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POLLINATORS AND CLIMATE CHANGE IN THE COLVILLE CONFEDERATED TRIBES TRADITIONAL TERRITORIES

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EXECUTIVE SUMMARY

The Colville Confederated Tribes are comprised of 12 bands, including the Moses-Columbia, San poil, Nespelem, Methow, Entiat, Colville, Lakes, Wenatchee (Wenatchi), Chief Joseph's Band of Nez Perce, Palus, Southern Okanagan, and Chelan. The traditional territories of the Colville Tribes cover parts of eastern Washington, British Columbia, Oregon, and Idaho spanning a diverse set of ecosystems. Since time immemorial, the Confederated Tribes have sustained themselves through their relationship with the earth, while being forced to adapt to colonized changes of their land and water systems. Projected changes in climate patterns over the next century will challenge the resilience of various plants and animals that have notable cultural significance to the Tribes. It will be paramount to assess the vulnerability of all species, especially pollinators, as climate change impacts continue to harm ecosystems at greater frequency and intensity.

In an effort to create a holistic climate plan that emphasizes nature, abundance, quality and sustainability (abbreviation being *NAQS* which translates to "one" in nslxcin), the Colville Confederated Tribes (CCT) wish to include pollinators of all kinds into their NAQS plan. In our report, we will explore previous research and work done to support pollinator protection. Our goal is to provide resources for further analysis for the CCT NAQS plan and give recommendations as they construct their climate action plan. Adequate research and education will be essential to ensuring the survival of a diverse range of pollinators. Previous academic research has shown a dip in pollinator populations and can be attributed to changes in climate and farming practices.

Within the traditional territories of the Colville Confederated Tribes live hundreds of pollinator species, each providing a unique service to the ecosystem. Pollinator health is crucial to managing natural landscapes and agriculture systems. Changes in land management, such as habitat destruction, increased pests and pathogens, pesticides and toxins, and decreased quality of nutritional resources, have been proven to have damaging impacts on pollinator populations. Nearly all of the seeded plants of the world rely on pollination for reproduction, genetic diversity, and dispersion. Bees and other pollinator species including butterflies, moths, wasps, beetles, flies, and hummingbirds provide an essential ecological function. Without their services, nearly all of the earth's terrestrial ecosystems would not survive and agricultural industries would fail to produce significant portions of their reserve. The relationship these impacts would have to humanity are dire.

Ensuring the adaptation of pollinators in the traditional territories of the Colville Confederated Tribes has not only substantial importance to community systems, but cultural significance as well. According to the United States Forest Service, "In the United States alone, pollination of agricultural crops is valued at 10 billion dollars annually." Native bees provide indispensable ecological services but face increasing vulnerability to a variety of threats. As climate change threatens natural and human systems, the balance between economic development, ecological conservation, and cultural revitalization is integral to the protection of native pollinators.

INTRODUCTION

We acknowledge the space we inhabit in the Methow Valley as the traditional land of the people who lived on and stewarded the land since time immemorial and continues to be stewarded, as seen in their developing climate plan. We are conducting this research based on the land of the Moses-Columbia, San Poil (or Sanpoil), Nespelem, Methow, Entiat, Colville, Lakes, Wenatchee (Wenatchi), Chief Joseph's Band of Nez Perce, Palus, Southern Okanagan, and Chelan peoples that remains unceded to newcomers such as ourselves.

FIGURE 1. MAP OF THE COLVILLE CONFEDERATED TRIBES TRADITIONAL TERRITORIES
https://www.cct-hsy.com/demographics

The purpose of this project is to compile a comprehensive inventory of the pollinators that populate the traditional land of the Colville Confederated Tribes. The region being represented in this research is land in northeastern Oregon, central to eastern Washington State, Western Idaho, and areas in southern British Columbia, Canada. Spanning over 39 million acres of land, the traditional land of the CCT is home to many species of pollinators and various types of habitats such as shrub steppe and coniferous forests. Pollinators are particularly important when it comes to preserving and maintaining the ethnobotany of the tribes that make up the CCT. Not all of the culturally significant plants may need pollination, however, pollinators are crucial to reproduction and promoting biodiversity. Therefore, we believe that it is within our best interests to protect and help mitigate any issues that pertain to pollinators by way of a climate action plan. This project is meant to contribute to the prioritization of pollinator health and habitat in the development of the CCT's NAQS plan.

FIGURE 2. SEAL OF THE COLVILLE CONFEDERATED TRIBES

According to the United States Department of Agriculture, "pollinators [...] are responsible for one in every three bites of food we take" (United States Department of Agriculture). Effectively addressing the issue of pollinator health decline means creating a community-based, local plan that adapts to the unique situations relevant to the CCT. The previously mentioned NAQS plan is based on the Tribes' Integrated Resource Management Plan (IRMP), which is in turn informed by the Community Survey Report (2015). Tracking the priorities of the community, as completed in the Community Survey Report (CSR), allowed for the best management practices concerning the Tribes' natural resources. With this tool, ties between community health and pollinator conservation became more apparent. In 2015, the CSR reported that roughly half of community survey respondents said that irrigation infrastructure should be developed to support an expanding agricultural presence on the reservation. A great way to support growing agribusiness would be to enforce the conservation of pollinators.

In order to conserve pollinators, the CCT require information regarding known pollinator species that are present within the traditional territories, academic research initiatives that look into the climate impacts on pollinators, and non-governmental and governmental entities that manage and protect those pollinators be it tribal, federal, state and local. In our research, we have seen ties between the goals of this project and the United Nations Sustainable Development Goals (SDG). Most notably are the goals striving towards Zero Hunger (SDG #2), Climate Action (SDG #13) and Life on Land (SDG #15) (United Nations, 2017). These goals provide the overarching reason why this research has been conducted; in an attempt to work towards a healthier and more stable future on this planet.

The programs that bring us to the Methow Valley this summer are Western Washington University's Climate Leadership Certificate (CLC) and the Community Learning Lab (CLL), a sustainability fellowship program. At the heart of the CLC and the CLL is an incentive to foster an interest in climate justice work and build a network between people entering the field of sustainability and professionals who have a foundation of experience. The programs also seek to promote professional growth and academic achievement in undergraduate students while also advancing sustainability efforts in organizations, schools, and businesses located in the Methow Valley. This is all done by a cohort of students living in the Valley for the duration of their fellowship with subjects pertaining to the heath and equity of the community, social justice, environmental quality, and environmental science.

METHODOLOGY

We relied on interviews and case studies to inform our studies concerning pollinators. We also did individual research to create an inventory of the pollinators that are present in the traditional territories of the Colville Confederated Tribes. We interviewed community members and experts about pollinators to gain a better context of the species connection to land and community. These interviews about pollinators in the area gave us a stronger understanding of what we are working towards. After hearing insights and knowledge from established people in the field, building a basis of accessible information was an easier process.

Common interview questions included:

What is your connection to pollinators? How did you get involved in this work?

In your own words, what is the importance of pollinators?

What steps do you see as important for pollinator conservation in the future?

What's the best way to educate people about pollinators?

How do you see pollinators changing from climate change?

The case studies were examples and models that we learned from and adapted to our project. The case studies were taken from different sectors including governmental organizations like the Washington Department of Agriculture and non-profits like the Xerces Society. Inventorying of existing pollinator research helped us complete our list and broaden our understanding of the larger importance of this project. Resources used to complete the species list of pollinators were bee survey data from Bob Gillespie and Joseph Wilson, the paper "Moths of the North Cascades" by Nick Engelfried, and the website iNaturalist which records citizen science observations. When using iNaturalist, species were included if the observations had been verified and there were more than one observation within the project area.

INVENTORY

KNOWN POLLINATORS IN CCT STUDY AREA

We were tasked with identifying the known pollinator species within the traditional territories of the CCT. This may seem simple, but it was the most prioritized aspect of this project because there was no cohesive accessible list for the CCT to work off of. There are hundreds if not thousands of pollinator species within the CCT study area. To consolidate this, pollinator species were included in this list only if there were observations which identified the species. While compiling the list (which can be found in the appendix) the most frequently observed bee species included Lasioglossum Evylaeus, Lasioglossum sedi, and Bombus bifarius. There were 101 identified species of bee observed within the traditional territories. There were also 97 moth species, 69 butterfly species, 4 bat, and 4 hummingbird species observed showing the diversity of pollinator species within the traditional territories of the CCT.

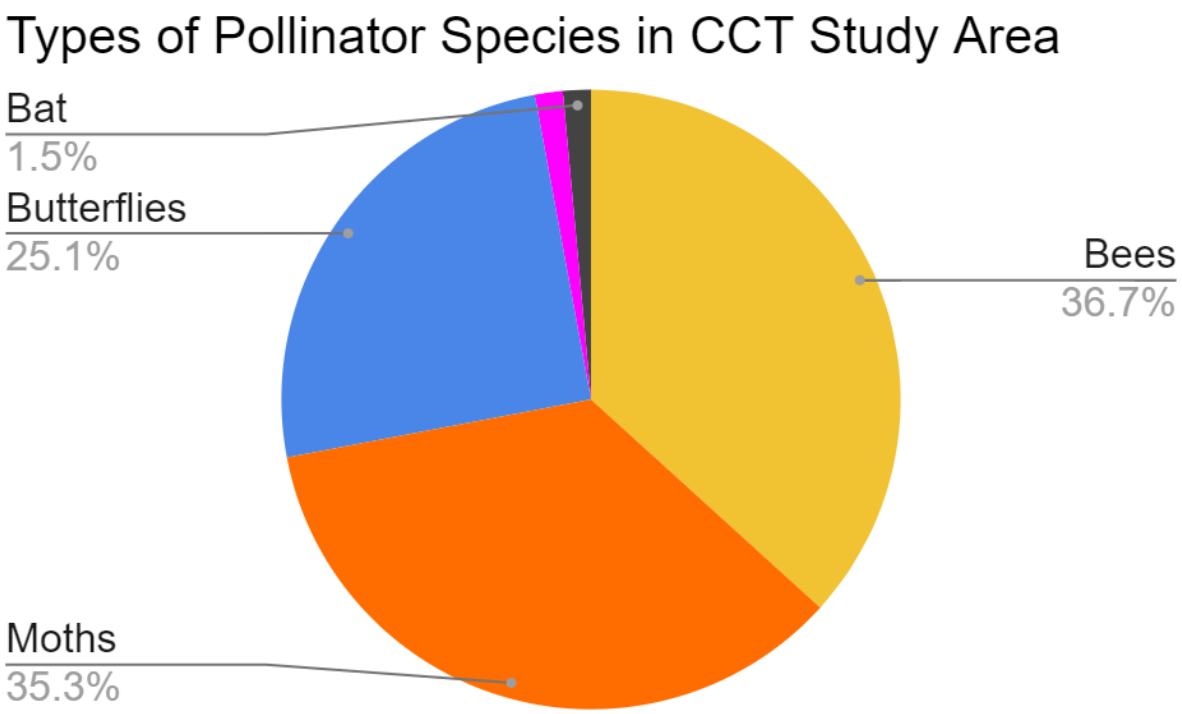

FIGURE 3. TYPES OF POLLINATOR SPECIES IN CCT STUDY AREA

Climate Action Plan Research

In searching for examples of existing pollinator protection, mitigation and adaptation in climate action plans, it became apparent that pollinators are not usually included. Most organizations or entities do not establish a connection between pollinators and the climate. Instead they tend to create two separate plans, one addressing climate change and another ensuring that pollinator populations are supported while also providing ample habitat. Fortunately, two tribal climate action plans were found, implemented by the Blackfeet and Karuk, that do address the importance of protecting pollinators for the sake of preserving native plant species that are culturally significant to the tribe.

Case Study 1: Blackfeet Climate Change Adaptation Plan (April 2018)

With the aid of the Blackfeet Agriculture Resource Management Planning team, the Blackfeet nation realized that climate change has already caused a decline in the population of select pollinator species. As global warming continues to progress, pollinator-plant relationships are very likely to change and cause them to fall out of sync. There is also predicted to be a possible loss of pollinator habitat as farmers seek expansion because of drought and reduced yields. Some culturally significant plant species have already begun to diminish in number and a loss of pollinators would also be reflected in a loss of such plant species. The strategic actions that were decided upon to help protect wildlife habitat, and pollinators by extension, are to create areas of permanent land conservation and enhance native pollinator habitat that provides both floral resources and nesting sites. The tribe also recognized that there is money to be found in a certain pollinator species; if they work to install pollinator gardens, the honeybees will in turn produce honey to be sold for profit in addition to encouraging plant health, reproduction and biodiversity.

Figure 4. Blackfeet Nation's Seal

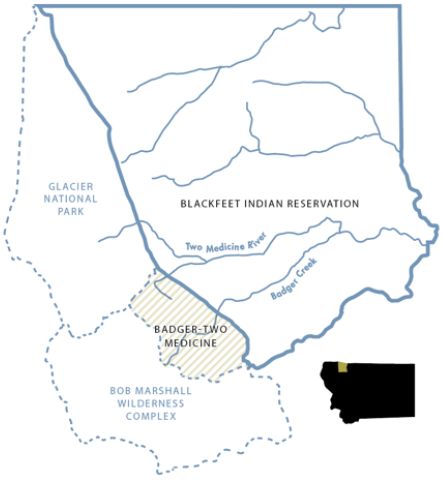

Figure 5. Map of the Blackfeet Indian Reservation

Case Study 2: Karuk Climate Adaptation Plan (March 2019)

The prairies and glades that make up grasslands have been and still are historically and culturally significant to the Karuk tribes of current day California. Due to the importance of the multiple bumblebee species found within the grasslands, they are considered to be cultural indicators in the Karuk tribe's climate adaptation plan. Many of the native bees found in the Karuk's aboriginal territories rely on habitat that is fire dependent, but the relationship between the two are not very well understood. There has been some recent work done noting that recent burn areas seem to support higher populations of bees.

FIGURE 6. KARUK TRIBE'S SEAL

The bumblebees are also affected by the fact their grasslands have been fragmented or lost, the grazing of cattle and livestock also reduces the nesting and foraging quality. An adaptation that could be made to support the bees are designing the landscape vegetation by aspect, topography and time. Another is doing burns at different levels of severity frequently across different topographies and vegetation to ensure continued early flowering. In this climate adaptation plan, the Karuk tribe acknowledges that recent changes in temperature and precipitation patterns will impact the pollinator-plant relationship in unique, but unknown ways.

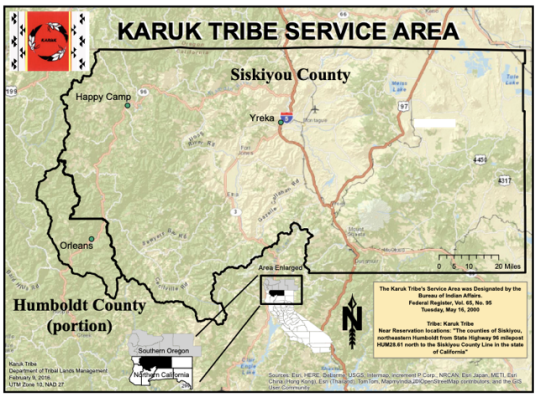

FIGURE 7. A MAP OF THE KARUK TRIBE'S SERVICE AREA IN NORTHERN CALIFORNIA

KEY TAKEAWAYS

There have been multiple attempts to incorporate pollinators into climate action and protection plans created by a number of cities and other governing bodies across the nation that are not associated with Native American tribes or reservations. The majority of these plans, in addition to the ones highlighted above, focus on promoting two overall goals. First is to seek out various pieces of land and convert them into pollinator gardens in order to generate pollinator specific habitat. Second is to prevent the use of certain pesticides that are known to kill pollinators. Both of these are achievable goals for individuals and entities to adopt, but in order to fully strive for sustainability and inclusivity we believe that there are additional actions that could be similarly adopted.

RECOMMENDATIONS

Conservationists should acknowledge that bees are not the only ones doing the work, but a diverse group of organisms that contribute in different ways to the overall health of the environment. It is for this reason that we believe the climate NAQS plan should expand to encompass other pollinators such as moths, butterflies and hummingbirds as they are equally as essential to the overall health of an environment.

We recommend education and outreach development in the future which can greatly impact pollinator health. People tend to be afraid of bees and insects because of their potential to harm or their alarming looks and build negative connotations towards them. The resulting fear and efforts to kill what we do not understand can be prevented through efforts to teach people what pollinators give to us, how they do it, and why we need to protect and care for them. The stewardship and conservation of pollinators can be grown through small scale education leading to lasting action. We believe that a climate action plan inclusive of pollinator specific outreach and education models is a great starting point.

Education around and control of pesticides is also a crucial way to protect pollinator health. The Washington state pollinator health task force has made a list of recommendations about pollinator health, including pesticides, which can inform decisions by the CCT.

Further research should be conducted on the associations of pollinators with native plant species that hold cultural significance for the CCT. The CCT has previously identified their most culturally significant plants, therefore presenting a guiding document for future investigative efforts. By identifying associations between pollinators and culturally significant plant species, conservation efforts can be made in both a cultural and ecological sense. This could easily be done using the CCT tribal greenhouses. While the greenhouses have mainly been focused on growing trees to be planted throughout the CCT Reservation, it has also been used in the past to grow native and culturally important plants.

The list given of known pollinator species within the traditional territories of the CCT is just a starting point. More data about pollinators, especially investigating if there are flies, beetles, or other animals in the study area that pollinate specific plants should be added to the existing list. The list also is not separated by native vs. introduced species and creating that separation could be helpful when identifying historical relationships between pollinators and culturally significant plants.

Gathering information from tribal members regarding their most culturally valuable plants and locations could serve as an important aspect to building pollinator health policy. As mentioned in the Final Programmatic Environmental Impact Statement released by the CCT in 2015, members may be reluctant to disclose this information because of the history of exploitation of indigenous knowledge in this country. Knowing the locations is crucial to the efforts to protect these spaces

by building land and forest management practices that cater to them. Building trust and informed communication, possibly through culture spanning intermediaries, can help tribal members feel more comfortable sharing details could help build this base knowledge.

Optional questions for tribal members include:

Have there been observed changes in the phenology (cyclic and seasonal phenomena in nature) of culturally significant plants over the course of your life?

What changes in plant species and abundance have you noticed in your life?

What changes do you think should be made to the ways land is managed in your area/on your traditional land?

How are interactions between pollinator species and their food source changing over time?

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

The CCT's climate NAQS plan is working to create a sustainable future for the twelve bands that comprise the CCT and also those that live on the reservation and on their traditional territories. In doing so, the United Nations STGs are being included and accounted for. The three that are closely linked to this project are as follows:

SDG 2: Zero Hunger: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

> Pollinators play a massive role in food production and they do it at absolutely no cost to us, even for a profit if they are honey bees. Without them many food products would not be grown which would greatly exacerbate the current problem even further.

SDG 13: Climate Action: Take urgent action to combat climate change and its impacts.

> The climate NAQS plan itself is an effort to fight climate change and reverse the worst of its impacts on the traditional territories of the CCT. Pollinators are a part of that because of their ties to the climate and how they are feeling the effects to a higher degree than other groups of organisms.

SDG 15: Life on Land: Protect, restore, and promote sustainable use or terrestrial ecosystems, sustainability manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

> As what could be considered a keystone species, pollinators are often an essential piece of many terrestrial ecosystems as they aid in plant reproduction and promote biodiversity via pollination. The installation of pollinator gardens with native plants is also a form of helping to combat desertification and land degradation.

MONITORING AND EVALUATION

RESEARCH INITIATIVES

The intention of researching academic initiatives surrounding pollinator health is to make connections between the developing CCT Climate Action Plan, and efforts already in place to conserve pollinators.

Many of the institutions listed in the following chart express a need to better understand pollinators in order to most effectively apply conservation tactics. For instance, the Washington State University Honey Bee + Pollinator Project touches on the relevance that pollinators hold in the realm of food security. The University of British Columbia, in their studies, emphasizes similar messages as Washington State. They touch on the fact that pollinators play a key role in the environment and therefore are responsive to changes and detriments in their ecosystems. Overall, these institutions center their research around pollinator health and work to build the knowledge base on how to support them.

Interacting with the research currently happening in the region would look like turning results and findings into policy. The overarching goal of restoring pollinators cannot be imposed without the backdrop of government and tribal reinforcement of scientific findings. Monitoring which pollinators are present, how they interact with culturally significant plants, and what preservation tactics are options would contribute towards the end goal of an ecosystem with more stable pollinator levels.

Organization	**Project Title**	**Description**	**Time Frame**	**Contact Person**
Washington State University	Honey Bee + Pollinator Project	Developing programs to help save bees	Opened in Spring 2020. Ongoing research	Steve Sheppard: shepp@wsu.edu Susan Cobey: s.cobey@wsu.edu Erin O'Rourke: beediagnosis.fd@wsu.edu
Oregon State University College of Agricultural Sciences	Honey Bee Research and Extension	Many projects investigating the role of honey bees in the realm of agriculture	Ongoing research	Ramesh Sagili

Independent Study	The Effect of Climate Change on Pollinators and the Implications for Global Agriculture: A Case Study in the H.J. Andrews Experimental Forest, Oregon.	Analyzing the impact of climate change on pollinators in Oregon forest.	2016	Anna Young Link to report; https://andrewsforest.oregonstate.edu/publications/4945
Okanogan Conservation District	Ongoing Pollinator Research	Working with orchardists in Okanogan County to better understand the presence of pollinators	Ongoing, unpublished at this point in time	Ricardo Angel: ricardo@okanogancd.org Mindy Untalan: mindy@okanogancd.org
The University of British Columbia	Research Excellence Cluster on Bee Health, Impact, and Value in the Environment (BeeHIVE)	Various projects to promote healthy bees	Ongoing research	Principal Investigator Dr. Dominique Weis: dweis@eoas.ubc.ca (604) 822-1697 Sr. Academic Bee Researcher Dr. Leonard Foster: foster@msl.ubc.ca (604) 822-8311
Montana State University	Pollinator Health Center	Research projects aimed to improve pollinator health and habitat	Ongoing research	Co-Director Michelle Flenniken: michelle.flenniken@montana.edu 406-994-7229 Co-Director Laura Burkle: laura.burkle@montana.edu

Government and Non-Government Entities in Pollinator Health

In order to examine the current initiatives and policies in place under government legislation within the traditional territories of the Colville Confederated Tribes, we have compiled a list of government and non-government entities focusing on the management and protection of pollinators.

The list below includes state and federal initiatives as well as other organizations working to support the conservation of pollinator species. Due to a lack of local and regional initiatives, broader examples were included in hopes of aiding research on this topic. Many states have laws addressing pollinator health as seen in the figure below. The state of Washington has enacted Bills 5552 and 2478 within recent legislation, in support of pollinator protection. Both bills focus on the outreach and education of agricultural systems as well as an improved protection initiative on pollinator habitats.

The traditional territories of the Colville Confederated Tribes expand across Washington, Oregon, Idaho, and British Columbia. For this reason, it is imperative for research to be conducted across all of these regions. In the development of the CCT Climate Action Plan, acknowledgement of government research initiatives may assist with collaboration in regional efforts. Non-governmental organizations may also support pollinator protection across the traditional territories of the CCT and should be recognized in the Climate Action Plan.

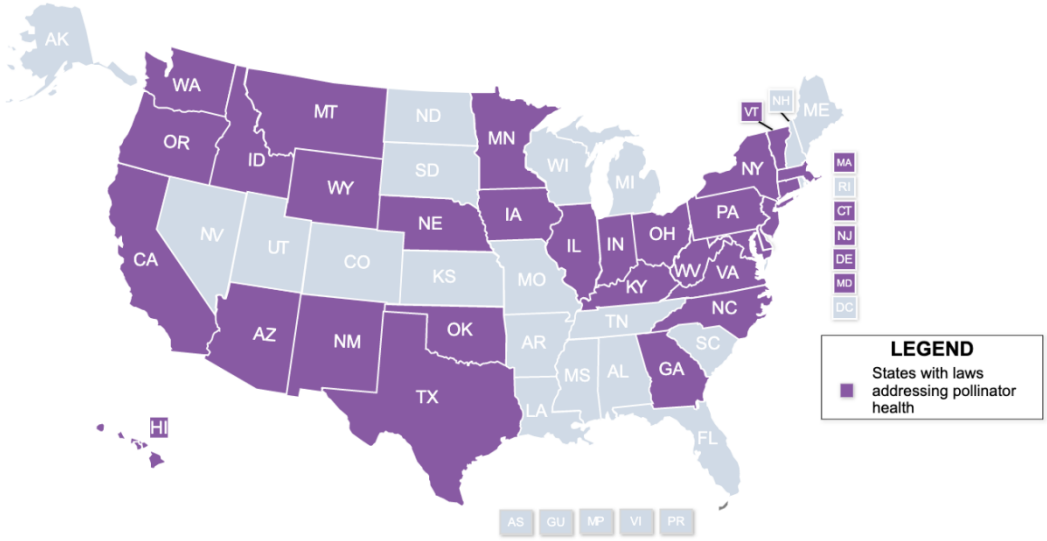

Figure 8. States with Laws Addressing Pollinator Health
https://www.ncsl.org/research/environment-and-natural-resources/pollinator-health.aspx

Entity Type	Project Title	Contact/Website	Description
Washington State Department of Agriculture (WSDA)	Recommendations of the Pollinator Health Task Force for Pollinator Health in Washington 2020	Katie Buckley: Pollinator Health Coordinator kbuckley@agr.wa.gov (360) 480-0602 https://cms.agr.wa.gov/WSDAKentico/Documents/PP/PestProgram/880-PollinatorHealthTaskForce-ReportToLegislature.pdf	Pollinator health task force created recommendations to promote discussion and decision making in the Washington Governor's Office for policy protection of pollinators. 42 recommendations were proposed and fall into categories including, 1. Habitat, 2. Pesticides, 3. Education, 4. Managed Pollinators, 5. Research. Recommendations include developing public and private partnerships to encourage pollinator protection, promoting seed banks and native plants beneficial for pollinators, and developing a plan to improve communication between beekeepers, landowners, and pesticide applicators.
Washington State University and WSDA	Managed Pollinator Protection Plan 2018	https://agr.wa.gov/getmedia/819f8d22-37b1-484d-a522-31f60875f9c9/101-681managedpollinatorprotectionplan.pdf	The Managed Pollinator Protection Plan discusses factors involved in important pollinator conservation practices. These include habitat preservation, wise pesticide use, beekeeper management practices, and landowner management practices.
Federal Initiative	Pollinator Research Action Plan 2015	https://honeybeehealthcoalition.org/wp-content/uploads/2017/03/Pollinator-Research-Action-Plan-2015.pdf	This Strategy was initiated by the Pollinator Health Task Force and lays out the current and planned federal actions aimed at pollinator protection. These include goals such as reducing honeybee colony loss and restoring pollinator habitat acreage. The plan promotes expanding research on pollinator losses, developing public education programs and outreach, and improving pollinator habitat. An accompanying *Pollinator Research Action Plan* was created in order to "outline gaps in current knowledge of pollinators and pollinator declines and identify priority research efforts needed to close these gaps."

State of Washington Legislation	Senate Bill 5552 2019	http://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/Senate%20Bills/5552.pdf?q=20210802174335	Passed in the 2019 Regular Session, this act supports the protection of native pollinators. With its enactment, a program to promote and protect pollinator habitats will be established to support state agencies, local governments, and private landowners. This bill promotes the implementation of certain practices to maintain pollinator habitat structure and security.
State of Washington Legislation	House Bill 2478 2016	http://lawfilesext.leg.wa.gov/biennium/2015-16/Pdf/Bills/House%20Bills/2478.pdf?q=20210811203810	This bill, proposed in 2016, supports agricultural production through the preservation of forage for pollinators. It highlights the need for research on best practices for landowners and managers facing the threat of noxious weeds.
Xerces Society	Pollinator Conservation Program	https://xerces.org/pollinator-resource-center/pnw General contact: (855) 232-6639	Provides region-specific resources for the protection of pollinators. Resources include habitat assessment guides, habitat installation improvements, plant lists, habitat management, pesticide protection, identification & monitoring resources, and native seed & plant vendors. The Xerces Society campaign is focused on growing pollinator-friendly flowers, providing nest sites, avoiding pesticides, and expanding outreach & education.
Non-profit organization in the US	Pollinator Partnership	https://www.pollinator.org/ info@pollinator.org	Pollinator Partnership is the largest non-profit organization in the world dedicated to the protection and promotion of pollinators and their ecosystems. Their work partners with a diverse set of governments, corporations, and universities across North America. This organization supports many pollinator protection programs including the North American Pollinator Protection Campaign (NAPPC).
National Campaign	North American Pollinator Protection	https://www.pollinator.org/nappc	NAPPC is a collaboration of over 170 partners with a vision of supporting major programs to protect pollinators. Their aim is

	Campaign (NAPPC)		to encourage public awareness and education and promote collaboration with researchers across the country.
Washington Environmental Council	Pollinator Pathway Initiative 2021	https://www.wec-ct.org/pollinator-pathway-initiative	The Washington Environmental Council (WEC) has spearheaded this initiative to connect pollinator habitats across the state. This work supports the use of native plants and pesticide free farming practices.

BUDGET

Pollinators have a considerable impact on the economy of the CCT reservation. The traditional territories take up close to 40 million acres while the reservation itself sits on 1.4 million acres of land. The occupancy of agriculture and practice of agribusiness on the land contributes to the overall general wealth of the community. If there is a desire to expand on the agribusiness of the CCT to further contribute to the economy, developing a budget around pollinator health is a key step in the process. One of the options that presents itself in the budget would be leaving space for the aforementioned improvements to irrigation infrastructure, a desire stated by community members in 2015.

Since pollinators contribute so heavily to the health of sustained indigenous culture, surrounding plant life, and support the stable access to food we consume and food that gets outsourced, space should be left in the budget to promote general pollinator health through any means. Funding projects to support pollinators on the CCT reservation, an example being pollinator gardens, is an effective way of monitoring.

CONCLUSION

The best decision that could be made is to aid and not inhibit pollinator protection, adaptation, and mitigation in such a rapidly changing climate. An all-encompassing, thorough climate action plan can do this. This report is meant to provide a baseline of essential information and important connections that may be used to create such a plan. The main purpose of this project is to contribute to and ensure that pollinator health and habitat is prioritized as the CCT's climate NAQS plan is being developed, as it is such an integral part to a sustainable future.

The three main things that need to be included and accounted for in order to accomplish all that needs to be done for pollinator health are as follows. The incorporation of all types of pollinators in the CCT's climate NAQS plan, including not only bees, but also moths, hummingbirds, butterflies and bats. The act of protecting pollinators goes far beyond creating a climate action plan, individual people and businesses should understand why pollinators need protection and how they can help. This is why supporting and promoting education and outreach is paramount, this will involve the community and aid in achieving the goals that are outlined in the climate plan. Pollinators are generally an unstudied group of animals and their interactions with plant and other animal species in many cases is unknown. For this reason, performing in depth research to expand on the existing information known on the relationship between culturally significant plants and pollinators would also be highly beneficial.

While many of the climate action plans found do not acknowledge pollinators at all, the NAQS plan is in a position to break away from this trend and become a model for other climate plans in the future. Establishing a clear link between pollinators, a healthy environment, and climate is crucial moving forward and currently an overlooked step in the climate plan writing process. Pollinators play a pivotal role in the growing of our food and receive no monetary compensation in return. The human race will be severely impacted if pollinator species continue to decline at the rate that they have been doing these last few years. Numerous terrestrial ecosystems would collapse as a result of the decreasing population numbers. Pollinators are a part of the climate and are being impacted by climate change and global warming just as much as other keystone species, if not more.

APPENDIX

FULL LIST OF IDENTIFIED POLLINATOR SPECIES

HTTPS://DOCS.GOOGLE.COM/SPREADSHEETS/D/17YBEIY3EZBCI5HKZCJUAHJCKB9A2YAIVQOOPQSYLABM/EDIT?USP=SHARING

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