIRECT EFFECTS ON OTHER  
TRIBAL AREAS/SECTORS/DEPARTMENTS?  
(No = 0, DEFINITELY = 5)

NP	4.8
UM	3.6
WS	4.1
YN	3.8

- + “If our First Foods are gone we have to depend on all this processed food—we are not adapted to it, very detrimental to our health.”
- + “Social well-being of our community, if we don’t have our culture then who we are, link to self-awareness, pride of being a Yakama will diminish, you can fall into the trap of our grandparents faced with modern stuff that drove them to alcoholism—impacts the social fabric of our people.”
- + “Indian health service could have more asthmatic or kids with ailments.”
- + “Definitely our health, not just poor air quality or temperatures . . . already have the highest instance of diabetes. If we don’t have sufficient diet or move away from our traditional diet, it will impact our health. Possible issues with mental health as well.”
- + “Historical changes in our diet because we don’t gather all the foods we used to gather; there has been a loss.”



- + “Health (more dust storms), less housing development (less water to serve them), overload of power grids (shown failures in recent years).”
- + The water algae toxicity issue which occurred on the Warm Springs Reservation seems to have been caused by a combination of water warmer than usual and already deteriorating nutrient loading conditions caused by upstream agricultural activities leading to an algae bloom. This affected the operation of the tribe’s water treatment plant and disruption of the water supply, as well as creating unsafe swimming and recreational conditions.
- + Medicinal plants are not as available as before: “you go and gather when it’s there, while it is there, you gather it as much as you can because you never know if you are going to have it the next season, and that has become very, very true these past few years.”
- + “With declining economy, the revenue-driven tribal services will decrease, affecting social programs that support people in need, people who are out of work, those with disabilities, and the elderly.”

### 3.2.7 *Environmental Justice*

Climate change impacts tend to disproportionately impact more vulnerable segments of the general economy such as the tribes and the tribal population that depends on these economies. Tribal food gatherers are especially concerned about these impacts, as they rely more on gathering of First Foods than other segments of the tribal population. Specific interviewee statements are presented below:

- + “Economic impacts on the reservation have a greater marginal impact.”
- + Climate change impacts reduce “equity” between tribal and non-tribal communities.
- + Tribal members may not have “access to affordable food.”
- + In terms of socio-economic impacts to the tribe, tribal members are more susceptible to poverty if they don’t have “access to a good living or an education.”
- + With relatively high unemployment rates on the reservations, many people depend on fishing, hunting, and gathering for food. When these food sources are negatively affected, hungry and poverty are accentuated.
- + “Climate refugees” will create additional pressures on the land resources.
- + “The burden of clean energy, of all the energies, usually gets borne by the native people.”



### 3.3 Role of Other Factors

Climate change is seen as another way in which “white man has to change everything from its naturalness, and it has affected us in every way.” The view was expressed that tribes “didn’t have these issues pre-European contact.” Often the impact of climate change is seen to worsen the conditions of an already-stressed ecosystem. “We have been trying to restore impacts to ecosystems, climate change is another factor on top of all that.”

DO NON-CLIMATE FACTORS ALSO AFFECT  
FIRST FOODS AND CULTURE?  
(No = 0, DEFINITELY = 5)

NP	4.4
UM	4.7
WS	4.6
YN	4.9

It is also apparent that the tribes’ outlook on what must be done is likely to have hardened, as affected by their historical experiences. As one interviewee stated, “They said the fish would be

WILL EFFECTS OF NON-CLIMATE FACTORS  
BE ACCENTUATED BY CLIMATE CHANGE?  
(No = 0, DEFINITELY = 5)

NP	5.0
UM	4.0
WS	4.0
YN	5.0

fine with the dams. Remember that?” Tribes also shared the view that addressing climate change must keep a longer time period in mind, “they planned for just 50 years versus seven generations and beyond.”

Several compounding effects, including dams, increased development and pollution in the region of the reservations, and alternative energy developments, were noted by the interviewees. The effect of dams was, perhaps unsurprisingly,

the most talked about, as presented below:

- + “Dams exacerbate climate change for fish migration. So sensitive species like salmon and all natural fisheries are going to be impacted.”
- + “Dams are impacting fishermen; pollution affecting water quality; some are bigger contributors than others, but all play a part.”
- + “Hydropower is considered clean power, but it affects fisheries.”
- + “The hydro system is the largest example . . . in terms of changed ecosystem—negative in terms of fish population, but positive in terms of cold water releases actually helping us manage or mitigate for some of the climate change effects of warmer water.”
- + “You already have lake-like conditions—algae building up, low dissolved oxygen levels, high turbidity—all these conditions are negative to salmon recovery.”
- + “Biggest concerns are water, fish, forestry—let me use fish: barriers and the dams in the irrigation districts, the roads, forest roads, fish have already seen that impact, now you add in the temperature, that is real concern that our food could be lost if we don’t concentrate on trying to fix it, just studying isn’t enough.”



- + “Rivers cannot flow like rivers anymore because of structures and altering”
- + “There’s limiting factors already that reduce fish survival across all of those life history states. Before all these cumulative non-climate impacts, fish were able to absorb environmental variations. Cumulative impacts have pushed them to the edge. That’s the way climate change impacts become real.”
- + “Dam operations, unless changed or modified in response to climate, might have effects, e.g., fish transportation.”
- + Dams “tore apart our communities, our relationships, our ties.” Climate change is “compounding the trauma . . . of something that already disrupted our culture.”
- + The three dams on the Deschutes River allow poisonous algae to grow in low velocity, stagnant waters. Climate change aggravates the conditions by causing water temperature to rise more.
- + “Dams on Metolious River don’t have fish passage. Climate change will make the job more challenging. Instead of spending so much on fixing them to help fish migrate, let the rivers flow again.”

However, strong viewpoints were also expressed regarding the impacts of previous and anticipated future developments of land for urban, agriculture, forestry, and other activities. Examples of such statements are as follows:

- + “Society, industries, and sectors influence our ability to continue on with our First Foods and cultural ways—impacts on fish (industrial pollution, dams); agriculture, timber harvest; transportation (coal trains, trucking).”
- + “Human population and size of population is driving some of the climate change; bigger populations have direct impact on the land, more dams, more infrastructure, more roads, etc.”
- + “The ag community, with respect to farming in the upper Snake Basin, is taking up the water for the fish.”
- + “In some areas, population shifts (migration) due to climate (drought, major catastrophes) impact areas and resources.”
- + “Impacts are exasperated with cattle grazing and timber management.”



- + “Roads in floodplains impact natural functions—change bridge design to less affect (reduce bridge footage, combine spans), or to not affect sediment movement, reduce brake duct oil or petroleum spills, which go right to creeks.”
- + “Restoring floodplain functions can aid in combating climate change effects—Taneum Creek example.”
- + “Water quality changes with ag”
- + Climate change affects “safety—increased floods, evacuation route planning—plans to get people out of remote areas”
- + “Overgrazing or number of horses, livestock and sheep on the reservation has kind of changed the plant community—transitioned from native plant to non-native; will that completely wipe out those species in those plant communities?”
- + “Agriculture producing different type of crops taking different types of machinery and different types of methods that are creating more dust, more debris.”
- + “Our river extends upstream to farmer country. They take a lot of water and then release nutrients and pesticides, which all flow back down into the rivers. Climate change will cause more diversions, leading to lower stream flows and higher pollution concentrations.”
- + “There is concern with more frequent and more extreme fires due to climate change effects ... added concern with increasing use of fire retardants to fight fires which may lead to more pollution.”
- + “It’s not going to be local flooding we need to worry about. It’s the local flood of Californians we need to worry about.”
- + “Higher water temperatures caused by industry . . . may not be able to cool water enough for salmon to survive [the existing water quality effects], e.g., methyl-mercury from mining operations.”
- + “People keep pumping aquifers . . . in response to climate warming trends.”
- + “If you’ve already over-appropriated water and tributaries and already over-developed floodplains and channelized them and then you have even less water going through, well it just accumulates. Our survival at main stem dams already takes half of the fish across eight dams or more.”



- + “First year ever we have had poison algae grow and it comes right out of that river that goes by . . . Crooked River . . . from fertilizer and it is spreading . . . water treatment plant is affected . . . and fish is also affected and cannot eat it.”
- + Current forest management practices may increase fire dangers associated with climatic changes since “just managing them for board-feet without even taking into account managing for huckleberries . . . just makes them ripe to get burned.”
- + Logging “tears apart the deer habitat and the berry fields.”

Finally, there were several statements regarding positive and negative effects of use of renewable and other forms of energy use with a cumulative effect on tribal resources, such as the following:

- + “Wind power development on private lands has been devastating in this region, directly impacting habitat use for a variety of species. Where is it going to go next? Public lands. What is miles and miles of additional roads and public lands going to do to First Foods? It is a secondary effect of climate change. We are trying to adapt away from carbon source fuels.”
- + “Big game will avoid habitat areas with wind towers on them.”
- + “Need to do an analysis of the impact of renewables on fishing and wildlife in the Columbia Basin, and we need to identify protected areas like we did for hydro.”
- + “Coal exports passing through our territory” is a source of concern.
- + “Running too much on hydro, need to use solar.”

### 3.4 Tribes’ Perceptions of Their Ability to Adapt

The viewpoints expressed in this survey indicate an expectation that the impacts to natural resources from climatic change will be faster than the rate at which these resources and the tribal communities can adapt, as exemplified by statements such as: “Definitely faster than we will react or adapt,” “Everything is already pushed to that limit, if not past it,” or “Much faster. The change right now is going way beyond the ability of the tribal communities and the species that they rely on to adapt.” Other statements from the interviewees on specific changes expected include the following:

- + “Salmon will have a tough time keeping up with their local adaptation process relative to the rate of climate

WILL THE TRIBE BE ABLE TO ADAPT?  
(No = 0, DEFINITELY = 5)

NP	4.6
UM	4.3
WS	3.7
YN	4.6



change and environmental shifts. The climate will change at a faster rate than the critters will evolve to maintain status quo. Salmon are indicator species because of the diversity of ecosystems that they utilize across the lifecycle.”

- + “If this past fire season is the new norm, we’re already here.”
- + “Even without climate change, there was so much change—impossible for the species to keep up.”
- + “For fisheries work, already beyond rate of adaptability.”
- + “Summers will dry out a lot quicker, going to increase all along the east slopes of the Cascades, which is our ceded land.”
- + “Faster, feel crunches lot quicker in agriculture.”
- + “Faster if our First Foods behave the same way next years as last.”
- + “Probably faster because we’re in a dry and arid sub-region. We’re already kind of hurting.”
- + “How fast can plants adapt to climate change? They don’t. If climate change happens quick enough, there will be massive habitat damage and potential loss of some species of plants. Game can migrate if it gets too hot or cold.”
- + We treat forests as tree farms which makes them very vulnerable. Climate change impacts are “going to hit hard because not much diversity . . . a bunch of very similar-aged trees growing very close together . . . fire is going to rip through it.”
- + We raise cows on rangeland, which builds a monoculture which is vulnerable to rapidly changing climatic conditions.
- + Some impacts will be faster than the rate of adaptation “such as disease spreading in trees, rising water temperatures and the like.” Some will be slower like “different species of trees starting to migrate north.”

However, some tribal interviewees, despite some reservations, were hopeful that they will adapt “no matter what” because:

- + “Have to, we always adapt . . . it won’t be a choice, it is not optional.”
- + “Indian people have always been very adaptive.”
- + “Elders, older folks say how we have adapted in the past.”



- + “We adapt to everything . . . we are good at figuring it out, making it go . . . we were here in the ice age and hunting, and we still are hunting.”
- + “Don’t have a choice, must adapt.”
- + “Definitely, we’ve gone through a lot of different changes and we’ve adapted.”
- + “We are survivors.”
- + “From a cultural perspective, we will adapt because the tribes will persist, but will we have a lot of heritage intact? I don’t think so.”
- + “Will adapt, but the rate of climate change and how fast they can adapt is the concern.”
- + “Don’t think so—if salmon don’t come back we have to switch to bass? Can we keep the water cold? Deal with water quality issues? Will be hard.”
- + “Don’t know if we can adapt to the heat.”

Despite the confidence, they recognize that adaptation won’t be guaranteed “unless we change how we manage it” and that “if we all spoke together and worked together we could.” It was also recognized that in the meantime, the tribes are “at a critical turning point . . . and need to buckle down a bit.” In the end, all recognize that adaptation is an involved process. As one member stated, it is “tough to say . . . what does it mean to adapt to climate change enough?”

“We will have to adapt. How willingly and quickly we do is the main question.” Interviewees further recognized that their sense of empowerment must be balanced with actions if it is not to be only an expression of hope, as indicated by the following statements:

- + “The Tribe is going to be able to adapt. The tribe has the ability to ford off, to mitigate to a certain extent, but we’ve got to be able to do things as a people—as an entire race of people—to make that change.”
- + “We are resilient people, we’ve seen it all, and we will continue to interact with our surrounding as we always have; but it will be painful when we have to replace salmon with some other kind of fish, when we start hunting different species of animals for our needs.”
- + “Definitely, but it is going to mean some very big decisions on changing how and what gets done for accessing treaty resources and the Indian way of life, e.g., it may not be salmon, but it’s fishing; being sustained by the aquatic critter that’s there now rather than just focused on salmon.”



- + “Better able to adapt to climate change than many other people. There is a reason we carry on these traditions—there will come a time when things will be so different we have to rely on them—depend on these foods, alchemy, roots, and berries.”
- + “For sure we are going to have to start addressing it.”
- + “If we can have some of our natural foods, then we can adapt.”
- + “Can people go to their preferred areas and gather the same sort of things, maybe not—they will need to move to different areas and will those areas be available to them? Who knows.”
- + “Somehow we’ll survive and I think that’s planning.”
- + “Of all the threats I see to our ability to adapt to climate change, the two greatest ones are: 1) our focus is in the wrong place, and 2) we are not integrating at the right level, not looking for solutions at the right level.”
- + “When it comes to First Foods not a very high adaptive capacity . . . will get by, but it’s not going to be how it used to be.”
- + “Only if they [tribes] really want to because to change some of the programs and funding. They have got this mindset that what they are doing is good enough and nobody needs to change that.”
- + “Can’t adapt within the scope of the reservation, can’t document changes at the reservation level. Change is much larger.”

Finally, the tribes realize that “much is out of tribe’s control but ability to fund projects is critical to get resources.” They need support from federal and state agencies to help with mitigation.

- + “There should be some type of strategy in place to keep the federal government’s fiduciary responsibility on treaty resources and climate change, not minimize their responsibilities in the future.”
- + “Hopefully we can get the states and federal government to work with us to get to a plan of operations when drought hits our ceded area.”
- + “If we can’t catch our fish, are we going to get hatchery fish again. Example: a long time ago when we didn’t have fish we told Oregon we needed fish for subsistence, so Oregon and Washington, both within our Columbia River Fish Management Plan, had to give us hatchery surplus fish and we brought them to tribal members and we also stored fish for our namings, funerals, and all ceremonial reasons.”



### 3.5 Summary of Key Findings

The tribes know their environment well and believe that it is their responsibility to take care of nature, so that nature takes care of them. They are well aware of changes in climate and in ecosystem responses. Although not universally accepted by tribal members, it is widely agreed that humans have caused climate change.

Observations of climatic changes are increasing and more tribal members are paying attention to the changes. The observations include changes in frequency, timing, and severity of weather events, occurrence and time of maturity of First Foods, and changes in location, range, and migration patterns of plant and animal species of interest on the reservations. Tribal members are surprised at the level of environmental change occurring within their lifetimes.

Many concerns were expressed about the observed, expected, or perceived significance of climate change impacts on the tribes. They specifically relate to impacts on food security, cultural longevity, tribal sovereignty, economic opportunities, ecosystem balance, human health, and environmental justice.

The tribes predominantly believe that climate change impacts will be faster than the rate at which the resources and the tribes can adapt. However, the interviewees, despite some reservations, were hopeful that they will adapt because they must. Despite their confidence, they recognize that adaptation won't be guaranteed unless they focus on it and allocate their resources to understanding and addressing it. They also are fully aware that they need cooperation and support from federal and state agencies.



## 4.0 Findings—Current Capacity to Address the Impacts

This section includes interviewee responses on the level of tribes' awareness of climate change impacts, their process to incorporate tribal member thoughts and viewpoints in policy development, approaches to development of mitigation strategies, and current programmatic infrastructure to enhance their understanding and implement strategies. Additionally, the information interviewees provided regarding the level of interactions they currently have with other tribes and with the federal, state, and local agencies and jurisdictions will be summarized. This information allows a mapping of the internal capacity of the CRITFC tribes, in both technical and policy levels, to continue to address climate change impacts.

### 4.1 Awareness of Climate Change Impacts

For the tribal governments to address climate change effects, they must be aware of the issues and concerns, and must know the level of engagement of the tribal members on this issue. Based on interviewee information, it appears that awareness of these issues within the tribes' governments ranges from low to moderate, but is certainly increasing. More work to disseminate and present information to them will be greatly advantageous to their climate change efforts.

The interviewees expressed the following specific thoughts regarding awareness of the tribal governments:

- + “They know it is changing but they don’t know the impacts or haven’t heard detailed presentations.”
- + “They are hungry to hear more . . . looking for more depth in technical staff . . . looking for guidance.”
- + “The tribal council discusses climate change often when discussing natural resources. They are asking questions.”
- + “Don’t think they understand the implications; varies between individuals.”
- + “Have had several symposium-type conferences nearby or even within our tribe [Umatilla] over the last few years. Several federal agencies have put out notices about climate change.”
- + “Tribal government . . . recently redid their tribal structure [Nez Perce] . . . Natural Resources [Department] actually have a climate change group.”
- + “Not the tribe’s highest priority, but it is a priority.”

IS THE TRIBAL GOVERNMENT AND THE TRIBE AS A WHOLE AWARE OF CLIMATE CHANGE?  
(No = 0, DEFINITELY = 5)

	<u>Gov’t</u>	<u>Tribe</u>
NP	3.1	2.2
UM	4.4	2.9
WS	2.9	3.1
YN	3.6	2.7



- + “If the Board does a list of their priority issues, it would probably show up on it.”
- + “Feels like the tribal government doesn’t have as clear communication with [food gatherers] as they could.”
- + “Important to have the leadership set the tone that this is important. But the effort should be grass root and the leadership should empower them. They could get a little more media training in publicly discussing it.”
- + “Identify even small projects that are meaningful to the community as example to educate the tribe on benefits of addressing the issue.”

The natural resource and other technical departments within the tribal governments have a much higher level of awareness, as exemplified below:

- + “The committees that work together, like the culture and heritage, land use, fish and wildlife, water board are aware of it.”
- + The Warm Springs has formed a multi-disciplinary climate change awareness group, with involvement from water, fisheries, wildlife, and other technical departments, and technical and legislative committees. “The idea is for this group to work together to address the issues . . . to do public outreach . . . and other activities.”
- + “Other [Umatilla] departments are already getting involved with this because they anticipate there are going to be large scale changes. For the vulnerability assessment, we have folks from DNR [Department of Natural Resources], the tribal Planning Office, Department of Science and Engineering and Information Technology, the GIS program, 11 or 12 of the 15 or 16 departments are involved.”

“Some [tribal] people are really aware and others are less . . . traditional food gatherers, even without education, understand it, have noticed it and are talking about it . . . they notice the day-to-day changes like salmon runs . . . people engaged in the old ways are aware that things are changing,” and “small amount of tribal members are very active in change.” However, the tribes’ general membership has an overall low degree of awareness and familiarity with climate change concepts and consequences. But they appear to be interested in learning more about it when specific issues arise: for example, “They are asking about . . . swimmers in the Umatilla River get bacterial infection because the water is so hot . . . just like the fish; gills getting bacterial infection is what’s killing the fish; it’s a huge concern.”

There are also tribal members who are skeptical of the concept of climate change, as evidenced by a few statements such as “many of them have not bought into it,” or “some do not seem to want to have an interest in it,” and “there is a lot of unbelievable known skeptics here that absolutely don’t like the idea of climate change and are super-opposed to the idea.” The



skepticism is likely for some of the same reasons as prevails in a segment of the larger non-Indian community.

Finally, there may be a general belief within the tribal communities that they were exposed to, and were aware of, climate changes and their impacts to their ecosystems early on. Many tribal members have demonstrable first-hand knowledge of the effects. Therefore, the general paradigm that climate change and its impacts were first noticed and expressed by non-Indian scientists may be alienating to some tribal members. They would like the non-Indian scientists to help tribal staff obtain financial and technical support so the tribes can eventually develop resilience in the tribal communities.

## 4.2 Internal Opinions

The ability of the tribal staff and general members to share their climate change viewpoints within the tribe is a general indicator of the degree and efficiency with which their ideas are incorporated into the tribes' decision-making process. Overall, significant technical and other discussions seem to be occurring between tribal staff, and between the technical staff and policy- and decision-makers ("Good dialogue between staff, council, and committees and general council").

Climate change impacts are discussed ad hoc "in small groups," during "conversations in the sweat lodge," on a "one-on-one" basis, and sometimes, "I will talk about it whenever I can." More discussions occur in various departments and committee meetings, such as "in the natural resources sub-committee" while discussing "our inventory and forest management plan" and during "management briefings" as "part of day-to-day management discussions." Similarly, ideas are "expressed when in a [Council] meeting, or when a specific question comes up regarding dealing with water or land issues." ("not only because of me, but the fish and wildlife commission brought it to the board")

IS YOUR OPINION BEING HEARD AT THE  
TRIBAL LEVEL?  
(No = 0, DEFINITELY = 5)

NP	3.0
UM	4.0
WS	2.0
YN	4.0

The discussions appear to have been increasing over the last couple of years. They were focused on acknowledging 1) the impacts of climate change, 2) that many of the potential effects are poorly understood, 3) that they may be significant, and 4) the need for funding to address them.

The information and thoughts put forward by the technical staff appear to be generally well received and are informing the positions proposed by policy-makers for further discussion. As more technical information and analysis on the needs of the tribes is completed, the input from the technical staff to the decision-makers will grow in completeness and detail. More departments will be involved in the discussions and will provide input.



The Yakama and Umatilla have begun formally to develop their vulnerability assessments and adaptation plans. Therefore, more extensive and focused discussions are occurring at various government levels in these tribes. In general, at all tribes, “regular conversations [are happening] with [policy-makers], discussions on real-life scenarios that have happened, and pushing for change on the government level.” It helps greatly that several staff at all the tribes have the opportunity to be “before Council all the time, and so these conversations are part of our broader spectrum.” In addition to opinions of individual staff, there are efforts to create departmental positions at all the tribes (such as at Umatilla) to more formally inform the policy-makers.

### 4.3 Capacity to Develop Mitigation Strategies

The tribes’ approaches to formulating their technical assessments and adaption and mitigation plans are currently evolving as their knowledge improves. Their current overall strategy appears to reflect their internal decision-making processes, including policy development infrastructure and availability of funding and dedicated staff, the degree to which they incorporate Traditional Ecological Knowledge (TEK) into decision-making, focused approaches to salmon recovery efforts, presence and extent of an energy policy, and how closely they pay attention to conferences and other information dissemination opportunities. The tribes have begun with specific projects to better understand the types and severity of climate change impacts, and to eventually develop adaptation plans. These studies are being conducted to form the technical basis for informed actions by the tribal decision-makers. The interviewee information collected on these topics is summarized below.

IS CLIMATE CHANGE ACCOUNTED FOR IN  
TRIBAL PLANS, POLICIES, REGULATIONS?  
(No = 0, DEFINITELY = 5)

NP	0.3
UM	1.6
WS	1.0
YN	1.7

#### 4.3.1 Decision-Making Infrastructure

While there are similarities among tribes, the decision-making infrastructure at each tribe is specific to its governance structure and funding sources, as described below for each tribe.

#### Nez Perce

The tribe is “moving toward developing a policy or a strategy to deal with climate change.” Its goal is to develop its climate change concerns into specific plans and policies that are integrated in the tribe’s Integrated Resource Management Plan. A climate change workshop was held in January 2016 for further planning and coordination among several tribal departments.

The Fisheries Department and the Department of Natural Resources have established a committee to study climate change issues, help guide the tribe’s discussions, and seek funding support. The January 2016 workshop which included staff of the Fisheries and Natural Resources Departments was intended to develop options to jointly address the needs.



There are apparently staff in various departments with expertise in climate issues, but there is no staff member assigned to this matter, due predominantly to lack of funding. There is a need for at least one full-time staff person dedicated to climate change coordination. The role of this position would be to study and research, and be a central focal role and a nexus for collaboration. The January 2016 workshop was planned to gather members from different departments to focus on coordinating climate change activities, potentially to also include a Council member to help address climate change.

The tribe has not yet conducted any explicit climate change projects. But most of its watershed restoration activities are compatible with climate change projects in terms of their objectives to maintain functional ecosystems. The tribe has received several grants to support climate-related planning and assessment projects. These have been received predominantly from BIA, but also from a few from other sources. Projects and funds mentioned by the interviewees are listed below:

- + BIA and U.S. Environmental Protection Agency (EPA) funding for wetlands work
- + BIA grant funds—one for workshops/training, one to bring on three interns to assist in the development of specific studies
- + BIA funding to the Forestry Division for monitoring vegetation changes
- + The Water Resources Division has developed a Clearwater River Subbasin Climate Change Adaptation Plan
- + University of Idaho for funding for tribal trust doctrine work
- + Funding from the U.S. Geological Survey to engage in the Landscape Conservation Cooperatives (LCCs) to participate in education but not “on the ground mitigation.”
- + Water Resources Division has written smaller grants focused on information and education outreach

Plans include:

- + “Fisheries and water resources are pursuing additional funding. Other departments are pursuing funds for prevention and education.”
- + “The tribe’s forest plan will include a chapter on managing the forest in a way to help mitigate climate change effects.”
- + “Cross-discipline our monitoring projects with climate-change-related monitoring needs.”



## Umatilla

Although there have been tribal acknowledgements, concerns, and efforts to deal with climate change impacts, they have been more general and opportunistic in scope. Like the other tribes, Umatilla have begun to include measures to better understand and address the impacts to their resources.

The tribal efforts are now based on a “more coordinated approach” and include preparation of a vulnerability assessment and development of an adaptation plan. It appears that the findings of the current planning efforts will be incorporated into the next five-year revision of the tribe’s comprehensive plan. The tribe’s Board of Trustees “says we need to be looking at this . . . not their highest priority, but it is a priority.” The process will start at the tribe. Subsequently, the tribe will approach the state or federal agencies regarding partnership opportunities and funding sources.

The tribe doesn’t have a department or staff dedicated to climate change. However, several staff at different departments are spending significant amounts of time on this issue. Two departments are involved with the initial planning effort—the Department of Natural Resources and the Department of Science and Technology. These departments are working cooperatively with other departments to identify the needs of the tribe. They have held several internal, inter-departmental workshops and held a public meeting in January 2015. The Umatilla County Climate Change Focus Group is also engaged with the tribe’s activities.

The tribe began a vulnerability assessment project to inform the decision-makers and policy-makers, completed in 2015. An adaptation action plan and implementation strategies will be prepared by end of 2017. The tribal staff will continue with several activities such as the following:

- + Working with the Great Northern Landscape Conservation Cooperatives (GNLCC) on regional impacts of climate change
- + Establishing a climate information database and presenting results to staff for their education and grant applications (the tribe’s Information Technology Office)
- + Modeling of migration of huckleberry and root plants on the scale of the Great Basin, funded by BIA and GNLCC
- + Working with the Forest Service since 2007, conducting an accelerated forest restoration plan program, including developing a GIS-based model to predict where the First Foods plants can be found on the reservation, field-testing the model, using it to identify areas for further monitoring



- + Using other grants to conduct vegetation modeling to evaluate potential impacts to the tribe's foods and root plants, and the impacts of invasive weeds (working with Forest Service)
- + Using possible funds from CRITFC for data collection, general assessment of conditions, trends analysis, and assessment of potential impacts from climate change
- + Receiving Board approval for the Department of Natural Resources to work on a climate change project focused on groundwater resources of the Umatilla Basin
- + Continuing to pursue Forest Service funding for the tribe's First Foods studies, currently focused on huckleberry migration pattern: future studies will focus on game population such as elk herds

## **Yakama**

The Yakama has been discussing and incorporating climate change mitigation efforts across a lot of its programs, such as forestry and fisheries, for the last 10 years, and more directly in the last 5 years. For example, the Forestry Department has been conducting disease control, flood plain and stream restoration work, and various habitat projects to gain additional resiliency. During that time the tribal Council has been increasingly participating in the various discussions and forums.

Climate change as a topic of interest and concern is new to the tribal plans, and only hinted at in some of the earlier plans. However, there is a recognition and expressed need to update the plans within a short time frame. There is a concern that the "Council meetings revolve around revenues, not realizing other things," such as climate change. However, the interviewees were optimistic that as the tribal staff, and the tribe as a whole, become more knowledgeable, the Council's level of engagement will increase. The tribe is "laying the foundation of what we need to do" and then will develop plans to integrate that into the tribal programs.

The tribe does not currently have any staff dedicated to climate change matters. Approximately six of the current staff from existing programs such as fisheries, wildlife, forestry, water resources, and others together form an ad hoc core group directly involved in discussions. However, the staff is occupied on other projects and lacks the time and funding to continue the efforts at the level needed to achieve the tribe's specific needs. A climate change office with its own staff would be able to support existing programs, be a "consistent solid voice within tribal government," and help "find additional funds for climate change and adaptation actions."

The tribe has started development of its vulnerability assessment and adaptation plan. It is the first dedicated climate change project by the tribe, funded primarily by BIA. The Department of Natural Resources is tasked with completing the plan. The plan will include setting priorities and developing a strategy to address climate change impacts. The plan is slated to be completed



in 2016. Once completed, it will be used to screen other tribal programs and projects to incorporate climate change adaptation needs as identified.

There was a note of dissatisfaction expressed by some interviewees that “local citizens don’t have access to that kind of information [on climate change efforts].” It appears that more communication from the tribal government and programs may be needed to inform the tribe’s general membership.

## **Warm Springs**

The tribe has formed a “climate change working group” that includes staff from tribal government departments with expertise in hydrology, biology, fisheries management, wildlife, forestry, fire management, and other disciplines. The group meets monthly and is currently working to identify vulnerabilities and develop steps to conduct assessments. It is in the planning phase of a formal vulnerability assessment and adaptation planning.

The working group is the tribe’s primary mechanism to identify adaptation and mitigation strategies. The various technical committees within the tribal government are the “eyes and ears of the tribal Council” and report to the Council on their deliberations, findings, and activities. Their representation on the working group allows a fair degree of intra-tribal communication on climate change issues.

The working group is starting to develop a baseline of pertinent information. The tribe has historically conducted a variety of natural resource conservation management projects, such as restoration of waterways. The Forestry Division under the Natural Resources Department has good baseline data and analyses on historical forest structures and changes over the last 150 years. Other tribal projects have focused on water issues, drought, and fire prevention and mitigation. Part of the tribe’s strategy is to work with other tribes to increase efficiency and effectiveness in data collection, management, and analyses.

Currently, tribal policies and regulations do not explicitly incorporate climate change strategies. The findings of the working group may get incorporated into the tribe’s Integrated Resource Management Plan (IRMP) during its next revision in 2017. This time frame will allow opportunities for the tribe to further build its infrastructure of technical and leadership resources, collect and interpret data and information, and conduct initial studies whose findings would inform such policy and regulation changes. The working group will recommend revisions to the tribe’s Project Inter-disciplinary Team (PIT) for their input and incorporation into the IRMP. The IRMP will form the basis for additional requests for grants and projects.

The tribe received BIA Rights Protection Implementation funds in 2014 and allocated some of its own funds to support a new staff position. The position was created with the initial objectives of developing a community group to focus on climate change issues and increase monitoring of



impacts of climate change on the streams. This is the only position or program that specializes in addressing climate change for Warm Springs.

Warm Springs has not generated specific reports yet, pending completion of initial planning work. It is expected that a draft vulnerability assessment report will be completed by the end of 2016, and potentially even some adaptation plans or mitigations.

The tribe is proceeding to evaluate funding sources to help it deal with climate change planning needs, with several recent and ongoing efforts mentioned as follows:

- + The tribe has a \$10,000 grant from the GNLCC to build travel capacity to discuss how climate change is impacting the timing of plants in general and tribal culturally sensitive plants specifically.
- + It has received a grant from EPA for \$150,000 to change a limited stretch of a transportation route away from a very significant stream.
- + The tribe's plant phenology working group has proposed an Inter-Tribal Phenology Network to BIA for a \$250,000 project for biological monitoring including monitoring of plant flowering, insect emergence, and animal migrations. The Institute for Tribal Environmental Professionals (ITEP) has offered their assistance at the webinars and for networking.

#### 4.3.2 Use of TEK

TEK is the knowledge of the natural resources accumulated by the tribes over millennia through close observations of the ecosystem behavior within the tribal ancestral areas. It is a practical understanding of the environment “developed by being on the landscape, using the species, understanding them, and building empirical knowledge” and is not just “legend and folklore.” The interviewees were asked whether their tribe utilizes TEK to identify, assess, and adapt to climate change impacts.

DOES THE TRIBES USE “TEK” TO IDENTIFY, ASSES, ADAPT TO CLIMATE CHANGE?  
(No = 0, DEFINITELY = 5)

NP	3.0
UM	3.0
WS	3.0
YN	4.0

What truly sets TEK apart from the “non-Indian” science is that it adheres to a “different perspective . . . and has a different value system,” leading to sometimes “different priorities” for the tribes than the larger community. An example given by an interviewee was of “a huge fire was threatening a summer camp. The tribe decided to let the camp burn than to take out old trees—camp can be re-built, but not old trees—non-Indians were surprised.” At its core, TEK provides a source of inspiration and resilience to the tribes and a guiding framework for decisions and actions, until they better understand the science of climate change. One interviewee stated that “It is really early for a lot of tribes . . . to know what it means and how we can address it . . . and to have management plans in place . . . [until then] we operate under our traditional values.” Another tribal member stated, “We have seen great . . . waves of change



that occurred [in the past] and the people persisted. The wave that is going on right now is way outside anything that occurred since the Mazama Floods. Recognition that these changes can be huge and we can still persist and that culture still lives on . . . is what traditional culture and knowledge is.”

Based on responses given throughout this survey, it is clear that the technical and scientific staff of the tribal government, as well as members of the tribal governments, are well aware of the value of TEK to the climate change discussions. It is the combination of the TEK and the broader sciences that enriches the tribes’ programs, even though when the tribes “apply TEK to resources, a lot of times the outsiders don’t really get it.” The tribes believe that TEK in “parallel with scientific knowledge work together to give a more robust, richer understanding” and that the tribes “incorporate traditional knowledge with sciences . . . we’re so connected to the land, TEK is definitely going to be useful with climate change.”

Many of the “scientific” and “leadership” interviewees thought that they are proactively including TEK in their climate change decision-making process and projects. In fact, there was an understanding that TEK has been included in planning and execution of projects prior to the beginning of climate change discussions (“we kind of ad hoc do”). Responses expressed included the following:

- + “Traditional ecological knowledge will be a strong facet of our [Nez Perce] planning and implementation of any kind of climate change activities.”
- + “It is inherent in the way the [Yakama] tribe manages its resources—this is our driving force, written into our mission statement of pretty much all the programs.”
- + “Traditional knowledge spoken at the long house been immigrated right in our [Umatilla] technical mission statement. We’re using both the traditional and the ecological sciences to acknowledge, to inform our programs.”
- + “Yes, in the monthly meetings [of the Warm Springs working group] that viewpoint is brought into the discussions . . . tribal members bring their concerns based on their observations . . . definitely think that that’s the backbone of how we are going to plan for this moving forward.”
- + “Use is really high . . . lot of elders talk about climate change . . . about what the indicators are out there . . . elders talk about it all the time.”
- + “The people recognized by the tribe as the keepers of TEK are those who really pay attention to the salmon runs . . . know when huckleberries are early . . . when the roots are ready . . . they are subject matter experts.”



Several responders did express their dissatisfaction that TEK is not being more effectively incorporated into the tribes' decision-making process. However, their thoughts appeared to span a more general theme of loss of cultural continuity rather than solely focusing on climate change.

- + "Elders knew what the elk and deer were going to do at certain times of the year, what plants were going to be ready at certain times of the year, and what medicines needed to be collected. We have lost that. Now it is more about how much money can be made selling them rather than how important it is to sustain plants, game so people get enough of them as they need. Used to be take only what you need; not like that anymore. We should start saying that traditional ecological knowledge should be our best science."
- + "Council observes their [people with TEK] knowledge in the ceremonies . . . they are not utilizing it in their science."
- + "Fire has become less used as tool for a number of things. Now it's seen as a bad thing because you're protecting property rights and human life."
- + "Nowadays instead of being stewards of the land, they do not know their language which ties them to land, First Foods."
- + "A lot of our traditional knowledge and ways are lost, people have fallen into drugs, our children don't take the time to learn traditional ways. They are too much into sports, video gaming, and all. They are not interested in learning our traditions, the long house is empty."
- + "Fewer and fewer people are still carrying on the traditional ways. But we have some teachers that have the knowledge, but they take it to the ground with them when they die because they are stingy with their teachings."
- + "At the policy table and particularly the Inter Tribe Commission [CRITFC] a tremendous amount of ecological knowledge was shared but not effectively connected to the decisions that were made."

#### 4.3.3 *Salmon Recovery Strategies*

Much planning and work has already been focused on salmon recovery efforts in the Columbia Basin by tribes, agencies, and many other organizations. This section only includes a summary of interviewee thoughts that specifically addressed climate change effects on salmon recovery efforts.

The interviewees expressed the viewpoint that climate change will adversely impact salmon habitat and survival rate, which has created a greater sense of urgency to develop and implement strategies to preserve and maintain the tribes' fisheries resources. It is "time for



action from the policy folks” is how one person reacted. There were thoughts that this will be a challenge, as indicated by the following statements:

- + “I don’t know how we could change the climate.”
- + “Don’t know how to protect salmon if waters are so warm.”
- + “Will have less water, and fires will burn [vegetation and habitat] near spawning beds most likely.”

However, there is the optimism that climate change impacts can be mitigated with additional policies, intra-tribal cooperation, cultural shift of focus, and additional technical work. There is also the idea that raising visibility of current and future projects will generate support and understanding. The following suggestions were stated regarding changes in tribal politics, policy, and cultural paradigms:

- + “Get rid of political red tape for collaboration . . . people are territorial sometimes . . . perhaps operating . . . on a policy level”
- + “Need to stay in front of our lobbying, think outside the box regarding our science and management ideas”
- + “On policy side, get counties to stop permitting buildings in floodplains”
- + “Not only through the business side, policies, and through developing adaptation plans”
- + “Going to have significant conversations about additional water storage in Yakima valley if we are going to preserve some of these rivers and spawning areas”
- + “We need to address the changes in the hydrograph; have to have more flows to mitigate water temperatures”
- + “Significant conversations regarding how to run hatcheries . . . have to have much greater acceptance of the hatchery fish”
- + “For those [fish] that will be lost, how are we going to naturally and culturally work to offset that loss. Unfortunately, may involve water storage and that has an impact. May need to see substitutions like the upper river tribes salmon study, i.e., resident fish substitution program. When you can’t have salmon, still want fish to be part of your culture, so will have to adapt with some of the things were unmanageable”
- + “From a harvest standpoint, need to harvest wisely and potentially forego harvest, forego the exercising of treaty rights under very harsh conditions”



- + “Our best protection is to continue to revive our spiritual side and culture”
- + “The basics of our religion, the basis of our responsibility should never change”

And the following technical project ideas were suggested:

- + “Work together, develop management plans, identify vulnerabilities and try to mitigate . . . do the things that we are capable of doing”
- + “Look at watersheds with a holistic approach . . . Watersheds and systems as a whole.”
- + “Similar to the monitoring of migration plant species due to climate change . . . can do with the fish and predict where the best areas are to put most of your effort in”
- + “Look at water, water quality, habitat restoration . . . not just focusing on hatchery mindset”
- + “Need to maintain or maximize the environment’s inherent ability to offset climate change effects. That means either maintaining good riparian vegetation or improving riparian vegetation so that stream temperatures are as low as possible under whatever temperature regime exists.”
- + “Important that the tribe [Nez Perce] actively use hatcheries to maintain some gene banks. Tribe has been a leader in cryopreservation and maintains the largest gene bank of salmon sperm in the world and the largest fish gene bank in North America as a whole.”
- + “Need to open up all the areas that fish used to be in . . . above the dams all built in early 20th century . . . start in the national forest and wilderness areas”
- + “Aquatic connectivity and the thermal barrier issue need to be addressed because it is going to get worse. Have to consider that and plan for the worst-case scenario.”

#### 4.3.4 *Energy Policy*

The tribes understand that climate change has been significantly affected by human activities. In keeping with their philosophy that it is the “responsibility of Indian tribes to take care of nature,” they are very interested in reducing their carbon footprints. However, they don’t have a specific energy vision that is officially part of their climate-change-related policies.

The tribes have been looking into a range of alternative energy sources to reduce their carbon footprints, reduce energy cost on the reservations, and create additional revenue sources. Although a few of these activities “still have a lot of work to do with actually bringing that to fruition,” they have been exploring alternative energy, co-generation, and other technologies.



The interviewee information regarding the status of energy visions or plans, carbon reduction projects, and alternative energy exploration activities are summarized below for each tribe.

### **Nez Perce**

- + “have a comprehensive energy plan . . . developed over the last five years . . . to look at the existing energy sources . . . create more sustainability”
- + “have an energy working group, done several feasibility studies for different types of energy development”
- + “a feasibility study looked at a bio-fuels project . . . would crush mustard seed, grape seed or canola to produce oil which would be used to make bio-diesel”
- + “... have done a feasibility study for wind and one for solar ...”
- + “... biofuels from downed woody debris from forests ...”
- + “however, fuel cost and distance to market cost-prohibitive and increase carbon footprint”
- + “... solar panels at tribal hatchery and Lapwai high school, and looking at other locations”
- + “conducted carbon sequestration strategies and plans on specific tribal owned lands”
- + “... passed resolution in the 90s regarding climate change and willingness to develop carbon projects to reduce carbon/take funds from selling carbon to buy more land, plant more trees. Have sold carbon credits in past; still monitoring the market”.

### **Umatilla**

- + “[Have a vision], but not well-known or embraced”
- + “Has an energy policy that is currently being updated”
- + “Definitely interested in reducing carbon footprint—energy efficient buildings, Tesla charging stations”
- + “Looking at how we can better use our energy . . . working with the maintenance people on how to become more efficient on energy use,” “the new health clinic touted as energy efficient”



- + “Carbon sequestration—early on we had some discussion . . . saying timber base of the tribes wasn’t enough to make a big contribution. With revision on the comprehensive plan, we can talk about that again”
- + “Working on a solar addition and we have a biodiesel fledgling program”
- + “Looking at wind and solar—little wind turbines, solar panels to reduce energy needs”
- + “Looking at . . . impacts that windmills can have potentially on natural resources”
- + “Tamastslit Cultural Institute recently put in a wind turbine to reduce its carbon footprint . . . now working on a solar project as well”

It must finally be pointed out that there was a strong undercurrent of thought that “it is the larger community that needs to reduce their carbon footprint . . . tribe didn’t create this problem . . . their contribution to carbon is very, very miniscule.” And that the “bigger question is how this community and the other tribal communities in the region affect the state and regional policies and national policies to hold the firms accountable.” It was further expressed that the public forums held by various agencies, organizations, and entities are “really disappointing” in that they “never talked about who is responsible” and therefore “it is up to our communities to stand up and say this.”

### **Yakama**

- + “[Energy Plan] in planning right now,” but “For the most part it is incomplete, inadequate to the needs of climate change”
- + “Carbon sequestration and alternative energy ideas been kicked around, but still in discussion phase”
- + “looking at wind and solar.” But “not much happening”
- + “Use the irrigation project to make electricity off of some of those drop points”
- + “Biomass through Yakama forest mill”

### **Warm Springs**

- + “We do carbon sequestration . . . registered it to the California market . . . 27,000 acres of conditional use land”
- + “have a solar array 200-300 kW”



- + "solar projects . . . general public is very interested"
- + have looked at "geothermal energy . . . not enough for the grid"
- + have looked at "wind energy . . . some endangered species issues"
- + have a "biomass project . . . kind of in the closing phases . . . potential for expanding it"
- + " could either have 60,000 bone dry tons of wood burn in forest fires and contribute to carbon emissions or do field reductions and thin trees and do biomass projects "

#### 4.3.5 Conferences, Information Collection, Dissemination

There have been several conferences, workshops, and meetings in the last few years focused, or containing segments, on climate change impacts to tribes. These have included the Affiliated Tribes of Northwest Indians (ATNI) conferences and symposia, Northwest Climate conferences held by the Pacific Northwest Tribal Climate Center of the University of Oregon, EPA, Intertribal Timber Council symposia, meetings by the GNLCC, the Climate Change Boot Camps by the Northwest Climate Science Center, the National Adaptation Forum conferences, the 2015 Coastal and Estuarine Research Federation conference in Portland, Oregon, and the Institute for Tribal Environmental Professionals and CRITFC joint meeting held in Fall 2013.

HAVE THE CLIMATE CHANGE CONFERENCES  
BEEN USEFUL?  
(No = 0, DEFINITELY = 5)

NP	5.0
UM	4.8
WS	3.9
YN	3.5

Attendance at these events by the tribal staff and members has not been overwhelming, due predominantly to relatively high expenses, but also lack of sufficient staff time and other competing priorities. As one interviewee stated, "Funding is limited for participation, there are so many centers of activity surrounding climate change, and to be at all of them is not realistic ... we don't have enough money and staff time to attend all of them." And another stated that he "probably wouldn't spend three days and travel to go to a conference." Additional travel assistance will significantly help tribes learn from, and contribute to, the current dialogues. Most of the tribal staff attendance has been at the local and regional events.

The interviewees who attended these events listed them as being useful to very useful, especially the conferences and workshops convened by ATNI. Specific thoughts of interest expressed include the following:

- + "Things that can educate the tribe to develop their own plans, and on how to meaningfully hook up with other tribes and agencies, rather than doing things independently"
- + "It would help if there were white papers to share back at the tribe from the conferences"



- + “Attended the Northwest Conservation meetings . . . interesting because the states were talking about how they want to address climate change, want tribal involvement . . . got the impression that they were not really listening to the tribes that were there”
- + “States are way ahead of us in planning . . . States have outreach to tribes, but we’re so busy doing our own thing we haven’t been able to participate”
- + “Need to have not just national, regional type conferences, but some small ones, roadshows”
- + “Conference should be on technical, educational, and policy information [to attract a] diverse group”
- + “Like to see a combination of technical and policy information”

#### 4.4 Cooperation Strategies and Infrastructure

Tribes understand that, in the face of competition for funding, cooperation with each other, with other tribes, with federal, state, and local agencies, and with universities and other entities is essential to meeting their goals within reasonable timelines. Currently, the cooperation levels are generally nonexistent to low. This is partly a continuation of an endemic issue. However, tribes’ immediate concerns with climate change impacts and the opportunity to make renewed appeal to protect their natural resources encourages them to enhance their networking, cooperation, and resource sharing. The interviewees’ thoughts regarding cooperation with other tribes, agencies, and others are presented below.

##### 4.4.1 Cooperation with Other Tribes

Throughout the interview process, many interviewees expressed, directly and indirectly, that cooperation with other tribes and entities will greatly advance their efforts. The interviewees were very specific that since “everybody is competing for finite funding . . .,” inter-tribal cooperation can lead to sharing of limited resources. Specific reasons for cooperation expressed by the interviewees include the following:

- + “We have similar eco-types and land base, and water conditions that need to be similar for fisheries.”
- + “The whole Columbia Basin can be looked at as one large landscape . . . need to coordinate management of the whole area.”
- + “Basin tribes share similar habitats, similar subsistence and cultural species . . . can learn from each other.”

IS IT USEFUL FOR COLUMBIA BASIN TRIBES  
TO SHARE RESOURCES?  
(No = 0, DEFINITELY = 5)

NP	4.9
UM	5.0
WS	4.9
YN	4.2



- + “Probably the only way to make a difference across a landscape of this size is to have more entities involved.”
- + What “we have in our favor is a cultural parallel” between tribes.
- + “We have same cultural identity, same instructions by our creator to protect the resources in our areas . . . each area has a different landscape and we are all charged to protect it—common thing is water.”
- + “Collaboration creates a better understanding.”
- + “We are all in this together.”
- + “Must work together to protect our fresh foods.”
- + “If we work together it gives us the advantage of financially getting funding for some of the projects.” “Can share capacity to get and administer grants.”
- + “We would be open to share whatever we have . . . talked to other folks that gather, hunt, fish . . . there is information trading on that point.”
- + “Studies such as this “and the information comes out that we are not alone, to connect us . . . we all start realizing that we do have a lot in common . . . we can work together.”
- + “We are sharing reports . . . not necessarily climate change related . . . we are open to work with different groups . . . just that the format isn’t there.”
- + “With the money from BIA for climate change . . . we are looking at coordinating with other tribes and have a nice discussion.”

The interviewees were also very specific about data sharing, as exemplified below:

- + “Studies about the changing availability of resources would be helpful for us to share; and best done through regular meetings, information network online, websites and those kinds of things.”
- + “ Warm Springs project; think it has something to do with phenology study.”
- + “We have data sharing agreements with various organizations; don't know to what extent that is [useful], e.g., water temperature—the data that we have for water quality and temperature, mortality rates for salmon, the growth of our roots and berries, timber management.”



- + "All the tribes probably have the same concerns—is there less precipitation? Is there dropping groundwater surface? These metrics or data, we probably ought to be doing it together."
- + "Sharing ability to compile broader units of data would be good for all of us. Climate change is so big; it's not something you could measure in one drainage or one watershed. We ought to jump in with regional data sharing and consistency."
- + "We can analyze the data . . . how [climate change] is impacting each tribe and their culture, finding out common threads . . . share them."
- + "Lot of monitoring need . . . water temperature, ambient temperature, precipitation . . . start gathering data in a region-wide basin and try to understand patterns."
- + "If not labeled climate change, tribes were collecting [environmental data] for another reason."

More significantly, cooperation helps the tribes' combined efforts to protect and enhance their common interests to the benefit of all the tribes, as expressed below:

- + "Start bringing our young people [from different tribes] together [around this issue], utilize them to regain this [inter-tribal] trust—they have a better ability to ally with each other."
- + "We should be working [together] on these types of things to get BIA to do a better job, forest management or grazing management, range management."
- + "We need to develop a coordinated approach . . . learning from each other so that we have a terrific plan with the four member tribes on how we're going to work together to protect our First Foods."
- + "If we . . . together . . . try as Indian people, share and utilize everything we have, would be very useful. Just like the history of Celilo, how people gathered to trade, come together, and share."
- + "Lot of ways we can empower each other . . . all kind of caught in this dynamic which is kind of colonial . . . we are used to them saying don't worry Indians, the government will take care of you, you'll be fine . . . we still more accept this outside influence than working with the people that are our relations by blood or trade."
- + "We are part of the dominant market system where we are being somewhat exploited. And so if we were putting more emphasis on building up our own systems, then I think it's a win-win situation."



- + "The tribal voice is not being heard at the national level . . . only way for it to happen is if people work together."
- + "Benefit to everybody and if it happens to one of us, it happens to rest of us pretty much."
- + "Strongly believe in our respectful network for making sure everybody is taken care of."

The interviewees did express a level of caution regarding inter-tribal cooperation, as stated below:

- + "Each tribe has its sovereign ability to achieve what is necessary for itself. But we should work together to meet challenges."
- + The tribes have "different positions, different resources, different priorities."
- + "Lot of politics . . . going from one of the smallest forest tribes to large ones."
- + "Some of the information is held strictly and confidentially by each tribe . . . some of the information is very significant."
- + "Everyone is acting like we are not going to tell them anything, don't give any secrets out."

Currently there is a low but increasing level of cooperation between the tribes regarding climate change work. These include informal discussions at forums such as the ATNI conferences and CRITFC forums, discussions at the EPA Region 10 regional tribal operations committee, at GNLCC meetings with a coalition of state-federal-tribal parties, and through Intertribal Timber Council activities such as focused on carbon sequestration. Lack of financial resources is a lead reason cited for not fostering more collaboration with others, due to many other competing demands on their time ("so buried in my own work and others too that we don't get enough time to convene with each other"). There are attempts to foster more cooperation, as evidenced by the following statements:

- + "There has been some departmental exchange, mainly technical staff level, mostly fisheries trying to figure out ways to adapt resources; water quality department trying to figure out welling systems and different alternatives for energy."
- + "Thinking about forming a tribal environmental network, specific for tribes and natural resources departments . . . there is a little talk about that right now."
- + "Natural resource staff is trying to explore it."
- + "A little bit of that over the years . . . never been formal."



- + “Look forward to developing stronger ties in future through preliminary kind of ground work, but got to get our house in order first.”
- + “I think other tribes that are further along than we are could definitely be helpful to us.”

Finally, there is an awareness of the work underway or completed by other tribes such as the work by the Washington State coastal tribes. There is a great desire to “incorporate a lot of their good work and good ideas into our efforts.”

#### 4.4.2 Cooperation with Federal, State, and Regional Agencies and Entities

As sovereign governments, the tribes have established relationships and communication channels with the federal government agencies. This allows them access to agency staff, programs, and potential funding opportunities. But the level of interaction regarding climate change issues has been uneven. There has been a fair degree of contact and good working relationships between the technical staff of the tribes and agencies on habitat and conservation projects. On the contrary, there hasn’t been much interaction at the leadership and policy levels yet. This is predominantly because the tribes “are not taking climate change issues to

IS TRIBES’ OPINION HEARD AT THE REGIONAL, STATE, FEDERAL LEVELS? (No = 0, DEFINITELY = 5)			
	<u>Regional</u>	<u>State</u>	<u>Federal</u>
NP	1.0	0.6	3.0
UM	3.7	3.2	4.0
WS	2.6	2.2	3.0
YN	3.6	3.5	3.0

anyone right now because we just don’t have set policies yet” and they are “still forming tribe’s position before voicing it so not really reached out yet.” The tribes “want kind of a plan of action ourselves.” Finally, the tribes understand that “it is up to the tribes to understand their needs . . . which is in its infancy.” The interviewees expected that, once the tribes complete their initial technical assessments and adaptation plans, they will be much better informed of their needs and can then formulate policies for more substantive discussions with the federal agencies.

Despite the need to develop their internal positions regarding climate change, the interviewees were concerned with the federal agencies’ general lack of awareness of the tribes’ issues and needs, as evidenced by the following thoughts:

- + “We’ve got 660,000 acres on the reservation [Warm Springs] and over 10 million acres of ceded lands . . . lot of money going to federal agencies and state agencies for climate change funding . . . I have no idea what they are doing . . . needs to be some cross-pollination so we know what they are doing.”
- + “I don’t think we have been heard . . . but again we’re so young in this.”



- + “They are not informing Tribal Council [Warm Springs] . . . they have recently started talking to our Natural Resources about it, but we [Council] are not aware of it yet.”
- + “Comes down to studies on water in the future because we are in a high desert [Warm Springs] . . . such as for aquifers in central Oregon . . . don’t know if they stretch into our reservation . . . and when our water rights freeze we own that water under the reservation.”
- + “Federal agencies . . . doing their climate vulnerability assessments . . . and not contacting tribes to participate . . . communicate through tribal liaisons which doesn’t work right . . . better to have [agencies] do a direct communication with the tribes”

However, there is a general agreement that the tribes must voice their concerns more visibly after completion of their plans. Because of their existing working relationships, they can greatly influence the decisions at the federal level to provide the tribes additional resources. The interviewees expressed the following specific opinions:

- + “We are being heard . . . we engage our folks at ATNI and also at CRITFC . . . have been over to DC, and hope to work with our federal partners . . . working with Oregon Department of Fish and Wildlife and when they come to us with their management plans we can tell them our concerns and issues.”
- + “We have been invited to some of [the agencies’] long-term comprehensive and management plans like at US Forest Service and they have included the tribe and we have a seat at the table.”
- + “Through the intertribal timber council . . . starting to be heard.”
- + “On the federal level, we have been engaged with the EPA, U.S. Forest Service and other agencies voicing concerns and wanting technical and other resources to assist.”
- + “The tribe has asked for the federal government to do a better job of planning or accommodating climate change within the ESA [Endangered Species Act] permitting and biological opinion processes, e.g., including climate change considerations into litigation such as that with timber harvest and mining activities litigation.”
- + “We get some assistance and cooperation from the feds, but [want] more interaction and influence over their treaty resources management.”
- + “Feds . . . really need to understand their role, trust responsibility better.”
- + “We are not totally silent but don’t think we are as loud as we could be.”



- + “Because of involvement with GNLCC, the tribe has had a huge impact at the regional level ... [without it] First Foods and the concepts of the tribe’s culture would [not] have risen to the top at all.”
- + “On the federal level, the GNLCC is led by the U.S. Fish and Wildlife Service and the National Park Service. They hear when I talk. They respect our opinions.”
- + “There is definitely the recognition at the agencies level that poor communities will be more affected and directly impacted by climate change . . . their action is not necessarily geared towards tribes other than they fall under that [poor community] umbrella.”
- + “Federal agencies have similar concerns [to us regarding climate change impacts] . . . working together to get access to more fish flows . . . we are talking and climate change is the driver for this.”

The “scientific” interviewees were engaged with specific projects and agencies such as with the Northwest Climate Science Center, Bureau of Land Management (BLM), BIA, the U.S. Forest Service, and several others.

- + “Think there is a lot of work being done in Oregon . . . we are plugged into the Pacific Northwest Tribal Climate working group . . . work with the landscape cooperatives.”
- + “Nature Conservancy did a climate resilience type project . . . they are prioritizing more resilient landscapes as higher priority.”
- + “BLM . . . mostly diffusing models.”
- + “I am connecting with some of these folks at these national forests . . . very slow . . . but doing work.”
- + “I am also recently out of [academia] and pretty well connected there . . . lot of research I could get funded to do here to help understand our vulnerabilities to drought, and fisheries habitat.”
- + “Up in Seattle . . . they have done adaptive timber harvest methods to increase snowpack accumulation and retention . . . to keep the soil moisture high up until the summer.”
- + “I believe BIA has been doing some monitoring since the 90s . . . don’t know whether they are still monitoring.”

However, the tribal staff were not all fully aware of specific details, or status, of work done by these agencies, as exemplified by the following thoughts:



- + “I have a hard time engaging in what exactly their work is.”
- + “Just went to National Adaptation Forum . . . the feds and regional agencies don’t have a clue and are asking the same questions as the tribes.”
- + “We are all in the same boat . . . all kind of struggling with what this all means . . . they don’t know how to do it either.”

Most funding for climate change projects appears to come from BIA. Other sources of related funding have been by agencies for their own projects when the projects included either a tribal element, or covered areas or practices that intersected tribal interests. These agencies included the U.S. Department of Fish and Wildlife, the Forest Service, the Park Service, the Bonneville Power Administration(BPA), and GNLCC. Views expressed on funding levels were generally appreciative and supportive, although a great need for more financial support was clear, as expressed below:

- + “BIA has competitive grants that are short term, but assistance level low.”
- + “Climate change help from BIA, nothing from others—need federal funding or they should take action themselves, need them to step up to it.”
- + “Have just enough to get our toes wet and participate and do basic small things, not enough to do the big things, more meaningful engagement.”
- + “Tools that are being created by the federal government at Fish and Wildlife Service and Park Service under the landscape Conservation Cooperatives are pretty outstanding. The risk is that the administration makes changes and the funding goes somewhere else, or to somebody else, or they de-fund things that we’re working on. Big problem is we have inadequate fund to engage at the level we would like to.”
- + “Talking to BIA to make them see that that this is a priority to tribes and to fund it accordingly.”
- + “A lot of support come from BIA funding or GNLCC funding . . . we speak their language . . . can do more . . . but like 1 percent of their funds has gone to tribes, if you correlate that with how much land we manage on reservation, we manage a larger percent of funds that they give us . . . their funds is geared towards producing the science they want, but we are just not quite there.”
- + “Surprised at how some federal agencies are willing to help . . . it is slow but they definitely try . . . they are clueless though on how to help . . . what we really need is money to take it from planning and policy to ground-level work where they can help with mitigation efforts.”



The level of engagement with the States of Idaho, Oregon, and Washington and the local jurisdictions surrounding the reservations and within the tribes' ceded areas is variable and generally needs much improvement. It was stated that "the dynamics between states and tribes is full of contention . . . we have applied for state (Oregon) funding but I never seen any state funding directly relevant to climate change." However, it is recognized that "one of the biggest problems dealing with climate change is that at least from the First Foods standpoint, local governments that make such important decision like zoning and permitting are not engaged and don't have a sense of what their role is in addressing things like habitat connectivity. The local level would be one area that I would highly recommend all of this considered." It appears that much more cooperation and communication must be fostered with local entities.

DO YOU GET ASSISTANCE AND COOPERATION FROM LOCAL JURISDICTIONS AND STATE, FEDERAL AGENCIES?  
(No = 0, DEFINITELY = 5)

	<u>Local</u>	<u>State</u>	<u>Federal</u>
NP	0	0	2
UM	2	2	3
WS	0	1	3
YN	1	1	4

The level of cooperation with, and adequacy of funding from, the State of Idaho appears to be the lowest of the three states. There is little dialogue with the State agencies or local entities. The best connections appear to be at the technical staff levels with the Idaho departments of Water Resources and Environmental Quality, and with universities where the tribes' interests and needs are being included to some degree at the grant request level. It was expressed that the low level of cooperation partly reflects a lack of clear opinions and strong statement from the tribe. The following additional statements were expressed:

- + State "politics ignores energy subsidies, green energy"
- + "It is low . . . but also the processes/forums to do that are not in place"
- + "I do not think there is a response to what they are hearing"
- + "Adversarial relationship with the state does not help"
- + "We have to figure out a way to communicate [climate change concerns] in a way that can give them some understanding of the importance of what we are saying"
- + "Could do a stronger campaign of climate change because we have a lot of shared waters and landscapes [with the state] and a lot of things that benefit each other"

The tribal interactions with the state of Washington appear to be much more positive than Idaho. "At least they listen" is how one member stated it. There are fairly well-developed cooperation channels with the state agencies, for example during the development of the Yakima River Basin Water Enhancement Project. However, there is a strong undercurrent of frustration with the state's strong pro-business and pro-job-creation agenda, and corporate



lobbying which is believed to happen at the expense of natural resources and tribal interests. The following specific statements were expressed:

- + “always the economic ventures supersede our health, jobs are more important no matter the cost”
- + “large industries, Boeing, Weyerhaeuser, aluminum industry, farmers, etc., dominate”
- + “hard to get around all the lobbyists for the corporations, always comes down to loss of jobs—so we need to reach out to the investors in these corporations.”
- + “at the local level the conversation is often between environmentalist and industry arguing too much with each other and not focusing on what really needs to be done, about resources and values that we are trying to protect”
- + “need some type of forum to help move us from drawing lines in the sand to finding action items and make things happen”

The state of Oregon appears to fall between Idaho and Washington in its extent of cooperation with Warm Springs and Umatilla, but is closer to Washington. It seems the state agencies “are all nodding their heads, but how far it goes after that you never know.” And that the “states share information with us but don’t really get us involved.” Despite this, in general, there seems to be a great working relationship with the state agencies and to some degree with the local entities, partly “through presence/participation in training, conferences, etc.,” and partly directly through local relationships, for example “Umatilla County Irrigation District has been very supportive, always inviting us [Umatilla] to meetings.” Additional work to have the state participate in more regional forums is seen as needed, i.e., “failure of the state of Oregon to engage at the larger level is something that the tribes collectively could force.”

The state has provided a limited amount of funding to support the tribes’ projects that have a climate change component to them, but not directly to climate change projects.

- + “State technical assistance, but limited; we’ve gotten no state funding to my knowledge”
- + “There are some [funding] opportunities with state, Department of Environmental Quality, Oregon Watershed Enhancement Board”
- + “Oregon Watershed Enhancement Board grants, through the state, [have been available] to do various habitat projects . . . haven’t communicated with them on policy positions for climate change”
- + “Biggest [funding] source we have tapped into is OWEB [Oregon Watershed Enhancement Board] . . . we are doing watershed projects, juniper removals . . . water conservation work



... habitat work for fisheries . . . doing bioengineering work for fisheries again . . . [some funds from] BPA [Bonneville Power Administration]"

+ "Nothing from state or from counties"

## 4.5 Summary of key findings

Awareness of climate change issues within the tribes' governments ranges from low to moderate, but is increasing. The tribes' technical staff have a much higher level of awareness. Among the general tribal population, other than food gatherers and hunters, the members have an overall low degree of awareness and familiarity with climate change concepts and consequences. But they appear to be interested in learning more about it when specific issues arise.

Significant technical and other related discussions seem to be occurring among and between staff and policy- and decision-makers. The information and thoughts put forward by the technical staff appear to be generally well received and are informing the policy positions.

The tribes' approaches in formulating climate change mitigation strategies are currently evolving as their knowledge improves. Their current overall strategy appears to reflect their internal decision-making process, degree of inclusion of TEK into decision-making, presence and extent of an energy policy, and level of participation in information dissemination forums such as conferences. There are, additionally, specific thoughts on how to enhance salmon recovery efforts in the face of climate change.

Interviewees broadly expressed that cooperation with other tribes and entities will greatly advance their efforts. Currently there is a low, but increasing, level of cooperation between the tribes regarding climate change work.

The interviewees were concerned with the federal agencies' general lack of awareness of the tribes' issues and needs. However, they expected that once the tribes complete their initial technical assessments and adaptation plans, they will be much better informed of their needs and can then formulate policies for more substantive discussions with the federal agencies.

At the state and local levels, the degree of engagement with the states of Idaho, Oregon, and Washington and the local jurisdictions surrounding the reservations and within the tribes' ceded areas is variable and generally needs much improvement.



## 5.0 Findings – Needs Assessment

The interviewees expressed a wide range of ideas on the needs to assist them with their adaptation and mitigation goals. Their ideas are broadly grouped into educational and public information, policy and regulatory, technical, and funding need categories, with a certain degree of overlap among all of them.

DO TRIBES NEED ASSISTANCE TO REACH  
THEIR GOALS?  
(No = 0, DEFINITELY = 5)

NP	4.7
UM	5.0
WS	4.8
YN	4.9

### 5.1 Educational/Public Information Needs

It was recognized that “attitudes have to change in order to reverse what’s going on [effects of climate change]. If people don’t even know what it is, they can never believe in it.” The attitudes can change if “information on how treaty, subsistence, and cultural resources could be impacted [is provided to tribes] to alert people that they need to give it more attention.” Otherwise, the “perception within tribal community is that climate change is a boring subject.” The interviewees identified specific needs and made several recommendations below to raise and enhance the tribes’ internal awareness of climate change issues and challenges.

#### 5.1.1 Information Dissemination to Tribal Members

The interviewees were almost unanimous in the view that, to educate the general tribal population, one must focus on school-age children and then on the general membership, as exemplified by statements such as the following:

- + “It’s a matter of being informed and educated, starting with the grade schools. The way to go about it is through education.”
- + “Definitely target the younger school-age kids . . . they take that home and show their parents and ask their parents.”
- + “The more money we can put into education of young kids to connect them to protect their culture.”
- + “More public education—educating students in the school system, educating people about what they can do in their homes to conserve energy, community level involvement, monthly articles in our tribal [newsletter], television announcements.”
- + “Scientist/technical types can get on internet or gather information and keep themselves apprised, but more effort is needed to get to policy people and tribal members.”
- + “Present basic information that is not super technical . . . to get support from the rank and file tribal members.”



- + “Need to get our young people to start eating our own natural foods again. It will take more than 5 years, but our young people need to understand and learn it.”
- + “Whatever knowledge we have, need to make sure to give it to young people.”
- + “Indigenous voices are often ignored . . . people [agencies, outside entities] talk about climate change and then don’t even have a tribal representative in the room.”

### 5.1.2 *Public Information Content and Format*

The content and format of the climate change information must be developed in a way to make it easily understandable by tribal members. The interviewees expressed the following ideas regarding the content of the information:

- + “Get information out that it [climate change work] doesn’t seem politicized.”
- + “Make people aware of what the future entails.”
- + “Focus on what climate change means to individual tribal members, e.g., where you fish for salmon now may change in location and time of year, or it may not be available because of warm water.”
- + “Inform what a warming climate or changing precipitation patterns mean, followed by tangible actions that those individuals can take to reduce their carbon footprint in the long-term, e.g., you can help reduce this impact by embracing solar power and here is a program that the tribes are offering for free solar panels for houses.”
- + “Convey real-life situations.”
- + “Use testimonials of people who go to gather First Foods to educate others.”
- + “Document what’s happened so far.”
- + “Give visibility to our work” on climate change.
- + “Recognizing tribal successes at conferences increases tribal participation.”
- + “Don’t call it [climate change] a job killer.”
- + “The climate change document [vulnerability assessment] will be a key piece for developing awareness [Yakama].”
- + “o some citizen science projects that youth can do . . . helps create pride”



- + “People don’t want to see others who are not from our tribe talking about a project.”
- + “The more imagery we can get out there and especially for youth [the more it helps with tribal education].”
- + “Get the draft plan to the people to get awareness, especially after this year [2015].”

And the following ideas regarding the format of the information to be disseminated were put forward:

- + Distribute information in the form of “e-mails, briefs, or reports . . . little video clips . . . it is going to really take all levels of communication . . . can’t be a top-down approach . . . e.g., scientists talking to a berry picker . . . [it must be the tribal members presenting their case] and the scientist can back that up with graphs, etc. . . . shows goodwill and support to the people . . . can be as short as seven seconds, the YouTube generation.”
- + “Start education via public announcements through the local newspaper and radio . . . put on some events . . . go to neighborhoods . . . show that we are working for the community.”
- + It would be good to hold “probably a conference, meetings to talk to people about climate change, put flyers out.”
- + “More than just a conference or a presentation . . . it would have to be a campaign.”
- + “Can happen at public meeting or events . . . tribal events where we have booths and displays.”
- + “Eastern Oregon Forum had fantastic workshops; really useful information on what we could do on the reservation.”
- + “Do [more of] what you are doing right now, get surveys, see what tribal people are thinking about.”
- + “Highly technical presentations are confusing to lay people.”
- + “Make the scientific terms understandable to citizens.”
- + “Make sure it is connected to the culture . . . key in information transfer.”
- + “Develop community-based information that is inclusive of folks who may not have really technical skills . . . and then they will push the Council . . . that will give Council support to engage with CRITFC, and then CRITFC will engage the federal agencies.”



- + “The conference that ATNI put on was really helpful . . . sitting face-to-face with other people and hearing reports”
- + “Briefs probably are the best [dissemination tool] and then with links to go find [related information] directly from there.”
- + “I’d like to see what has been synthesized out of the meetings . . . what trends are we moving in . . . I have to communicate this to the policy people in our tribal Council and help them and guide them through what all this information means.”

### 5.1.3 *Role of CRITFC*

The interviewees had specific ideas regarding the roles that CRITFC can play in further educating the tribal general membership, including: being a centralized point of communication among the tribes and a clearing house of technical and other information; bringing the tribes together and being a regional and federal focal point for discussions; convening conferences, symposia, and forums to help bring funding; coordinating sharing of resources; and leading technical projects. As one interviewee stated, “CRITFC needs to participate in a real way, they have a unique responsibility within the fishery, they do a good job walking the balance of powers between the tribes, it should be more assertive relative to individual members.”

The following statements exemplify the above viewpoints:

- + “Information and resource flow; biggest roles for CRITFC.”
- + “A centralized point for the information from the conferences/symposiums would be good.”
- + “CRITFC is a good centralized location and regular meeting place. Good if it [climate change] became a regular discussion item on the agenda.”
- + “CRITFC can help keep communications open.”
- + “Provide funding or actually host conferences where the tribe can remain engaged in the larger community; making sure we are informed on the latest science and the latest opportunities for improving our situation—funding and forums.”
- + “CRITC should put forums together, they are in a better position to do this.”
- + “Host conference series specific to salmon and climate change every five years.”
- + “Could have climate change workshops at annual meetings to share what the neighboring tribes are doing.”



- + “First step would be to form an appropriate consortium between CRITFC and other tribal organizations to form . . . CRITFC can spearhead this to gather a number of tribes outside CRITFC and coordinate the outreach tools and messages . . . this will be a main source of information rather than everybody making it all up and recreating the wheel.”
- + “ATNI and CRITFC could take leadership positions in advocating for a larger tribal forum, pulling all the players together and funding integrated tribal assessment, integrated tribal plans instead of this patchwork.”
- + “CRITFC could help in terms of getting everybody on a coordinated regional effort not just a small tribal area.”
- + “Similar to what they are doing now: coordination and technical assistance and bring people and different groups together. They have really built a good foundation to do that and a lot of organizations and people are recognizing that now.”
- + “CRITFC could lead some project assessments possibly on a large scale that would be beneficial to all of the tribes; they could get all the tribes together to talk about climate change; they could look into partnerships with universities or other agencies.”
- + “This study is a big part of it . . . the study and its information [will help us understand] that we are not alone, and helps connect us . . . we all start realizing that we have a lot in common . . . to identify what we can work on together . . . keep doing what you are doing (this study) . . . just keep door open that people like you (CRITFC) can connect to the tribe and give them information.”

#### 5.1.4 *Recognition of First Foods*

Several interviewees expressed a need to have the significance of First Foods recognized more fully by the tribes, as exemplified by the following statements:

- + “We got slapped for even using this term [First Foods] . . . just the level of push back we’re facing.”
- + “First Foods is a term we have used over and over . . . but we have to fight to even use it because people felt threatened.”
- + “Our goal is to get those voices heard that say First Foods are important to us . . . that we don’t need a scientist to tell us that, but we can have a scientist to back us up, and that would help us.”

And finally, it was stated that “some elders [are skeptical as to] why are you going to play god? God’s going to fix what is being done.” Another dismissive viewpoint that appears to exist



within at least a segment of the tribal community is that “this is foretelling of what is to be expected because of the damage that the non-Indians have caused to all things.” There appears to be “a lot of fatalism with Indians, [and they will be] not going to be real proactive to take on things.” On a more pragmatic level, some tribal decision-makers have “kind of taken the position we don’t want to scare anybody . . . don’t want to say don’t drink that water, don’t go swimming.” These viewpoints are likely a normal part of the spectrum of thoughts that exist within the tribes on such profound issues, and are not dissimilar to the wider United States population. There are tribal viewpoints that well balance the more fatalistic thoughts, stating for example that “climate is part of the bigger picture of degradation of fish habitat, wildlife habitat, of forest, and all,” and further that “we cannot sit and do nothing, we are responsible and it’s under our law.”

## 5.2 Policy and Regulatory Needs

A variety of needs were expressed to create the policy framework and subsequent regulatory approaches to guide the tribes’ climate change efforts. The needs and recommendations fall within several categories, including how to help the tribes better voice their opinions and needs to outside agencies, how to develop new, or enhance existing, policies, and finally how to best increase tribal capacity (i.e., staff resources). The interviewee ideas are presented below.

### 5.2.1 *Develop New Tribal Policies*

The interviewees stated that none of the tribes “have set policies yet.” They recognize that “first, people need to understand [climate change], second recognize it, codify it, and memorialize it in our decision-making policies.” To accomplish that, the tribes need to “get data, facts, set [policy] direction, then pass resolutions and ordinances.” But the tribes are working to “come up with a climate change strategy or policy” where the issues are “beginning to be addressed, but need some direction . . . we are not scientists in Council.” There is a viewpoint that “policies should reflect the treaty.” But until “we change our mindset . . . we might have one-off success to get funds until we get our policy in place.”

However, at some tribes’ some level of “plans and policies are already in place, just need to have climate change information integrated into them.” Some interviewees thought that there is “no need for additional policies, we need to evaluate what we are doing, for example where we are with respect to floodplain [management].” Others thought that “we have to make what we have work better . . . some of the management plans and regulations—like burning policy—are not being followed very well.” Or that “we [Warm Springs] have really good policies in place, but they do not necessarily follow them . . . some type of enforcement would be good . . . for example, if the grazing plan was actually followed it would be better for the community.” Still, the interviewees by and large thought much more must be done to develop new climate change policies and or regulations, or incorporate climate change issues into existing policies.

Generally, the tribes need to “enact policies that educate tribal members on how to be stewards of tribally owned lands.” Specifically, they have identified that they need to know “what



climate change is . . . what the impacts are, and develop policy specific on climate change . . . from that they can develop their actions, regulations.” Currently, they need to complete their “adaptation plans and then policies to be proactive.” Once “finalized, the tribal council stamps it with a resolution to go to the general membership.”

The tribes need “to have better enforcement or regulatory type enforcement effort” developed internally, in parallel with policy development. They will need to have “implementing authority once the strategy is completed.” Regardless of the internal mechanisms, the tribes should be vigilant that they receive “assistance in the form of states doing the right things.” Politically, there is the understanding that “to put a dent in anything, it needs to become a legislative action at state or federal levels.”

Specific programmatic recommendations offered included the following:

- + “We have a lot of authority and power to regulate . . . so we have to train people about our treaty rights.”
- + “Direct [tribal] programs to account for climate change in their activities or management plans.”
- + Enact tribal “employee policies such as carpooling incentives, better management of vehicles, tribal laws and ordinances that can be enforced, provide incentives.”
- + “Need a framework, and funding to participate effectively in, regional efforts through the GNLCCs . . . need full-time staff at high management and tactical levels to be engaged.”
- + “Be more forceful to Congress so they honor their words in the treaties.”
- + “An annual policy directive.”
- + “More energy independence.”
- + “Need a communications policy.”
- + “Need to recognize First Foods as part of our management scheme, as a start.”
- + “Diversify the economy so it doesn’t rely only on natural resources.”
- + “Bring in business consultants to consider . . . new economies.”
- + “We have gotten into the non-Indian perspective where we exceed what we need . . . to some degree it’s okay. But when it becomes excessive or abusive then it’s a concern.”



- + “Need to be smarter in cutting cost, e.g., there’s a lot of waste in electricity usage.”

Recommendations specifically regarding water include the following:

- + “Start to inventory who needs water and how much water landscape can provide.”
- + “Make sure water gets back to river [Yakama], and without pesticides and other nutrients that diminish its quality.”
- + “Irrigators aren’t going to trust the Indians—Need to build trust based on common benefits.”
- + Need to work with “Oregon and Washington . . . to identify increases [in flow from in-stream gains] and protect them, and enforce it accordingly. Their management of water hasn’t changed much.”
- + “Provide incentives to landowners to improve riparian fencing and maintain it.”
- + “Improve our water infrastructure.”
- + “Building of channel reservoirs . . . may have to be something this region considers.”

Other specific recommendations included the needs to focus on building “energy efficient buildings” and on “carbon reduction across all aspects of human activity where the tribe has authority, policies that promote green energy sources by the tribe, but also putting stipulations on carbon generation by non-tribal entities within the reservation boundary.”

### 5.2.2 *Additional Studies to Help Develop Policies*

The following needs were identified, and recommendations offered, for additional studies to help the tribes set new, or enhance existing, policies:

- + “Doing what you are doing right now . . . getting surveys, seeing what tribal people are thinking about . . . getting the best understanding from a technical side, having our folks understand . . . be well engaged with the politics, from the federal agencies, and at state level.”
- + “Four tribes getting together and saying TEK is valuable, period.”
- + “Show that people can still make a living on resources, but need to change how we manage it than stopping every activity we do.”



- + “Show that you are not going to get hurt if we change how you fence off the range, or how you use irrigation water or how you do these things.”
- + “Show that climate change adaptation doesn’t mean that there are no ways to make money.”
- + “Give information to folks that they don’t need to be afraid, that this is actually going to help them.”
- + “Show the most affected people who don’t necessarily see that this could actually help them.”
- + “Show that in the long run we will be better off . . . our grandkids will be better off . . . more sustainable . . . more resilient.”

### 5.2.3 *Internal Capacity Building*

By far, the greatest need identified by the interviewees at all the tribes was availability of “knowledgeable committed staff” to focus on climate change issues. To address this need, Warm Springs has formed a climate change work group, and the Umatilla Department of Natural Resources has an inter-disciplinary team approach. However, other than the new position created by Warm Springs with limited initial funding, climate-change-related work is done by staff who are already committed elsewhere. Specific viewpoints expressed include the following:

- + “Staff needs to be focused specifically on the impacts [of climate change] and the ability to address whatever those are.”
- + “Get a dedicated climate change employee so there is a centralized location to raise issues and discuss consequences and impacts.”
- + “Within five years we need to have a program and technical staff that specifically deal with climate change.”
- + “Train a position as the first step. We have no dedicated staff right now.”
- + “Need dedicated staff that is integrated with the tribal programs.”
- + “Definitely need staff specifically working on climate change.”
- + “Need a coordinator . . . an entire job description, full-time job.”
- + “Definitely create a climate change program.”



- + “Fixing it is going to be different for all regions. All of us have the water temperature problems, may not have the same solution to address it . . . all have a different approach, but it needs a coordinator.”

#### 5.2.4 *Voicing Tribal Viewpoints Assertively*

The tribes recognize that they need to “be more diligent in reaching out to authorities.” The tribes “are not totally silent but don’t think [they] are as loud as [they] could be.” They must work to have their ideas, positions, and views better heard at the federal, state, and regional/local levels. This may also include strategies to “go out, fight, and use our treaty rights for our gathering and subsistence.” An example of this strategy may be “go to court like we did for the fish to have berries put into management plans for the national forests in our ceded areas.”

The tribes have been proactive in voicing their opinions to some degree—some tribes more than others. They realize that they are “still forming [their] position” on climate change impacts and specific effects on their resources and ways of life before voicing it, so have not really reached out yet. As the vulnerability assessments and adaptation plans of action are developed by the tribes, the positions of the tribes to request resources both internally and externally will be much strengthened. The tribes are starting to ask agencies and partners about their activities more directly.

Additional specific effort can be expended within existing forums. For example, the tribes must “exercise more influence through the intertribal timber council” or contribute more assertively to the “Indian Forest Management assessment team that . . . looked at climate change.” In addition, more effort must be devoted to enhancing communication with the federal, state, and local agencies so that they can better coordinate efforts, take advantage of funding opportunities, and have policies and regulations that are enacted in their state and surrounding communities not negate the effects of tribal policies. Ideally, such policies and regulations would help them to protect their resources and cultural values from climate change impacts. Specific actions recommended by the interviewees to increase effectiveness of their communication with the federal agencies are as follows:

- + Tribes must convey “more information to [the federal agencies]. The agencies really need to understand their federal role and trust responsibility better.” The tribes “need a stronger response from the feds.”
- + The agency liaison staff must make more focused efforts to more effectively connect the tribes to the agencies on multiple levels. “Federal agencies . . . do their climate vulnerability assessments . . . without contacting the tribes to participate . . . they communicate through tribal liaisons, which doesn’t necessarily work . . . better to have the agencies do a direct communication with the tribes.”



- + Engage with the BIA more directly and effectively. The BIA appears to be more involved with the tribal climate change efforts than other agencies. They have funded the tribes' initial assessment and planning efforts. However, it is not clear how much they really understand the extent of the tribal needs for resources. It appears that the BIA "doesn't have the personnel or the capacity to do much on climate change."
- + Engage more effectively and extensively with other federal agencies such as the EPA, U.S. Forest Service, and others. The tribes have been voicing concerns and expressing the need for more technical and other resources to assist the tribes. The GNLCC has been a notable success in this regard, but in a limited way. It is led by the U.S. Fish and Wildlife Service and the National Park Service. These agencies appear to listen to, and incorporate, the tribal members' views in their planning efforts.
- + The tribes must continue to "ask the federal government to do a better job of planning or accommodating climate change within the ESA permitting and biological opinion processes, e.g., including climate change considerations into litigation such as that with timber harvest and mining activities litigation."

As discussed previously, the level of communication with the state and regional entities appears to be uneven among the tribes, with Idaho's dialogue with Nez Perce requiring much more attention than others at the state and regional levels. Specific recommendations include the following:

- + The tribe must form "a clear opinion and strong statement on climate change" as the basis for its actions.
- + Tribes must work with the state to identify "processes/forums" to foster mutual working relationships. Start with state agencies such as the departments of Water Resource and Environmental Quality, with whom the tribe currently has good technical relationships.
- + Find ways to "communicate in a way that can give them [the agencies] some understanding of the importance of what we are saying."

#### 5.2.5 *Role of CRITFC*

It was stated that the tribes "could almost form a commission just specific to [climate change]." However, there appears to be a change of perceptions regarding effectiveness of CRITFC, as exemplified by the statement "Don't agree with the old argument that we don't want to go through CRITFC because we can do that on our own . . . the younger generation is ready to say why do we have to re-invent everything." The interviewees made many statements to indicate that they perceive CRITFC as the primary tribal organization best suited to help the tribes with the climate change issues.



In general, there is an internal tribal role and an external role within the broader community (outside agencies and entities) in which CRITFC can assist the tribes. Externally, CRITFC was recommended as the organization to advocate the tribes' positions with the federal, state, and regional and local agencies on the one hand, and with the business interests on the other. The following statements exemplify this viewpoint:

- + "CRITFC does a good job of advocating for us."
- + "In Washington State, large industries, Boeing, Weyerhaeuser, the aluminum industry, farmers, etc., dominate. It is hard to get around all the lobbyists for the corporations. It always comes down to loss of jobs—we need to reach out to the investors in these corporations."
- + "Don't really feel like it [our opinion] is necessarily being heard [by agencies], probably . . . but work that CRITFC does touches on both regional and federal governments."
- + "We cannot do it alone . . . going to take on everybody . . . need tribal partners . . . like CRITFC and others."
- + "Use them [CRITFC] as a buffer, especially with certain issues where CRITFC can take a position that really hurt the tribe, or be adverse to the tribe . . . CRITFC can take the lead."
- + "CRITFC is stronger at a national policy level, even at state and local levels, too."
- + "[Can consider having] climate change accords like the fish accords."
- + "Same as the salmon . . . would be CRITFC and the other tribal organizations on the river."
- + "Maybe can use the Columbia River Treaty as a model [for climate change discussions]."

Internally, the interviewees recommended that CRITFC help develop policies on a state and regional scale to benefit the tribes as a whole and provide bridges among the four CRITFC tribes and also between them and the other tribes. The following statements exemplify this viewpoint:

- + "A way for tribes to get information that wouldn't seem so political . . . through CRITFC or somebody of people that we can trust"
- + "Making climate change a piece of how they think . . . it's already helped . . . people said climate change isn't even real and . . . it is on CRITFC level, on ATNI, on the National Congress of American Indians level . . . those are all good things . . . if they just keep hammering it home to our leadership"



- + “What are the primary things politically, economically, socially, and ecologically that the plateau tribes can get together on and collaborate on so that we can start to fill gaps collectively. Plateau tribes are by my experience some of the most sophisticated in terms of their governance, their science, their use and integration of traditional cultural knowledge, e.g., the First Foods mission of this tribe”
- + “It’s going to take a neutral party/group like CRITFC that doesn’t share in individual tribal interests to bring everybody together”
- + “We could go to ATNI or one of the larger tribal organizations and develop an integrated tribal climate strategy and identify things that we can do at home and identify things that we need to influence away from home and identify science needs that are unique to the tribal first foods conservation vision and push for funding of those science needs”
- + “We all have the same concern so better work together”
- + “CRITFC can coordinate with other CRB tribes”
- + “CRITFC could take leadership positions in advocating for a larger tribal forum, pulling all the players together and funding integrated tribal assessment, integrated tribal plans instead of this patchwork”
- + “Interaction with the other tribes is good especially at the policy level to resolve cultural issues between Indians and non-Indians. This is a national issue, so joining together in tribal organizations presents a more unified front”
- + “Try to standardize” practices and approaches
- + “Do [more of] what you are doing right now, get surveys, see what tribal people are thinking about”
- + “A lot of people see this information as threats . . . internally the loggers are upset, the ranchers, they are worried . . . afraid for their livelihoods . . . they think we’re coming after them . . . facing quite a bit of institutional resistance and push back . . . hopefully CRITFC can help be an ally.”

### 5.3 Technical Needs

The technical needs focused on raising the tribes’ internal technical awareness, programmatic changes to accommodate adaptation/mitigation efforts within the current tribal infrastructure, specific technical studies, enhanced efforts to protect salmon species, additional technical, staffing, and training resource needs, and the roles recommended for CRITFC. These needs are described in detail in this section.



### 5.3.1 *Raise Internal Awareness*

There is a need to increase the level of technical understanding of the climate change issues within the tribal general population. They need to be informed as to “what a warming climate or changing precipitation patterns mean, followed by tangible actions that those individuals can take to reduce their carbon footprint in the long term, e.g., reduce impact by embracing solar power and here is a program that the tribes are offering for free solar panels for houses.” There is a “need [for] historical data . . . good data on snowpack, snow melt, and salmon runs and temperature . . . to develop educational information based on this data and get buy-in . . . right now it is difficult [to get buy in] . . . since information is not in writing, it is kind of hard to see long-term needs . . . also need elders to weigh in.” Finally, “a lot of people are working on climate change across public and private sectors and we don’t want to reinvent the wheel, so being engaged in what others are doing, communicating back to tribe at all levels is vitally important.” See Section 5.1 for additional education needs.

### 5.3.2 *Programmatic Changes*

A wide range of recommendations were made that affect how tribes may revise their programs to deal with climate change impacts. There were recommendations on unique specific situations such as adding provisions to enforce the grazing regulations in the Warm Springs IRMP because “there are grazing associations with complete authority [who do not report to Council] . . . they overgraze,” or to “encourage recycling, things that are important to the reuse of materials” on the Umatilla Reservation, or the “need to completely rethink how we [Yakama] coordinate and interact with multiple county, state, federal, and tribal governments to work on the big picture . . . very expensive items . . . need to be thinking about it sooner rather than later.” However, most of the multi-tribal recommendations made were to enhance internal planning, manage natural resources, and develop energy programs.

A few needs were identified that transcend specific tribal programs. These include an emphasis on internal motivations i.e., “Make sure the tribal programs are fed by your own community,” or conducting demonstration projects that allow the tribes to test new ideas, i.e., “Do pilot projects to try different approaches and don’t invest too much in any one project”. Another recommendation was to take a long-term view of the adjustments that the tribes will have to make to address climate change impacts, i.e., “in the longer term, we need to be much smarter about the types of impacts that are going to occur and start to adjust our infrastructure and what we’re implementing on the ground to make sure that they are functional under a climate change world, e.g., changing our energy sources now to be less carbon-intensive types.”

Programmatic needs expressed that affect a wide range of natural resources include the following:

- + “Let’s put legislative tools in place . . . get our conservation partners focused on buying [land] properties [for] conservation . . . take our financial resources to [help] conservation organizations so they can do that.”



- + “Need the Natural Resources Department to take a position and see if the Council wants to adopt it . . . don’t have goals right now.”
- + “Keep your actions at the local level, but they have to be tiered into a larger level, because that is where the changes are occurring.”
- + “Needs to be teed up from the existing Col River Treaty discussions, already somewhat of a forum, can be evolved into a climate change one.”
- + “We can get all together probably the same way as through the Columbia River Treaty . . . we all have our own individual interest, but we also recognize that this is a nationwide problem, not just basin-wide . . . all of us can be working and putting the pressure on the different states and federal agencies to address climate change to seek a solution as to how we can gather the data, seek a solution, and develop an overall plan for climate change.”
- + “Unless we figure out how to make it a basin-wide approach, we’re not going to get the states and the federal agencies to step up . . . we did it with the Columbia River Treaty and we can do it again with the Columbia River climate change.”
- + “Not really focusing on all the resources . . . more focusing on fish, plant resources, and not seen very much on wildlife.”

Needs expressed that specifically affect tribal water resources include the following:

- + “In the short term update the IRMP [Warm Springs] . . . build more hatcheries in the woods, more acclimating ponds”
- + “Need a better relationship with the State regarding transportation infrastructure and its impact on water resources”
- + “Updating our plans in our contingencies . . . water management to conservation . . . our wells [Warm Springs] are running dry in the rural areas and so our people don’t know what to do . . . don’t really have a plan”
- + “Change the way we [Warm Springs] get our water supply . . . adapt our drinking water quality . . . implement water conservation, develop a plan and infrastructure to conserve water”
- + “With the increased rainfall and less snow, can we store some it for later release?”
- + “Slow down the erosion that comes with the peak flow”



- + “the more resources available to work on habitat issues at the watershed scale, the better off we are”
- + “The better the watershed is in the near term, the better we are in the long term”
- + “Let the natural process revitalize itself from tributary watersheds all the way to the confluence”
- + “Need to fully implement the various plans e.g., Yakama Basin Irrigation Plan”
- + “Do conservation on all water projects . . . it’s the whole picture broad spectrum, getting roads out of creek beds, letting floods happen like it would naturally”

Needs expressed that focus on tribal plant resources include the following:

- + “Manage native vegetation in the short term [like managing other resources] . . . convert tribal lands that were converted from forest land to other uses back to forest lands.”
- + “Need to get more nurseries restored to replace lots of plants that are specific to the region where they come from.”
- + “Thin forests to reduce fire risk.”

Needs expressed that focus on tribal energy use and planning include the following:

- + “In the long term, focus on energy policies, decrease use of fossil fuels and [switch to] other energy uses, e.g., solar, wind.”
- + Focus on “tribal response to our energy use . . . need to be thinking about energy footprint, reducing energy consumption, generating additional solar energy, better insulation.”
- + “[Focus on] solar panels; reduce our dependence on hydroelectricity.”
- + “Use better technology in our buildings, use more efficient heating and cooling systems.”
- + “Continue with more green buildings and more energy efficient kind of things.”

### 5.3.3 *Technical Studies*

The tribes are in various stages of conducting climate change technical assessments and adaptation planning. They are “not at a point to know what else exactly needs to be done . . . after the plan is in.” Additionally, as discussed elsewhere in this report, many studies have been done by tribes and others that relate directly to understanding climate change impacts on tribes.



Several of these are ongoing. For example, the Umatilla staff is “working very diligently through GNLCC to pull together critical information about the potential impacts of climate change on the tribe’s First Food.” Nevertheless, several technical studies were recommended to assist with planning and mitigation as detailed below.

More general recommendations include the following:

- + “We’re now seeing changes, but don’t know if we’re documenting it yet.”
- + “All the tribes probably have the same concerns—is there less precipitation? Is there dropping surface in groundwater? All these metrics or data, we probably ought to be doing it together.”
- + “Sharing overall ability to compile broader units of data would be good for all of us probably. Climate change is so big; it’s not something you could probably measure in one drainage or one watershed. We ought to jump in with regional data sharing and consistency.”
- + “Need to look at connectivity for different species which frequently cover the same [ecosystem] bottlenecks. Need to identify, from the 10,000-foot level, the most critical bottlenecks and then develop working groups to address that with the political, social, and economic tools necessary.”
- + “In the next 5 years, it’s really important to solidify the long-term monitoring actions and get them started . . . then maintain those in the long term . . . need to have resources available to react to environmental conditions.
- + “Monitor First Foods . . . we have data that are interesting to look at.”
- + “Understand the life cycle of the natural foods.”

Recommended studies focused on plant communities include the following:

- + “[Conduct] lot of vegetation type work . . . effects of climate change on certain ecosystems . . . more of that [type of work] would be in our best interest . . . some watershed-scale work would be good . . . like for the entire Deschutes Basin.”
- + “[Focus on] changes in water quality and disease expression . . . forecasting will be a huge thing . . . e.g., change in elevation of huckleberries and its potential expansion over the next 50 years . . . as precipitation becomes less at lower elevations but offers opportunities with increasing elevation.”



- + “Monitor vegetative index . . . monitoring info in general is lacking for things like soil moisture long term.”
- + “[Continue with the] Phenology [project]- very very, long term . . . unfortunately the money doesn’t match the timeframe . . . has to be over 30, 40, 50 years . . . challenge is to keep funding coming once you get something going since monitoring is long term . . . just two years’ worth of data isn’t going to be useful.”
- + “Much of our vegetation monitoring has been centered on tree growth and timber production, and not as much on other species in the forest; monitoring distribution of all species would be useful.”
- + “There are huge data gaps in understanding of species responses, e.g., how huckleberries react when temperature gets warmer.”
- + “Might need to do an updated forest inventory.”

Recommended studies focused on game species include the following:

- + “Lots of wild horses . . . need a place to sell them . . . horses overgraze the grasses and weeds come in.”
- + “There [are] data gaps regarding individual species migration corridors and connectivity, although there is also much data available.”

Recommended studies focused on water resources include the following:

- + “Stable isotopes are really useful to determine residence times with a given water year . . . how connected it [a body of water] is to a given water year . . . ages of all our water sources . . . it is expensive and should be an interagency type of approach.”
- + “Need water studies, aquifer studies . . . don’t think we got the technical staff to do that . . . have adequate water rights in the water settlement but we don’t have the staff, or the money to do the other needed studies.”
- + “Water quality and water quantity retention studies . . . undoing past decades of water grabs as a result of Snake River Basin adjudication.”
- + “Our biggest concern is reservation water . . . what are [our water] resources going to be like in the future and how can we reverse impacts.”
- + “Do assessments of our Wapato Irrigation Project dealing with Yakama Basin flows.”



- + “If there is climate change in weather patterns and less precipitation, maybe we need some more precipitation monitoring; surface and groundwater monitoring.”

#### 5.3.4 *Salmon Protection*

Interviewees identified the need to change habitat protection to a holistic, system-wide approach from the current approach, as exemplified below:

- + “Use whole ecosystem approach. Otherwise we won’t have salmon in 50 years and no need for hatcheries.”
- + “Use climate change as a great mechanism to seek holistic type of systems approaches.”
- + “[Need to] look at watersheds . . . use a holistic approach.”
- + “[Focus on] watersheds and systems as a whole.”

Recommended studies focused on the ecosystem include the following:

- + “Look at water quantity, quality, and habitat restoration . . . don’t just focus on a hatchery mindset.”
- + “Build fish habitat with access to cold pool water from groundwater, water from deeper wells . . . try to come up with habitat designs to lessen some of the impacts.”
- + “Acceleration of floodplain restoration is very appropriate, acceleration of legislative processes to remove constraints to flood plain [restoration is needed even more].”
- + “Forest Service lands have roads and have the best fishing habitats, water, and watersheds—got to get the fish to where these are. This will cost a lot of money, but the burden has been borne by our people, it is time for them to step up.”
- + “[Need to continue] doing the same things we are doing but in smaller tributaries . . . seems like all the projects we are doing habitat-wise are these big, mega, Cadillac projects that are costing millions of dollars, but we have got a lot of smaller tributaries. Years ago, we put roads up them and incised all the way up. We seem to be ignoring them. We can mimic dams, beavers and put these little check dams in them just to get some silt and water to start staying in the system a little bit longer. Get cottonwood and vegetation growing. Trap some beavers and put them in there.”
- + “Near-term, intensify the planning and assessments for longer term actions. We’re doing a lot of planning and large stream reach assessments for future floodplain work . . . intensify planning and assessments for floodplain enhancement, intensify planning for efforts to



acquire more in-stream flows (purchase, available water rides, irrigation efficiency, flow exchanges, anything that results in more in-stream flow); intensify water conservation planning.”

- + “Pending completion of the vulnerability assessment . . . if flooding is seen as an issue, then new bridges probably going to be the greatest impact other than temperatures.”
- + “One thing we’ve been pushing, along with BPA is: let’s fix the habitat . . . the water is going to stay in the basin longer, it’s going to filter itself longer and it’s going to be cooler when it gets to the Columbia River. There are 39 tributaries and if all of them keep the water cooler and in the system longer . . . would impact the Columbia Basin as a whole.”
- + “Because of the construction of highways or railroads, they straightened the Umatilla River. Because of the meandering that we’re creating in the river now, we’re creating more opportunities for water to filter and keep itself cool . . . that needs to be documented because then we’ll get more money into habitat projects.”
- + “Fully engage the accords to do the habitat work to make the river more functional.”

Specific studies were recommended to focus on water quality enhancements, as follows:

- + “[In the future, we] will be looking at less water, and fires will burn near spawning beds most likely.”
- + “[Need to push establishment of] water quality standards with the state of Idaho and the Forest Service on federal lands management . . . need to be more active.”
- + “Stop putting Band-Aids over these large problems like toxins, irrigation chemicals, water temperatures.”

### 5.3.5 *Additional Resource Needs*

It is clear from the interviews that there is much work that the tribes realize must be done and very limited resources to do them. It was stated that “Yes . . . we will need assistance to rebuild, to restore and protect . . . tribes can’t do it alone . . . going to have to restore our water, land, timber harvest.” The need for additional funding support is discussed specifically in Section 5.4. The needs for technical resources, additional tribal staffing, and training are discussed below.

### **Technical Needs**

It was stated very clearly that the tribes must conduct much of the climate change work themselves, due to their familiarity with the needs of their reservations and ceded areas, and familiarity with and direct interest in their objectives. But they realize their interdependence



with universities and governmental agencies in accomplishing their objectives. These viewpoints are specifically included in the following interviewee statements:

- + “Tribes should conduct the monitoring . . . There is potential for the tribes to work with each other on certain projects.”
- + “Tribe should conduct them, takes a great deal of leadership, lot of dialogue to make sure we don’t leave an important species out . . . not interested to tell everybody what all the species are good for so we don’t draw more attention to our resources than we have to.”
- + “Conducting these studies is probably bigger than any one entity . . . tribes have a unique position to do a lot of that work as well as leverage others to partnership or take the lead.”
- + “They are doing studies but it’s not tribally focused. Studies don’t have to be tribally focused but just looking at those communities that support our First Food or our resources that are important to us.”
- + “Need our own people, own biologists, own scientists.”
- + “A lot could be done, not by just one entity. It’s going to take a lot of different research institutes, laboratories, Forest Service, and NW Research Station. There is interest in Umatilla Tribe collecting their own information.”
- + “Data should be shared . . . the Forest Service has a network and monitoring plots across the country . . . need to standardize certain data collection procedures between groups, so that data is more usable over large areas and more reliable.”
- + “Soil and water conservation districts and universities need to study how to retain soil better in climate change.”
- + “Collection of studies and research directly applicable to our homeland with support from area universities/colleges.”
- + “Universities need to produce studies geared to Nez Perce homelands or on a broader spectrum of industry and natural resource management in the region.”
- + “We need federal land managers to protect our treaty area to truthfully begin to incorporate management regimes or philosophies that would be necessary to protect the treaty resources.”
- + “Need a combination [of financial and technical assistance] . . . if independent people [are contracted to conduct studies], bring folks from the tribe in an internal capacity.”



- + “[Agencies should try to] partner with a broad base of the tribe, not just with the departments”
- + “NRCS [National Resources Conservation Service] apparently has tribal programs” which tribes might take advantage of.
- + “Partnerships with Pacific North West Research Center, with EPA, definitely with our trustees U.S. Forest Service, BLM.”
- + “There’s a lot more work to be done. Probably by universities, it could be tribes, maybe even as partnerships with multiple parties looking at the same challenge.”
- + “Definitely need to utilize the UW [University of Washington] and UI [University of Idaho], OSU [Oregon State University], UO [University of Oregon] have really good climate change programs and much technical resources.”
- + “Need financial assistance and technical support . . . need climate scientists to help us understand what really is going on.”

### **Staffing Needs**

Additional staffing at the tribal departments and institutions are needed to focus on the climate change issues and coordinate development of mitigation strategies and implementation plans, as exemplified in the statements below.

- + “Need to have own people to be educated to help the tribe. When we have our own people we can incorporate our value system” into the projects.
- + “More resources would definitely be helpful; we could be collecting more useful information, but we do not have the staff.”
- + “The Tribe does not have the resources to conduct long-term monitoring and collect this data right now.”
- + “Have some staff capacity . . . need additional capacity . . . there is potential to work with the universities.”
- + “Need more people, up to three perhaps, to address all these thing . . . we don’t have that yet for ecosystems.”
- + “Making efforts to try to recruit more of our young people into natural resources studies, hydrology and the kind, like to have our own tribal members be put in these.”



- + “Tribe needs additional resources to help out, we have a lot of institutional knowledge to help frame the studies internally, but to have the capacity to really do that we need more people.”
- + “They need assistance, e.g., additional staff, more help in planning/managing for federal lands within the tribal territory (vegetation management, controlling invasive species, species migration, reducing the effects of fire on the land).”

## Training

Additional training of tribal staff will enhance tribal infrastructure capabilities, as follows:

- + “We are kind of at the 30,000-foot level in the Council . . . get everyone to a training to [learn] what other tribes are doing . . . can spark their mind.”
- + “I am more technical than people I work with, but I feel at the same time so green in my technical experience . . . some way to have additional training to do climate change work.”
- + “EcoAdapt developed an online toolkit called CAKE . . . it is a matter of time to get into it and learn it.”
- + “Need to be educated in how to effectively use those tools.”
- + “Should be joint effort with others, they are opportunities for our staff to get hands-on experience, lot of internal information they have that helps us out.”

### 5.3.6 Role of CRITFC

It is believed that “CRITFC is plugged into climate change networks.” As a result, the interviewees recommended that the primary role for CRITFC is to act as a focal organization on behalf of the tribes for the following broad range of services:

- + “Similar to what they are doing now. Coordination and technical assistance and bring people and different groups together. They have really built a good foundation of being able to do that and a lot of organizations and people are recognizing that now.”
- + “That connection of trying to bring people to the table; they could host things and invite all the tribes to come to talk about specific things like fisheries or wildlife.”
- + “I understand a little about what each of the tribes are doing . . . think we need to develop a coordinated approach . . . learning from each other so that we have a terrific plan with the four member tribes on how we’re going to work together to protect our First Foods.”



- + “Yes, we have examples of these adaptation strategies; need to stop everybody creating their own and start looking for ones that are already done and let’s get a group of tribes, tribal staff and leaders, together to craft a common framework where we can easily talk to one another about where we can collaborate to address the climate change and the opportunities and the threats that it presents.”
- + “Need some form of technical clearinghouse for technical staff to interact with other colleagues, tribes.”
- + “Any information they are willing to share . . . maybe on a secured website that the tribes have access to, maybe CRITFC, maybe through data sharing agreements, maybe a conference.”
- + “Meetings, conferences, centralized website or database where tribes can throw their non-proprietary information; one central location that everybody knows.”
- + “Similar to what they are doing now. Coordination and technical assistance and bring people and different groups together. They have really built a good foundation of being able to do that and a lot of organizations and people are recognizing that now.”
- + “CRITFC could help get everybody on a coordinated regional effort not just a small tribal area.”
- + “Broad integration and coordination across tribes, agencies . . . any field work, monitoring . . . some kind of depository, common sites where standard monitoring [data and information] goes and everybody contributes, [then] we might really have something.”
- + “Develop capacity in the membership committee . . . CRITFC can bridge that gap.”
- + “Everybody is competing for finite funding, so nobody [tribes] has the incentive to help the other tribe out . . . everyone is acting like . . . not going to tell them anything, don’t give any secrets out.” CRITFC may provide a mechanism to bridge that gap.
- + “Models or studies that are indicative of resources or treaty resources that are important to more than one tribe. Inter-tribal organizations can create things that are a benefit to all tribes, regionally, e.g., CRITFC regarding the cold-water refugia for salmon recovery.”
- + “Technical role, coordination between the tribes so that we can address it as a region where all tribes are working together if we want to have a change in policy and regulatory changes.”
- + “CRITFC could help in terms of getting everybody on a coordinated regional effort not just a small tribal area. ”



- + “Some kind of protocol or methodology or identification of key metrics to monitor so we’re all kind of on the same page . . . CRITFC would be in a good position to convey that to all member tribes, and to other tribal organizations.”
- + “Other tribes . . . playing a role but first we have to have a standard important metrics protocol. CRITFC is more in a position to help us do that.”

A counter-point was expressed that “Climate change is so broad . . . First Foods, water, employment, natural resources . . . have to coordinate . . . facilitate . . . they [CRITFC] are more salmon driven . . . not really climate change . . . if get outside salmon area, get onto other tribes, don’t like them doing that.” It appears that if CRITFC is to provide a significant role in climate change work on behalf of the four tribes, that this issue must be addressed.

Recommendations on conducting technical assessments include the following:

- + “CRITFC could lead some project assessments, possibly on a large scale, that would be beneficial to all of the tribes . . . they could get all the tribes together to talk about climate change . . . they could look into partnerships with universities or other agencies.”
- + “CRITFC has a research branch, so they do some data collection . . . they coordinate with tribes within the Columbia Basin; they could have a role in coordinating the whole landscape with the Basin.”
- + “Provide lot of technical assistance . . . already paired with CRITFC to do some database stuff, trying to use the Ecosystem Diagnosis and Treatment model.”

Recommendations on providing political support to the tribes include the following:

- + “Tribes all got this initial shot through CRITFC, so continuation and support of both initial studies or assessments . . . and then CRITFC would probably support this unified approach or data management, puts all on the same page for collecting information.”
- + “If CRITFC could talk to BPA to identify how to interact with them to disseminate information to the tribes . . . do studies . . . and generate data . . . identify resilient watersheds or strongholds.”

## 5.4 Funding Needs

Interviewees identified a broad range of funding needs. From their statements, it is clear that additional and continued financial support to the tribes is critical for them to achieve their climate change adaptation goals. A baseline level of financial support has been provided (mostly from BIA) specifically focused on completing vulnerability assessments and adaptation planning. However, “providing additional funding sources that span not just natural resources



but the whole social complexities, psychological conditions, and human health” is required to fully address climate change impacts. This section includes interviewee thoughts on areas where specific financial resources are needed by the tribes.

General needs identified include the following:

- + “Tribe needs additional resources, outside funds . . . because we fund things that will generate revenue, but this [climate change work] isn’t a revenue builder . . . have to look at protecting our resources . . . federal funding is especially needed.”
- + “Need financial assistance . . . if we could create true climate change funding . . . create educational opportunities for tribal members to pursue research on their own reservation, and bridging the culture and the community to climate change and adaptation policy reform.”
- + “Funding the working group [Warm Springs] would incentivize more work to be done.”
- + “There will be money for assessments . . . have to get the mindset changed in DC that all tribes are not the same . . . not all are going to do the same thing and require the same funding. Some will be able to do something more innovative or have a different situation, and some are going to have to have a lot done.”
- + “I don’t think we have an infrastructure problem. We have a funding staffing problem, not an infrastructure problem.”
- + Funds needed to focus on educational and networking opportunities include the following:
  - + “Traveling money . . . to attend region-wide meetings”
  - + “Tribe needs more funding . . . for education and understanding impacts . . . funding to participate meaningfully.”
  - + “Providing funding or actually hosting conferences where the tribe can remain engaged in the larger community; making sure we are informed on the latest science and the latest opportunities for improving our situation.”

Funds needed to focus on policy changes include the following:

- + “We need to fund a more deliberate look at the socioeconomic human migratory issue; people need to understand that threat.”



- + “It is important for our policy people to encourage collaboration with different entities to seek out funding agencies that might be capable of increasing capacity to address climate change.”

Funds needed to focus on technical needs of the tribes include the following:

- + Funds needed so the tribes can “pay their employees . . . insufficient pay forces people to leave after a short time and the new people must be trained from the beginning.”
- + “We will need funding and a connection to experts, either in the university setting or federal agencies or independent think tanks, to gain technical knowledge and so we have a place at the table in protecting our treaty and subsistence resources.”
- + “Definitely, funding will be needed to put natural resources management actions in place that either sustain the existing treaty resources or help promote new ones; to educate and promote the Indian way of life with alternative approaches; dealing with the potential threat to tribal community infrastructure.”
- + “Need financial assistance . . . to help us understand what really is going on.”
- + “Need help and resources, financial resources to conduct some of the studies in partnership; we have done it with federal agencies and need to continue to have those partnership; enter into data sharing agreements.”
- + “We need continued funding to enhance floodplains . . . federal and state floodplain management needs improvements . . . what the Corps of Engineers has done in the past and still does to floodplains . . . counties still allow development in floodplains through their land use regulations . . . tighter management rules and regulations that recognize the value of floodplain health and water and stream. Tribes will need assistance to ramp up our co-management efforts to deal with the counties and the cities not just states.”
- + “Will need funding to support research, ideas for adaptation.”
- + “We need a regional framework and funding to participate effectively in it. The framework is starting to develop through the GNLCCs, all LCCs, but we need full-time staff at a high management and tactical level to be engaged.”
- + “Secure long-term funding for water temperature and water flow databases; the NW database that the USFS [U.S. Forest Service] has developed is a great tool for tracking and assessing climate change here at the local level, but it does not have long-term funding.”
- + “Funding for monitoring long-term population status and trends for multiple species has not been established with climate change monitoring as the primary justification in the



Snake Basin. We have started some abundance monitoring for steelhead in multiple streams, but we have not secured funding to understand how steelhead within these populations may use different elevations to maintain their lifecycle.”

- + “Tribe should be at the forefront in collaboration with the State Fish and Wildlife Manager. Federal funding from National Marine Fishery Service, NOAA [National Oceanic and Atmospheric Administration], and joint effort with U.S. Fish and Wildlife Service would be highly justified. They should set up a long-term funding commitment . . . these are 50-year funding decisions.”
- + “Some startup money could get us on a different trajectory of how we’re going to do new land management practices.”
- + “More resources would definitely be helpful; we could be collecting more useful information, but we do not have the staff.”

Roles that CRITFC can assume in generating additional funding support include the following:

- + “If the organizations could show that there is funding available and how to best match that . . . they could be the umbrella organization to help tribes administer them . . . every tribe is trying to do everything all the time . . . we are grant submitters, overseers, and everything else . . . what if CRITFC had a position that focused on only getting grants . . . we would answer to CRITFC and they answer to funding agencies . . . prepare the quarterly or annual reports”
- + “Better communication with CRITFC, with enough heads-up time to really go after some of these opportunities [grants, funding, others] that are available to tribal members.”
- + “Get funding through CRITFC so we can do the important work, it requires resources.”
- + “Support from CRITFC from Pacific Coastal Salmon Recovery Funds”
- + “What’s been really helpful is CRITFC applying for the climate change funding on behalf of the member tribes.”
- + “ATNI and CRITFC could take leadership positions in advocating for a larger tribal forum, pulling all the players together and funding integrated tribal assessments and plans instead of this patchwork.”

## 5.5 Summary of Key Findings

The interviewees discussed a wide range of needs to assist them with their adaptation and mitigation goals. By far, the greatest need identified by the interviewees at all the tribes was



availability of knowledgeable committed staff to focus on climate change issues. Most of the multi-tribal recommendations made were to enhance internal planning, manage natural resources, and develop energy programs.

There is a need to increase the level of technical understanding of the climate change issues within the tribal general population. To raise and enhance the tribes' internal awareness of climate change issues and challenges, the interviewees expressed that they must focus on school-age children and then on the general membership. The content and format of the information must be developed in a way to make it easily understandable by tribal members. Several interviewees expressed a need to have the significance of First Foods recognized more fully by the tribes.

A variety of needs were expressed to create the policy framework and subsequent regulatory approaches to guide the tribes' climate change efforts. It was stated that none of the tribes have set policies yet, but are working to come up with strategies or policies. The interviewees also expressed that the tribes should better voice their needs to the outside agencies. They realize that they will be able to do that once their positions on climate change impacts are better understood.

The tribes are conducting climate change technical assessments and adaptation planning. Nevertheless, many types of studies were identified as necessary to help the tribes with planning and mitigation. These include general, broad-scope studies, as well as studies focused on plant communities, game species, ecosystems, and water resources. Additionally, the interviewees expressed a desire to change the current habitat protection approach to a holistic, system-wide approach.

The interviewees made many statements to indicate that they perceive CRITFC as the primary tribal organization best suited to help the tribes with the climate change issues. There is an internal tribal role and an external role within the broader community (outside agencies and entities) in which CRITFC can assist the tribes. The interviewees recommended that the primary role for CRITFC is to act as a focal organization on behalf of the tribes for conducting technical assessments, providing political support, and assisting with obtaining funding.



# APPENDICES



# Appendix A

## Survey Questionnaire



# Addressing Climate Change in Indian Country.

Columbia Basin tribes are uniquely reliant on the **First Foods**: water, salmon, Pacific lamprey, wild game, roots and berries. These are the cornerstone of their spiritual, economic, and nutritional sustenance. Their cultures and histories are intertwined with the First Foods and they harbor considerable knowledge about the best approaches to sustainable preservation and replenishment of these foods. This intimate connection with salmon and lamprey and the knowledge of their physical and biological needs gives the tribes both a great interest and a great expertise in their restoration and protection.

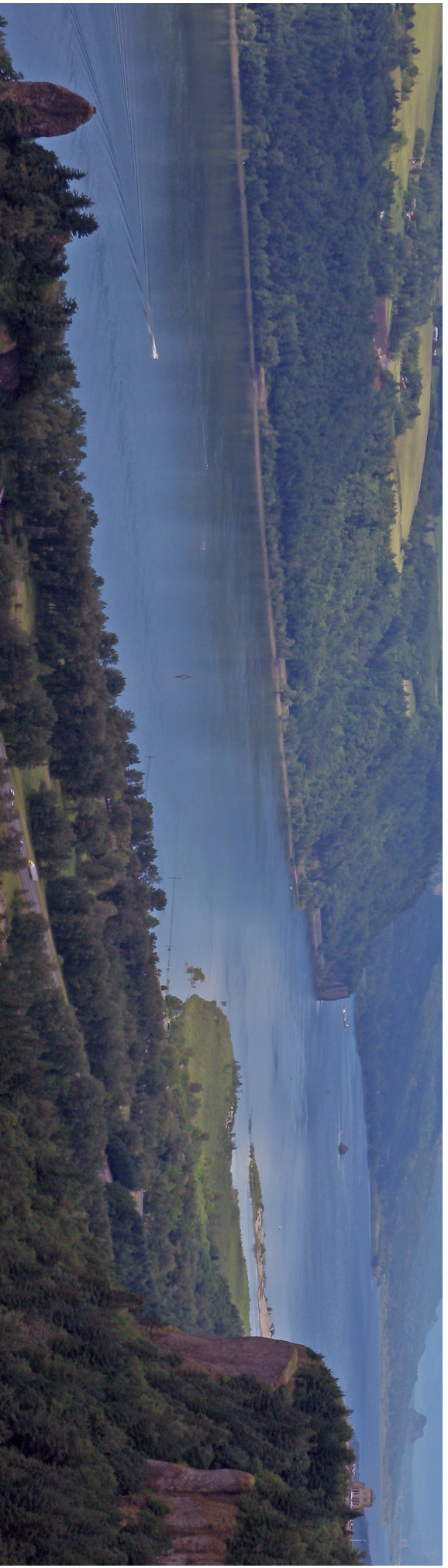
Climate change is already having an impact on these First Foods. The Yakama, Umatilla, Warm Springs, and Nez Perce tribes, individually and collectively through CRITFC, are preparing for climate change by developing, mitigating, and adapting natural resource programs and policies. As part of this effort, CRITFC has commissioned the Indian-owned firm Akana to conduct a **Climate Change Needs Assessment Survey** of its member tribes. The results of this survey will help identify the policy, technical, and programmatic capacity needs required for the Columbia Basin tribes to address climate change impacts.



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## **Columbia River Inter-Tribal Fish Commission (CRITFC) CLIMATE CHANGE NEEDS ASSESSMENT SURVEY**

Columbia Basin tribes are uniquely reliant on the **First Foods**: water, salmon, Pacific lamprey, wild game, roots and berries. These are the cornerstone of their spiritual, economic, and nutritional sustenance. Their cultures and histories are intertwined with the First Foods and they harbor considerable knowledge about the best approaches to sustainable preservation and replenishment of these foods. This intimate connection with salmon and lamprey and the knowledge of their physical and biological needs gives the tribes both a great interest and a great expertise in their restoration and protection.

Climate change is already having an impact on these First Foods. The Yakama, Umatilla, Warm Springs, and Nez Perce tribes, individually and collectively through CRITFC, are preparing for climate change by developing, mitigating, and adapting natural resource programs and policies to manage current and future impacts. As part of this effort, CRITFC has commissioned the Indian-owned firm Akana to conduct the attached survey of its member tribes. The results of this survey will help identify the policy, technical, and programmatic capacity needs required for the Columbia Basin tribes to effectively address climate change impacts.

**Confidentiality Disclosure:** CRITFC, on behalf of the tribes, shall retain all right, title and interest to all information, proposals, papers or materials developed through the course of this climate change survey. Copies of, or the sources of, all information, proposals, papers, or materials developed and/or accumulated by Akana are the immediate property of CRITFC and shall be turned over upon request. Any work performed by Akana is of confidential nature. Any publication of the results of the survey shall not contain confidential information.

### **General Information**

Name:

Tribal Affiliation:

Title:

Department:

Contact information:

Date:

Time:

A GENERAL		(L&S)
1	What does climate change mean to you?	(+T)
2	Have you noticed it? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	(+T)
	How (change in climate, vegetation/animal diversity or type)?	
3	Is climate change important to you? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	(+T)
	To your tribe? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	
	Why? What are your concerns regarding climate change impacts?	
4	Does climate change impact the ecosystems in your Tribe's management area? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	
	Which ecosystems?	
	Please explain?	
5	Is the Tribal government <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely, and the Tribe as a whole <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely, aware of climate change issues?	(+T)
6	What more needs to/can be done to raise the Tribe's level of awareness of climate change?	(+T)
7	Is your opinion on climate change being heard at the Tribal level? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	(+T)
8	How do you share your opinion with your colleagues?	

9	Is the Tribe's opinion being heard at the regional federal <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely levels?, State <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely, or If not, what must be done to better reach out to them?	
10	Will the Tribe be able to adapt to climate change? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely	(+T)
11	Does it need assistance to reach its goals? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely What type of assistance?	
<b>B</b>	<b>FIRST FOODS, AND CULTURAL, ECONOMIC, OTHER IMPACTS</b>	<b>(L&amp;S)</b>
1	Are there First Foods that might be affected by climate change? Which ones?	(+T)
2	Would the effects of climate change affect tribal culture and sovereignty? Please explain?	(+T)
3	Do non-climate factors (presence of dams, pollution, etc.) also affect First Foods and culture? <input type="radio"/> None = 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 = Definitely Please explain?	(+T)
4	Will effects of the non-climate factors be accentuated by climate change? Please explain?	(+T)
5	How do we best protect indigenous cultural and sovereign connections to salmon in the face of climate change (technical and/or policy mechanisms)?	

6	Does the Tribe utilize traditional ecological knowledge to identify, assess, and adapt to climate change impacts? <div>None = 0   1   2   3   4   5 = Definitely</div>	(+T)
7	Are there potential economic impacts to the Tribe from climate change? If so, please specify what the impacts are and why they may occur? <div>None = 0   1   2   3   4   5 = Definitely</div>	
8	Beyond ecosystem and economic impacts, do you foresee other areas/ sectors/ departments within the Tribe that will be affected by climate change, either directly or indirectly? Please explain which ones? <div>None = 0   1   2   3   4   5 = Definitely</div>	
C	<b>MITIGATION/ADAPTATION STRATEGY DEVELOPMENT, TECHNICAL ASSESSMENTS, IMPLEMENTATION</b>	<b>(S)</b>
1	Is your Tribe currently doing any climate change related projects including planning, design, and implementation projects? Have they in the past? If so, what has been/is being done? By whom? Who has funded these projects and for approximately how much?	(+L)
2	Are there any projects planned for the future?	(+L)
3	Are there reports your Tribe has completed on climate change vulnerability/adaptation/mitigation topics?	
4	What is the projected timeline to complete studies currently underway or planned?	
5	Are climate change impacts likely to be faster or slower relative to the rate of adaptability of the ecosystems in your management area?	

6	Are you aware of work by other Tribes (technical, policy, organizational) that might be useful to your Tribe's efforts? Please explain?
7	Are you aware of technical assessments or studies, completed or underway by other entities (within/near Tribe's management area or e.g., by climate change centers, universities, federal agencies) to understand the rate and effects of climate change in your management area?  What types of assessments?  Who is conducting them?
8	What additional assessments/studies may be needed to augment the current projects?  If yes, who should conduct them?
9	If the Tribe must conduct additional studies, what resources are available to them now?  Are additional resources needed?  What types of resources, and for what purpose?
10	What recommendations can you make for near-term mitigation/adaptation actions (less than 5 years)?  For long-term actions or next steps?  (+L)
11	To what extent are the impacts of climate change explicitly accounted for in the current Tribal plans, policies, and regulations <div> <div>None = 0</div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5 = Definitely</div> </div> ? Is that adequate?  Please provide examples.  (+L)
12	What additional Tribal actions, authorities, policies, or regulations by Tribes are needed for managing climate change impacts on Tribal lands?  (+L)

13	What is the Tribe's process to identify adaptation/mitigation strategies?  Are there existing forums or committees?	
14	What recommendations can you make for near-term regulatory/policy actions (less than 5 years)?  For long-term actions or next steps?	(+L)
15	Does the tribe have an energy vision or policy?	(+L)
16	Is the tribe interested/engaged in the following:  Reducing its carbon footprint? Any projects being considered or conducted?  Carbon reduction strategies such as carbon sequestration? Any projects being considered or conducted?  Alternative energy sources such as wind, solar, etc. to supply its energy needs? Any projects being considered or conducted?	(+L)
17	Would additional technical, educational, policy, or other types of climate change information increase your ability to mitigate for/adapt to the impacts?	(+L)
18	Are there technical, policy, or other communications/coordination occurring between your Tribe and other Tribes?	(+L)
19	Are there efforts planned or currently underway to share technical resources between your Tribe and other Tribes?  Which ones?	

20	<p>Do you think it is useful for the Columbia River Basin Tribes to share resources amongst themselves?</p> <p>None = 0   1   2   3   4   5 = Definitely</p> <p>If yes, what kind of resource sharing is needed?</p> <p>How do you think it can be done?</p> <p>Why or why not?</p>	(+L)
21	<p>Are there conferences/symposia held on this topic that are of interest to you?</p> <p>Technical, policy, or educational?</p> <p>Have you or others attended them?</p> <p>Have they been useful?</p> <p>How useful? None = 0   1   2   3   4   5 = Definitely</p>	(+L)
22	<p>Is there more effort needed to disseminate information to you and your colleagues?</p> <p>What type of information (technical, regulatory, policy, cultural, etc.)?</p> <p>How would you need to receive it? (e-mail, web site, reports, briefs, focused conferences, etc.)</p>	(+L)

D	TRIBAL INFRASTRUCTURE	(L&S)
1	Does your Tribe have staff/programs that <u>specialize</u> in addressing climate change?  Do you think there should be? Please explain.	
2	<p>Do you get assistance and cooperation on climate change impacts and mitigation options from federal agencies <input type="text" value="None = 0"/> <input type="text" value="1"/> <input type="text" value="2"/> <input type="text" value="3"/> <input type="text" value="4"/> <input type="text" value="5 = Definitely"/> , state agencies <input type="text" value="None = 0"/> <input type="text" value="1"/> <input type="text" value="2"/> <input type="text" value="3"/> <input type="text" value="4"/> <input type="text" value="5 = Definitely"/> , or local jurisdictions <input type="text" value="None = 0"/> <input type="text" value="1"/> <input type="text" value="2"/> <input type="text" value="3"/> <input type="text" value="4"/> <input type="text" value="5 = Definitely"/> ?</p> <p>Is there more that is needed?</p> <p>In what way?</p>	
3	What role do you see for CRITFC or other inter-tribal organizations to assist the Tribe to mitigate for/adapt to climate change impacts?	
4	How can CRITFC coordinate with the other tribes in the Columbia River Basin to address climate change impacts?	
5	What recommendations can you make for near-term Tribal infrastructure actions (less than 5 years)?  For long-term actions or next steps?	(L)

**Have we covered everything? Please provide any additional information that you would like to share.**

**THANK YOU!**

