Resiliency Through Food Security of a Coastal Culture: the Peskotomuhkati

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RESILIENCY THROUGH FOOD SECURITY OF A COASTAL CULTURE:

THE PESKOTOMUHKATI

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A DISSERTATION

Submitted in Partial Fulfillment of the

Requirements for the Degree of Doctor of Philosophy

(In Interdisciplinary Studies)

The Graduate School
The University of Maine
December 2021

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RESILIENCY THROUGH FOOD SECURITY OF A COASTAL CULTURE:
The Peskotomuhkatik

By Natalie Michelle
Dissertation Advisor: Dr. Darren Ranco

An Abstract of the Dissertation Presented in
Partial Fulfillment of the Requirements for the Degree of Interdisciplinary Doctor of Philosophy
December 2021

A qualitative study using culturally consistent methods of story circles and individual testimony was completed at Passamaquoddy Indian Nation (Peskotomuhkatik), concerning food security through the ocean fisheries at Pleasant Point (Sipay’k), Maine in 2017. Participants included approximately 24 commercial and subsistence harvesters that involved both fishermen and fisherwomen. The historical and anthropocentric impact on the ontological and epistemological aspects of the Waponaki have constrained cultural customs and practices of indigenous interrelationship and interdependency linking Native food systems within the ecology. The multifaceted implications of regulatory control, climate change impacts, access to safe quality nutrient sources through a mixed subsistence diet and the right to practice traditional culture by interfacing with the natural world unabated, poses threats to cultural identity and survival of the Peskotomuhkati of Maine. The complexity of the multifaceted aspects of human induced climate change combined with an inability to self-determine traditional food systems of treaty tribes hinder the ability to build mechanisms for social-ecological resiliency amid environmental challenges. Planning models that are culturally consistent will guide the co-management and stewardship for the equitable distribution of the coastal fisheries within Peskotomuhkatik territory. Community-based models utilizing an indigenous perspective will guide future generations and provide an avenue to incorporate traditional value systems into
environmental stewardship through individual agency must steer towards policies for inclusiveness that are sustainably and culturally responsive.

**Key terms** – food security, food sovereignty, resiliency, climate change, food systems, cultural identity, traditional harvester, fisheries, coastal culture, socio-ecological systems,

Seven Fires Prophecy
DEDICATION

The journey in the study of the traditional ocean fisheries was a result of my wish to give back to my maternal lineage of my Kihci-uhkomossol - Great-great grandmother Nancy Dana, Great-grandmother Mary Dana, Grandmother Mabel Dana-Ranco, Nikuwoss Eleanor Dana-Mitchell and my maternal Mosums Jerome Neptune and to all those relatives at Peskotomuhkatik who have lived before to make my time possible here on Nikuwosskiktamik. I extend my love and acknowledgement to my paternal Peskotomuhkti Kihci-uhkomossol, Mary Jane Soctomah, the last of the true medicine women of her clan. To my sweet qossis and mishun, Sage Nequtahtahwet Rapp whom I lost to the Creator during this journey. You were foremost in my mind throughout this experience, Kihcikulu. Finally, my Nmihtaqs and Pahnawaskewi for giving me the possibility to pursue my PhD, to Dr. Theodore (Ted) Mitchell. I know you were with me throughout these few years. I dedicate this work to all of you with all my love and respect. Pehqiyal, Koselmul!
ACKNOWLEDGEMENTS

I would like to extend my gratitude to Dr. Darren Ranco for his unrelenting support and intellectual guidance throughout this journey for many years at the Waponaki Center. His intellectual and professional support to give voice to the indigenous knowledge bases in environmental studies have given me inspiration throughout this process. I could not have completed this work without his support. Kihciwoliwon Darren!

I would also extend my appreciation to my committee members: Dr. John Daigle, Dr. Marcella Sorg and Dr. Sandra De Urioste-Stone. You have placed much faith in me to succeed and continue despite the personal losses along the way. Thank you all so much for this opportunity to engage and explore throughout these years at UMaine.

I would like to thank Dr. Edward Laverty for his inspirational teaching style and brilliance to continue in environmental sustainability and management and his earnest interest in indigenous issues. Much gratitude to Dr. John Shemwell who taught me so much about the process of qualitative research, how to pick away at the strands of valuable information derived in the coding process yet provide the reflexiveness needed for its objectivity. Your skill and passion for the work on qualitative studies remains inspiring and illuminating.

I thank the EPSCOR NEST-SSI Program for the funding to make this study possible. The ability to give back in a constructive way to the tribes is a rare and crucial process that provides an avenue towards equity in the decision-making processes of the fisheries. I would like to especially thank fellow EPSCOR cohort, my friend and coffee mate Tyler Quiring for being there to lend an ear of support and comradery. I shall always think of you as a dear friend. I shall miss dinners with you and your wife Amanda.
Special thanks to Kyle Whyte, Professor in Environment and Sustainability at the University of Michigan for his support and opportunities extended through his graduate projects along the way. Thank you for your sincerity, your interest in my success and enduring generosity.

I would like to thank Chief and Vice Chief of the Peskotomuhkati; Fredrick Moore III and Vera Francis, respectively, for providing the opportunity to work in my mother's community. I would also like to thank all those who participated in this study, the fishermen and fisherwomen who gave generously to the story circles. I learned so much from the harvesters during our discussions on ocean fisheries. I hope, I succeeded in telling your stories in a good way as you have portrayed and trusted them to me. Your friendship and support were invaluable. Special thanks to Brenda Moore for her help in the organization of the focus groups and talking circles at the museum. Kihciwoliwon!

To my parents, Dr. Ted Mitchell and Eleanor Mitchell, as well as my late brother Theodore Bear (Wayne) Mitchell, for believing in me and providing the resiliency to endure. I shall miss our talks on public administration, the legislative processes, and political inquiries. Rest in Peace, Nhesis. Koselmul.
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CHAPTER 1: FIRST CONTACT, CLIMATE CHANGE, FOOD INSECURITY

Traditional Stories Of The Waponaki On The Ecology:

Kulu

The Golden Eagle

Kulu, the golden eagle was sent to carry an important message from the creator to all the living beings on Nikuwosskiktamik - mother earth. He was instructed to show them how to live woli-litu – a good life. As Kulu was circling high up in the sky over the ocean, he looked down for a place to land. He finally found a place on a rock that was shaped like an arrowhead. As he sat there looking over the land, suddenly he screeched very loudly. He beckoned to all the animals to gather around as he had something especially important to tell them. All the animals gathered around from all directions. There were deer, bear, turtles, ravens, geese, loons, wolves, porpoises, seals, orcas, sharks and even whales as far as the eyes could see. As they gathered all around, Kulu opened his macilqenuwit (wings). You see, the animals were confused, and they did not understand where they belonged or what they needed to do to live as the creator had instructed them. Ksihkehe - They had lost their way. So Kulu came to talk with them and to show them what they needed to do to live woli-litu – a good life. He said, “first we must make a circle, so all of us will be protected here. The creator will protect us while we are talking.” He beckoned Cihkonaqc (turtle) to come up to where he was perched. Kulu stretched out his wings. He instructed Cihkonaqc (turtle) to take oluwikinok wiphonal (seven feathers). As Cihkonaqc (turtle) brother was instructed, he plucked the feathers from Kulu's wings. He instructed Cihkonaqc (turtle) to walk clockwise around the circle.

Putep (Whale) and others were close to the shore so they could listen to what Kulu had to say that was so important. As the creator had instructed him, Kulu told all the animals to listen carefully to what he had to teach them. Kulu says, “I’m going to show you which direction you must travel, so you will not starve, and you can find the right way to live woli-litu – a good life.” He turned to face the south and called out to all the winged beings. As he pointed, he told the winged beings this is where you shall go, it will be warm there and provide haven for your kind. All the winged brothers and sisters stretched out their wings and flew into the southern direction.

Then he turned to face the west. Kulu called out to all the water brothers and sisters as he pointed towards the setting sun. All the water beings were unsure as they looked at Kulu quizzically and wondered why they had to go that way. The Orca whale asked, “Kulu, why that way?” Kulu answered, “You will see, and you will be able to multiply in great numbers! There will be no
harm coming to you.” So, all the water beings turned toward the west and did as Kulu had instructed them. Then, Kulu turned to face the north. He instructed the Wapahit Cihpecut (White Buffalo), Wapahit Muwin (White Bear), Wapahit Mulsoms (White Wolf) and all the other white animals to go as he pointed with his wing. He said, “It is cold there and you will have the wisdom to thrive there.”

He now turned one more time as Cihkonaqc (turtle) brother was watching and listening most earnestly for his instructions from Kulu. The rest of beings like Muwin (bear), Musiyap (moose), Chikonaqc (turtle) and all the other beings must go to the east. Kulu said, “You will have plenty to eat. There will be plenty of salmon for all of you! Oh, now Muwin (Bear) was so happy! So Kulu told them, we all have our directions on where we come from. Now, I will show you one of my brothers.” Then, Kulu beckoned his brother to him.

Cihpolakon (Bald Eagle) swooped down and landed next to Kulu. Kulu nodded with acknowledgement to honor Cihpolakon and says, “When I’m not around this is who you will seek out for guidance to bring messages from the Creator. I am going to go away for a while, but I will return to help you again, when you need to re-member yourselves to Nikuwosskiktamik.” It was then Kulu flew away higher and higher up until he was but a speck in the sky. As he flew higher and higher oluwikinok wiphonal (seven feathers) floated into the sky and formed a headdress. Each year the people set out a feast for Kulu near the ocean in the east to honor him. They remember him and the instructions he had given them. They honor and acknowledge each of the animals from the four directions to impart the sacred teachings for all to learn so they will not forget how to live woli-litu – a good life.

Woliwon Nacitpostaq,

As told by Bear Woman, 2020
**Introduction**

For the Waponaki people, socio-cultural and socio-ecological relationships through active participation with the terrestrial and aquatic habitats have remained paramount for cultural perpetuity through activities of food and resource acquisition, including the ability to access critical environmental knowledge contained within the ancestral territories of Maine and the Maritime regions. The active process of food acquisition for food security through sustenance harvesting has been central to indigenous epistemology of the land, waterways, oceans, and wildlife. For the Peskotomuhkatiki, the importance of interrelationship with the ecology and elder-youth relationships in the transfer of cultural knowledge about the ocean environment through indigenous language use has been disrupted because of environmental challenges. Prominently, challenges of access to culturally significant resources has become extremely difficult due to land tenure changes, through regulatory mechanisms, and open access policies in the fisheries. The complexity of the multifaceted aspects of human-induced climate change combined with an attempt to dissolve sovereign rights to self-determination of treaty tribes hinder the ability to build mechanisms for social-ecological resiliency amid environmental changes. Even more significantly, the dimensions of environmental changes and its impact to socio-ecological systems for resiliency within the indigenous populations have remained largely undetermined for Maine tribes. However, despite these challenges of limited access to traditional fisheries at Peskotomuhkatik, many harvesters still share the willingness to co-partner with state agencies keen on greater inclusivity of indigenous knowledge systems. Many hold onto the hopes for community-based learning projects to preserve and restore
the ocean fisheries with considerations centered on future generations (both human and non-human) for greater sustainability.

I will explore the importance of Waponaki epistemology for the potential generation of alternative knowledge bases using the ancient language of the fishermen and fisherwomen that may complement best science practices and may hold the key to true sustainability through better ethics of the ocean ecology. We will hear from the many voices of traditional and commercial harvesters at Peskotomuhkatik who have had the earnest interest to share their personal views and historic accounts of the fisheries from a cultural perspective. I will reveal through their example, cultural values of the ocean habitat and the concept of holism. Holism within Waponaki cosmology is fundamentally a lifeway that includes a paradigm that links the indigenous people as co-participant amid the dynamic ecology and ensures the inclusivity of all life while simultaneously sharing the land and water with others- both human and non-human. I will introduce a culturally relevant indigenous model focused on community-based participation for coastal fisheries management which remain fundamental in building cultural resiliency for the Peskotomuhkati at Sipay’k, Maine.

The research approach for this study utilized mixed methods for qualitative research of Grounded Theory Social Constructivist and Indigenous Research Methodology to discuss the anthropocentric impacts on the ontological and epistemological aspects of an ocean culture at Peskotomuhkatik. The paper discusses the importance of utilizing mixed research approaches of qualitative theory in the study of indigenous knowledge systems that are culturally consistent to facilitate avenues for greater human understanding of the socio-ecological systems (SES) of the original people of Maine.
The study discusses the broader implications of inequitable access to culturally important species that have constrained cultural customs and practices of indigenous interrelationship and interdependency of the Peskotomuhkati that link Native food systems within the ecology. This paper reviews the historical and legal content that has suppressed the context of understanding by the indigenous people and have led to the inability for the tribes to access culturally significant resources for food security and to rightfully practice culture. I also discuss the testimony of traditional harvesters including the infringements of regulatory control, policy, and human-induced climate change that have determined who may have access to the fisheries resources, its cultural implications, and the lack of co-management structures for tribal involvement that will inevitably pose risk of cultural loss of an ocean culture for generations to come.

Chapter 1 discusses the historical uses of Native food systems in early European economic systems for world dominance, ontological and epistemological aspects of Waponaki culture and the historic landscape, and the foreign concept of private land ownership and its impacts on traditional life ways at first contact. The multifaceted issues in global, regional, and state climate change impacts within indigenous communities throughout North America will be reviewed. I describe the demographic conditions of the Peskotomuhkati and its implication on self-determination efforts to offset hunger and the contributory consequences on food insecurity among tribal fishermen and fisherwomen.

Chapter 2 and other parts of this paper discuss the value of building community-based fisher knowledge utilizing models for food security, socio-environmental justice models and models for resilience for mixed subsistence lifestyles. I explore a variety of potential policy approaches gleaned from various socio-ecological models that may provide
opportunity for building resiliency by linking human-ecological relationship while cultivating systems for adaptive capacity through greater distributive equality of the fisheries that will lead to greater food security. The introduction and discussion of a culturally relevant model for socio-ecological systems referred to as, the 'Woli-litu Model' for adaptation strategies in ‘Wolankeyutomuk’ (stewardship) that will provide greater access to the ocean fisheries.

The 'Woli-litu Model' may also foster new perspectives for better ocean ethics that are tribally determined, cultural consistent with tribal epistemology and complementary to co-management arrangements that benefit future fisheries management while considering all life. The discussion will reflect on the influences of human-linked ecological systems research of culturally significant food sources that offset conditions of hunger from a Native American perspective. I introduce culturally relevant approaches utilizing traditional decision-making processes that are mutually beneficial within community-based practices of the Waponaki.

I review the implications of historical Tribal-State relationships on coastal fisheries, global and local policies of coastal fisheries and its impact on cultural survival of the Peskotomuhkati community of Downeast, Maine. This paper provides an overview of the framework for Federal Indian Law, Maine Tribal-State relations, and its impacts on traditional subsistence practices. In particular, I review the Donald Marshal Jr. case as it pertains to the ability to access traditional economic systems of a coastal culture for food security in subsistence practices and to supplement wage labor.

Chapter 3 discusses the theoretical framework of mixed approaches to qualitative research Grounded Theory and Indigenous Research Methodology framework for working
in native communities while making space for the understanding of alternative knowledge bases. **Chapter 4** discusses the overarching themes of equitable access, cultural epistemology, and conservation and management approaches that are linked to food security of an ocean culture. I identify and discuss emerging themes gathered from the harvesters that will be utilized to garner better solutions through better understanding in preserving cultural practices through co-management arrangements. I explore the resolute voices of the harvesters who sponsor human agency and appeal to the need for beneficial collaborations with state agencies to facilitate greater resiliency from culturally significant food sources to offset conditions of hunger, while simultaneously ensuring cultural permanence through traditional ethics of the ocean fisheries.

**Chapter 5** concludes with the critical features within the research distinguishing where two divergent cultures collide, how the Peskotomuhkati have persisted through cultural values and their innate ability to adapt to upcoming earth changes. The significance of co-management structures to foster individual agency are discussed, including building cultural resiliency through food security for the Peskotomuhkati amidst climate change. I examine potential markers for mobilization of indigenous knowledge in policy decisions that strengthen resiliency through co-partnership arrangements for complementary knowledge bases, culturally consistent initiatives based on citizen science, while concurrently identifying areas for potential future research studies.

**Historical Uses of Indigenous Food Systems**

Since European contact of Cristóbal Colon at La Isabela of Hispaniola (Dominican Republic) in 1493, the quest for riches from the new lands of North and South America by explorers and their extractions of the natural environment has been a motive for
hierarchical dominance (Mann, 2011). The impetus of the early Spanish explorers as agents of imperialism while under the guise of the Christian doctrine of discovery was to subdue the wilderness and conquer it. Mann (2011) further contends the occupation of the Americas created disruption in the social structure through inequity to access culturally significant resources that led to the instability of indigenous communities and an inability to practice culture.

Early accounts show indigenous food systems were used to accomplish objectives of domination in the Americas and to ward off famines occurring in Europe and Asia (Mann, 2011). With the arrival of the ‘general crisis’ of the seventeenth-century famine of Europe, indigenous crops had made its way across the Atlantic for commerce and trade into Europe. These initial food crops included maize, beans, tomatoes, sunflower, tobacco and ultimately the potato that ended the famines in Northern Europe, including Asia. The indigenous food crops led to the stability of European populations and politics in European Nations and allowed for the dominion over most of the world during the periods of 1750-1950 (Mann, 2011). These economic advancements in food trade and nutritional imperialism fueled the rise in the west known today as, ‘the agro-industrial complex.’

Early historical accounts describe two vastly different perspectives that involve cultural, political, and economic influences of land tenure changes between the original people and colonial presence within the local regions of New England (Cronon, 1983). He points out that environmental changes occurred under two sets of human-ecological circumstances - one of indigenous relationship (interconnection) and the frenzy of European extraction and economic dominance of the resources (capitalistic – market driven).
Since this time, hegemonic influences have been evident in land use and natural resource extraction throughout the history of colonial dominance in the United States. For hundreds of years, the capitalistic system has worked to disrupt the traditional food systems and its acquisition by indigenous people that have led to violent interfaces with European imperialism (Davis, 2001). The Marxist view of ‘reification’ in which capitalistic concepts of settler states concerning nature and land, sponsored the commodification of the natural resources to feed the urban class, but in time gave rise to poverty conditions throughout history (Grey & Patel, 2015).

The competitions for food dominance and resource extraction via Marxist’s ideals have had destructive implications to the cultural resiliency and social cohesiveness of many indigenous cultures in the western hemisphere through its regulation and policies that have extended its influence within the origins of Federal Indian Law. Further, the Eurocentric internal structures through its dismantling of indigenous food acquisition processes allowed for the gradual dismantling of indigenous ways of life including gender roles that encompassed the knowledge required for its harvesting, preparation, production, processing and storage (Grey & Patel, 2015). Generally, the undoing of major skill sets vital to the acquisition of ecological knowledge linked to indigenous food systems imposed distinct challenges to cultural integrity and resiliency (Figure 21). The imposition to these basic liberties of food acquisition and its place-based knowledge conveyed through an interactive process utilizing local languages has had a destructive impact to indigenous cultures the world over.

In early colonial establishment, the impositions placed on Native American cultural well-being were further intensified with federal policies of rationing, treaty annuities for
land exchanges and state-run commodity programs in 1883 imposed on reservation systems (Henninger-Voss, 2002). These actions have led to the prevalence of many contemporary health issues in Native communities today (Michelle-Rapp, 1995). While the sequestration of Native American people to reservation life destroyed much of the living culture, the indigenous people have continued to persist despite the adversities that colonization has imposed upon them.

Cronon’s (1983) description of early commercial harvesting of not only land plants and animal life but included resources within the coastal waters, left the Europeans scrambling in disbelief at the site of the extraordinary abundance of fish stock. Early accounts of coastal waters by local Waponaki elders reminisce of the abundance of fish stock at the turn of the twentieth century. The elders’ recollection of early fishing experiences as young men would describe the water swarming with fish and all one needed to do was cast a net and hundreds of fishes could be taken within a short period of time (Personal testimony, Dr. Ted Mitchell, University of Maine 1985). These resources were culturally significant food sources, medicines and/or utilitarian commodities and were equally important to Waponaki survival (Figure 2). According to early memories of harvesters within these bioregions and ecological edges were reminiscent of a once-abundant yield of shellfish, sea-run fish stocks, and mammals such as whale, seal, and porpoise are no longer available today because of commercial overfishing, pollution, and habitat loss. The urgent need to build culturally resilient food systems while addressing the unique challenges imposed by these environmental changes remain critical for most indigenous communities across North America. However, despite the loss of biodiversity in the coastal areas and in carrying out
business as usual, anthropogenic mechanisms continue to dominate in natural resource
extraction and management within the United States.

The ancestral territories of the Waponaki included areas in what is now known as
the State of Maine, New Hampshire, Vermont and the Maritime Canada of New Brunswick,
Nova Scotia, Prince Edward Island and areas of Quebec for more than eleven thousand
years. (American Friends Service Committee, 1989). The Waponaki word meaning, People
of the Dawn Lands or People of First Light includes the Pahkahwapskekekik (Penobscot),
Modahkomikuk (Indian Township-Passamaquoddy), Peskomuhkatik (Pleasant Point-
Passamaquoddy), Maliseet (Houlton Band), and Mi’kmaq (Presque Isle Band). For purposes
of this paper, I will use the terms Penobscot and Abenaki interchangeably. The Waponaki
village sizes ranged from six dwellings to over a hundred and were located along major
water systems including the coastal regions, estuaries of rivers, near lakes, rivers and
streams (American Friends Service Committee, 1989). The place-based languages of a
living culture for the Waponaki informed the social organization through kinship
structures, customs for decision-making in traditional governance and ways of knowing
about the ecology that includes land and ocean ethics.

Early governance, as I shall discuss in greater detail later, was one of consensus-
making and enabling community well-being. Kinship and sharing was a primary
relationship experienced within the traditional daily culture. It wasn’t unusual for hunters
to hang bear, deer, moose or fish for the families to share for the evening meals. Southern
gardens were used to share with the northern people when gatherings, celebrations or
annual ceremonies took place. The waterways acted as major travel routes between
villages that were used for accessing harvesting areas, seasonal homes, trade routes and
building alliances with other neighboring tribes and families. The Waponaki vested their well-being both spiritually and culturally to the ocean resources, lakes, tributaries, and terrestrial systems. Traditional economic systems of food acquisition, particularly in the fisheries, including the cultural practices for food security remain fundamental in the recovery, transmission and mobilization of ecological knowledge.

The ability to participate in cultural activities, such as language use, the transmission of knowledge and wisdom carried within various elders and traditional harvesters about the environment enable the holistic relationship by the people within the natural world that has occurred for countless generations. Cultural customs of storytelling have been representative of the terrestrial and aquatic systems that link important values in safeguarding traditional food sources and ensure the persistence of the people, culture, and the ecological survivability of many culturally significant resources from overuse. The intimate knowledge of the plants and animals in relation to seasonal changes and migratory patterns determined Waponaki movement on the land and water for purposes of resources acquisition to engage traditional economic activities, sustenance harvesting, utilitarianism, and medicinal needs for health and well-being (Daigle et al., 2019). Early changes in land tenure encumbered the cultural well-being and the ways of knowing about the environment to the younger generation of traditional harvesters. The ability to access the water resources to ensure cultural resiliency and its implications to cultural survival of a coastal culture among the Peskotomuhkati of Maine are the focus and discussion of this paper.
Changes in Ancestral Relationship

The Passamaquoddy (Peskotomuhkati) tribe is an eastern indigenous Native American tribe located in Pleasant Point (Sipay’k) Maine, Princeton and St. Andrew’s in Canada. The various communities of the Peskotomuhkati comprises one of the easternmost tribe in the United States. Culturally, the Passamaquoddy are one of several tribes of the Waponaki groups. The ancient indigenous language of the Waponaki are of the Algonquin phyla. The ancestral home of the Passamaquoddy tribe covered the entire St. Croix River watershed, in Washington County, Maine, and adjacent New Brunswick, Canada, an area in excess of three million acres.

The ‘Peskotomuhkati’ (People Who Spear Pollock) are recognized for its coastal culture located on Passamaquoddy Bay along a peninsula called, ‘Sipay’k’ (Pleasant Point). The tribe has approximately 3,611 people on their tribal census (Bassett, 2015). Located across the Passamaquoddy Bay on the Canadian side exists the sister tribe, ‘Qonasqamkuk’, a St. Croix Schoodic Band located in St. Andrew’s, New Brunswick, and another settlement north, known as ‘Modahkomikuk’, located in Indian Township, Princeton, Maine a woodland lake society (Figure 1).
As Bassett (2015) describes, the Peskotomuhkatik original homeland includes 6,277 square miles of land, various waterways, and ocean front territory, with the Penobscot River tributaries to the west and St. John River to the North as borders. The central river of the ‘Peskotomuhkatik’ that connects the ancestral saltwater fishing territory of the two Passamaquoddy communities in the State of Maine is the ‘Skutik’ St. Croix River territory and its tributaries. The ‘Peskotomuhkatik’ have occupied its present location for at least 500 generations (Bassett, 2015). Historically, access to the coastal waters and major waterways and water trails for personal use and transportation has been essential to exploit a variety of ecosystems and wildlife habitat throughout the region annually. Basset (2015) describes the biodiversity of marine life and intertidal zones of Bay of Fundy, Passamaquoddy Bay,
Cobscook Bay and Schoodic River as renowned for its richness and productivity that provided the tribe unlimited fishery resources and prime utility. Today, harvesting areas have dwindled since first contact for sustenance harvesters to 2 1/2 miles of ocean front that is limited to shellfisheries such as clams and periwinkles located on reservation territory at Sipay’k.

In areas of Maine, Grant (1907) quotes agriculture was observed by Champlain at the mouth of the Saco River, he notes:

*Otherwise known as the Algonquin; corn, squash and beans along with plants of tobacco the southern bands were cultivated (primarily a responsibility of the women). For the southern tribes, corn and beans supplied more than half the caloric requirements for a family of five. Twenty – five to sixty bushels of corn/2 acres provided three-quarters of the families’ subsistence needs. Men were primarily responsible for extended fishing and hunting trips. Water going vessels such as, birch bark canoes were much easier to portage and were preferred for offshore fishing and hunting. Nightly hunts for eels and sturgeons were accomplished by torch lights.*

*(Champlain, Voyages of Samuel de Champlain, Grant 1907)*

For the northern villagers, hunting, gathering, gardening, fishing, and trapping provided the primary sources for calories and crucial nutrients for the winter months. The subsistence practices would supply three-fourths of the small village’s food supply. However, coastal Natives relied more heavily on seafood and utilized smaller amounts of game species during the subsistence cycle (Cronon, 1983).

According to Cronon (1983), Eurocentric views of the landscape were divergent to indigenous cultural perspectives in the reliance of hunting, fishing, and gathering for food and were regarded as being lazy by the colonists. While on the other hand, subsistence activities were considered a portrayal of masculinity and provided critical skills for cultural
survival and identity. Primarily, these skills served spiritually as rites of passage for the Waponaki and contained sacred teaching about manhood, personal evolution through self-realization and values about the environment (Lynn et al., 2013). However, it was through these accusations of laziness that justified the colonist’s views to deny the Native people their rightful claim to the original subsistence territories (Cronon, 1983). He contends, it was the notion of this settler state perspective which constituted the applicable uses of the environment that ultimately reinforced the false European concepts of conquest. Later, this false perspective of conquest will be discussed under the origins of Federal Indian Law concerning the Discovery Doctrine and its perpetual use in major court decisions influencing the precedence of Federal Indian Law and state court decisions that have defined land-ownership in the U.S. today.

The dichotomy of living by using the land and waterways between the Native people and the colonist gave rise to central conflicts of wealth, property, and boundaries of the landscape. The Native people expected to continue with cultural activities of regional access to the resources during the subsistence cycles. The concept of biodiversity for the indigenous peoples meant preservation of the various species in the area, that included sustaining the ecology and habitat to enable species abundance, stability, and the maintenance of the reproductive capacity of the wildlife for future generations (human and non-human), a concept I shall refer to as ‘co-participant’ in this paper. Comparatively, the colonist sought to ‘fix’ the landscape with permanent settlements that included cleared fields, pastures, buildings, and fences for agricultural purposes. The colonists simply viewed the use of the land for agriculture as the only legitimate Native property they would honor. The idea of usufruct rights was irrelevant to the colonists. These constricted views
of land tenure included indigenous fishing territories, clam banks, fishponds, berry harvesting areas, and hunting lands. In Cronon’s review, within the constructs of colonial ideology of land tenure, the northern bands were not afforded any rights to their cultural heritage and identity as indigenous people. Hence, the rights to waterways and coastal areas were no different.

Under the context of understanding for the indigenous people, Cronon (1983) specifically mentions the early arrangements with the Native Agawan people of Massachusetts had more to do with sharing the lands than alienating it for individual purposes. The ‘sale’ of the land and uses of it were understood as usufruct rights for specific resources, not the ownership of the land itself (Brooks & Brooks, 2010; Cronon, 1983). For the Agawan, it was understood the members gave up none of the ‘reserved rights’ to hunt and gather, while retaining access to specific uses of the land. The sale included only the right to use the land jointly for agriculture, trade and to utilize the ecological cornucopia as needed to survive. Moreover, the Agawan villagers never gave up their sovereignty over themselves or relinquished their right to engage in cultural activities. These same perspectives within treaty agreements between the Waponaki people and the British can be illustrated in the Don Marshall Jr fisheries case in ‘Mikmaq Treaty’s on Trial’ by Wicken 2002 and is discussed in greater detail later.

This colonial idealism of land acquisition and individual ownership remained widespread through New England and the Maritime regions. Cronon (1983) asserts there were basically two avenues the colonial claims to ownership of the land that materialized: through purchase or grants from the English crown. From historical accounts, the British claim came through its own claim of the regions by way of Cabot’s discovery in 1497-98 as
Genesis 1.28 biblical code required and represented symbolically as the first Christian monarch to step foot on ‘discovered’ land (Cronon, 1983; Newcomb, 2008). Further, colonies utilized the integrated concept of church and state as its political right of sovereignty and access to the lands from the crown of England (Cronon, 1983; Newcomb, 2008; Wicken, 2002). It was this distinction of sovereignty and ownership that was crucial in expediently incorporating written concepts of British law into the new lands, while negating the original laws of the land (Wampum Belts Oral Testimony and Treaty-making) by the original people. This rationale of settler states opened the door to the earliest form of development for a commercial market of land ownership and the idea of a capitalistic state within the North American hemisphere.

During this period, the Massachusetts Bay Colony’s General Court ordered that “no person whatsoever shall buy land of any Indian without leave from the court.” Thus, began the limitations of rights of the indigenous people to exercise sovereignty (Cronon, 1983; Newcomb, 2008; Wilkins & Lomawaima, 2002). In 1717, the Connecticut court deemed all lands part of the English colonial jurisdiction and defined the system of property rights that operated on the land. The granting of lots and allocations, land use and land tenure moved from the commons of usufruct rights to permanent private ownership (Cronon, 1983; Wicken, 2002). Ultimately, colonies began to create land use regulations that restricted how land may be used or sold by both colonists and the original people.

The transitions of subsistence to private ownership, agriculture, commodity, and market developed into a complex array of commercial agricultural endeavors for urban industrialism. The transition was the beginning of a Marxist economy of capitalism in America. The lands and coastal areas of New England became a ‘commodity.’ Various items
of the landscape and seascape became nothing more than an object of commerce, primarily fish, furs and timber that gave rise to commercial trade in the region. It was the items of profit from European market demands that explains the ecological transformation observed as the key causal agent for environmental changes in New England (Cronon, 1983). Historical evidence of human-induced environmental challenges as Cronon and others have described have had overwhelming effects to the core of traditional lifeways and fishery practices for the Waponaki of Maine and the Maritime Regions. The outcomes of these ecological impacts of first contact were devastatingly widespread along the coastal areas of the Atlantic.

Many of the original fishing and hunting villages are located along rich pristine areas known for its abundance in annual migration of sea-run fish that had its premium at the turn of the century (Bassett, 2015). The area was recognized for its biodiversity of cod, sturgeon, pollock, salmon, striped bass, mackerel, and river herring, including catadromous species such as eel and other culturally important species to name a few. Shellfish such as the lobster, scallops, shrimp, crabs, and clams have been a main stay in the indigenous diets for hundreds of years. The intertidal zones were once a major habitat and breeding ground for flounder (Personal testimony, Dale Mitchell, 2017; Daigle et al., 2019).

It can be said, fishing was the primary commodity for many villages and an important nutrient source. For the Waponaki in Maine, more than half of the food supply came from coastal access including rivers and tributaries (Cronon, 1983). Smelts arrived from late March to May in the rivers followed with alewives, sturgeon, and salmon. Pollock and flounder were generally taken from the coastal shores including brook trout, striped bass that were taken closer to tidewaters with the use of nets, weirs, and spears for
harvesting. Native women and children harvested scallops, clams, lobster, and crabs as a steady base for the village diet throughout the subsistence cycle.

**Figure 2. Uses of Natural Resources in Indigenous Communities**

The fisheries of sea mammals included whales, porpoises, walruses and seals for the caloric content, oils, tools, ceremony and to make winter clothing (Prins & McBride, 2007). Once the villages moved inland in mid-August – September eels would be caught while returning from the sea. Early spring muskrat was a delicacy from the pristine waters within the river watersheds (Lynn et al., 2013).

Despite the dramatic environmental changes that took place since British and colonial intrusion of the Northeastern regions of America, the Peskotomuhkati coastal culture continues to persist today. Coastal fisheries remained a primary food and major nutrient source for many of the Waponaki people in the region. Until the turn of the twentieth century, the river herring (Alewives and Blueback) was a main staple to the Peskotomuhkatik for over 10,000 years (Bassett, 2015). An anadromous species, the river
herring migrated to the upper head waters of the St. Croix River and into its tributaries approximately 80 miles inland. The river herring was an important protein and omega fatty acid source in the indigenous diet, as well as several other sea-run species. Once teaming in the St. Croix River, the herring is also known as a keystone species (Bassett, 2015). Its ecological contribution to the river was essential for the survival and balance of many organisms both in the aquatic environment and for land mammals, avian species, including humans. Alewife populations in the river were estimated to reach 30-40 million each year to spawn (Molyneaux, 2014).

According to the elders, the early fisheries was plentiful. The Peskotomuhkati were able to spear pollack on the shores of ‘Sipay’k’ Pleasant Point. Hence, as their traditional name implies, the Peskotomuhkati inhabited and fished these coastal areas into ancient times through present day. They have held onto kinship teachings of the ocean, its occupants and migratory knowledge of the fisheries for generations. Ancient fishing cycles and knowledge of optimal harvesting times to lessen impact during reproductive cycles were utilized to foster the sustainability of the fisheries. Fred Moore (2012) states, “there was no other place on the east coast that this knowledge of the fishing cycle took place” (Figure 3). This ancient cycle of fishing knowledge has been interrupted by the coming of the European and on-going human impact. Changes in harvest calendar have primarily been a result in the shift of the seasons within the fisheries by approximately 2-4 weeks early than usual. Codfish that was normally caught in February and March are now caught occasionally in April and May (Personal communication, Fredrick Moore III, 2012). According to Fred Moore (2012), “We have to search for these fish around old fishing Islands, watching currents or fishing miles out to sea. Traditional harvesters are always
contemplating the resource supply and realize a need to balance supply with the harvest.”

Various changes appear to have been through human impact and climate change, such as, the change in migratory species, shift in currents, extreme weather events and increase in water temperatures that has caused changes in the ecology.

**Figure 3. Ancient Fish Cycle, Passamaquoddy Bay**

Porpoise meat and oil once in good supply was used for medicine, ceremony, lubricants, and a dietary staple. This is no longer true today and the nutritional state of the animal has been compromised with less fat stores (due to the lack of food) and diseased livers from heavy metal contaminants, which are no longer eaten. According to traditional harvester Ed Basset (2010), “*Traditional fishermen choose to hunt smaller younger animals that are less diseased.*” Traditional fishermen have great concern for the sustainability and reproductive capacity of the key fisheries. Fredrick Moore (2010) states, “*Canadians Fishermen have set gill nets in the Bay of Fundy to the Gulf of Maine to trap pollack, haddock, tuna, cod, hake and salmon. As a result, these companies have been catching more fish than can get through to these ancient pathways and the migratory and reproductive patterns have*
been interrupted.” These colonial values of unrelenting harvest of the fisheries have had devastating impacts on the sustainability of the various species and ecological habitat along the Maritime regions of Peskotomuhkatik.

Additionally, ground fish have been depleted to levels where they are no longer observed. For instance, certain fish do not come into the bay any longer due to over harvesting such as, small tuna, sunfish, blue fish, basking sharks, and other species. Other fish are nearly gone altogether such as flounder, haddock, cod, pollack, smelts and herring (Personal testimony, Traditional Harvester, Fred Moore, 2012 & Dale Mitchell 2017; Daigle et al., 2019). Environmental factors such as bioaccumulation of pollution and heavy metals have left the clams in the Schoodic River unfit to eat. Anthropogenic factors (non-native commercial fishing methods and industrialization) have been highly destructive to the resource in the long-term. According to Moore, other major factors include toxic spills that are measured in dollars lost, not the destruction of nature and the fisheries, while this impact is long-term and can be devastating to native fishermen.

As a council member in the fall of 2006, the Natural Resource Council meeting took place discussing initial concerns the State of Maine has blocked the passage for Alewives in the St Croix Watershed to protect the small mouth bass introduced for sports fishing for more than 20 years. The collapse of the Alewives was a result of the blockage that occurred between 1987 and 2002. In 2012, herring numbers were estimated to be a mere 900 due to habitat loss from industry, the lack of adequate science, and from poor management decisions (Bassett, 2015). In 2013, the tribe entered into cooperative agreement with the Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (USFWS) and NOAA-Fisheries and the Environmental Protection Agency (EPA) to restore and reopen the St. Croix River
Watershed to native Alewives. The goals have been to develop a River Herring Conservation Plan 2013 in efforts to restore this keystone species and its numbers to near historic levels, while anticipating the reestablishment of the river ecology.

There have been several commercial factors that have affected the productivity of the fisheries in the St. Croix and Passamaquoddy Bay for many years and include hydroelectric dams, industrial pollution from paper mill companies and cannery operations. Chief Hugh Akagi of the ‘Qonasqamkuk’ St. Andrew’s Band states, “Never again should indigenous people be involved in blocking an indigenous species from its homelands. This is what has been done to us” (Molyneaux, 2014). According to Basset (2014), the tribe has been looking to restore river ecosystems through mediation projects and fish nurseries to improve productivity and enhance biodiversity of the river system. Since 2014 the population numbers for alewives in the St. Croix have increased to approximately 600,000 as of 2020 (Personal testimony, Bassett, 2020).

Since 2014, the tribe has been contemplating the removal of the causeway that links neighboring towns of Perry to Eastport via highway Route 190 that runs directly through the reservation. The causeway has altered the estuary of Half-moon Cove a natural intertidal flow and prime habitat and harvesting site for many shellfish such as lobster, clams, and breeding ground for flounder. The highway was built with plans for an Intertidal Power Project that was never implemented but without the tribes’ consent (Basset, 2015). The tribe’s goal is to reestablish the natural intertidal flow and habitat of the estuary for the restoration of these cultural important species and food sources for the Peskotomuhkati.
The Passamaquoddy Joint Tribal Council approved the Fisheries Management Plan on June 12, 2012, which is based on the responsibility to balance the interest of native fishermen with that of the resource and future generations. The objective of the plan hopes to ensure the sustainability of community, family, and the environment by integrating traditional values of respect, responsibility, and reciprocity in its approach. The plan addresses issues of access and the view of the resources that are culturally unique:

- The fisheries belonged to everyone, not just non-native fishermen.
- The Passamaquoddy people are interconnected to the sea and looked at the resources with utmost respect and reverence as observed through clan relationships and ceremony.

**Figure 4** is an illustrative map of the traditional harvesting areas of Peskotomukatik. The ancient fishing areas extend into Canada, Massachusetts, and the Outer banks regions. The traditional fisheries in Passamaquoddy Bay and the Bay of Fundy have been providing a viable solution for the people to offset the health and economic disparities, although access for most families has been limiting.
Increasingly, many tribes are relying on Indigenous Knowledge (IK) systems that are integrated with contemporary tools and research methods to address environmental change well in advance of policy changes due to financial constraints and limitations to infrastructure capacity (First Stewards Climate Change Symposium, 2012; Grossman & Parker, 2012). While many believe that climate change is not real or even a slow process, scientist believe that the potential for sudden and abrupt shifts in the ecosystems conditions may lead to catastrophic loss of habitat, human lives and property (Parry et al., 2007). Hence, the urgency to use familiar tools such as indigenous knowledge (IK) of the environment as an
adaptation strategy over time becomes paramount in planning, management and resiliency building for climate change impacts in Native American communities.

In Maine, current conditions of climate change have forced species to adapt to increasing temperatures by shifting their habitat range northward or to higher elevations where conditions are cooler (Daigle & Putman, 2009). Many of these species’ habitat and range have been destroyed or are facing extinction, while displacing other species through competition. The limited access to culturally important species and habitats have posed challenges to many Native groups and the flexibility to practice their traditional lifeway’s across the United States (Grossman & Parker, 2012).

**Demographics and Economic Indicators**

Today, it has been estimated that 1.2 million (60%) of U.S. tribal members live on or near reservation continue to depend on a mixed traditional subsistence lifestyle and wage labor (Houser et al., 2001). Historically, the Waponaki have harvested major culturally significant food sources such as fiddleheads, wild rice, nuts, wild berries, maple syrup, wild greens, various tubers, fresh and ocean water fisheries, eggs, deer, moose, bear, beaver, muskrat, turkey, partridge (Prins & McBride, 2007) including water resources of seafood such as lobster, scallops, clams and various shellfish, sea mammals, such as the whale, porpoise and seal (Figure 5). Today, the Waponaki peoples of the State of Maine have depended on seasonal jobs for wage labor combined with the harvest of cultural significant foods from the environment for their livelihood (Daigle et al., 2019).
In recent times, the living culture provides an opportunity to economic self-sufficiency that wage labor only partially provides for basic liberties that includes clothing, utility, and food – as supplemental nutrition for indigenous families. Mostly, mixed subsistence lifestyles ensure food security while linking socio-ecological aspects of cultural identity, resiliency and the transmitting of traditional knowledge through language. These activities ensure the transmission of the original teachings of holism while caring for ‘Nikuwosskitamik’ (Mother earth) that ultimately states, ‘all life is sacred and interconnected.’

**Figure 5. Procurement and Processing of the Seal**

Adapted, Mabel Dana, 1907

The imperialistic appropriation of the fisheries from the coastal culture of the Peskotomuhkati over the past century by settler states have contributed to one of the most impoverished and vulnerable tribes in the Northeast. According to income poverty levels for the US and the State of Maine, poverty rates at Peskotomuhkatik are at 25% for the
families aged 18-34 years old and 24% for families aged 35-54 years old (Town Charts; Passamaquoddy Pleasant Point Reservation, Maine; Economic Data, 2017). Poverty rates for children under age 12 years are at 29%. Unmarried with children and unmarried females with children are the highest in the State of Maine at 69% and 71%, respectively and rank #1 for the area. Of those living in poverty, 51% have less than a High School education and 48% with some college experience. Major sources of income include wages, self-employment, social security, and public assistance with minor percentages coming from investments and retirement. Primary employment sources are located on the reservation within the tribal administration. Work force development monies are derived primarily from federal sources that include the Bureau of Indian Affairs and Indian Health Service with non-Native employees securing the higher median income than Native employees ($26,250 versus $20,938, respectively).

As the demographic data indicates, there have been little opportunity for the Peskotomuhkati to build a thriving community for its membership due to the lack of educational and employment opportunities, lack of state accountability, isolationism, climatic changes, cultural loss, and food insecurity and hunger. The lack of access to the fisheries through a decrease in traditional harvesting areas, compounded by a decrease in fish stock, lack of habitat by climatic changes and pollution, losses of biodiversity, overharvesting by commercial fisheries and overregulation by the state has led to conditions of hunger and food insecurity for many tribal members.

In the last 100 years, accesses to traditional harvesting practices of the coastal community have become constrained, to say the least and an element for numerous confrontations for the Maine tribes with the State of Maine. Legislative actions and public
hearings point to evidence of polemic activity by the Attorney General's Office and the Department of Marine Resources (DMR) that appear to give precedence over the marine resources to the economic wheel of commercial fisheries (Maine State Tribal Commission, 2014). These adversarial actions affecting cultural customs and ways of life are often the result of political processes and social structures within the fisheries industry that have little accountability to the Maine tribes.

**Climate Change and Indigenous Peoples**

In recent climate change research findings, indigenous populations have been identified as the most vulnerable group from the impacts of climate change (IPCC, 2007). As a result of their dependency and direct relationship within the ecological regions undergoing rapid environmental changes pose a number of threats that include increased mortality and morbidity rates in the United States (Ford, 2021). Ford (2021) has identified key factors that hold much broader implications of vulnerability risk to indigenous health in climate changes that include increased exposure to infectious diseases, water insecurity, food insecurity, natural disasters, population displacement, limited technological capacity, weak institutions, high levels of poverty and political inequality. As Ford (2021) espouses in his review for health implications and as this research suggests, the Waponaki are among those at high risk of numerous key factors for vulnerability exposure in climate change.

Globally, scientific evidence of human-induced climate change has been overwhelming and intensifying across the country and threatens the physical, social, and economic well-being of the populous (USGCRP, Vol II, 2018). The ocean and cryosphere in a changing climate indicate the upcoming changes will have a profound effect on marine fisheries, ocean ecosystems, extreme weather patterns and water supply. The ocean
observations indicate accelerated warming trends, ocean acidification, and oxygen depletion (Solomon s. et al., 2007). Regionally, climate change evidence on the oceans, forests, wetlands, lakes and rivers will impact the way of life for many Maine citizens and above all the natural economy in which many depend (Jacobson, et al., 2020). National, State policy and regulations, and the lack of the availability of co-management structures through meaningful involvement that are culturally sensitive have had critical implications to cultural resiliency and social cohesiveness of the coastal fisheries particularly within Peskotomuhkati tribal community in the Downeast region of Maine.

Overwhelmingly, the indigenous people have relied on the international front through the United Nations as a potential advocate for treaty rights and to gain traction for environmental justice issues. For instance, the ‘UN Convention on Elimination of All Forms of Racial Discrimination, (1963)’ the ‘International Labor Organization (ILO), (1989), in which Article 7 of the ILO Convention 169, states that ‘governments shall ensure, whenever appropriate studies are carried out, in cooperation with the people concerned, to assess the social, spiritual, cultural, and environmental impact on them of planned development activities. These studies shall be considered as fundamental criteria for the implementation of these activities’ (International Labour Organization, 1989). In 1992, the RIO Declaration on Environment and Development Earth Summit included Principle 22 which states that ‘indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. In 1991, United Nations Conference on Environment and Development, put forth the ‘Statement of Principles for Global Consensus on the Managements, Conservation, and Sustainable Development of All Types of Forests' call on ‘national policies to recognize and
support the identity, culture and rights of indigenous peoples’ which have already been set in place through treaty rights and trust obligations.

Nevertheless, the World Summit in Johannesburg Africa (2002), surmised the total failure of the UN to uphold the Articles of RIO 10, while indigenous delegates issued the “Kimberly Declaration’ which specifically urged world governments to ratify and strengthen the Kyoto Protocol to reduce greenhouse gas (GHG) emissions, but openly opposed the carbon sinks and carbon trading mechanisms as a legal avenue for multinational corporations (MNC) to pollute (Kimberley Declaration, 2002).

Many tribes and non-government organizations (NGO’s) assert that Clean Development Mechanisms (CDM) establishes a global carbon trading system as another way for large corporations to generate revenues through the commodification of the atmosphere and promote privatization, which continue to grease the wheel of global capitalism. The International Indigenous People’s Forum on Climate Change state that these trading mechanisms and pollution through industry are instead trades offs which MNC are making for human lives. Many tribes have used the approach of human rights for environmental protection rather than relying solely on the UNFCCC process to internationalize their demands on climate change issues. These claims have drawn attention toward international and national government systems for the violations of these inherent rights of access and freedom in cultural and religious practices. The UN has since dispatched a special rapporteur on religious tolerance to investigate the U.S. on human rights violations.

The Inuit Circumpolar Council (ICC) in 2005 petitioned the Inter-American Commission on Human Rights (IACHR) seeking relief from these violations resulting from
global warming caused by GHG emission to pressure the U.S. to reduce GHG’s (Inter-American Commission on Human Rights, 1948; Watt-Cloutier et al., 2004). Many indigenous groups from around the world have become increasingly more vocal in their attempts to convey environmental concerns and urgency in the international debates involving climate change. The International Panel on Climate Change (IPCC) (2007) have identified Native American communities as the most climate-sensitive populations in North America (Barker, 2007). Subsequently, climate change will inevitably cause inequities in impact over time and space and will disproportionately affect the lower income groups because of economic globalization.

Nationally, the IPCC (2014) states that the consequences of greenhouse gases within the earth’s atmosphere will create global increases in temperatures and extreme weather events (Solomon et al., 2007). In 2019, global projections have been exceptional with not only increases in global temperatures on record, but retreating glacial ice and record sea-level rise (WMO 2019b). In the 2019a special report the IPCC clearly points out the vital importance of indigenous stewardship of the food systems, freshwater resources and improving biodiversity. Moreover, the IPCC (2009) contends the ongoing exploitation of Earth’s resources has only served to exacerbate the climate crisis.

The IPCC Fourth Assessment Report: Climate Change (2007), reviews ‘adaptation practices, options and constraints’ by considering the customs of indigenous peoples and their cultural adaptation strategies for ‘flexibility’ and ‘coping’ mechanisms employed through indigenous knowledge systems to circumvent the negative impacts of climate change. IPCC (2007) clarifies the goal to lessen the magnitude of these impacts of environmental changes through proactive measures. IPCC (2007) defines adaptation as:
‘The adjustment in natural or human systems in response to actual or expected climatic stimuli or the effects.’

Typical economies of tribal governments rely heavily on agriculture, forest products, fisheries and tourism (Solomon et al., 2007). The IPCC (2007) acknowledges the fact that indigenous groups have developed resiliency over time through kinship ties, sharing information concerning the environment, social organizational strategies, and innovated practices. Many of these strategies are still being employed today with the exception of mobility. However, IPCC (2007) points out that these coping mechanisms may become constrained as social, cultural, economic, and political forces impinge on the native people from internal and external sources in the future. Special attention will need to be given to Native Americans and other indigenous peoples with subsistence livelihoods, limited access to information and few means to adapt.

The IPCC (2007) affirm the Artic communities and Canada’s indigenous peoples have experienced the economic constraints of climate change though changes in sea ice and lake ice that is necessary for travel, hunting, fishing, and whaling. Insect infestation has been devastating to many First Nation forestry resources and wildlife. The exposure of coastal infrastructure from diminishing sea ice and erosion has caused further damage. The shift in the range or abundance of wildlife crucial to the well-being of indigenous culture will be disruptive and destructive to the communities and their identity as Native Americans. Additionally, poor infrastructure design or lack of adequate development have had disparate impacts on indigenous populations, and many are limited to address issues of land and water management. Further, the subsistence lifestyles, resiliency and the flexibility of resource procurement systems will be jeopardized in the face of uncertainty.
Local knowledge and knowledge transfer may become challenged together with the increase to human vulnerability as climatic change progresses.

In order to meet these unique challenges, the IPCC (2007) established the UN Permanent Forum on Indigenous Issues (UNPFII) which initiated the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) (Houser et al., 2001). UNDRIP’s aim was to address the international community to mitigate climate change by recognizing the role of indigenous people in the global regulatory process specifically dealing with environmental impact and policy development. The International Indigenous Peoples Forum on Climate Change (IIPFCC) (2009), have jointly developed a statement recognizing indigenous customs that may be complementary to the best science practices for disaster and response planning (Tauli-Corpuz et al., 2008). The IIPFCC calls for the:

‘Full and effective participation of indigenous peoples’ subject to their free, prior and informed consent at all stages of the adaptation process, including governance and financial disbursements, planning, implementation, monitoring and reporting consistent with UNDRIP.’

International, National and State policy and regulation involving co-partnership and meaningful involvement in the decision-making processes will be critical for successful capacity building (adaptive practices) in climatic changes. Tribal involvement will be paramount to strengthen tribally resilient systems for economic well-being as well as food security for local indigenous communities worldwide.

**Climate Change Impacts for the State of Maine**

In early 2008, the University of Maine’s Climate Change Institute and Maine Sea Grant initiated an assessment on Maine’s climate changes that identified climate indicators for the State of Maine. Again, in 2015 an update published descriptors for environmental changes that will have definite impacts to the people, economy, and the environment for
the state of Maine. The Maine Climate Assessment (2020) most recent update and summary for climate change indicators for the State of Maine are discussed here.

The chemistry of the ocean environment is changing because of carbon dioxide being absorbed into the ocean ecology to form a more acidic medium known as, “ocean acidification” whereby the pH is reduced by the formation of carbonic acid. The acidic conditions have led to a reduction in the availability of minerals for mollusk and the calcification needed for shell integrity (Figure 6). As climate scientists point out, ocean acidification will pose long-term implications for the shellfish industry in Maine, particularly lobster (Jacobson, et al., 2020).

**Figure 6. Map: Coastal Acidification in the Northeast Region**

Adapted, Maine Climate Assessment 2020
Accordingly, temperatures in Maine have increased statewide by 3.2 degrees Fahrenheit in the last 124 years with most notable increases taking place since 1960. It has been established that the Northeast is warming faster than any other regions in the U.S. (Fernandez et al., 2020). The temperatures are projected to increase by 5.4 degrees Fahrenheit with greatest increases occurring along the coastal areas, while global increase reach 3.6 degrees Fahrenheit (Figure 7).

**Figure 7. Chart: Maine Average Annual Air Temperature, 1895-2018**

Annual temperature, 1895-2018, averaged across Maine based on monthly data from the NOAA U.S. Climate Divisional Database (NOAA CAAG). Linear trends calculated for the entire record (dashed line) and since 1960 (dotted line).

Coastal acidification conditions in the Northeast (adapted from Figure 2, Gledhill et al. 2015). This map provides a general illustration of ocean and coastal acidification conditions in the Northeast based on the minimum monthly aragonite saturation state at the sea surface (minimum monthly pixel-by-pixel averages between 2003–2010). Lowest values tend to occur in early spring. During this period, values north of Cape Cod are
generally between 1.2 and 1.5 (or frequently lower), levels that are considered harmful to young shellfish.

Precipitation (rain) has increased by 5.8 inches annually (15%) since 1895. Annual snowfall has decreased by 2.3 inches (20%) (Figure 8). Storm intensity and frequency has dramatically increased in the last two decades state-wide. Intense storms and precipitation impact along the coastal regions have resulted in cyclone-like hurricanes with warming temperatures (Huang et al., 2017, Huang et al., 2018). Flash runoffs due to storm intensity and volume overwhelm the streams, rivers, and the Gulf of Maine. These extreme events have resulted in flooding with freshwater intrusion and have impacted the quality of drinking water in local areas. High winds have left Maine people without power with heavy damage to power lines (Russell, 2018).

**Figure 8. Graph: Maine Average Annual Precipitation, 1895-2018**

Total annual precipitation, 1895-2018, averaged across Maine based on monthly data from the NOAA U.S. Climate Divisional Database (NOAA CAAG). Linear trends are depicted for the entire record (dashed) and since 1960 (dotted).

Precipitation has increased at a rate of 0.107 inches per year since 1960, more than twice as fast as the long-term rate of increase of 0.048 inches per year.

Increase of 5.8 inches
Winter appears to be the fastest changing season with warming occurring with average temperature increasing 3.7 to 4.3 degrees Fahrenheit. Snow cover has changed with fewer days of extreme cold, frost, snow, and ice (Figure 9). Freeze-thaw conditions have had its impact on prime revenues generating activities such as forestry operations with bare grounds and mud (Contosta et al., 2019).

**Figure 9. Graph: Maine Average Annual Snowfall, 1896-2019**

Estimated annual snowfall, 1896-2019, averaged across Maine for the contiguous winter months November-April, with linear trends for the record period (dashed), and since 1960 (dotted). Values derived from monthly temperature and precipitation data from the NOAA U.S. Climate Divisional Database (NOAA CAAG), where snow precipitation is assumed for all months (November through April) with a mean temperature of less than 32 °F.

An erratic frost in the spring, such as the one in June 2018 (Cooperative Extension 2018), can kill flowers that would have become fruit. “We didn’t used to have these unpredictable events,” wild blueberry specialist with Cooperative Extension Lily Calderwood told *The New York Times*. “We could rely on gradual and reliable growing seasons. Now it is all starting to skip around, and these frost events come out of the blue” (Severson 2019). *Photo: Jennifer D’Appollonio*

Adapted, Maine Climate Assessment 2020
Warming trends in the Gulf of Maine have created changes to the patterns of currents and ocean circulation that have resulted in heat waves in Maine. The average annual temperature increases of 2.9 degrees Fahrenheit for sea surfaces have been observed since 1895 (Figure 10). The steepest rise occurring between 2012-2016 (Pershing, A. J. et al., 2018). The greatest warming trends take place between June to October. Seasonal summer conditions have increased to at least two months longer than in 1982 (Thomas, A. C. et al., 2017). The increase ocean temperatures result in less nitrogen mixing along the surface that could compromise the ocean ecology to a less productive Gulf of Maine (Balch et al., 2016).

**Figure 10. Graph: Gulf of Maine Temperature, 1895-2018**


Temperature has increased 0.059 °F per year since 1960, more than twice as fast as the long-term rate of 0.024 °F per year.

Adapted, Maine Climate Assessment 2020
Sea level rise from melting glaciers has led to more frequent flooding along the coastal regions that create changes in the strength of gulf stream and wind patterns. Overall increase since 1912 has been 7.5 inches (Figure 11). Storm waves and tides have created storm surges into the immediate coastline. Flooding has occurred 12 more times a year during winter Nor’easters (Slovinsky, 2019). Erosion has cost the State of Maine $70M in coastal real-estate value. Additionally, saltwater intrusion to fresh bodies of water have occurred in many coastal communities.

Figure 11. Graph: Sea Level Rise in Maine

Atmospheric warming is a result of increased concentrations of carbon dioxide (CO$_2$) and other pollutants such as inorganic nitrogen and sulfate. Maine atmospheric CO$_2$ concentrations have been consistently about 400 parts per million (ppm) (Figure 12). Methane and nitrous oxide are at lower concentrations but have more potent impacts to
greenhouse gases effect that are incrementally growing in Maine (EPA, 2019). These gases also provide a fertilizer effect for essentially all plants including invasive species present in prime habitats and ecosystems (Hristov et al., 2018). It is still questionable how these high nitrogen conditions are impacting the sphagnum bog systems that are an important carbon sink in the Northeastern regions.

**Figure 12.4 Graphs: Increases in Greenhouse Gases**

![Graphs: Increases in Greenhouse Gases](image)

Global concentration of atmospheric carbon dioxide, 800,000 years ago to present in parts per million (μmol mol\(^{-1}\)) from a variety of data sources (A; EPA-GGE). Atmospheric carbon dioxide (B) in parts per million (μmol mol\(^{-1}\)); methane (C), and nitrous oxide (D) in parts per billion (nmol mol\(^{-1}\)) measured at Argyle, Maine, 2003-2018 (NOAA-ESRL). This Earth System Research Laboratory (ESRL) site is a collaboration between the University of Maine and NOAA.

Adapted, Maine Climate Assessment 2020

Forestry industry in Maine are impacted by increased temperature, precipitation and CO\(_2\) levels (Janokwiak et al., 2018). Culturally, important species to the Wabanaki such as sugar maple, birch and brown ash have become at risk for species abundance and occurrence (Bose et al., 2017). Invasive insects such as the pine beetle and emerald ash bore pose risk to the forest industry and indigenous economies with warmer winter minimums (Dodds et al., 2018).
Drought poses its own challenges to the stress of economically important species within the forestry and agricultural industry in Maine. Models show a short-term gain in growth and productivity but a decrease in carrying capacity for economically important species into the future (Andrews et al., 2018). Spruce and pine are projected to decline under all the climate change scenarios for temperature, precipitation, invasive pests, and drought if these conditions persist as experts have predicted. These species along with hemlock are expected to migrate into the northern regions in the next 20 years. Invasive pest such as the ash borer, spruce budworm, butternut canker is expected to reduce the adaptive capacity of these species to upcoming climatic changes (Janokwiak et al., 2018).

For the marine fisheries the warming trends for the northern Atlantic oceans have pushed cold water species to the outer banks and further north, while the warmer water species are becoming more prevalent in the Gulf of Maine (Pershing et al., 2015). Changes in the food web via warming trends and ocean acidification will have long-term impacts on the lobster economy. The shell fisheries such as shrimp fisheries have closed all together. Ground fish like Atlantic herring, flounder, and haddock have migrated along the continental shelf (Kleisner et al., 2016). There will be a loss of habitat for most of these species. Others species such as the Atlantic croaker, black sea bass, bluefish, butter fish, longfin squid, scup and windowpane flounder are expected to adapt to the new circumstance (Jacobson et al., 2020). Vulnerable species such as the Atlantic salmon, alewife, blueback herring eastern oyster, rainbow smelt, Atlantic sturgeons, winter flounder and the short nose sturgeon will be impacted by habitat conditions based on increasing temperature (Hare et al., 2016). Lobster is expected to increase for the short term due to migrating habitats but decline in the long-term (Oppenheim et al., 2019).
**Tribal-Educational Partnerships in Climate Change**

In early 2016, the University of Maine and the five Maine tribal communities formed a Tribal-Educational Partnership to discuss key Climate Change issues impacting Maine. The sessions were coordinated through the Wabanaki Center and Native Studies Educational Research and Scholars Program and the University of Maine Northeast Center for Climate Science (NECCS). The intent of the Climate Change Educational Impact work sessions was to provide a general overview of climate change vulnerabilities in the regional areas of Maine through Tribal-Educational Partnerships in collaboration with the University of Maine. The primary goal of the educational partnership was to assist the Maine tribes in the development of a framework for response for an adaptation and mitigation for climate change into a formal Tribal Comprehensive Environmental Adaptation Plan. In addition, the information collected in this process would provide baseline data to the tribes for future comparisons in adaptation planning.

Generally, the project identified and collected relevant information such as, river ecology and hydrology issues, marine issues and information concerning culturally significant vulnerable species, natural resources, or infrastructure unique to the various tribal regions. For the Peskotomuhkatik, the climate change observations from the harvesters and environmental staff can be viewed as paralleling that of the NECCS research scientists. Climate change topics addressed for Peskotomuhkati area included climatology, fisheries, forestry, blueberry agriculture, uses of GIS scenarios and storm surge mapping, respectively. Preliminary tribal concerns can be viewed in the question-and-answer period that took place after each session (**Table 1.1**).
Tribal communities are becoming increasingly more vulnerable to climate change with combined impact of past anthropogenic changes and limited access to the resources. There were lengthy discussions concerning the urgency to transmit the traditional knowledge from the Native elders to the tribal communities about the importance of interrelationship to the relatives (natural resources) and the significance of carrying that knowledge forward to share with future generations (Table 1.2).

<table>
<thead>
<tr>
<th>Table 1.1 Passamaquoddy Work Session, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Resiliency in Fisheries</td>
</tr>
<tr>
<td>Restoration of Alewives in St. Croix River</td>
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<tr>
<td>Fisheries Habitat Expansion</td>
</tr>
<tr>
<td>Lobster Economy</td>
</tr>
<tr>
<td>Cod Habitat</td>
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<tr>
<td>Disease Rates</td>
</tr>
<tr>
<td>Species Shifts (butterfish as one example)</td>
</tr>
<tr>
<td>Ecosystem Responses to Ocean warming</td>
</tr>
<tr>
<td>(Decrease O2 levels and Best Growing</td>
</tr>
<tr>
<td>Conditions)</td>
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<tr>
<td>Ocean Acidification</td>
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<tr>
<td>Early ice out impacts</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Table 1.2 Passamaquoddy Cultural Concerns, 2016</th>
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</thead>
<tbody>
<tr>
<td>Decrease in knowledge transmission</td>
</tr>
<tr>
<td>Decrease in skills to adapt</td>
</tr>
<tr>
<td>Cultural expression</td>
</tr>
<tr>
<td>Livelihood</td>
</tr>
<tr>
<td>Traditional kinship ties and relationship</td>
</tr>
<tr>
<td>to the ancestors/relatives</td>
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</tbody>
</table>

Later in 2017, a local comprehensive assessment of climatic changes within the Peskotomuhkatik regions was undertaken to identify vulnerable areas of cultural important species and its impacts on the tribal economic systems. The project was initiated again through the Tribal-Educational Partnerships at the University of Maine’s Wabanaki Centers’ Educational Outreach and Research Program. The identification of multiple factors
of environmental changes included increasing temperatures, increase in degree-days during winter months, uncertainty, and unpredictability for the future markets for tribal forestry products, the long-term economic impacts for tribal forestry products due to ecological impacts on the migration and distribution of key tree spp., freeze-thaw conditions and extreme precipitation events that impinged on the economic security for tribal harvesters. The loss of culturally important spp. has posed ecological challenges with impacts on wildlife – particularly on the moose status, invasive insects (ticks), other culturally important plants and animals, loss of habitat for geographically restricted fisheries, and traditional ecological knowledge (TEK) transfer. Many harvesters have contemplated how the Native language will address the arrival of different species and the impact of various environmental changes. In the ocean community at Pleasant Point, there is evidence of ocean acidification, salt-water intrusion, and increase in ocean/lake water temperatures, increase ozone, coastal erosion, and sea level rise, extirpation of culturally important spp., tribal sovereignty, food security and public health (Table 1.3).
### Table 1.3 Passamaquoddy Major Climate Change Themes, 2017

<table>
<thead>
<tr>
<th>Theme</th>
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</thead>
<tbody>
<tr>
<td>↑ Temperatures</td>
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<tr>
<td>↑ Degree days in Winter</td>
</tr>
<tr>
<td>↑ Ozone</td>
</tr>
<tr>
<td>Freeze-thaw Conditions</td>
</tr>
<tr>
<td>Extreme precipitation events</td>
</tr>
<tr>
<td>Economic Impacts on Forestry Products</td>
</tr>
<tr>
<td>Forestry Markets</td>
</tr>
<tr>
<td>Loss of Habitat</td>
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<tr>
<td>Extirpation of culturally important spp.</td>
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<tr>
<td>Mitigation</td>
</tr>
<tr>
<td>Restoration</td>
</tr>
<tr>
<td>Conservation</td>
</tr>
<tr>
<td>Moose Status</td>
</tr>
<tr>
<td>Tick Infestations</td>
</tr>
<tr>
<td>Invasive Insects (EAB, Spruce Budworm)</td>
</tr>
<tr>
<td>Loss of Culturally Important Species (plant/animal)</td>
</tr>
<tr>
<td>Cultural Resiliency</td>
</tr>
<tr>
<td>Language Impacts</td>
</tr>
<tr>
<td>TEK</td>
</tr>
<tr>
<td>Ocean Acidification</td>
</tr>
<tr>
<td>Ocean warming</td>
</tr>
<tr>
<td>Sea-level Rise</td>
</tr>
<tr>
<td>Erosion</td>
</tr>
<tr>
<td>Salt-water Intrusion</td>
</tr>
<tr>
<td>Fisheries (Shellfish and ground fish)</td>
</tr>
<tr>
<td>Geographic Restriction</td>
</tr>
<tr>
<td>Threats of Litigation</td>
</tr>
<tr>
<td>Management and Planning for Adaptation</td>
</tr>
<tr>
<td>Food Security</td>
</tr>
<tr>
<td>Public Health</td>
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<tr>
<td>Tribal Sovereignty</td>
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<tr>
<td>Self-determination</td>
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<tr>
<td>Trust Relationships</td>
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During the work sessions, the Director of the Environmental Department at Sipay’k expressed the need for more scientific work on the local level through observation, monitoring and documentation. Mr. Cling (2016) states,
“I’m always worried about the tribal resource user, whether it be for commercial, cultural. We’re not hearing enough from them - whether they can still take a plant, an animal and whether the quality of the plant or whatever they’re extracting or harvesting from Mother Nature, whether these resources are diminishing in quality and quantity. I’m concerned about the productivity of the tribal ecosystem… and we need to find ways to boost the productivity of the ecosystem, especially the Gulf of Maine.”

There has been an overall concern about the resiliency of the ocean environment and the Passamaquoddy’s ocean culture in the region. Species abundance, productivity and biodiversity has dwindled over the past 40 years. Tribal harvesters are no longer able to utilize the marine sea life for mixed subsistence practices due to a lack of access through regulation, loss of habitat and species abundance, and geographic restrictions of the reservation. As Director Cling points out,

“There’s a lot of things that tribal members use out there that aren’t valuable to mainstream society or the big global commercial economy, and how these resources are impacted and it’s tied to culture, it’s tied to how tribal members connect to the land.”

Fisheries productivity in the Gulf of Maine has been a major concern because of overharvest and competitions from big commercial fisheries, local fishermen and human development around the bay area. Access to cultural resources will be constrained because of the overharvest, rural development, and lack of habitat. There have been inconsistencies in the application of shore zoning ordinances for International, State, and local agencies that have led to the destruction of natural buffering systems for storm runoffs into the waterways and wetlands. Further, sea level rise and saltwater intrusion into the community infrastructure and private homes have been a primary concern. Presently, the water treatment facilities at Pleasant Point have been at risk from inundation by salt-water intrusion from extreme hurricane like conditions and contamination of shellfish in
surrounding areas due to sea level rise and runoff. Finally, the loss of numerous historic sites are at risk of being lost along much of the coastal regions.

The Passamaquoddy tribe members identified multiple concerns for environmental challenges that have dire consequences for the economy and cultural integrity for the tribe. However, tribal members feel the cultural ways and belief system will provide the needed individual resiliency to face the new and upcoming challenges of climate change. Paramount is the urgency to pass on the traditional knowledge to the next generation who will encounter new challenges of adaptation and cultural resiliency.

The tribal environmental program has voiced a need to look for alternative ways to meet the demands of the membership through agriculture or aquaculture for purposes of mixed –subsistence and economic security. The ability to utilize traditional approaches to adaptations practices woven into the new fabric of daily living that are practical for individual families will be paramount. The primary overarching themes from the interviews with the Maine tribes were expressed from various perspectives important to the tribes (Table 1.4).
Table 1.4. Overarching Themes in the Waponaki Communities 2017

<table>
<thead>
<tr>
<th>Theme</th>
<th>Penobscot</th>
<th>Passamaquoddy</th>
<th>Maliseet</th>
<th>Micmac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Economic Security</td>
<td>“I see forestry being impacted greatly, and not just because of potential CC, but shifts in markets that have been driven by other economic factors in combination with the unpredictability of what the future is going to look like in terms of species composition, combined with the change in world economics that are driving some of the marketing opportunities.” Banks, 2017</td>
<td>“Mud season is a guessing game. We try to do our very best to keep the loggers cutting, keep the wood harvesting, but the weather just seems to be so unpredictable. So, you basically come up with a date to shut down the logging operations for the mud season because things are soft, soils are soft, trying to prevent all these environmental issues and problems.” Neptune, 2017</td>
<td>“Oh, you know, those ones might be up in couple of days, but then it was really, really hot that day so they all came up really fast. So then when you went back out a few days later they had already past, so it was just – it seemed yeah, like the growth of them was very unpredictable as well because of the effect of the weather so it made it hard to go out and pick.” Williams, 2017</td>
<td>“These warm winters like we’ve had last winter are really wreaking havoc with the wood industry. We’ve got a lot of – they call it ‘wet ground’ or ‘winter harvest ground’ meaning that the woods are too wet to go in and harvest any other time of the year than in the dead of winter when things are solidly frozen.” Corey, 2017</td>
</tr>
<tr>
<td>Loss of Cultural Resiliency</td>
<td>“I think what most concerns me is the uncertainty that climate change presents for our tribe’s ability to continue to carry to its cultural activities and traditional activities associated with the natural world…..it’s affecting our tribal members and their seasonal uses of our resources, of our lands, our waters.” Banks, 2017</td>
<td>“There’s a lot of things that tribal members use out there that aren’t valuable to mainstream society or the big global commercial economy, and how these resources are impacted, and it’s tied to culture, it’s tied to how tribal members connect to the land.” Cling, 2017</td>
<td>“I’m concerned about at what point will their growth and spawning rates be affected so much that they just die out, mostly from a cultural aspect because I feel like that’s the only connection I have, so of the past other than traditions and stuff you read about or hear about, yeah.” St. John, 2017</td>
<td>“….some hunters are saying is that when it’s real warm like that the moose aren’t particularly energetic. They just tend to lie around and they’re not on the move, so hunting was really poor in part of the season….we’re already seeing those effects on the ability of tribal hunters to practice their traditional hunt.” Corey, 2017</td>
</tr>
</tbody>
</table>
The compounding aspects of access to the fisheries are evident with the reductions in traditional harvesting areas, a reduction in fish stock, lack of coastal habitat and shifting migratory patterns imposed by climatic changes and pollution, losses of biodiversity, overharvesting by commercial fisheries, policy and regulatory infringements by the State of Maine have led to conditions of hunger and food insecurity for many tribal members of Peskotomuhkatik (Figure 13). The issues of cultural access to traditional food sources, basic liberties, and coastal livelihoods for the Peskotomuhkatki have remained silent within the legislative processes and bureaucracies within the State of Maine.

**Figure 13. Factors of Cultural Risk of Traditional Coastal Fisheries, 2017**

The paradigm toward better tribal-state relationships requires a shift toward co-partnership if the tribes are going to successfully build secure resilient economic systems and achieve food security through the traditional fisheries in the future. The trend in state-tribal relationships have consistently been led down the political avenue, rather than the consideration of the need to include indigenous voices on the local level. We may only hope
that there will be a consistency with upcoming administrations to foster productive relationships with the Waponaki people to make this a reality in Maine.

In 2019, there was a shift in policy perspectives that appear positive for the climate future of Maine and its natural resources. The then newly-elected governor Janet Mills signed into law legislation that focuses on reducing greenhouse gases by establishing more robust avenues for renewable energy systems. In addition, a newly formed Maine Climate Council (MCC, 2019) provided an integrated action plan in 2020. Since the inception of this plan, tribal concerns on culturally significant resources and territories are in the process of being developed by tribal representatives. The goals of the project will be to reduce greenhouse gases by 45 percent below 1990 levels by 2030 and at least 80 percent below 1990 by 2050 while establishing carbon neutrality by 2045 (Office of the Governor, 2019). How these state initiatives impact indigenous ways of life and traditional harvesting practices of food security, including traditional economic systems, becomes a primary question. Co-participation through meaningful involvement will be crucial for the traditional harvesters within the tribe, tribal environmental officials, and Native American environmental scientists’ (at the State Universities) qualified input into the MCC to present the issues in an informed and holistic manner. The consequences of involvement from Native professionals in the field are time-critical. Genuine efforts to include indigenous people at the local level must take precedence to build adaptive capacity and resilient systems within indigenous communities. We must strive to place individual political goals and agendas aside in favor of inclusive efforts for tribal well-being.

The lack of co-management structures of the Peskotomuhkati in agency planning and management of the coastal fisheries have hindered many aspects of building adaptive
capacity and resiliency amid environmental uncertainty in Maine. Overall, there has been extraordinarily little participation and involvement of the Waponaki in the development of policy as it relates to ecosystem services. Primarily, these socio-ecological services involve access to culturally significant food sources from the waterways and ocean environment. The dismissal of ‘meaningful involvement’ of indigenous people at the State and local levels are apparent, particularly for equitable access to socio-economic services contained in the coastal fisheries at the Peskotomukatik coastal community at Sipay’k (Pleasant Point).

Moreover, there has been little scholarship addressing indigenous –nature interactions within ecological systems as it pertains to food security. This deliberate lack of effective responsiveness from State institutions for informed policy development involving indigenous environmental professionals and scientists continues to undermine how power distribution in SES (social ecological systems) governance function as it pertains to substantive rights of marginalized indigenous people and the human right to cultural practices within the State of Maine.

**Waponaki Epistemology and Concepts of Holism**

The ways of knowing through ancient human interactions with the ecology are founded on the culturally embedded sacred covenant with ‘t’olonapemkowakk’- all our relations (human and non-human) as depicted in the Penobscot, Passamaquoddy and Maliseet including ‘Msit Nqkmaq’ in Mi’kmaq language. The conceptual framework of ‘holism’ links the Waponaki as co-participant through aspects of individualism, kinships, socio-cultural ties, and the cultural connections to the greater ecology and have been handed down through the generations with values of interrelationship and interdependency. These values form the foundations of ecological mutualism.
Cronon (1983) describes indigenous epistemology of the land as being dynamic in nature while producing contradictions and continuities of relationship in which he refers to as ‘dialectic.’ He renders indigenous relationship within the ecology as environmental circumstances that produces a new set of possibilities for cultural reproduction that gives rise to new cycle of ‘mutual determination.’ The creation and re-creation necessitate the re-examination of change for social as well as ecological relationship referred to today as, ‘adaptive practices.’ Cronon (1983) depicts these expressions of change in the Northeastern regions as representative of the indigenous language that illustrates a new phase of stability and ecological transformations by which cultural relationship reshapes and adapts to various choices the environment may present, better known today as ‘traditional ecological knowledge’ or TEK.

Gregory Cajete (2018) defines Native Science or TEK as a broad term that is inclusive of ecological practices that may include perspective of metaphysics, philosophy, art, architecture, technologies, agriculture, ritual, and ceremony. He adds, “Native Science perspectives are natural worldviews gained or a result of using whole body/mind senses that are in direct participation with the earth rhythms and cycles.” TEK utilizes an understanding of the Seventh-Generation paradigm of indigenous sustainability that is dependent on knowledge exchanges of lessons, principles, and practices of the environment. The author suggests in order to achieve true sustainability measures the new (contemporary) science must renew its authenticity as a co-creator to the primal world and its awareness of life to embrace the cultural paradigm of holism (Cajete, 2018).

Through a utilitarian perspective, Whyte (2013) sees indigenous knowledge bases about the environment as ‘supplementary’ to scientific data not ordinarily tracked through
scientific methods. TEK as a contextual knowledge system may fill in gaps in scientific inquiry particularly in areas which lack local or historical data. Further, Native science can improve the planning process for conservation and management efforts that may have governance value (Whyte, 2013). As an example, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (2010) developed a First Foods Framework to inform their governance strategies for climate adaptation management and objectives. Kinship and clan networks have been utilized in the constructs of stewardship, harvesting, preparing storing and sharing the range of culturally significant food sources in its connection to social, cultural, political and traditional economy (CTUIR, 2010). Foremost, in terms of management are the importance of gender roles and associated knowledge which must be acknowledged for its important to the comprehensive plan referred to as “Women’s Foods” and includes berries and roots in which women have stewardship responsibility. In administering food assessments, women lead by asserting their knowledge to support balanced management decisions in the process of resiliency building. In the process of resiliency planning and together with scientific methods of ArcGIS management, decisions are guided by women’s knowledge to develop a landscape level model of geographic data with the field inventory data to identify supportive habitat for key food plants. The generation of data assists activities of the harvesters to preserve, manage and restore gathering locations throughout tribal territories as well as providing direct knowledge on climate assessments and informing potential strategies for climate adaptation. Whyte (2018) asserts, the value of indigenous knowledge bases stem from the fact that it is tied to the holistic well-being of indigenous persons, families, communities, and nation. Secondly, that indigenous knowledge becomes one of protecting internal capacity to adapt, cultivate,
transmit, re-member and exercise the rights to organize and plan. Third, indigenous knowledges can guide scientific inquiry and not necessarily the other way around as seen in the CUIR Women’s Food Project.

Okanagan elder, Jeannette Armstrong (2018) speaks of the ‘nsyilxcin’ language represents and embeds environmental land use ethics that is transferred through oral story and practice steeped in the wisdom of Syilx governance and represents a model of ‘living in place.’ She illustrates the Syilx word ‘tmix’ to convey many relationships within the land and all life within the ecology (Armstrong, 2018). The word, ‘tmix’ as Armstrong points out represents access to the concept of human responsibility to the creation and is the life force of place. She emphasizes that human communities must carry out the institutional values of reciprocity through social codes that fortify and regenerate the ecology.

Like the Waponaki of Maine and the Marine regions, the Okanagan-Coville of British Columbia (B.C.) had easy access to at least 2-3 major vegetation zones and numerous habitats such as swamps, meadows, slopes, river backs, lakes, and rocky outcrops (Turner et al., 1980). Each family went to these same vicinities year after year for fishing, digging and harvesting. These multiple zone uses acted in a sense like a huge perma-garden in a vertical ecological land-use system with harvest beginning in the spring in the lower lands, moving up in summer. Although the Waponaki moved to the coastal areas in the summers, to the foothills and moving further up to the alpine forest areas in the fall, only to move to the lower lands and river systems in the winter.1 Like the Okanagan-Coville of B.C.

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knowledge of the ecology and the phenology of significant plants were essential. The concepts and vision of 'tmix' held deep social codes to insure the regenerative capacity of the land.

Native science or traditional ecological knowledge (TEK) has been coined to encompass the indigenous mindset of environmental and ecological practices at the individual and communal levels (Cajete, 2000). It is a ‘relational’ construct that is based on tribal philosophies, cultural ways of living, customs, and language that are applicable to ancestral lands, history and to the earth. TEK is defined as dynamic reciprocal interactions that are iterative within traditional relationships of the ecology which demonstrate in re-establishing entirely new relationships that ultimately lead to new knowledges and technologies over time (Cajete 2000). These new knowledges have been conveyed through oral traditions of storytelling, mythological symbols, and cultural hero’s or in transformer stories to depict changes in the ecological landscapes and forces of nature.

For the Waponaki, fisheries have been a culturally significant food source and utilitarian commodity since time immemorial. The fisheries not only provided sustenance but as a primary nutritional source of essential nutrients important to healthy growth and development during pregnancy, childhood and during the aging process. The cultural aspects of fishery harvest were built on elaborate technologies of harvest, processing, preserving and storage to provide a continual means of substance into the winter months when food sources became constrained. An example of Peskotomuhkati harvesting technologies such as fish weirs, provided a sustainable means with extraordinarily little interference with the fisheries. Therefore, not damaging species abundance that were designed to provide an escapement for the species to reach their spawning grounds. Many of the fish weir were often located at the entrance of a tributary below the high tide in various estuaries (Figure 14).
The basic premise of fish weir harvesting was accomplished during the ebb of high tide to ensure the spawning salmon school to move at high tide unimpeded to the reproductive grounds to maintain healthy runs (Menzies, 2006).

In Menzies (2006) study on fish traps with the Prince of Wales Tlingit groups, fishing technologies were very elaborate and sophisticated. Fishery technologies were based on the premise to capturing only a portion of the run to ensure fisheries sustainability. There were three primary principles in which the technology operated:

- Structure was located on the half tide in the intertidal zone (no structures were visible above the water at high tide)
- Semi-circular traps were located on tidal flats in immediate proximity to the intertidal stream
- All the harvesting was designed to take place during the ebb tide to ensure escapement
- The stream channel would not be blocked above the tidal range.
On the other hand, European harvesters and early American canneries constructed “zapor” or barricades to completely block streams right at the high tide line to capture the maximum number of salmon and violated the principle indigenous values of reciprocity and relationship. Unlike the indigenous peoples, European Americans constructed their harvesting techniques to catch fish no matter the tide to the fullest capacity with little regard to ensure the continuous replenishment of the species. It was these incentives of monetary gain and the values of success in a capitalistic system that overwhelmed the abundance of our wild fish species in the northeast coastal areas of the U.S. and Maritime Provinces. The impact of indigenous economies by Euro-American industry has had a deconstructive impact on traditional labor and production for food security. It has also criminalized cultural customs of harvesting and trades, banned key social institutions such as rights to religious freedom through ceremony that specifically instilled values of the environment including knowledge transfer about the fisheries, customary laws regarding kinship and lineages of inheritance to harvesting properties (Brooks & Brooks, 2010; Cronon, 1983; Daigle et al., 2019; Menzies, 2006).

Examples of the concept of holism in TEK and ecological mutualism can be observed within social codes of kinship for building resiliency by Hawaiian fishermen who have designated ‘wao’ socio-ecological zones of the uplands to the shores and into the sea to holistically and synergistically manage biodiversity and to ensure their abundance (Chang et al., 2019). Their knowledge teaches the health of the upland determines the health of the levels below it, including food production systems. Traditional Hawaiian knowledge of these coupled systems states that; ‘wao akua -region of god, sacred forests, captured fog, retain rainwater, maintain core water shed's and serve as refugia for endemic and culturally
significant biodiversity.’ Further, the sea-bird colonies were responsible for ensuring delivery of the phosphorous cycles important to the uplands that fertilized the forests. However, most food acquisition came from the socio-ecological system of ‘wao-kanaka’ region of mankind. It consisted for various agricultural crops and ecological conditions of lava fields, deserts and rainforests that have sustained the Hawaiian people for hundreds of years.

**Figure 15. Socio-cultural Determinants to Resiliency**

Traditional Hawaiian fisheries management such as the ‘opelu’ fishery was determined locally using the ‘konohiki’ approach. The head fisherman would determine optional fishing periods and closures based on spawning dates. During these off seasons, the ‘opelu’ were fed excess vegetables grown in the uplands and stewardship assigned to specific families during critical periods of ‘hanai’ (feeding). These practices safeguard from overharvesting the ‘opelu’ and ensured a successful spawn. The abundance of ‘opelu’ also ensured the food chain of larger species of food fish. However, commercial year-round fishing has created an imbalance in the fishery's critical growth and developmental periods that provides little protection of the fisheries.
In reviving and restoring community-based ‘konohiki’ fishery management the E Alu Pu communities formed a community-based Subsistence Fishing Area (CBSFA) through the alternative rewards and movement vision. The CBSFA was promulgated into law in 1994. Partnership with the State included the principle of ‘hanaia’ai’ meaning, ‘fed and then eat’. The state of Hawaii affirmed its constitutional mandate to protect the ‘traditional and customary’ gathering rights of the Hawaiian people by directing the Department of Land and Natural Resources (DLNR) to partner with the Hawaiian communities to assist in creating the CBSFA designation and management plans in accordance with traditional practices. These and other initiatives that have emerged have engaged co-partnerships and co-management supporting a community-based approach of ‘konohiki’ to ensure ‘pili’ (relationship).

Climate change factors (human induced and non-human induced) have only complicated the reliable acquisition of cultural foods that are safe from toxins and pollution. Many Native communities across the continent are looking to the solutions of ethical harvest, good health, environmental stewardship to reawaken and revitalize traditional food systems. In terms of fishery practices, tribal resiliency efforts have resulted in limited access due to policy and decision-making from state-run institutions. Tribal harvesters are unable to respond to climatic changes as quickly, while hunter and gatherers with no alternative to mixed subsistence lifestyles end up breaking the law in order to survive (Lindholm, 2019). For the Peskotomuhkati and others, traditional coastal foods are central to resiliency building through cultural expression, identity, spirituality, and physical well-being (Figure 15). The urgencies of hunger in native community are very real and there has been a definite need to create a balance between policy and the needs of
indigenous human rights to consume cultural foods to counteract dependences on colonial foods and reduce the incidences of chronic disease outcomes.

Whyte (2019) suggests traditional foods are a vector to understanding the relationship between climate changes and justice. Although Whyte’s definition involves environmental justice into his idea of collective continuance, it becomes another way of viewing the Waponaki concepts of ‘holism.’ He states that ‘first foods’ are actually the conceptions of collective self-determination that integrates ecological, cultural, social and political dimensions of indigenous cultures of relationship or kinship with the collective community of socio-ecological systems that involves interaction between the non-human and human relatives. He refers to this complex web as ‘collective continuance.’ Thus, food sovereignty in the context of traditional culture becomes a matter of profound expression of climate justice, while offering up the idea of collective continuance and the ability/capacity to adapt while retaining options of ‘woli-litu,’ (living in a good way) in Peskotomuhkati language with the challenges of climate change in indigenous community. Ultimately, Whyte submits, collective continuance relies on our collective ancestral ecological memories with each successive generation in order to sustain cultural permanency and to maintain these cultural legacies of a placed-based culture (Whyte, 2019).

**Limitations in the Integration of TEK and Scientific Approaches**

The spatial and temporal limitations of integrating TEK into contemporary quantitative approaches have posed several challenges to environmental policy considerations. The anthropogenic influences have become increasingly destructive to global fisheries while advocates pressure policy changes toward mainstream fisheries management approaches (WFI, 2010). Indigenous knowledge and technologies have
become the focus to informing the future of sustainability through adaptation planning in policy making forums (Butler, 2006). Non-native settlers’ industry and resource extraction for commercial purposes have had a serious impact to coastal fisheries by overharvest, environmental changes, erosion, disruption in the river ecology and water quality. All these changes have impacted the fisheries culture and knowledge of the ocean fisheries at Peskotomuhkatik. Fishing was a social activity that enhanced kinship relations as well as a way of knowledge exchange. This has been observed in the Sto:lo First Nations, the intrusion of government regulations dislocated these relationships through closure, gear restriction, traditional food acquisition systems, source v. commercial methods through trade or sale (Butler, 2006). These policies that disrupt traditional economies and dissect the interconnection of Peskotomuhkatik cultural food economies hinder cultural practices necessary to building a robust community structure. Today, DMR determines the timing and practice of harvesting and dictates avenues of acquisition, trade, or sale. Private land ownership and policy have completely changed the circumstances and cultural fisheries practices for the Peskotomukatik. The Peskotomukatik are no longer able to decide what, how or when to practice their coastal way of living since these decisional processes have been alienated from traditional harvesters.

The utilization of IK with contemporary practices can be of value for its cumulative and dynamic nature of these socio-ecological systems for management planning. It can also be utilized to reveal the shortcomings of contemporary resource management frameworks by illuminating the influences of the framework over time (Butler, 2006; Nadasdy, 2006). The use of IK has been controversial, if not totally ignored in many arenas of environmental management. There have been methodological obstacles to knowledge integration as
Nadasdy (2006) has mentioned, specifically time, space, and knowledge base. Aspects of time or temporal dimensions are vital to natural resource management.

For example, in the multi-stakeholder co-management body established in 1995 for the conservation of Ruby Range Dall Sheep in the Yukon, the Ruby Range Sheep Steering Committee (RRSSC) addressed concerns directed at populations decline by combining 2 different knowledge bases – scientific methods and with that of Gig Game Outfitters an important commercial economic stakeholder from the area. The basis of the RRSSC was to integrate and translate knowledge from the various stakeholders; First Nation hunters, big game hunter, and wildlife biologists into a form compatible and complementary with the reports and published papers. There was discrepancy in the timing of the aerial survey (July) and the timing of big game hunter local land-based survey of the hunters (fall). The use of scientific aerial data (quantitative) v. the local knowledge bases (qualitative) has been viewed as incommensurable knowledge among scientific community. The precedence of scientific knowledge gathering only added to the unequal power relations of natural resource knowledge integration and successful co-management with the hunters, rather than becoming a transformative solution (Nadasdy, 2006).

The disagreement on valid knowledge was the focal point of disagreement and obviously possessed political dimensions of economic underpinnings to the big game hunters and the region. Problematic factors of First Nation knowledge and scientific knowledge appeared to be within the temporal dimensions of knowledge gathering. Foremost, there was no temporal factors associated with IK as with the biological data. It is precisely the purpose of IK on animal populations that are used to supplement scientific data into the past that have been valuable to resource managers. However, the RRSSC
remained unwilling to integrate this knowledge into the present survey to constitute a target population model. The development of mistrust in the biologists and outfitters observations were intensified as First Nations hunters felt the biologist observations were deemed less of quality for its annual observations, while lifetime experiences of the First Nation hunters were essentially ignored. In contrast, First Nation hunters observed these animals all year round (over longer periods of time) rather than in snapshots of time used with scientific methods. Therefore, the First Nation hunters claimed that the biologists accounts gave an inaccurate perspective of population sizes (timing of birth rates and survival rates at a given time of the year). The First Nation hunters also contended there were higher mortality rates after scientific counts.

Spatial (geographical) dimensions of sheep counts are technically problematic. First Nations hunters did not see Ruby Range as a sole area of decline in sheep populations. The declines extended to other areas between the White River and Alaska (Nadasdy, 2006). However, conservation was only decided for the Ruby Range study area (an exceedingly small geographic range). Although, this testimony of decline was corroborated by Yukon territorial reports of 40-70% decline, First Nation knowledge was not deemed useful for conservation purposes in this case. Personal or kinship hunting areas are not unusual in indigenous territories. Therefore, the knowledge gathered by each hunter with unique hunting knowledge may vary. The variation of the information has often been deemed inaccurate, mistrusted, or misinterpreted by scientific researchers. Science has often disregarded the knowledge as unreliable due to the dynamic nature and its contextual nature. These difficulties only establish to inflame biases inherent in the project which added to the uncertainty of how to incorporate the complex nature of TEK into management
approaches and strategies. The First Nation hunters had little voice in the decision outcome, while stakeholders like the outfitter groups having considerable influence with political associations within the Yukon legislative assembly. It is without question that trust remains the predominant factor in successful co-management processes.

Like the Peskotomukatik, the local knowledge of mixed multiple livelihoods, as Griffith (2006) describes are complex with implication of ecological, geographical, historical, and socio-economic information. This contrasts with intensive agriculture, experimental science, or commodity markets of the economy. Local fisher knowledge as Griffith puts forth are layered and may include factors of phases of the moon, wind speed, and direction, salinity, oxygen levels, water temperature, substrate levels, shoreline characteristics, time of year (season), food web dynamics (predation) and water depth (Griffith, 2006). These types of knowledge considered with geographic (spatial) information, recent events (temporal) and other natural and social phenomena creates problems of regional generalization with local coastal areas. The understanding of the dynamic of TEK and the multifactorial implications of the fisheries are often understood in a larger social context or through folklore or relationship with the resource. While regulation can impact fisheries on the various levels, commercial fisheries, and local fisherfolk develop complex fisher knowledge of various fish behavior, shellfish and over the general marine lifecycle, rather than individual species. Individual fisherfolk are likely to recognize problems with water quality and natural or human-induced problems with estuaries.

In the late 1970’s an interest in bringing such local knowledge into fisheries management gained momentum when it was observed local fisherfolk were adapting to ecological conditions, while current approaches to management became increasingly
constrained with environmental challenges (McGoodwin, 2006). Contemporary management practices were in many instances, urged to evaluate its effectiveness by shifting its stance on greater understanding of why fisherfolk were becoming lawbreakers. Management was essentially forced to cooperate with local fishers in their knowledge to reduce the conflict as a benefit to better relations. Other factors to consider is the prevention the ‘tragedy of the commons’ from developing a management approach that has been proven to fail by ignoring or denying recognition of fisher’s cultural heritage. McGoodwin (2006) claims these avenues of policy development have only worked to undermine customary practices of work and social organization that could prompt resistance or non-cooperation, competition, socio-economic atomism, anxiety, disaffection, and other socio-economic implications.

Reconciling fisher’s knowledge with scientific inquiry and management decisions will necessitate the focus on a bio-economic model that accommodate different kinds of human-ecological relationship, while incorporating social concerns to be successful in environmental challenges as observed at Peskotomuhkatik. McGoodwin (2006) insists that long-standing knowledge contains a greater level of consensus, especially when that knowledge and customs of the fisheries have sustained them for generations. Science in general will have a greater working knowledge of carrying capacity and collapse as we have heard testimony from the Peskotomukatik fishermen. Many harvesters who observed these collapses in the fisheries and have already self-regulated by limiting harvests or self-imposed gear restrictions as witnessed at Peskotomukatik.
CHAPTER 2: FOOD SECURITY AND FOOD SOVEREIGNTY

Food security, particularly through the fisheries, have been on the forefront of major concern of many coastal cultures worldwide. Global fisheries and aquaculture reform have played an important role in providing food and income in many developing countries worldwide. According to the World Fisheries Center (WFC) (2010), this food sector alone contributes to 10% of the GDP, revenue generation through tax, trade, and license fees. The value of fisheries income contributes a multiplier effect economically especially in marginalized areas throughout the world.

According to the Environmental Justice Foundation (2010), human rights factors have entered the many work-related conditions of the fisheries for undocumented labor that involve exposure to slave labor conditions, unsafe and unsanitary work environments in both Thailand and West Africa. Highlighted in recent research have been much of the less obvious human-rights violations that have been associated with the commercial fisheries appear subtler and have prevailing long-term social impacts of greater magnitude in many indigenous fishing communities. The social deficits of economic opportunities, cultural spectrums of poverty and exclusion that lack distributive justice in the small-scale local fisheries much like the Peskotomuhkati, continue to receive little attention in policy, legal and institutional reform (World Fish Center, 2010).

For many developing communities, hunger has become a primary concern for many coastal families. The WFC has defined hunger in three stages; a lack of food is short term and is often caused when shocks such as drought (climate changes) or war affect vulnerable populations. Chronic hunger is a constant or recurrent lack of food and results in underweight and stunted children, and high infant mortality. Hidden hunger is a lack of
essential micronutrients in diets. For many coastal indigenous families at Peskotomuhkati, these conditions of hunger remain unchecked. Consequently, the Food and Agricultural Organization (FAO) under the United Nations (UN) (2001) have identified the need to strengthen fisheries governance practices through clarification of individual rights to access fisheries to offset hunger. These failures in policy designs have posed challenges for indigenous people while trying to maintain well-being through the practice of tribal customs and traditional ways of life.

The WFC (2010) point out that coastal cultural practices around the world have come to a halt for many indigenous harvesters or have become constrained because of diminishing access. Indigenous scholars have found that accompanying socioecological and sociocultural changes have led to momentous cultural losses including language loss, ecological knowledge preservation and transmission due mainly from the inability to practice indigenous culture, loss of intertribal-clan relationships, traditional value losses and interconnectivity to the landscape, oceans and waterways that define Native American culture (Daigle et al., 2019). Concomitantly, human-induced environmental changes have only exacerbated the limited access to culturally significant species that has led to economic and cultural hardships for many indigenous people of North America (Grossman & Parker, 2012). These economic and cultural hardships are primarily a result of environmental challenges and identify the distributive inequality of culturally significant resources that give precedence to commercial industry.

Anthropocentric mechanisms have continued to dominate in natural resource extraction and management within the United States. As a result of poor management and planning these policies have hindered many aspects of capacity building through adaptive
practices that may contribute to distributive equality and food security through the acquisition of culturally significant food sources. For the original people, representation and collaboration in the International, National and State level continue to be a struggle for treaty tribes to address the issue of environmental changes, the negative impacts on culturally important species and other natural resources in which many Native people depend for their basic liberties, livelihood and well-being (UNDRIP, 2007). In many instances, the environmental policies and human rights laws have not been complying, including a lack of commitment toward the protection of these culturally important resources that these mandates are supposed to protect (EPA Office of Environmental Justice and NEJAC - Indigenous Peoples Work Group, 2012). The State of Maine has been no exception in impeding tribal ability to build sustainable systems and economic self-sufficiency through efforts of food sovereignty for tribal fishermen and fisherwomen of Peskotomuhkatik (People Who Spear Pollock) at Sipay’k (Pleasant Point), Maine.

Globally, the WFC (2010) investigations have contended fisheries policies and regulations have been implicated in the multifaceted challenges to fishing rights. These challenges have fostered issues on the lack of tenure, remained silent on the recognition of traditional fishing rights of original coastal territories in State constitutions and laws. The lack of acknowledgement of traditional fishing rights have contributed to compounding impacts of discriminatory and culturally insensitive polices, including the inclusiveness of indigenous coastal people in marine development projects. These challenges have hindered the opportunity of coastal people to manifest opportunities to participate through the utilization of community-based knowledge for resiliency and impose obstacles to building adaptive capacity to upcoming climatic changes.
Models for Food Security and Food Sovereignty

Paramount to the right to feed families and children quality foods, Peskotomuhkati tribal members are looking for ways to build culturally responsive food systems to off-set hunger in the surrounding communities through shared gardens and food pantries. Native harvesters are utilizing the traditional economic systems of food acquisition through a Native American lens of cultural survival. Subsistence activities for food security involves ecosystems services that are heavily interlinked and are contingent on the utilization of the ocean and freshwater systems, tributaries, land, wildlife, and native plants. The traditional economic systems provide the same security as any other form of employment or career dependencies that exist within contemporary economies (Figures 16 and 17). These traditional economic activities may include hunting, fishing, gathering, shelter materials for building homes for families or shelter for farm animals, knowledge systems transfer of the ecology, a means of commerce through trade, bartering items, family expenses and financial obligations, elder-care and needs, energy needs (fire wood), traditional and non-traditional governance systems and values, transportation via highways and waterways, native guide services, indigenous arts, and for ceremonial and spiritual support to traditional leaders with the communities.

It is through these very same systems of the traditional Native American economy that provide a means of information flow particularly, TEK on the status of the environment within the communities, between the traditional harvesters, and the ecology. It is through these traditional activities of knowledge exchange that support the ability to adapt and therefore enable resiliency building within indigenous community.
Figure 16. Peskotomuhkati Subsistence Harvesting of Soft-Shell Clams, Sipay’k, 2017

Figure 17. Limited Access to Subsistence Harvesting at Peskotomuhkatik, 2017
**Food Models in Socio-Ecological Resiliency**

Recent research has identified resiliency thinking as the primary perceptual emphasis in linking human-ecological relationship in anthropogenic challenges. Investigators assert there are mounting aspects of resiliency thinking within Social Ecological Systems (SES) that link food security and food sovereignty issues and the interdependency between social and ecological systems (Walsh-Dilley et al 2016). Within the context of recent research in SES, the definition of resiliency has been depicted as:

> ‘the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks and therefore identity’ (Folke et al., 2010).

Walsh-Dilley et al (2016) have identified a key mechanism of resiliency building as the ability to ‘adapt’ in various conditions of change. The author’s state resiliency is not about crossing thresholds or enduring shocks, but a way of coping in all ways. They suggest by focusing on specific scenarios (silo approaches) for novel shocks may lead to shortsightedness and may increase the likelihood of new types of instability. Various world organizations such as the Food and Agriculture Organization (FAO) emphasizes resiliency as stability to food security shocks, while the World Resources Institute (WRI) emphasizes wealth creation through the development of nature-based enterprises (FAO, 2009) (WRI, 2008). Socio-economic supportive measures for resiliency building put forth by the FAO (date unknown) and WRI 2008 include income, food access, access to basic services, social safety nets, assets, adaptive capacity and stability, ownership, capacity connections, enabling environment, supportive politics, tax, and regulatory environment, technical, resource and marketing support and financial service and funding (WRI, 2008) (Figure 20).
There have been a few adaptive models to building resiliency in social ecological systems, particularly in the coastal fisheries. There have been various initiatives in indigenous communities for Food Sovereignty and Food Security that are consistent with indigenous oncological and epistemological aspects for resiliency around the world. These initiatives have been integrated into SES for resiliency building through aspects of human agency (Walsh-Dilley, et al., 2016).

The Food Sovereignty Model (La via Campesina, 1996) a concept of ‘food sovereignty’ was first defined as a political approach to food security via the global agrarian social movements to address issues of poverty, the underdevelopment of rural communities and the domination of the agricultural system by agricultural policies of the US and Europe (Wittman, 2009). During the World Food Summit of 1996, La Via Campesina declared food sovereignty as precursor to food security. As Wittman indicates La Via Campesina’s goal was to reduce global food trade and re-orientate toward local food production that was grounded in agro-ecological principles. This approach and value system were consistent with the cultural values of the peasant’s community in South America concerning the degradation of the environment, particularly soils, associated with current global industrialized food production systems.

La Via Campesina’s main impetus was to convey and promote social justice and a dignity of peasants, farmers, rural residents, and agricultural workers to support small-scale sustainable food production systems that was like the concepts of self-determination used in Native American communities in North American and without restriction of current food acquisition systems. The term food sovereignty was further developed and defined as:
“The right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods and their right to define their own food and agricultural system” (Via Campesina 2009).

FAO and WRI in 2001, went on to identify the four pillars of food security as availability, access, utilization and stability. How these 4 pillars are achieved would require more co-participation in the decisions-making processes within management of social-ecological systems that includes indigenous communities. Food security as a concept was meant to describe a state of well-being, although it did not make evident a resolution to improving access to adequate food sources or sustaining the original ways of knowing about the environment in indigenous community. Regrettably, as investigators point out, the concept of food security amounted to nothing more of an economic agenda by the World Bank that appeared through hindsight as a push for the free trade agenda, rather than strengthening localized food systems and addressing the inequalities of the global agricultural economies (Clapp, 2014).

Community-Based Model discussed by Walsh-Dilley et al., (2016) assert there are mounting aspects of resiliency thinking within SES that link food security issues and ecological systems. The authors maintain that supportive mechanisms in the development of resiliency in food sovereignty are those of decentralized governance and a natural resource management approach that includes eliciting local knowledge, skills, and capacity. Further, the development of these supportive elements may inform resilience thinking that maintains social and environmental justice such as indigenous food security and food sovereignty (Walsh-Dilley, Wolford, & McCarthy, 2016). The community-based model would act to have more participation and involvement in the management and governance
of the local food systems – an interface of social–ecological interactions that are inherent in many indigenous cultures around the world.

In the Social-Environmental Justice Model, Capistrano (2010) discusses food security in traditional fisheries from a social-environmental justice perspective as the principles of both property rights (catch) and indigenous rights (to practice culture). The social-environmental justice perspective recognizes the potential of indigenous peoples managing resources and influencing institutions toward policy advocacy and reform (Figure 18). Under the development agenda, Capistrano (2010) points out that property rights (catch) within marine policy is not a matter of charity but is an entitlement that influences the ability of the indigenous communities to exercise their aboriginal right to manage culturally important resources. Further, any management mechanism must acknowledge the significance of incentive for cooperation and individual self-interest (under an indigenous model of individual self-determination would be to enable self-actualization through active participation in ones’ culture) including balancing the use of the resource through most of its uses and multiple users.

Capistrano (2010) states that time and labor contributions are only a part of the goals but should also include the conception of influencing, sharing or redistributing power and control of resources, acknowledgement of benefits, knowledge and skills to be gained through community involvement, particularly TEK of the indigenous people in the decision-making process (Capistrano, 2010). Capistrano’s development model closely aligns with the Waponaki cultural values and traditional lifeways for a living culture, while emphasizing indigenous people as co-participant with the ecology.
Human Rights Based Model investigators Allison et al., (2012) argue that rather than addressing the strengthening of fisheries governance through state and international actions in illegal unregulated and unreported fishing (IUU) more attention is needed to include clarifying exclusive or community rights to access fishery resources with policy prescriptions (Allison, et al, 2012). The authors espouse that incentive-based approaches operate on the assumption that fish folk as rights holders will participate since their livelihood depends on its success. The authors have identified drivers of overfishing and poverty in fishing communities:

- The income and asset ownership status of fish folk are highly variable within communities, incomes are often declining with declining fish stocks and are uncertain and seasonal.

- Fish folks are often excluded from access to other employment opportunities, equitable access to land, social services and may have weak political representation. They may also have poor infrastructure such as roads, markets and other infrastructure that leads to marginalized conditions in fisheries development processes.
• Fishing people are vulnerable because of marginalization, insecure rights of access to resources and dependence on uncertain production systems as well as high risk nature of fishing operations. Further, their marginalization makes it more challenging to adapt to the impacts of ‘shocks or adverse trends of the environment, the economy or to policy and governance failures.

The FAO 2009 state that income, asset poverty, marginalization and vulnerability are interrelated and overlapping conditions (Figure 19.)

**Figure 19. Overlapping Conditions of Overfishing**

![Overlapping Conditions of Overfishing](image)

Adapted, FAO 2009

The rights-based development framework goal is to provide greater security through attainment of basic liberties and as an avenue to creating greater equity in resource access and under the international human rights law and codification in national legal systems. The rights-based development framework aims at securing the rights of groups of citizens’ who the state or its partners are currently neglecting or harming (FAO, 2009). Researchers suggest management approaches that explicitly include the poor, women, and crew laborers, while addressing the social factors for the exclusion, the benefits of co-participation in community-based management will favor the redistribution of power among small-scale fishers (Allison et al., 2012). The evidence of greater incentives to protect their local fishery resource will be optimized for positive gains in future yield.
Creating an atmosphere to the contrary will only produce undesirable social ecological outcomes and work to undermine the incentives and capacity within the fisheries community.

However, the investigators suggest the need for better understanding is indeed necessary to illuminate economic motives for saving more/security (fish less) or spend more (fish more). The FAO (2009) point out, in other third world fishing communities such as Africa show that major life concerns are health, food security, access to cash, lack of infrastructure and education. The major concerns for these communities have not always been the state of the fish stock and access to the resource. Many of these major life concerns as we shall see are evident at Peskotomuhkatik.

For the Peskotomuhkati, culturally consistent models for capacity building and resiliency would entail more avenues to understanding the social-cultural interactions with the coastal ecology as it pertains to food security and economic livelihood. Researchers maintain that with more secure, less vulnerable fishers will have more incentive to participate in saving fish stocks (Allison et al., 2012). Hence, they suggest that when inclusive participatory or rights-based fisheries governance approaches are implemented the more effective fishery management approaches will become achievable and sustainable. The motives and incentives extend beyond, albeit important concerns of policy issues of economic motives and conservation, to one of equitable access, the recognition of their right to their traditional fishing territories, the preservation of their culture, traditional practices, and access to culturally significant resources within the marine coastal areas (Allison et al., 2012).

Scholars warn that failure to uphold the basic economic, social and cultural rights of small-scale fisheries folk and fish dependent indigenous people right to food, work and children’s rights (as this research points out – those rights include access to quality
nutrition) – the States are in violation of basic human rights (Allison et al., 2012; FAO, 2009; OHCHR, 2004). Further, these authors contend these inactions work to undermine the governability of fisheries, fisheries management obligations and fisheries development programs. The WRI and CARE have identified key factors of socio-economic support to build resiliency in climate change (Figure 20).

More recently, CARE International emphasizes resiliency as community-based adaptation, building resilience from the ground up, equity and gender equity. Supportive actions include climate mitigation measures, disaster planning, rejuvenate traditional knowledge systems, diversify income sources and enhance local capacity, protections of rights, and address underlying causes of climate vulnerability (CARE International, 2018).

Figure 20. Socio-economic Support Measures for Resiliency

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<td>• Climate Mitigation Measures</td>
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<td>• Rejuvenate Traditional Knowledge Systems</td>
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<td>• Diversify Income Sources</td>
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<td>• Protections of Rights</td>
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<td>• ID underlying Causes of Vulnerability</td>
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Indigenous Food Sovereignty Model

The practices of traditional food acquisition systems and associated values are intertwined with the fundamental aspects of cultural identity, epistemology, and ceremony. Indigenous cultural survival and avenues for knowledge transfer through language utilization during harvesting of culturally significant food sources of acquisition, processing, procurement, and preservation are inextricably linked to the environment and ancestral territories (Figure 21). Global food movements have emerged as a result of community hunger, unsustainable agricultural practices, economic inequality and the right to access traditional culturally appropriate food systems (Mihesuah & Hoover, 2019). Traditional food acquisition systems within indigenous socio-ecological practices have been disrupted by being forced in many instances, onto isolated marginal land areas and deterioration of ecosystem habitats. Many indigenous harvesters are alienated from traditional hunting and harvesting territories due to the precedence of colonial economic systems and dominance for food acquisition the world over. Indigenous food procurement became insignificant in the greater scheme of colonial land ownership. However, it has been the very nature of colonial land, water and social policies, planning and government structures that have impacted indigenous rights to basic liberties and adequate access to culturally significant food sources.
Figure 21. Traditional Food Pyramid

Why is Eating Traditional Foods Important?

Diagram by Jared Qwustenuxun Williams

Traditional Food Production Fosters Culture

#myexistenceisresistance

Adapted, Jared Qwustenuxun 2019
The emergence of indigenous food sovereignty activities provides an avenue of self-determination to reclaiming cultural identity, customs, community well-being, and meaningful involvement in the decision-making processes in matters impacting ancestral relationship to the land, water and ultimately traditional food systems (Hare, et al 2016; Morrison, 2019). Morrison (2019) suggest conventional approaches to resource management has left little to the rich complexity of IK to the shallows of narrowly defined facts that ignore indigenous relationship to the temporal and spatial aspects of place-based cultures. The authors model attempts to shift the paradigm of food sovereignty discourse toward cultural regeneration, indigeneity, and sustainability through the revitalization of Native food systems. The model hopes to provide a matrix of restorative measures to healthy food systems that may potentially overcome and expose key areas of IK while building resiliency that has become obscured by western based science (Figure 22).

**Figure 22. Food Sovereignty as Cultural Regeneration Model**
Morrison (2019) suggests a regenerative approach to management planning that is understood and expressed through non-linear relational events that are holistic for community well-being both human and non-human. In the ‘Decolonizing Research and Relationship: Cross-Cultural Interface Framework’, the author incorporates four-guiding principles which provides conceptual tools to guide the assessment of underlying social and environmental injustices that interfere with indigenous ability to utilize indigeneity to protect, conserve and restore relationship of land, water, food and ultimately practice culture (Figure 23).

**Figure 23. Reestablishing Our Roots**
Alfred and Corntassel (2005) have coined a Resurgence Framework for food sovereignty as a call to action to shift away from state-defined politics of recognition to one of resistance through practices that enhances the celebration and reconnection with land-based relationship through cultural practices of empowerment and autonomy. In the case of the Peskotomuhkatik at Sipay’k, it would involve not only the ancestral lands but coastal territories and cultural practices of sacred relationship. Within the cosmology of indigenous culture, the Resurgence Framework is key to values of indigenous relationship to the land and is described through the following themes:

- Land as provider – survival
- Land as identity
- Land as core to all relationships

Secondly, cultural sustainability is key to practices of land-based relationship. Thirdly, cultural inequity and sovereignty is celebrated through everyday practices. The Resurgence Framework provides a non-capitalistic relationship with the land, the revitalization and reclamation of the traditional food acquisition systems, ancestral memories, stories, and healing of indigenous community of past traumas.

Mihesuah and Hoover (2019) contend restoring cultural knowledge, protecting environments, and regaining health have defined food sovereignty as: ‘nested layers of sovereignty that goes beyond the broader concepts of peasant struggle or urban communities, but by one of self-determination.’ The authors state, food sovereignty has been operationalized to include leveraging cultural, political and economic autonomy in revitalizing traditional food acquisition systems. While other investigators suggest that food sovereignty entails much deeper focus of responsibility to cultural, including
reciprocity through the ecological and spiritual relationships that are mutually beneficial with the landscape, water and the life within it (Mihesuah & Hoover, 2019). Therefore, the cultural relevancy for the traditional values of responsibility (to the next seven generations – both human and non-human) lies within the framework of decision-making in forest rangeland, fisheries, agriculture, community planning, health and environmental management that is paramount to indigenous food sovereignty as opposed to the colonial values of domination and extractionism (Table 1.5).

Traditional food acquisition of culturally significant foods is fundamental to indigenous cultural survival, restoration and revitalization and has been reiterated by many indigenous communities across the country in their quest for food security. Importantly, trade networks have been a mechanism for traditional economies in a subsistence culture to flourish and the need to reestablish these avenues for economic and cultural support have been through the Intertribal Agriculture Council (Intertribal Agriculture Council, 1987). The Mobile Farmers Market Reconnecting the Tribal Trade Routes Road trip 2014 provided a means of purchasing, collecting, and exchanging culturally relevant foods from tribal communities across the U.S. A national market has been established in Madison, Wisconsin and stocks food products and non-consumables that have been traded across Native communities.
### Table 1.5 Traditional Economic Values vs Colonial Economic Values in Food Systems

<table>
<thead>
<tr>
<th>Food Systems</th>
<th>Native Values</th>
<th>Colonial values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition</td>
<td>Sharing/Cooperation</td>
<td>Capitalism/Competition</td>
</tr>
<tr>
<td>Procurement</td>
<td>Reciprocity</td>
<td>Extractionism</td>
</tr>
<tr>
<td>Stability</td>
<td>Collectivity/Transfer of TEK to youth</td>
<td>Individualism</td>
</tr>
<tr>
<td>Security</td>
<td>Community-based</td>
<td>Commercially based</td>
</tr>
<tr>
<td>Planning</td>
<td>Long-term sustainability-Reciprocity, “7 Generations Policy” (Human &amp; non-human)</td>
<td>Short-term Profits and Reward System</td>
</tr>
<tr>
<td>Decision-Making</td>
<td>Locally/collectively controlled</td>
<td>Globally controlled MNC**</td>
</tr>
<tr>
<td>Distribution</td>
<td>Assessable to community members</td>
<td>Ability to pay</td>
</tr>
<tr>
<td>Consumer System</td>
<td>Relationship</td>
<td>Dependency</td>
</tr>
<tr>
<td>TEK/SEK* – Management Approach</td>
<td>Responsibility/Relationship/Reciprocity/Holistic</td>
<td>Exploit/Dominate/Silo</td>
</tr>
<tr>
<td>Nutritional Benefits</td>
<td>Quality Food Sources of Culturally Significant Foods</td>
<td>Suboptimal Commercial Food Sources</td>
</tr>
</tbody>
</table>

*TEK - Traditional Ecological Knowledge & SEK - Scientific Ecological Knowledge  
**MNC – Multinational Corporations

In 2019 the Working Group on Indigenous Food Sovereignty developed four principles of Indigenous Food Sovereignty:

- Food is sacred: while upholding the scared responsibilities of relationship to land plants and animals that provide food
- Daily participation and maintenance in food related activities at all levels of individual, family, and community
- The ability to respond to family/community needs for culturally relevant foods through decision-making over hunting, fishing, gathering, growing, and consuming quality food
- Reconciliation and support of indigenous food and cultural values through legislation and policy support with colonial laws policies and economic activities
Devon Mihesuah (2019) states in being food sovereign, the tribes must control production, quality and distribution. Therefore, tribes would not be subject to state regulation and control while determining their own proclamations, regulations, and ways of governance within the precepts of self-determination. The tribes would decide collectively, if they would want to trade or purchase food outside its boundaries. For instance, in the achievement of food sovereignty the Native Hawaiians have identified the need to change the conventional and convenient organizational hierarchy of colonial constructs (Chang et al., 2019). Organizational frameworks are transformed into one that eliminates dividing lines of isolated individuals through the attainment of “aina momona’ community well-being with fostering an atmosphere to co-creation and partnership with mutual support, the holistic value of kinship whereby individual problems are a community problem and the changing of the conventional reward system (commercial fisheries) while sustaining the vision of ‘aina momona” through a shift toward ‘kononiki’ a resource management approach that fosters community stewardship. Under this framework, TEK would be retained, rediscovered, or redeveloped into a community-based cultural resurgence and reawakening that is evolving daily.

Indigenous perspectives of community health and individual well-being is not always synonymous with the western views and constructs of good health. Native American views of health include the ability to interconnect with the land, culturally significant food sources and water bases of ancestral origins. Separation from these aspects of wellness have had their negative implications to socio-ecological systems, socio-psychological and spiritual development within Native society and subsistence way of life over the generations. In Alaska, the disconnections from cultural worldviews have led to
mental stress, sedentary lifestyles, loss of connection to individual identities, cultural history, land, kinship ties and spiritualism (Lindholm, 2019). Lindholm (2019) has coined the term, ‘nutritional colonialism’ to describe the values and practice of the dominate food system that have impacted the well-being of Native Americans. Lindholm suggests, nutritional colonialism has essentially ignored the subsistence lifeways, suppressed cultural practices through marginalization have essentially eliminated control of the local resources, fostered dependence to western food systems, degraded the environment, increased the prevalence of chronic disease rates in Native populations and have negated any sense of responsibility to the land and water.

In Alaska and as witnessed within Peskotomuhkatik, nutritional colonialism has been maintained through state or federal conservation policies and legislative actions on the coastal fisheries. These mandates have restricted indigenous access to their original coastal subsistence territories. Native people are not allowed to sell subsistence foods and are deprived of income to off-set their purchasing power and ability to pay. They are often barred from the very consumer system they have been forced to participate, as seen at both the Peskotomuhkatik of Maine and in the Yup’ik community in Alaska. The Yup’ik were forced to give up their cultural lifeway for a corporate culture in 1971 (Alaska Native Claims Settlement Act – ANCSA, 1971).
Resiliency Model: The Seven Sacred Teachings

_The Seven Fire Prophecy_ teachings indicate a descriptive timeline of the epochal changes to indigenous life in the Americas and the earth. It provides a picture of what life will be like with the coming of colonization. It also suggests the basic respect if followed by the different races uniting to find solutions for mankind and the environment. Within the prophecies, seven prophets will come with seven different teachings for the people. The teachings will provide two choices for living:

- One road will be green, robust and provide a haven
- The other road will be black, charred and will cut the bottom of the feet when walking

However, in this prophecy the people may choose neither road and turn back to re-member themselves to the earth and reclaim the wisdom of those who came before them. If they choose the right road the Seventh Fire will light the Eight Fire and the people will find peace, love, and respect for the earth and each other. If the wrong road is chosen by the light skinned people, there will be much suffering and destruction that will result in the extinguishment to all the Earth’s people. _We are now at the end time of the Seventh Fire!_  

*Oral Reading of the Seven Prophecies, Jim Dumont, Anishinaabe 2018*

The right to have voice in environmental planning and management for indigenous communities have come a long way since the 1960’s. Early discourse on the environment with indigenous groups has been a topic in civil rights movements since this time in which world views of the collective experiences in Native territories came to light in the national media through activism concerning strip mining, uranium, hydro-electric dams, and milling (Jojola 2001). By 1970’s indigenous community development emerged out of the collective epistemology and ontological experiences in the territories of Washington State by the Native Indian Youth Council (NIYC) asserting their fishing rights that distinguished the
indigenous environmental injustices from that of contemporary society. It was through these assertions that indigenous worldviews in planning and management came to the forefront made possible through the financial sponsorship from Indian Gaming at Oneida Wisconsin in 1994. This assembly of Native nations illuminated the disparities impacting Native communities.

A few years earlier, in 1992 within the department of Community Fellow Program at Massachusetts Institute of Technology (MIT) ‘communities of color’ project formulated a new theory of action called, indigenous planning. The grassroots activism called for the reexamination of contemporary planning practice through long-term learning, the empowerment of a community voice and the advocacy of culture and tradition that spurred the formation of the Indigenous Planning Network (IPN) in 1995. As influenced by the International Decade of the World’s Indigenous People under the UN, the Oneida Nation once again provided the impetus for the environmental initiative in indigenous planning utilizing indigenous principles.

Created out of this paradigm of indigenous planning sprung out the academic counterpart of interdisciplinary study using a case study approach with concepts from Indian law, planning and management framework that deconstructed real-world community development problems. Together these mainstream disciplines utilize the skills learned in combination with experiential knowledge within the indigenous communities. The principles derived in indigenous management and planning were reformulated from principles and practices utilized by a traditional framework that have been in place for millennia.

The indigenous planning model was based on traditional practices of land tenure – a long and sustained pattern of stewardship over successive generations, rather than the
colonial approach of land use (*See Cronin, Changes in the Landscape, 1983*). The indigenous form of land stewardship was to foster sustainability over a period for the upcoming generations who would inherit it—*the Seven Generation Policy (Human and Non-human)*. Within the construct of shared experiences overtime the evolution of values to maintain balance and relationship provided the foundations of the collective decision making that entailed reaching consensus through a unanimous agreement (Jojola, 2001). The very same system that was used by the Assembly of the Wabanaki Confederacy of Chiefs in collective decision-making for the communities (*Abenaki: The Consensual Decison-making Process, Cowasuck Band of the Pennacook-Abenaki, 2010*). This process was unlike the reactionary decision-making of western systems that were based on contemporary systems that maximizes individual profits and yield. Out of these paradigms of indigenous resource planning and management, Jojola 2001 has developed the foundational tenets that act as a decolonizing guide for Native community:

- The indigenous people are not minorities. The territories of indigenous peoples are characterized socially and geographically in which a nonnative is the minority becomes the outsider. As long as the indigenous community continue to apply the notion that their power is insolvent because non-natives are geographically the majorities, the collective will continue to be marginalized, invisible and made to be insignificant.

- Indigenous people excel in the process of decolonization (deconstructionism) as characterized by reflection and introspection. Indigenous people are not afraid to be a part of their own community research while the role of the researcher is tempered by the collective experience.

- Native people are poised to take their rightful role as enablers and work to empower their own communities through mutual respect, consensus making and adherence to traditional protocols.

- The Indigenous Planning Model is informed by the traditional worldviews of indigenous territory, land tenure and stewardship based on co-partnerships and relationship to the natural world by living in balance and fostering ecological viability and sustainability. The worldviews integrate ideals of the past, present and future.
Contrary to indigenous thought of land tenure, the western characterization of indigenous stewardship has historically portrayed through the stagnant lens of tribal-state affairs with evidence of racism and assimilative attitudes that are politically based. As a result, the idea of self-determination efforts in Native community there has been an attempt to repair (through decolonization efforts) the damage to the traditional systems of community and the environment. There has been a need for a paradigm shift towards decolonization because of years of capitalistic paternal rule and the lack of acknowledgement in indigenous-agency co-partnerships in managing and planning for their own future amid climate change. It is with clarity and cohesion tribal autonomy must take on the collective strategy through the inclusion of knowledge carriers of the environment in planning through its’ ancient laws of consensus and land tenure for greater self-reliance within the framework of the ‘Seven Generation Policy.’

Today, one can see the need for alternative methods of adaptation that foster true sustainability of the aquatic relatives and culturally significant food sources for sustenance. In the revitalization of indigenous knowledge bases for the land, ocean, waterways, and the universe it is important to resolve the stereotypical perspectives of indigenous cultural life ways and lead with an openness to learn new ways of living in balance amid climate change. There are copious lessons to teach and learn from Native Science that will provide the necessary paradigm shift in caring for all relatives (human and non-human). Native Science is an ancient system that is qualitative, observational and provides living knowledge that utilizes historical, philosophical and spiritual foundations as its primary management framework and has sustained indigenous communities throughout time (Cajete, 2000). As Cajete points out, we have witnessed the western contemporary model of
progress and industrialization lead to unconstrained extraction and individual wealth for a few with little consideration for the multidimensional relational processes of social, cultural, and ecological consequences to ‘Nikuwosskiktamik’ mother earth.

Indigenous planning models for the future must steer towards perspectives of sustainably and culturally responsive community-based models that are inclusive of its’ membership and knowledge carriers. Community-based models must be culturally consistent models that enhance the re-vitalization and re-creation of indigenous communities collectively, rather than the perpetuating aspects of socio-cultural and socio-ecological inequality through colonial constructs of wealth and power. Alternative consideration of local solutions and advocacy are necessary rather than sole authority of state or federal agency mechanisms for resource conservation that are detached from the cultural needs of the indigenous community. The solutions should arise and evolve from the foundations of socio-cultural knowledge bases within the indigenous community and primarily from the indigenous harvesters themselves. Cajete (2000) postulates we must change our way of thinking about the environment as a way of life (Figure 24). He surmises the goal of living is through living a good life ‘woli-litu’ by thinking the highest thought ‘Piyemitahamqot’ of oneself, one’s community and one’s environment with utmost respect and compassion for the original place of the people and t’olonapemkowakk - all our relations.

The highest levels of thinking – ‘Piyemitahamqot’ involve a multidimensional process for living sustainably.

- Knowing one’s home or earth which one lives – understanding the extensions and integration of connections with nature and people
- Understanding the nature of our relationship to the people, relatives (plants/animals) and the natural world
Reflective contemplation – the capacity to think things through completely and make wise choices – expression of morals, values, and ethics

Learning through the active processes of living and experiences of human life-wisdom

Figure 24. Paradigm of Living Sustainably (Woli-litu)

At the local level indigenous people have a good understanding of the impacts of environmental changes on the natural resources and its constraints to providing a way of living. The traditional knowledge carried by local harvesters can also inform, complement, and supplement scientific and conservation efforts in resource management (Menzies, 2006). There have been concerns in research to the validity of TEK. The discussions both academically, professionally, and culturally have centered around the loss of TEK or erosion of TEK due to the colonization within the indigenous community, loss of historic access to original territories, and the loss of the ability to transmit knowledge through the
language throughout the generations. The elders and traditional harvesters within the community are key to answering some of these questions. Tribal Historical Preservation Officers (THPO’s) and traditional elders within the tribes may identify some of the carriers of the historical knowledge and experiences that have accumulated over time that are multigenerational and gender informed. Historical knowledge can provide a picture of environmental changes over time and provide a baseline for future inquiry for indigenous research and management consideration.

Menzies (2006) through personal experience points out, “local people can provide a wealth of information and understanding of their area in detail that other forms of inquiry cannot.” He advises to greater understanding of local knowledge requires a few basic responses in co-management activities within the following guidelines.

- In-depth TEK documentation of every ecosystem – utilizing methods of observation, influence, verification, and prediction (adaptive approaches)
- Ethnographic documentation of culturally significant animals and plants through traditional stories of the area and epistemological knowledge system must be understood.
- The practice of TEK within indigenous culture recognizes the elements of the ecology are interconnected and cannot be segmented or violated and must be viewed from its holistic perspective, “all our relations are important, or all life is sacred.”
- TEK is part of the cultural context of the traditional economy and processes of acquisition through kinship relationships, rules, taboos and becomes a way of understanding the world around the people. It provides a continuity and intimacy to the land-base that is unique to place.
- TEK practices are grounded in moral and spiritual relationships. Practices are governed by principles of reciprocity, responsibility and respect that collectively safeguards for the next 7 generations (survival) and guard against waste or greed (exploitation).
The consideration of these guidelines encompasses the epistemological and ontological underpinnings of indigenous knowledge bases for inquiry into Native Science.

Native nations throughout the country have utilized the wisdom of TEK in adaptive management to conserve the ecology of culturally important species and land-bases (Zoltan Grossman & Parker, 2012). Self-determination efforts through environmental sovereignty among the tribes has been used to safeguard culturally important territories and species when federal and state agencies have not acted in a timely manner. Indigenous people are often forced to choose between areas of original territory and what is necessary to save and preserve culturally important species, a process referred to as, “cultural triage” (Menzies, 2006). These choices of what is significant by forced choice may put other culturally important species at risk and is not consistent with the epistemology of holism which states, “all life is sacred; all our relations are important or interconnected.” Hence, when planning for any type of development in the territories both approaches of holism and cultural triage must be acknowledged within its management framework.

Secondly, the characteristics of TEK is often distilled into products of western management approaches. The removal of the traditional knowledge base from its cultural and ecological context is referred to as, ‘decontextualization and distillation’ that becomes nothing more than an instrument for western science (Menzies, 2006; Nadasdy, 1999). TEK is qualitative and attempts should not be made to quantify it. Many indigenous communities feel the issues of cultural importance of TEK is incomplete in the conclusion of research and is used only to meet agency requirements. It is important that TEK research be utilized to reflect the concerns of the community and respected in the way the information is utilized and intellectual property rights protected.
Additionally, traditional rules of stewardship and kinship roles can influence who will be able to convey information of harvesting areas and its uses or in the documentation of these culturally important areas. It is important for the researcher and management that they recruit community-based participation in determining land use patterns and identify alternative areas for development or study. Many traditional harvesters through kinship roles may decide not to disclose the areas to preserve them. Younger generation researchers may want to check with the elders before documenting the information.

The TEK of the ecology should be gathered from several different sources within the community to validate it’s uses when used to inform planning and conservation practices (Figure 25). The tribal members in the communities hold different knowledge bases of understanding with the varying uses of the culturally significant species. For instance, resources through the various kinship and gender structures for acquisition, preparation, processing, and storage hold various foundational wisdom and knowledge bases. In discussions with Elder Fred Tomah, he recalls in preparing snowshoes, “I can remember them, cutting weavers from them out of hides for them. I asked them, what is the good stuff? The women stated, the belly of the small moose – the smaller the moose, the better, the more supple the leather” (Daigle et al., 2019). The approach of inclusiveness will not only provide a cross-check between traditional uses and other areas of personal and historical utility but overcome the limitation of fragmentation from colonial contact. Differential knowledge bases of the environment are commonly held within varying ways of knowing about the ecology or species within kinship and gender roles. Finally, it is also important to understand that TEK is not stagnant knowledge but rather evolving and adapting with the cultural practice of subsistence harvesting and utility needs within socio-economic
practices (traditional and non-traditional) of the indigenous people to meet today's environmental challenges.

**Figure 25. Benefits of Sharing TEK in Conservation Efforts**

![Diagram showing benefits of sharing TEK in conservation efforts]

Since the challenges of adaptation are numerous within indigenous community, the Ojibwe and the Menominee have united in their attempt to address the gaps in Climate Change adaptation models through the indigenous lens to not only decolonize approaches to management, but to act in ways familiar to cultural ways of knowing. The Tribal Climate Adaptation Menu (TCAM) addresses the gaps of previous models and incorporates the unique needs of indigenous views of the earth and ways of living in balance. The TCAM framework fosters the traditional values and culture of the North-eastern people and
integrates TEK, culture, language and history onto the climate adaptation planning process (Tribal Adaptation Menu Team, 2019).

The Tribal Climate Adaptation Menu (2019) has been developed out of the need to address culturally significant food species such as the ‘wild rice restoration project.’ The TCAM was based on a regional adaptation menu from the Northern Institute of Applied Climate Science (NIACS) (2016) which published the booklet for land managers called, the Forest Adaptation Resources Climate Change Tools and Approaches for Land Managers 2019 (Swanson et al., 2016). The goal of the Menominee and Ojibwe was to incorporate and include tribal traditional values, language, and epistemology into its strategies for planning and development. The flexible (spatially and temporally) menu strongly advocates cultural practices and spiritual guidance on adaptation is achieved by respecting and building dynamic relationship through honoring cultural responsibility and history with mindful practices that are mutually beneficial to the people and the landscape. For example, in strategy 1 of the Menominee Menu states, consider cultural practices, and seek spiritual guidance (teaching of humility) and strategy 2 states, learn through careful and respectful observation (gikinawaabi) (teaching of wisdom and respect), while strategy 3 emphasizes, support tribal engagement in the environment (teaching of humility), with each strategy listing various activities in which to achieve these approaches. The menu also addresses historic violations of trust that hindered on building co-partnerships necessary between agencies, academic and research institutions that have not worked in the interest of the indigenous communities. The booklet was developed to guide efforts to transform relationships of the dominating society to a more culturally, ethical, effective, and sustainable approach to living in balance with t’olonapemkowakk - all our relations.
Seven Grandfather Teachings in Management and Planning

It has been the attempt within many indigenous nations to design adaptation strategies that meet the cultural context of indigenous teachings about the environment is referred to as, ‘Wolankeyutomuk’ - to take care for the land or Nikuwosskiktamik – mother earth. Utilizing the epistemology and language to re-vitalize and re-member themselves to the environment has been a means of cultural survival and resistance. According to ancient migratory stories and teachings of the Seven Fires, the Ojibwe and the Menominee historically have been a close relative to the Waponaki people of this region. It is said in historical accounts and oral histories the Anishinabek people migrated from the ocean territories of the Waponaki – People of First Light. The Teaching of the Seven Grandfathers shared by the Anishinaabe and the Waponaki was used long ago in our creations stories to lead the people back to Woli-litu - living in a good way. The seven teaching were humility, bravery, honesty, wisdom, truth, respect, and love. Each were depicted by the sacred relations of significant animals that make up our traditional clan systems and our sacred connections to t’olonapemkowakk (Figure 26).
Each clan has a specific role and teaching within the community. The seven teachings have been handed down through time in traditional stories and ceremonies. These teachings were meant to ensure the collective survival of the people and the way in which the indigenous people were to live according to the sacred instructions of ‘Woli-litu.’ Most of the teachings are shared throughout indigenous territory in the western continent and provide the primary epistemological concepts of holism but vary due to geographic location of each group and linguistic variation that provide the unique cultural foundations. The teachings are applied through principles of respect, reciprocity, and relationship with t'olonapemkwakw (all our relations), and original teachers.
The teaching of *Kseltom (Love)* *teaches vision and balance* is incorporated in the Management of the Goals and Objectives in the adaptation model evident upon receiving teachings from the cultural important relatives (natural resources) is to continually be aware of the dynamic interconnection with our own existence as indigenous peoples and to base our action plans for stewardship on this wisdom – *holism*. Indigenous people’s continual existence, identity through these teachings and cultural survival into the future
will be determined on how effectively the people respond to the environmental challenges imposed on the ancestral territories through climatic changes. This concept is what I have coined, ‘the Seven Generation Policy.’ The policy and our planning model for adaptation should be to continually gather and apply new information, sharing TEK and embrace the lessons learned through teachings we receive from the interactions with the relatives (natural resources).

The teaching of Sapitahamquosu (Honesty) instills understanding words and actions in the model is meant to function in intertribal collaboratives, co-partnership approaches, and MOU’s that spans over large and diverse landscapes and waterscapes in which the people practice traditional lifeways. The Climate Change Response Model Framework depicts an iterative approach into planning and adaptation activities that is based on co-partnerships and are consistent with traditional values of respect, responsibility, and reciprocity. The Framework diagram provides a visual on the flow and organization to management in adaptation (Framework Approach for Management within the Forest Adaptation Resources Booklet, Chapter 1 Adapting to a Changing Climate Figure 3) (Swanston et al., 2016). Each of the components within the framework are frequently evaluated for adjustments based on feedback and relies on transparency and accountability from land and water managers within agencies of federal, state, tribal, nonprofit, and private organizations that provides an iterative process.

The teaching of Kinapihihkuwal (Bravery) in the model is to make good decisions by learning in the process that includes Vulnerability Assessments. According to the IPCC (2007) vulnerability is the degree to which a system is susceptible to and unable to cope with adverse effect of climate change. Vulnerability Assessments are used to inform
decision-making on the uncertainty of climatic change and considers regional projected impacts on the relatives (natural resources) much of which is quantitative and includes observational data, statistical models and through simulations or surveys. There is a complex array of information that contains a bewildering amount of climate scenario’s, models and time scales and projections along with several management implications as the CCRF suggests. However, the assessments must be place-based and rooted into the knowledge of the local region that are interpreted by regional experts and includes tribal input into the decision making that is qualitative, TEK based and cultural significance.

The teaching of Anelsu (Humility) and Wolamewakon (Truth) of inclusiveness and journey is achieved with consensus building utilizing the traditional approach that is imperative to ensure credibility in the mutually beneficial outcomes of the environment and stewardship practices that ensure sustainability. The traditional approach to decision-making must be in the best interests of all the people. Consensus does not mean that all agree, but that all understand the decisions being made that considers present conditions and future generations. Representation must be within any collective group of people, whether it is within kinship ties, Clan, Band, Tribe, Nation, or Confederation, and equitable representation must be given to all groups. The “Three Truths” must be met during the deliberations:

- Peace - Does it preserve the peace that is already established?
- Righteousness - Is it morally, correct?
- Power - Does it preserve the present and future integrity of the group?

*Present - What does it do for the present generation?  
*Future - How does it affect the future seven generations from now? The decisions made today must benefit all the people from the present to the next seven generations (human and non-human).
Much of the scientific areas of research on vulnerability has taken place in the Northeastern regions of the US and have been based on the academic literature and widespread input from the scientific community (Swanston et al., 2016). For purposes of the bioregion the NIACS has developed a report for New England Projections in Climate Vulnerability (See Box 2 for Janowiak et al (in review) New England Forest Ecosystem Vulnerability Assessment and Synthesis). However, the concern with the inclusivity of indigenous epistemology, the assessment must be grounded into the original management plan and activities within local experiences. The willingness to include a wide range of users that foster a diversity of approaches to adaptation must include Native perspectives and understandings, Native Science, values, and cultural objectives.

The limitation of the contemporary model to vulnerability assessment is the cultural significance of relationship to the importance of tribal identity and survivability. In order to address this shortsightedness to management, professionals must reach out to traditional harvesters for assistance and guidance while including the impacts on kinship roles and gender roles. Initiations to include harvesters must recognize the utilization of TEK and aspects of holism in its approaches. Vulnerability assessments can help identify those areas where there is a high confidence in a particular outcome is likely to occur and a place to focus on areas where further research and observation is needed.

The final teachings of Kcicihtuwin (Wisdom) and Kcitolmitahatom (Respect) brings us to the traditional values of observation and judgements as explained by Marshall & Marshall 2012 through ‘Two Eyed Seeing’ in which the authors describe Two-Eyed Seeing as “learn to see from your one eye with the best or the strengths in the Indigenous knowledges and ways of knowing ... and learn to see from your other eye with the best or the strengths in
the mainstream (Western or Eurocentric) knowledges and ways of knowing ... but most importantly, learn to see with both these eyes together, for the benefit of all”. Marshall & Marshall (2012) emphasizes the need for an on-going journey of co-learning within contemporary science and native science which is both required and essential to develop the new knowledge bases, collaborative understandings and capabilities that Two-Eyed Seeing encourages. Thus, co-learning becomes an on-going and iterative process that is constantly evolving while implementing adaptative strategies into resource management.

The adaptation strategies and approaches for managers have been used successfully for on the ground management activities (See www.adaptationworkbook.org). The adaptations workbook is intended to help resource managers view climate change as an emerging management consideration that can be incorporate into already existing plans and decision-making activities. The workbook assists in integrating a variety of approaches and strategies into management directions based on the existing goals and objectives. It allows the discussion and sharing of information on climate related topics with coworkers, team members and other collaborators. Finally, the adaptation workbook assists in documenting the decisions made regarding climate change and management. However, it does not make recommendations or set guidelines for establishing a monitoring plan (See Figure 30). The use of monitoring the actions strategies used will help inform future management decisions utilizing the concepts of Two Eyed Seeing. The illustration below is a step-by-step process in implementing an adaptive process in management (Figure 28).

As Marshall & Marshall (2012) suggest, in addition to encouraging inter-cultural collaboration, Two-Eyed Seeing assist in the efforts to greater understanding of the cultural
perspectives of holism alongside the distinct nature of the Western knowledges, thereby, providing broader understandings between TEK and SEK complementary approach.

**Figure 28. Step by Step Adaptive Process in Management**

Adapted, USDA Forest Service, 2016

In the process of incorporating Two-Eyed Seeing it may require a “weaving back and forth” between knowledges, and this will draw upon abilities to engage through traditional consensus meaningfully and respectfully with greater understanding and mutually beneficial practices in collaborative settings (Marshall & Marshall 2012).

The incorporation of the seven teachings will guide the management and stewardship of the environment within Waponaki territory into an indigenous framework that will guide generations to come and provide an avenue to incorporate their belief systems into their work as future stewards. It is within this paradigm one must consider *t’olonapemkowakk* (non-human and human relatives) are all connected by *Niweskw* -
essence of the life spirit. These are the sacred foundational teachings of Kciniweskw (Great Spirit) and the underpinnings of holism. We must be respectful and mindful of all life.

Community-based models for adaptive research have served multiple uses to stimulate thought around revitalizing traditional adaptive practices and methods while sharing knowledge about implementing action solutions to address climate change. Once implemented, the baseline data will act as a synergistic means of informing and strengthening self-determination efforts within indigenous communities. The data may primarily serve as a resource for funding applications for various fisheries projects and future training needs that will enable tribes to act on their own unique tribal concerns. For example, other tribes have implemented such programs that have included water testing for contaminants and parasites by the Native youth, monitoring water temperatures and PH for salmon sustainability, elder led hunts, and traditional food gathering along with language instruction. Other innovative approaches that impact policy decisions may include monitoring fisheries recovery efforts by initiating a culturally consistent tribally run citizen science program tailored to traditional harvesters and tribal school systems that serve to build future resiliency efforts through mobilization and documentation of community-based knowledge.

**Content v. Context and Its Impact on Equitable Access for Food Security**

Since first contact by Spanish voyagers in the America’s, nature was conceptualized as a place to be subdued and conquered. The indigenous people were lumped into this category and not separated by concepts of being wild and Godless. Newcomb’s (2008) postulates, the historical ‘doctrine of discovery’ was used to create a body of rules by the early federalists’ systems to deface the indigenous people as integral to the ecology, impede
cultural solvency, and rights to the ancestral land bases. These early acts were primarily to amalgamate the individual property rights of settler-states. A policy that was foreign to the perceptions of indigenous land use and values of relationship with the ecology.

Thus, it is important to understand the inceptions of discovery within Federal Indian Law to truly understand the issues of the Maine tribes. The origin of Federal Indian Law pertaining to the indigenous people in the U.S. and Canada have been centered around land tenure and private land ownership. According to scholars, historical Federal Indian Law has been inculpated as being an arbitrary or capricious process involving court decisions of federally recognized tribes when deciding cases pertaining to the context of Native American rights (Newcomb, 2008; Wilkins & Lomawaima, 2002). Firstly, for the sake of a balanced justice, individual dispositions within the courts should not apply unless the correct laws and canons are used with mutual assent. Moreover, the States are under legal obligation to understand these laws and have the responsibility to ensure these laws are applied properly and justly.

However, the precedence of the discovered land of the Americas to European expansion and absolute title of the Americas to European Nations of Spain, France and Great Britain and remains entrenched within Federal Indian Law and policy that permeates many significant court decisions today. As we shall see, the discovery doctrine continues to operate in Maine district court decisions pertaining to the Waponaki including traditional fisheries practices among the Peskotomuhkati. It was this doctrine which pervaded the exclusivity of discovering that gave European nations the preemptive authority to purchase lands from the indigenous people should the tribes agree to sell any of its original
territories. The preemptive authority later became law that is known today as the ‘Trade and Intercourse Act of 1790.’

Newcomb (2008) has described various Idealized Cognitive Models (ICM’s) applied within doctrines regarding substantive rights of the original people of America that the courts relied on to reach decisions throughout its evolution of case law. There have been two primary cognitive models that Newcomb describes, ‘The Conqueror and the Chosen People - Promised Land’ ideology that also provided the rational through ‘assumption and abstract justice’ while deciding cases involving the Maine Indian Land Claims case and Peskotomuhkati fishing rights. Newcomb (2008) describes this schema as the right to subdue and to dominate or occupy distant lands through military (there was not a viable military occupation during this time) or colonial occupation. The central conqueror figure can be traced back to Christendom in which the King, Monarch, Emperor or Pope is considered to have divine power or emanate power from a divine source (Figgis, 1914). These schemata taken out of context can be traced back to biblical passages of Genesis 1:28 and Psalms 2:8, whereby Christianity ordained themselves as the ‘new chosen people’ who have determined to subdue nature on earth and extend dominion over all living things (Cronon, 1983; Newcomb, 2008; Wicken, 2002; Wilkins & Lomawaima, 2002). These metaphors have been unconsciously implied through the dominating culture of colonial practices and conditions especially within court decisions.

Newcomb (2008) describes the Johnson v. M’Intosh case of 1818 that held precedent for Federal Indian Law and all title derived from colonization. It was through the concepts of discovery in which the doctrine of “stare de cisis’ or res judicata’ have confirmed judgement without reexamination. Newcomb states the origin of landownership
and land tenure in the U.S. was a result of the inceptions of Federal Indian Law that operated in the Johnson v. M’Intosh case of 1818 “has become the lynchpin for all other land laws in the U.S.” Thus, these maps of understanding and general reference of these assumptions can be observed repeatedly in major court ruling and dialogue impacting the original people and their territories in the U.S. This precedence has ultimately extended into cultural rights to access traditional food for subsistence and customary ways of living.

The legal interpretations prompted for the denial of Native Americans access to free existence within the original lands and territory including food security through mixed subsistence lifestyles. These interpretations and assumptions have dominated the judiciary decision-making in indigenous land and water rights. These assumptions of abstract justice have been the impetuous of various issues of food insecurity that includes legislative actions and decision-making concerning indigenous hunting, gathering, and fishing rights within the courts. As legal experts point out, these interpretations of Federal Indian Law have been deliberated as ‘irreconcilable’ under the declarations of tribal sovereignty and trust-relationships within the United States (Wilkins and Lomawaima 2002, Newcomb 2008). The schemata as instruments of the courts have ultimately led to imperial expansion and represented a means of expunging the indigenous way of life from their original lands and thus traditional food sources.

Within the history and confines of jurisprudence, the disenfranchisement of the Native American peoples’ claim to their original lands can be witnessed in key decisions by the courts that have influenced the out of court decision (Plenary Power Doctrine, the Trust Doctrine and the Trade and Intercourse Act) of the Maine Indian Claims settlement of 1980 (Passamaquoddy Tribe V. Morton, 1975). It was the precedence established under the
Johnson v. M'Intosh case of 1818 dispute between two non-native entities: the Illinois Land Company and the Wabash Land Company that have dictated decisions in many cases involving indigenous territories. The land titles in dispute were originally purchased in 1773 and later in 1775 from the Wabash Indian and Kaskaskais Indian, respectively. In 1818, these lands came under dispute when the U.S. government sold a portion of these lands to William M'Intosh after the statehood of Illinois. In settling the case, the court had to determine who had the authority to sell lands i.e., *superior title*. In this illustrated case Newcomb postulates, Chief Justice Marshall utilizes the ICM ‘s schema based on a *metaphor* to derive his conclusions that the court on behalf of the U.S. government had the unquestionable ‘*rights of civilized nations*’ on ‘*principles of abstract justice*’ in favor of the settler-states. This same ‘*abstract reasoning*’ was applied again in its’ decision handed down by the District Court in Maine concerning Peskotomuhkati fishing rights.

The abstract justice, in which Marshall (1832) eludes, were that of the ‘discovery doctrine.’ Ultimately, Marshall decides though *assumption* that occupancy had been viewed by the U.S. as diminished based on ‘conquest’ (Christian discovery) and has become the law of the land that may not be questioned (‘stare de cisis’ or ‘res judicta’). In Worchester v. Georgia, 321 U.S. (6 Pet.) 515 (1832), Marshall based his rational of conquest through assumption on these terms:

“In this view, perhaps, our ancestors, when they first migrated to this country, might have taken possession of a limited extent of the domain, had they been sufficiently powerful, without negotiation purchase from the Native Indian. But this course is believed to have been nowhere taken. A more conciliatory mode was preferred, and one which was better calculated to impress the Indians who were then powerful, with a sense of the justice of their white neighbors.”

In Marshall’s imperious assertions, he further deliberates that:
“If the principle of conquest was used initially and afterwards, would become the law of the land and would not have been questioned!”

It was Newcomb’s (2008) assertions, the U.S. through its assumptions of having ‘plenary power’ over Native Nations based on the claim of discovery - the right to appropriate vast tracks of land and resources within the confines of Turtle Island (North America) for the economic benefit of the settler states. This decision has set the course for property laws in the U.S. and within Federal Indian Law and policy today. As we shall see, this decision was repeated verbatim with the very same conquer schema of discovery using stare de cisis or res judicta, that was implied in the court decision handed down through ‘assumption’ by the District Courts for the State of Maine concerning Peskotomuhkatik fishing rights (MITSC, 2014).

Under Federal Indian Law, Wilkins and Lomawaima (2001) suggest these policies, such as plenary power have been used to ‘privilege’ the powers of government over the rights of self-determination of recognized tribes in the United States. The authors suggest there are four doctrines that have been used in court decisions to define and interpret federal law impacting the original people of these lands and their original territories; the Discovery Doctrine, Plenary Power Doctrine, the Trust Principle and Reserved Rights Principle which have served the interest of the United States, while diminishing tribal autonomy. As Wilkins and Lomawaima (2001) assert the discovery doctrine provided a means of ‘benevolent paternalism.’ Whereby, tribes are unfit to manage their own lands, while equating its definition with complete conquest.

The precedence of preemptive authority was born out of the concepts of the Plenary Power Doctrine and has served the interest of the U.S. through exclusive right of first purchase, while many tribes have been deemed ‘wards of the state’ that have been
implored particularly within the State of Maine. Conflictingly, the Plenary Power Doctrine utilized in the MICSA of 1980, proposes an exclusive preemptive, absolute, and unlimited power over tribes creates a paradox that are contrary to the inherent sovereignty exercised and enjoyed by many Native American Nations, as well as to the ideals of a democratic government. However, the courts have repeatedly based their rulings on a two-pronged concept of relationship that are unfounded; Native Americans as wards are deemed helplessness, while ethnocentric assertions of U.S. rights to land are applied under the discovery doctrine (*United States v. Kagama and Another, Indians*, 1886).

However, the very act of negotiation, ratification and proclamation of Native American treaties have affirmed their political status as a distinct sovereign with the ability to exercise inherent sovereign authority over their original lands. Treaties have been deemed *extraconstitutional* or existed before the constitution was drafted (Wilkins & Lomawaima 2001). The policy of federally recognized tribes falls under this category and the Waponaki people are not distinct from this affirmation. Thus, having a unique political status that distinguishes them from other minority groups. However, the State of Maine continues to view its relationship with the Maine tribes as ‘wards of the State.’ Distinctively, the tribes in Maine have received federal recognition since 1977 and fall within the framework of Federal Indian Law and its applicability as sovereign tribes. Hence, the relationships with the tribes must be afforded the same liberties as any other citizen of the U.S. and within the State of Maine.

**Maine Indian Claim Settlement Act of 1980**

Internationally and nationally, treaties remain the law of the land, unless disavowed by Congress who possess supreme authority over State constitutions. Historically, most
treaties negotiated with the tribes in the U.S. were designed to restore peace after the Revolutionary War and the War of 1812 with British defeat (Wicken 2002; Wilkins & Lomawaima 2002). As a result, the U.S. relinquished claims to reserved land and were based on preemption and not ownership through treaty agreements. It was through negotiations of the U.S. and Great Britain that, tribal sovereignty would continue to be recognized and honored as it pertained to their preexisting rights, including their territorial rights to their original land base. These treaty agreements applied long before Maine reached Statehood. In 1814, the Treaty of Ghent, Article 9 was negotiated and acknowledged that the U.S. would recognize the rights and possession of tribes that existed prior to 1811 and states:

“The United States of America engage to put an end, immediately after the ratification of the present treaty, to hostilities with all the tribes or nations of Indians with whom they may be at war at the time of such ratification, and forthwith to restore to such tribes or nations, respectively, all the possessions, rights, and privileges which they may have enjoyed or been entitled to...provided always, that such tribe or nations shall agree to desist from all hostilities against the United States of America, their citizens and subjects, upon the ratification of the present treaty being notified to the such tribes or nations, and shall so desists accordingly.”

A second policy that acknowledges tribal sovereignty assumes the federal right to purchase land but not one of automatic ownership prior to purchase from Native American Nations is the “Trade and Intercourse Act of 1834, section 12 states:

“No purchase, grant, lease or other conveyance of land, or of any title or claim thereto, for any Indian Nation or tribe of Indians, shall be made by treaty or convention entered into pursuant to the Constitution (4 stat, 729).”

It was through this Act that the Maine Indian Land Claims Settlement of 1980 was based under the pillars of Plenary Power and Trust Responsibility of the federal
government. Although the judiciary branch (Supreme Court) sways tremendous influence in Federal Indian Law and policy, the primary role is to interpret treaty language and is the ultimate arbitrator of U.S. law with the intent to be fair and just, while being carried out with the informed consent from the tribes. Wilkins and Lomawaima (2001) assert the interpretations and reinterpretations via political and social trends have set precedence in the interests of the government for economic trends or simply ignored or overturned in many decisions concerning the tribes to which it was not intended. Historical trends in conflicts concerning the tribes harvesting rights for food security in the State of Maine have been set by the same preferential qualities of decision-making and individual disposition within the district court for the past 200 years.

As Wilkins & Lomawaima (2001) and Newcomb (2008) point out it is these inconsistencies that changed the course of relationships between the U.S. and the tribes, as well as the State of Maine. These inconsistencies have set novel precedency of many court decisions including Worchester v. Georgia 1832 case affecting Native American sovereignty, federal trust relationships and codified laws. According to legal experts, was under Marshall’s pretensions of conquest or cession to rights of property that have remained in question. According to legal interpretation by Wilkins and Lomawaima 2001, it is through processes of treaty negotiations, not military conquest (assumptions), that hold the underpinnings of Indian policy in the U.S. It has been the impact of the judgements through assumptions within the district court that persist over Peskotomuhkatik fisheries and the ability to practice traditional harvesting of culturally important food sources. Marshall’s pretensions and short sightedness have led to long term implications for food
insecurity, hunger, and threats to cultural solvency not only at Peskotomuhkatik, but in
Native American communities throughout the U.S.

Legal experts recognize the tribal sense of trust holds any treaty or agreement once
approved, the rights or land in perpetuity or until both parties *mutually* agree to change the
agreement conditions. The 1790 Trade and Intercourse Act reiterated federal trust
responsibility towards tribes, including state recognized tribes. It was the Trust Doctrine
and the 1790 Trade and Intercourse Act; that the Passamaquoddy and the Penobscot tribes
along with the Massachusetts Colony had a long history of diplomatic and reciprocal
relationships with American colonists and Great Britain. The US Congress of 1977 states:

> “The trust doctrine emanates from a unique relationship between the US
> and Indians in which the government undertook the obligation to insure
> the survival of Indians.... its broad purpose is to protect and enhance the
> people, the property and the self-government of Indian tribes.”

The newly instated, State of Maine of 1820, while under the political control of state
officials ignored a 1794 treaty with the Commonwealth of Massachusetts that resulted in
the illegal sale of 12 m acres of tribal lands. Further, the tribes alleged, the State of Maine
violated the 1794 treaty and the 1790 Trade and Intercourse Act that was meant to protect
the tribe’s lands from private and state claims or sales. The tribes contended the federal
government did not consent to the alienation of these lands to Massachusetts or other third
parties through private sales. Ultimately, the Commonwealth had simply ignored its own
laws through the 1790 Trade and Intercourse Act.

In 1974, the U.S. District Court in Maine upheld the decision to recognize the federal
Trade and Intercourse Act, the First Circuit Court of Appeals in this case held that the
alienation of Indian land applied to all tribally held lands, whether there was federal recognition or not, the Passamaquoddy and Penobscot lands were part of Indian territory. In 1980, Congress passed the Maine Indian Claims Settlement Act (94 stat. 1785; Brodeur 1985) settling the case for the Passamaquoddy, Penobscot, and Maliseet Indians to up to 12.5 m acres in Maine for the illegal selling of Waponaki lands and territories. A miniscule amount of land compared to that illegally transferred by the State of Maine.

Historical injustices of environmental inequity have forced many treaty tribes to turn to the ‘trust doctrine and reserved rights doctrine’ through activities of self-determination to legally practice their culture in the U.S., while within their original territories (Ruckelshaus, 1984). Historical accounts of land tenure changes show numerous conflicts in hunting and fishing for Native people began when the State of Maine passed legislation in 1897 for the requirement of licenses by Native guides (MacDougall, 2004). Although the requirement applied to guide services, the new law was arbitrarily applied to Native subsistence harvesters as well. The tribe tried to negotiate with the Commissioner of Inland Fisheries and Game to allow Native people to hunt and fish year-round. However, the request was denied even though the Native families depended on these foods for subsistence. The tribe went on and continued to use their skill of the land and waterways for their livelihood unabated despite the state requirement of licensure.

Since the MICSA of 1980, basic liberties, transmission of indigenous knowledge bases, languages and cultural customs of the harvesting activities including religious/ceremonial practices have been hindered by the State of Maine’s marginalization and gridlock through threats of litigation and fines according to the Peskotomuhkati fishermen and fisherwomen.
The State of Maine continues to deny Maine tribes inherent hunting and fishing rights to rivers and waterways including rights to their original ocean territories for food security from ecological sources that are safe by the incremental erosion of an out of court settlement known as, the Maine Indian Claims Settlement Act of 1980 (MICSA).

Once passed into law, the Maine Implement Act (MIA) (MRSA Title 30, Chapter 601) provided oversight by the MITSC intergovernmental organization as an act of trust relationship, that consisted of representatives of the State of Maine -legislative bodies, Passamaquoddy, and Penobscot Tribe and later in 2009 included the Houlton Band of Maliseet Indian.

“MITSC’s general charge was to continually review the effectiveness of the Act and the social, economic, and legal relationship between the tribes and the State.”

The MICSA gave federal permission for the MIA to take effect while retaining federal recognition through federal trust relationship between the tribes of Maine and the U.S. Congress.

However, the State of Maine has essentially ignored the legal mandates for federally recognized tribes set forth under Federal Indian Law, as well as the sovereign co-tenancy arrangements in which these extra-constitutional trust obligations are supposed to protect. Over the years, challenges appear to be mediated by the lack of commitment to National and State policies such as the MICSA, including infringements of commercial and industrial competition through its anthropogenic mechanisms that often take precedence over the tribes. These enacted agency policies and court decisions have interfered with the tribes to freely practice their culture for food security within original fishing territories.
There have been recurrent attempts to weaken the government-to-government arrangements inferred by the Maine Implementing Act (MIA). Over the past few decades, the State of Maine Attorney General Office (OAG) has been reliable in its incremental attempts to erode the MICSA and the MIA including treaty rights of the federally recognized tribes by its lack of transparency and lack of accountability to the legislative process. Further, the failure of legislature to include tribal participation by the exclusion of tribal oversight or meaningful involvement in issues through MITSC affect their sovereignty as federally recognized tribes under the Trust Doctrine defined by Federal Indian Law (MITSC 2014). Both parties have had opposing views of the tribes fishing rights since it was not explicitly and mutually addressed before MICSA became law in 1980. The State of Maine has essentially denied the applicable law of the ‘Reserved Rights Doctrine’ and the contextual oral agreements of the historic wampum belts and treaty making processes as it pertains to the epistemological perspectives of the Waponaki.

Early tensions began soon after the 1980 settlement that included a review of saltwater fisheries at Peskotomuhkatik by the tribe and Department of Marine Resources (DMR). In 1998, then Representative Moore introduced a bill concerning the ‘Taking of Marine Resources by members of the Passamaquoddy Tribe’, known as LD 2145, which recognized the tribe’s authority to regulate its own saltwater fisheries and required a Tribal-State Compact. However, the State decided to strike the compact requirements in its amendment and specified limitations on lobster, crab, and urchin free markets, while the definition of sustenance was left as an internal tribal matter. The full extent of the amendments to the MIA can be viewed in the *MITSC Report on Saltwater Fisheries, 2014*.
Within its amendment the OAG recommended the inclusion of a *blow-up clause* that essentially can be used to destroy a whole or part of the contract or law, including the administrative processes mandated in the MIA, that includes the tribe’s *meaningful involvement* in any amendments to the MICSA by the State. The OAG essentially lobbed the ball back into the tribe’s court through the ‘burden of proof’, thus subverting the tribe’s right to participate in the decision-making processes without litigation. This act served two primary purposes of the OAG that included an attempt in weakening cultural solvency, including rights to tribal self-determination, but also served to exert the State’s economic dominance of the fisheries industry. A precedential action no less of tyranny invoked onto the tribes by the State of Maine, while ignoring its accountability to MITSC under the MIA and trust obligations under Federal Indian law. The questions remain; can the State of Maine invoke such a clause in legislative acts overriding Federal Indian law and ignore historical treaties with the Waponaki, all the while ignoring the constitutional stipulations of the *Separation of Powers* that is meant to protect tribal economic interests before Maine could achieve statehood in 1880? These questions remain to be answered.

In an example of content taking precedence over context once again, can be exemplified in 1979 under the Maine Indian Claims Settlement Act (MICSA) § 6207, that states,

> “the Regulation of Fish and Wildlife Resources shall be under the jurisdiction and exclusive authority of the Passamaquoddy and Penobscot tribes within their respective territories to promulgate and enact ordinances regulating:

a) Hunting trapping or other taking of wildlife

b) Taking of fish on any pond in which the shoreline and all submerged lands are wholly within Indian Territory and which is less than 10 acres in surface area.”
However, the tribes have argued that the originally titled case of the Maine Indian Land Claims Settlement Act (MILCSA) (1980) is just that – LAND claims and does not explicitly or mutually include ocean run resources or water issues. As the tribes contend, these codified laws enacted by the state was never mutually agreed upon by the tribes. According to the negotiations of MICSA, there were no decisions confirming fisheries and that the tribes had relied on the Reserved Rights Doctrine to continue unabated from subsistence practices in their original territories. The tribes have argued the two primary issues have not been considered under the Maine Implementing Act (MIA) and therefore are not subject to Maine law. The treaty tribes have had to contend with State agency officials to exert their sovereign rights of environmental self-determination to manage their natural resources according to ‘trust obligations’ under Federal Indian Law (US v. Winans, 198 US 371, 380-81, 1905). However, conflicts and disagreements persist regarding tribal fisheries in policy development and interpretations of the law through the MIA. Federal expert and Deputy Solicitor of the US Department of the Interior, Edward Cohen (1997) has characterized aboriginal fishing rights as Reserved Rights, rather than the perspective of ‘granted rights’ a position presently held by the State agencies. He articulates the federal position as follows.


The Penobscot and Passamaquoddy tribes have argued that the State jurisdiction does not include the tribe’s ancestral territory of water resources and saltwater fisheries and have never ceded rights to regulate these two areas of contention. The District Courts of Maine under the decision of Judge John Romei (1998) disagreed and has “assumed
without deciding” (Conqueror Schema) its jurisdiction and authority since MICSA does not explicitly reserve exclusive rights to these areas (State v. Beal, 1998). Once again, the content of State law took precedence over the context of understanding by the federally recognized tribes of Maine.

Intergovernmental conflicts have been lobbed back and forth with the courts and the Maine tribes. In early 1998, the State Attorney General’s office found 13 members of the Passamaquoddy tribe in violation of Maine Resource laws for clamming in a closed area, possessing under sized clams and selling the clams and scallops without a license (State of Maine v. Beal, 1998). The tribal members stated the tribe has retained its aboriginal fishing rights stemming from their strong cultural and historic ties to salt-water fishing activities despite the Implementing Act and is an ‘internal tribal matter’ that is not subject to State authority. The court ruled that the case was subject to Maine laws and argued that the MICSA included all jurisdictions in Maine. A judgement deemed by many as arbitrary and captious.

The State further argued the tribes relinquished the control over its aboriginal fishing rights, since there was no mention of ocean fishing or water resources in the settlement act and the Defendants were subject to the above violations. The State’s rationale was based on the ‘codified agreement’ which through their ‘written interpretation’ terminated any inherent saltwater fishing rights concerning non-reservation lands that the tribes possessed prior to its passage. Thus, the Maine law would apply unless, “otherwise provided in the act.”

These issues have been historically a source of dispute and continue into present time within the legal system. Noticeably, with the settlement of the MICSA of 1980, there has been the convenient elimination of the “L” –within the MILCSA (1980) and is referred
to the case as the “Maine Indian Claims Settlement Act, (MICSA) officially removing the word, “Land” out of its original title when negotiations were taking place (Figure 29).

Figure 29. Incremental Erosion of MICSA by the State of Maine

The use of the written word taking precedence over oral negotiations of understanding with the tribes within the MICSA along with the exclusion for applying the three Canons of Construction as federal Indian law stipulates that impact treaty tribes.

The Passamaquoddy tribe came under numerous squabbles yet again in 2013 and 2014, with the Department of Marine Resources (DMR) to defend its right to manage its elver’s fisheries. The American eel, ‘Anguilla rostrata’ has been an important cultural species and has uses for food, medicine and utility by the Waponaki people for hundreds of years (Daigle et al., 2019). This dispute has been a manifestation of the present market value of the elver’s and nothing more (See Reserved Rights Doctrine and Separation of Powers for Statehood). In 2013, the elver’s official catch was estimated to be worth $40
million. The State legislature moved quickly through negotiations with the tribes to pass a law allowing the Passamaquoddy to issue 200 elver’s licenses, but the tribe on the other hand issued more than 500. This exercise of sovereign authority created quite a stir on the State level with Governor LePage threatening the tribes with regulatory enforcement through the National Guard, while reneging on past agreements with the tribes (Cairn, 2013).

In 1998 approximately 60 tribal members was charged with various violations and included the confiscation of personal fishing gear was later thrown out of court (MITSC, 2014). The 500 licenses issued were based on a quota limit set by the tribe. The rational was to give tribal members an equal opportunity to access the fisheries and to earn a partial income. The confiscation of fishing gear left most fishermen and fisherwomen unable to secure a supplemental income and provide for their families. The actions by DMR created financial hardship while exacerbating conditions of food insecurity for tribal families.

According to Passamaquoddy Tribal Fisheries Commission, the quota law set by the tribe was stricter than the State law with a total limit of 3,600 pounds to sustain the resource. This amounted to 4 pounds per tribal member. Additionally, the tribes used dip nets as opposed to fyke nets for conservation purposes. According to tribal officials Moore and Francis (2015), although the tribe issued 500 permits, only 30-50% of the licenses were used. The State did not provide a limit or quota for catch, but its approach was basically a *free for all* with commercial non-native fishermen getting 744 licenses issued by the State without consideration for the sustainability of the fishery.

The Passamaquoddy, Penobscot, Maliseet and Micmac tribes and the Atlantic States Marine Fisheries Commission and the Department of Maine Resources (DMR) attempted to enter into a Memorandum of Agreement (MOA) in 2013 to reduce the overall catch of
elvers as a part of a conservation plan. The MOA marked the first acknowledgement of the tribes' inherent rights to hunt and fish as contained in the MICSA of 1980. The State had also adopted the practice of reciprocity and responsibility of the fisheries from tribal conservation plans of fishing quotas for non-native license holders. However, on March 13, 2014, 4 days before elver’s season the legislature enacted into law LD 1625 that required the tribe to manage its fishery according to state regulations and LD 1723 that outlined new compliance requirements, enforcement provisions and penalties in various commercial fisheries (See Figure 14). A full review and discussion on the amendments leading to erosion of LD 273, LD 2145, LD 451, LD 1625, and LD 1723 can be found in the Assessment of the Intergovernmental Saltwater Fisheries Conflict between Passamaquoddy and the State of Maine (MITSC 2014). Both bills for LD 1625 and LD 1723 were in direct opposition to an earlier negotiated agreement between the tribes and DMR. The tribes responded by assigning individual quotas and adding language that stated:

“This license is issued pursuant to the inherent rights of the Passamaquoddy Tribe as secured under various treaties and federal law, and as implemented through the Tribe’s Fisheries Management Plan Governing Saltwater Hunting, Fishing and Gathering.”

Subsequently in 2014, Attorney General Mill threw out the MOA raising constitutional questions of legitimacy. Again, we see the tribes trying to establish co-partnerships (relationship), while the State is thwarting tribal efforts for meaningful involvement to manage cultural resources. Moreover, the Maine State Legislature in turn passed amended bills containing provisions of the fisheries laws that did not have the tribes free, prior, and informed consent as stated in the UN Declaration on the Rights of Indigenous People 2007 (UNDRIP), which was passed by the Maine Senate and House of
Representatives in April 2008. Further, the bills were not evaluated and deliberated through the agreed legislative process of the MIA within the role of MITSC that was intended to ensure a quasi-surrogate trust relationship (MITSC 2014). MITSC’s role has been to; “continually review the effectiveness for the Act and the social, economic, and legal relationship between the Maliseet’s, Passamaquoddy and Penobscot’s and the State” [30 M.R.S.A § 6213 (3)] under the terms of the Trust Doctrine. Furthermore, it will be the MITSC charge to review and examine any questions or issue regarding the taking of marine resources by members of the Passamaquoddy tribe regarding saltwater fisheries.

MITSC (2014) has alleged the State of Maine of tactically overriding legislation intended to protect the tribe’s sovereign authority to manage their own natural resources within its original territories, while undermining the MICSA of 1980. The history of conflicts within the areas of fisheries among the tribes and the State of Maine has occurred because of the States unwillingness to uphold the MIA and the administrative duties to negotiate on a government-to-government basis with the tribes. As witnessed here in the State of Maine, litigation over jurisdictional issues surrounding management and access to the fisheries have only stifled tribal resources to be directed toward more innovated and coordinated approaches with the DMR. A community-based approach that would include a mutually beneficial outcome through co-management in conservation projects to build resiliency and sustainability of the fisheries resources that would improve food security of its tribal members.

A lack of clarity of the MICSA and MIA by state legislature regarding tribal fisheries persist in policy development and interpretation, primarily, by the lack of understanding of Federal Indian Law by the state agencies, while refusing to apply appropriate laws to court
proceedings, namely the ‘Separation of Powers’ and ‘Canons of Construction’ including the ‘Separation of Church and State’ in rendering court decisions (Newcomb, 2008; Wilkins & Lomawaima, 2002). As mentioned previously, recurrent unaccountable attempts to weaken the government-to-government arrangements inferred by the Maine Implementing Act (MIA) have been to abrogate through assumptions. In particularly, the Attorney General’s Office (OAG) through its actions have incrementally eroded agreement of MICSA and the MIA, including “expressly retained sovereign activities” through reserved rights of federally recognized tribes within the United States.

Ultimately, the State of Maine has unilaterally allowed itself to define tribal-state relationships on their own terms concerning saltwater fisheries and have disregarded the State Disclaimer of Separation of Powers required for Statehood within its constitution that is intended to protect tribes for unfair discriminatory practices. The Constitution of the State of Maine 1825, Article X, Sec 5, Part 5 states:

“The new State shall, as soon as the necessary arrangements can be made for that purpose, assume and perform all the duties and obligations of this Commonwealth, towards the Indians within said District of Maine, whether the same arise from treaties, or otherwise; and for this purpose shall obtain the assent of said Indians, and their re-lease to this Commonwealth of claims and stipulations arising under the treaty at present existing between the said Commonwealth and said Indians”

MITSC stated the OAG has a fiduciary responsibility to define the tribal-state relationship and in the development of law and policy through negotiated agreements of the MICSA under federal law. Additionally, to inform all parties to provide a more transparent discussion on critical issues impacting the tribes, which did not take place. Once again forcing the tribes into expensive litigation. Recommendations from the MITSC have been numerous and included a renewed relationship between the tribes and the State
be forged with full participation of the tribes. The MITSC (2014) report sets clear reporting standards of accountability that has set forth the Judiciary Committee as oversight.

The question remains whether the tribes will be held liable for exerting tribal autonomy through mechanisms of self-determination, since actions of the OAG and the State was not in compliance to the MICSA and MIA. The tribes will have had no other alternative but to exert its self-determination efforts through the implementation of its own fisheries management plans (which has been ratified and implemented by Peskotomuhkati tribal council) and fisheries programs and activities under equal protection laws and federal trust obligations.

The tribe has yet to see any positive action from the OAG’s office since the review by MITSC. In fact, the State of Maine seemed to have abolished all obligations of the MICSA of 1980 implemented under the policy mandates of Federal Indian Law during the Lepage administration. MITSC was no longer in operation within the State to act as oversight as the Trust Doctrine of responsibility, transparency and accountability requires since 2014. These inactions have essentially ‘kicked the can’ of co-participation through ‘meaningful involvement’ of the tribes down the road with no constructive deliberative attempts to engage with the tribes by the State of Maine.

Historically, the outcome in the Maine legislature have not been in the tribe’s interest to self-determine their own destiny and well-being of its people, while being treated equitably as citizens of Maine. The tribes must continually rely on the clemency of the federal justice system when treaty agreements of the original forefathers are unheeded to ensure their very survival as an indigenous people. A unique way of life that has had compounding implications of climate change, commercial industry, pollution, while
overregulation has unscrupulously imposed undue hardship of food insecurity and hunger toward its’ original people of Maine.

The acknowledgement of subsistence practices and innovative fisheries programs by co-partnership arrangements may offset these hardships through culturally significant, nutrient dense food sources which are necessary for the impoverished status of many indigenous families. Ultimately, State interference of efforts in environmental self-determination through traditional economies for food security have worked to exacerbate the tribe’s ability to ensure sustainability and resiliency measures through its own agency to preserve existing resources and sacred relationship with the ecology for the next seven generations.

Historically, inherent Reserved Rights Doctrine have been a point of contention while many states, tribes and non-natives who have perceived these rights as special rights and have led to hostility and violence throughout the U.S. Many settler states feel it is unconstitutional and inappropriate under present day circumstances without any scholarly understanding of socio-ecological systems of relationship as it pertains to indigenous culture. Further, legal experts in Federal Indian Law contend, “Tribes do not exercise rights because Congress granted those rights. Tribes exercise rights based on their original and indigenous sovereignty.” This same contention has been held by the tribes in Maine and in accordance with their fishing, hunting, and gathering rights to their original lands. Although tribal sovereignty seems to have diminished within the court’s decisions over the last few decades, Wilkins and Lomawaima (2001) assert it should not erode any further than the tribes allow. Contrary to Congressional or State claims, sovereignty or tribal rights do not arise from congressional actions, it resides with the tribes.
The Reserved Rights Doctrine includes property rights (to fish, hunt or gather); or a political right to regulate domestic relations, tax, administer justice or exercise civil and criminal jurisdiction (Wilkson & Lomawaima 2001). Reserved rights are those rights that a tribe never expressly surrendered or gave up. All rights are reserved, except those expressly given up in a treaty or mutual agreement (Wilkins & Lomawaima 2001). The authors assert that treaties and agreements reserve those rights and all the powers specifically stated and all those not expressly ceded.

Historically, it was expressly regulated by Congress and not the states, because of the inconsistent and frequently unfair trade practices with tribal nations. For instance, in Kansas Indians, 72 (5 Wall) 737 (1866), the Supreme Courts held ‘State Disclaimers’ be required as a condition of admission into Statehood using the exclusion/supremacy rational that each state ‘forever disclaim all right and title to Indian land. This amendment ensures that neither the State nor the federal government has absolute or unlimited powers. The embodiment of what is known as, federalism, today.

Even though tribal rights were not created by the Constitution or subject to constitutional limitations, the fragility of these rights has been a result of Court interpretations and individual dispositions of the times must be reiterated. It is through these limitations, the reserved rights including fishing, hunting, and gathering rights become inherent under tribal sovereignty (Wilkins & Lomawaima 2001). As the authors indicate, when the reserved rights doctrine is subject to situations of indeterminacy and ambiguity with the courts, ‘canons of construction’ are to be utilized to support treaty and the trust doctrine. The canons are a system of fundamental rules and maxims that the judiciary are obliged to recognize and use to interpret the rationales of historic written instruments.
In 1993, a precedence-based court judgement in the Don Marshall Jr. case was overturned on the basis in which oral agreements and understanding through indigenous perspectives (readings of the Wampum Belts of the Waponaki Confederacy) must be applied through original treaty arrangements and must be considered. As an authoritative rule, it does not always stand in decision-making of law and policy as seen in the case of Peskotomuhkatik fishing rights with the State of Maine. The canons for the reserved rights doctrine have supported such cases of Worchester v. Georgia, 1832, in the Kansas Indian, 1866 and the US v. Winans, 1905, but have been set aside in the Cherokee Tobacco, 1871 and the Ward v. Racehorse, 1896 and more recently supported in R v. Donald Marshall Jr, 1999. Historically, the courts have ruled in the direction of explicit rights over implied rights – the legal concept of ‘the Reserve Rights Principle’ within its original intent is to protect under treaty agreements.

Historically, the judiciary precedents have ruled in favor of the privileges of federal power over tribal powers, federal grants of recognition to tribes over assertions of tribal identity arising from original sovereignty and production of profits over efforts delineating tribal rights. For many tribes who have challenged these obstacles, base their success in the belief of their inherent rights and original sovereignty while exercising political, economic, and cultural self-determination to do so. This is particularly true in the case of food sovereignty issues, while practicing mixed subsistence lifestyles in their struggles to provide basic needs for their families using traditional economic systems and the human right to practice the culture that ensure their survival.

Under Federal Indian Law, when discrepancies arise over these shared agreements, as it has in the instance of the Peskotomuhkati fishing disputes, the three Canons of
Construction must direct the courts in their decision making; (a) resolve ambiguities expressed in favor of the tribes, (b) interpret treaties/arrangements as the Native people themselves understood them, (c) liberally construe treaties/agreements in favor of the tribes. The courts are not able to decide on public policy through judiciary processes under the doctrine of implied repeals as evident in the Peskotomuhkati fishing case. Only the routes of congressional arena are legally valid to manage the best interest of the tribes – all assets (property, i.e., definition of ‘take’ under fishery law) for tribal benefit and that the trust responsibility are legally mandated and not a moral obligation. This has not happened with the Maine tribes nor within the context of the coastal fisheries. The Peskotomuhkati have witnessed another violation of trust through the state courts and through the constitutional mandates of ‘separation of power’ of the State of Maine.

The battle of content vs. context would be seen again in 1999, whereby the Supreme Court of Canada overturned a previous decision of the lower court and dismissed the criminal charges against Donald Marshall Jr. for fishing without a license for basic liberties or “necessaries.’ In the Marshall case, expert analysis of the original treaties of Friendship and Peace with the British, the Commonwealth of Massachusetts and the Waponaki people of 1760-61, urged that treaties must be viewed in their historical context, while the oral tradition of the Waponaki people be properly understood for its time frame and ambiguities in language.

Judge Binnie summed up the principal disagreements between the defendant and the government in three areas of whether Mr. Marshall had the ‘right to trade’, but to also pursue traditional hunting, fishing, and gathering activities to support trade. Thirdly, whether the written text of the original treaty incorporated all agreements made between
the Mi’kmak and the British government. Justice Binnie held that the lower courts ‘erred in law’ by failing to give equal consideration and perspectives of the Mi’kmak people and relied exclusively on the written text and concerns of the British. Foremost, when interpreting treaties, ‘the courts are under legal obligation to evaluate the historical negotiations between both parties when rendering a decision that informed the written treaty text and common intent.’ However, the lower courts gave ample weight to the written document itself and eliminating the perspectives of the Abenaki (Penobscot), Mi’kmak, Maliseet, and Passamaquoddy delegation on the ‘trade clause.’ Under the trade clause, it was understood that a truck house in Fort Fredrick be established for purpose of furnishing them (the Native people) with ‘necessaries.’ “Necessaries’ understood by the courts and early delegation was an avenue to provide the Native members an opportunity to trade fish at the truck houses to make a ‘moderate living.’ Ultimately, it was precisely what Don Marshall, Jr. was doing, while the Supreme Court of Canada concurred and rendered a decision to dismiss charges for fishing and selling eels without a license (Wilkins, 2002).

It can be seen in Wicken’s (2002) historical analyses of treaty, the initial assertion by the courts were the written English words that would ultimately become the principal arbitrator in all future interpretations of treaty deliberations, rather than the oral conveyance of testimonials utilizing the contextual understandings of Friendship and Peace by the Waponaki that preceded the treaty’s ratifications. The Articles of Peace and Agreement meant two different things to the British, the Commonwealth of Massachusetts, New Hampshire, Nova Scotia and the Waponaki. For the colonizers, it meant submission to the King, while the Waponaki viewed the articles as creating a relationship between them with a reciprocal obligation of friendship, protection, and trust. However, the real intention
of the colonists was financial via access to the fisheries and to the lands. The small price to pay for the Commonwealth of Massachusetts, New Hampshire and British of Nova Scotia considering the incommensurable expense to Waponaki cultural permanence within the region as we shall see has led to extreme financial hardship and adjunct poverty for the Maine tribes.

Early treaties of the Waponaki people indicate differences of understanding concerning the content of the written (British colonial emphasis) and the oral context (systematic form of diplomatic exchange of understanding through the oration of the Wampum belts) in negotiations. Oral discussions with the unified nations of the Waponaki took place preceding any formal agreements with the colonists using the Wampum belts. Penobscot messengers (official envoys of the Waponaki Confederacy) were sent out to carry the messages in the form of complex symbolic depictions woven within wampum belts, rather the written words. Wampum belts allowed for the systematic oral transfer of information to the Waponaki allies and communities. As history has come to show, the written version of British context has taken precedence over the oral conveyance of the wampum belts utilized by the Waponaki emissaries from the Abenaki (Penobscot), Passamaquoddy, Maliseet, and Mi’kmaq.

An early example of content over context was witnessed during negotiations of July 3, 1725, where two Penobscot envoys were sent to speak on behalf of the Waponaki Confederacy. Loron Sagourrab and John Ehennekourt arrived to hear the proposals concerning the potential for reciprocal peaceful relationships with the colonists at Boston, Massachusetts (Conference of Delegates, 1725). There were two separate accounts of what had transpired between the colonists and the delegates of the Abenaki (Penobscot envoys).
These written accounts consisted of translations in English and one in French language that records the Penobscot delegates response to the discussions taking place at the negotiations. The accounts of the discussions were significantly different from the perspectives of Lt. Governor William Dunmer and Josiah Willard, Secretary to Council of the British colonies; (a) the Abenaki was responsible for the war at Norridgewock with the British; (b) they would respect and honor King Georges’ jurisdiction over Abenaki lands and his authority; (c) previous purchases would be honored by the Abenaki; (d) future disputes would be resolved according to British law. In Dunmer’s account, the Abenaki acquiesced to British demands. Under the French interpretation and perspective, it was Loron who was quick to respond to the contrary by stating the Abenaki were not responsible to initiating war with the British and he states:

“I do not give him for answer – I am come to ask your pardon; nor I come to make my submission to you; nor, I come to receive your commands. All the answer, I made was that I come on his invitation to me to hear the propositions for a settlement that he wished to make.”

Loron reiterates, the Waponaki had not submitted to the authority of King George, nor did Loron admit the British as ‘master’ of lands purchase by the British. Finally, Loron goes onto say, concerning the British settling disputes among the Waponaki under British law. He responds,

“I understood only he should judge his people, and I would judge mine.”

It was this discussion that would be the source of all future disagreements and contentions among the Waponaki and the settler-states. It was the written British account that was accepted as the ‘official version’ of the Commonwealth of Massachusetts in their written accounts. Notably, it was the Waponaki oral account that contains the
epistemological and ontological aspects of culture that was not recorded in the official written record. Speciously, it was these official records that have been used to point out the Waponaki recognition of these stipulations to legitimize New England’s title to lands in the Northeast including areas of Casco Bay, the Androscoggin, the Kennebec and areas of Nova Scotia including the coastal shores of Peskotomuhkatik.

According to Wicken’s (2002), to maintain access to the fisheries, the early colonists made various promises to subvert war and on-going conflicts with the Waponaki. As understood through discussion with the Waponaki delegation, the Commonwealth of Massachusetts, New Hampshire, and the British colonist in Nova Scotia under the ‘Reciprocal Promises made by Captain John Doucett, 1726’ states:

“And I do further promise and in the absence of the honble the Lt. Govr of the Province inbehalf of the this said Government, that the said Indian shall not be ‘molested’ in their persons, hunting, fishing and shooting and planting on their planting ground nor in any other their ‘lawful’ occasions, by his majesty’s Subjects or their dependents in the exercise of their religion provided the missionary’s residing amongst them have leave from the government for so doing. That if any Indians are injured by any of his majesty’s subjects or their dependents, they shall have satisfaction and reparation made to them according to his majesty’s laws whereof the Indians shall have the benefit equall with his majesty’s other subjects.”

One important concept Doucett in 1726 misunderstood in the interpretation was the concept of ‘molest’ as Wicken mentions, encompassed the cosmology of the Waponaki that perceives the spiritual aspects of the land and all that dwells there as animate beings and includes the water, animal, trees, plants and even rocks., mountains, etc. (Wicken, 1993). We can observe aspects of ‘holism’ being expressed through early negotiations and the epistemology of the Waponaki that will be discussed in greater detail later. The Waponaki assumed those areas for hunting, fishing, gathering, and planting would not be interfered with by the British.
The Waponaki understood through cultural context the control of the lands would remain with the Waponaki over these areas for their use and regulation including regulation of movement of the traders. For instance, ‘lawful to be made’ as understood by the Waponaki people referred to their approval or consultation in land changes or fishing territories. It was under these terms, the Waponaki believed they would be consulted by the British and future governments with any new settlements. Further, the British had exclusive rights to their land in settlement. It was understood they did not have rights over lands that had not been purchased from the Abenaki or other tribes. However, the growing British presence and building of new towns created greater tensions between the two sides including the interpretation of treaty agreements. In the historical context of jurisprudence, one can see these same written texts privileging in favor of the settler-states over Waponaki contextual interpretations and understandings today.

These and other accounts were the future examples of how the British and the Commonwealth exploited the written text of the actual negotiations to enforce British and colonial law at the expense of the Waponaki people including the Mi’kmaq of Nova Scotia. The 1726 treaty and subsequent treaties would later be ratified by the unified front of the Waponaki Confederacy to maximize their impact, while negotiating under these terms and continue to persist today. The arguments of land use between the settler-states and the Abenaki would be on-going with the colonial privatization of land versus the communal right to land by the Waponaki.

Although later modifications in treaty renewal took place throughout the years, the legal opinion unequivocally states in treaty agreements that unless specifically abrogated or modified, treaties still stand and remain in force (Wilkins & Lomawaima 2001, Wicken
2002). Most importantly, the Waponaki understanding of the treaty would stand in the agreement, not just the side the British and colonists chose to renew. As many court decisions have ‘assumed’ through conservative (to put it mildly) interpretation verbatim of historical content of written words without historical context to legitimize their ‘abstract’ opinions of conquest based on political and economic interests, ultimately have been violating their own basic laws of the land. These assumptions while ignoring ontological and epistemological framework of understanding have worked to further vanquish Native American human rights through the inability to practice culture through subsistence practices in favor of commerce. The economic basis for these judicial and legislative decisions foreshadows nothing more of tyranny within a pluralistic democratic society.

The paradox of historical Friendship and Peace treaty interpretations that incorporates concepts of Christianity, English constructs of policymaking and primacy of agriculture on a hunting and fishing society, while trying to affirm a foreign political order upon Waponaki agency remain fundamentally flawed in context. As Chief Moore (2015) has stated, a context of understanding that has become “grossly opportunistic and unrepresentative of its true intent.” The outcomes of the trial on Donald Marshall Jr. reinforces the veracity of the Mi’kmaq and Waponaki alliances who still hold proprietary rights over their fishing, hunting, gathering, and planting including other activities associated with their bio-culturalism and traditional economies. As Newcomb (2002) contends any continual attempt to abrogate and undermine those understandings as the forefathers understood them through the cultural lens and in this case of the Waponaki is nothing short of reinventing history for opportunistic means and aggrandizement of a conqueror schema.
CHAPTER 3: RESEARCH METHODS AND ANALYSES

Historically, language and storytelling has been the primary means of understanding the human condition, the significance of lived experiences, and the fundamentals of cultural expression that influence everyday lives within indigenous community. More importantly, indigenous voices and perspectives collectively become the vital starting point for illuminating the context to important issues impacting cultural survival during environmental changes including access to traditional foods through subsistence harvesting. As stated previously, storytelling, songs, and ceremonial rituals, languages and clanship/kinship alliances have been integral to cultural customs and survival of indigenous communities and their way of life. More recently, indigenous storywork in research by Native scholars has been an avenue for the reassertion and revitalization of cultural autonomy for living sustainably (holism), respecting all our relations (social-ecological justice for humans and non-humans) and the human agency of stewardship (reciprocity, respect, and responsibility) and use of the traditional adaptation practices (traditional consensus-making, two eyed seeing and self-determination).

In my cultural understanding of Waponaki epistemology, the concept of holism became an avenue to provide continuity and clarity to the stories being told by the Peskotomuhkati fishermen and fisherwomen. In this respect, my interviews focused on the concepts holism that became central to linking the Waponaki epistemologies to the validity of storywork as an indigenous research method in gaining understanding in alternative knowledge bases. The process of making meaning through a holistic approach provided the form and context that honored the individual story and truths according to tribal perceptions of the fisheries and cultural worldviews. The making-meaning process
illuminated aspects of interrelationship and interdependency amidst broader anthropogenic challenges of climate change while clarifying external factors that hinder opportunities for building socio-ecological resiliency among Peskotomuhkati harvesters. The association of interview data was evaluated with overlapping concerns of food security factors defined by the FAO and WRI and included availability, access, utilization, and stability.

Many researchers have contemplated the challenges of western constructs of research methodology such as positivistic inquiry within the contextual characteristics of indigenous research methodology. However, the social constructivist approach in grounded theory allows for the incorporation of indigenous worldviews into its understanding of the phenomena that have not been lost or obscured during the process (Absolon & Willett, 2005; Charmaz, 2006). For instance, the working method of focus groups vs the indigenous aspect of story circles provided an open-ended process that is elastic and allows for what I refer to as, ‘Pomawsuwakon (life flows through it).’ In guided sessions within qualitative theory, the goal is to answer a specific question, while the indigenous methods of story circles were used to privilege Peskotomuhkati knowledge base, while concurrently providing an avenue for transferring knowledge or lived experiences that is contextual and familiar. The interruption of their stories was not culturally recommended to allow for Pomawsuwakon as the conversation emerged within their own understandings. The research approach of refraining from interruptions or prompting also eliminated potential power differentials from forming between the researcher and the participant (Kovach, 2010).

In Stevenson’s account of research in the Plains Cree community, holism in storywork involves the understandings and uses of religious teachings, metaphysical links,
cultural insights, history, linguistic structures, literary and aesthetic form and indigenous truths (Stevenson, 2000). The concept of holism in indigenous epistemology links storywork with making meaning through the interrelatedness between aspects of individualism, the mutualism of kinship, socio-cultural ties, and the interdependency of the greater ecology of Nikuwosskiktamik. Weaving indigenous epistemology with western methodologies of research into an indigenous research framework carries with it indigenous worldviews and cultural norms into a meaningful dialogue. Nevertheless, the ancient paradigm of teaching and knowledge transfer utilized in indigenous research has become the center for the decolonization processes in many Native societies throughout the U.S. and Canada (Archibald et al., 2019; Kovach, 2010).

**Theoretical Framework**

The Peskotomuhkatik study has created an avenue for thoughtful process through the need to represent, recognize, recreate, and revitalize the ontological and epistemological vision for a more suitable and ethical future in Native studies for its people and the indigenous communities in Maine. An attempt to reestablish the integrity and credibility of indigenous knowledge bases within the fisheries consistent with values of relationship, reciprocity and re-membering the role of the Peskotomuhkati as co-participant within the natural world maintains their identity as the original people of first light, *the Waponaki*. The outcomes of engaging research holistically within the perspectives of indigenous lifeways and traditional practices utilizing IK, while recognizing the interrelationships with oneself, family, and community (includes natural land bases/water bases/human society) are embedded historically, politically, culturally, and socially (Archibald, 2008).
These holistic relationships are contextual in nature and is referred to as, “making-meaning” for the researcher (Archibald, 2008). My storywork attempted to articulate the holistic world of the Peskotomuhkati, while reclaiming their stories, relationships and experience within the traditional fisheries that identify them as, the Peskotomuhkat. While ‘making-meaning’ has become an important avenue in research to inspire and revitalize the Peskotomuhkati culture throughout the storytelling process, it provided greater understanding of the ocean culture while earnestly sharing the hearts, minds and spirits of my grandmother, grandfather, and mothers’ people. The research experience has been an avenue of expressing as a contemporary indigenous scholar, the value of reciprocity and responsibility to my kinship ties and my cultural heritage. While in a political sense, the research has extended the recognition and acknowledgment to the Waponaki for their contributions through reciprocal relationship and diplomacy which ultimately led to the culmination of statehood for the State of Maine in 1880.

The storywork attempts to convey the voices of the participants in this study that transcends the methods of vignettes, case-studies, and applied narratives of qualitative methodology, but has been grounded in a cultural framework relevant to the Peskotomuhkati (Archibald et al., 2019). I use “storywork” and “making-meaning” as terms to describe the processes of gathering data through story circles, data analysis and using a holistic lens that employs Waponaki epistemology within the indigenous inquiry to develop my narrative within the dissertation. I can only hope, as a researcher, that my attempts have not been futile. It is my attempt; the storywork puts forth the thoughts and concerns of the Peskotomuhkati and their coastal culture. Optimistically, the storywork will not only provide a platform for transformational change through greater understanding but also
expedite social justice in the distributive-equality of the fisheries, self-determination, and food sovereignty for the [study] families from culturally significant food sources within the Peskotomuhkati ocean fisheries.

Intergenerational trauma created through the processes of colonization that forbade the Peskotomuhkati for practicing fishery culture has only worked to create tribal resolve in reclaiming, revitalizing, and reestablishing the IK systems, values and cultural customs that have formed the core of indigenous identity for millennia (Archibald et al., 2019). The art of ‘making-meaning’ came about through an indigenous research approach guided by the principles of social constructivism in grounded theory research that are embedded in these hidden positions, networks, situations, and relationships that is flexible and interpretive (Charmaz, 2006). The social constructivist approach of grounded theory has been developed as an application to advance social justice and explain how people are experiencing a phenomenon. The constructivist perspective emphasizes the complexity of multiple realities within the diversity of local views and actions. It unveils how the phenomena are maintained and perpetuated through lived experiences within a social context. Charmaz (2006) contends, it is through these differences and distinctions between people, the phenomena such as the courses of colonization are made visible within hierarchies of power, communication, and opportunity. Finally, Charmaz (2006) asserts interpretivism or social constructivist approach places more emphasis and understanding on the views, values, beliefs, feelings, assumptions, and ideologies of individuals within historic and cultural norms, rather than on methods of research. It is through the inductively developed theory or pattern of meaning in which the individual views or
perspectives emerge from the threads of data. The constructivist approach is often utilized in social justice theory, advocacy, equity, and universal human rights agendas (Charmaz, 2006).

Although my research design included a social constructivist approach and incorporated various aspects of the indigenous framework mentioned by Kovach (2010) and Archibald et al. (2019), it was a way of ensuring a more ethical approach to indigenous research. I came to understand its urgency that if we are to understand IK systems in climatic changes, we must consider the processes by which the knowledge systems are generated, contextualized, and expressed through a range of tribal members – commercial and traditional harvesters – young, elder, man or woman, who have come to know the fisheries for generations.

The indigenous storywork approach has been my attempt through the exploratory nature of constructivist grounded theory to utilize Archibald (2008) seven storywork principles of respect, responsibility, reciprocity, reverence, holism, interrelationship, and synergy as an ethical approach to accountability in Native American research studies. Thus, the perspectives and experiences of the realities of the participants evolved within the process of storywork and storytelling consistent with Peskotomuhkati understanding that reflected traditional epistemology and ontological worldviews. My relationship with the Peskotomuhkati has been deeply embedded with great respect for the people and their stories uninterrupted for sharing themselves throughout the process and our shared cultural ancestry imbued into the design of my storywork.

The methodical process of data analyses was to carefully make meaning of the information and experiences that the fishermen and fisherwomen chose to share with me using line-by-line coding. The line-by-line coding process afforded the reflexiveness
necessary as a lead researcher. My honor and authenticity to the participants is to share their experiences and their concerns on the state of the fisheries and the quandary to practice culture. It is through this approach, the participants maintain the power of their own stories, while as a researcher serving only as an observer and guide during the processes of storywork. The process of weaving their storywork into the interrelatedness of the physical, emotional, spiritual, and psychological aspects of an ocean culture and land-based changes helped create a holistic view of the cultural identity as the people of first light – *the Waponaki*. The act of the making meaning throughout the process provided a synergy needed to breathe life into the storywork and enhanced my own intellectual enrichment process as an indigenous researcher that is respectful, ethical, and responsive to the participants utilizing the seven principles of indigenous research in a good way for Native community.

The emergent fellowship of indigenous researchers have called forth the need for research studies that are inclusive and respects indigenous culture and cultural ways of knowing (Archibald et al., 2019; Kovach, 2010). In Kovach’s (2010) work in indigenous research, she emphasizes that indigenous methods of qualitative research must be nested in both a knowledge belief system (epistemology and ontology) and the actual methods of collecting data. As an example, in participatory action research, the author points out the two function in relationship to the other in their relational qualitative approaches that value process and content, while becoming the center of the methodology from an epistemological framework. It is the indigenous framework that becomes distinct from the qualitative approaches of current research design. Kovach (2010) expresses that qualitative research methods offer a more inclusive and self-reflective approach to research.
The paradigm is shifting for indigenous scholars to include a contextualized knowledge base such as the indigenous framework. Historically, indigenous communities have been examined by non-indigenous academics who have little knowledge of indigenous epistemology and have derived findings through a western lens of policies and practices that may not have been culturally informative, respectful or provide positive social effect, while the benefits of the work went to the researcher and not the people (Kovach, 2010). As Kovach (2010) suggests, a sort of hit-and-run methodology that places content over context without regard for the epistemological and ontological aspects to emerge, which was often political. As a result of these research outcomes, the very mention of ‘research’ has become an unwelcome word in Native community and must be reversed by the indigenous scholars who are interested in strengthening tribal autonomy and accountability to tribal worldview. Although a challenging process, there are differences in the fundamental epistemology between western and indigenous thought which has proven to arouse conflicts in philosophy, ideology, and methodology. These ideologies in research must be overcome as indigenous researchers in developing storywork (Kovach, 2010). In many instances, the scholars and students may feel isolated personally or structurally within the academic space of research that remains entrenched and conform to western methodologies and excludes reflexive self-study needed for an alternative process that offer a systematic approach to understanding other world views.

As Kovach (2010) suggests, the research design included story circles, cultural protocols (tribal/clan origins, offerings, or ceremony) and a central methodology flowing from a tribal epistemological framework within the research. The design variability consisted of the younger generations of fishermen and women, elder fishers and mix of
traditional and commercial harvesters and some fishers who depended on mixed seasonal sustenance practices with part-time employment. Contextually, I chose to follow the cultural protocol of identifying myself, my maternal lineage with my tribal and ancestral relationship to the community. My relational approach of tribal origin set the atmosphere of trust that is important in story circles and set a relationship that is equitable to all participants. All testimony from the participants was acknowledged and valued with good intentions. I found the flexibility of social constructivism to explicate freely into the participants indigenous processes of storytelling and context while enlightened by the cultural knowledge bases of the participants. Although, I felt apprehensive of the possible loss of focus on the research questions, it was my choice to allow the discourse to flow uninterrupted and to eliminate prompting during the information sharing of cultural knowledge and perspectives.

In this study, I utilized the framework for indigenous research methodology and design developed by Kovach (2010). The author has identified three distinct aspect of indigenous research methods that consist of cultural knowledge that influence research choices, methods used in researching these choices and interpreting the knowledge information that are relevant and useful. In her Nehiyaw Plain Cree methodological approach, Kovach (2010) utilized a non-linear conceptual framework that is consistent with Cree epistemology (Figure 30).
In Kovach’s (2010) study, the research preparation followed a non-structured methodology (exploratory) with storytelling and conversations. Kovach (2010) espouses that the primacy of western knowledge and western research principles in epistemologies (our understanding of the world) and ideologies (what counts as knowledge and who makes the decisions on what is relevant) has been used to maintain privilege in academia. She contends indigenous knowledge systems have become marginalized and let off the menu of methodological options. While western society has legitimized knowledge through a homogenous lens, indigenous research methods overcome the hurdles in knowledge production through a decolonizing approach that ultimately becomes the main avenue for quality research methodology. Therefore, as Kovach (2010) and other researchers have
emphasized decolonizing research through indigenous approaches may analyze power differences between groups, document historical experiences of colonial relations, transform research and tribally centered methodology that clearly establishes indigenous epistemology as distinct from western approaches through the storywork (Charmaz, 2006; Kovach, 2010). The decolonizing approach to research may act as a bridge between the two worlds of indigenous research and academia while making space for indigenous protocols, ethics, data collection processes, and analyses. The shifting from the western paradigm towards the indigenous paradigm opens the door for IK systems to emerge while building agency and capacity within Native community.

The historical aspects of western education early on traces back to the internalized oppression within academia of what manifests as acceptable knowledge. I have personally been on the receiving end of the destruction of IK systems. My Peskotomuhkati mother was subject time and again to leave her IK behind while trying to learn math given the fact that her first language was Peskotomuhkat. Her ways of knowing were forbidden and her mouth was washed out with a bar of soap each time she spoke her language. Her ways of knowing became devalued, marginalized and ultimately her identity subdued along with the rejection of her indigenous women’s-based knowledge system. The way she came to know math well without speaking the English language amid subjugation is beyond my comprehension of a quality education in a safe environment.

Paradoxically, the experiences of colonial and Christian interruption have been the impetus for resistance within the indigenous communities, while the necessity to build capacity and proficiency in higher education for indigenous scholars remains unprecedented. The urgency to protect culture for the next generation by taking back the
knowledge systems and language are paramount in times for resiliency building during climate change. Customarily, storytelling has been a legitimate form of knowing, validation and understanding in many Native communities throughout time for intergenerational knowledge transfer. In my research approach, the concepts of holism within Waponaki epistemology and storytelling were used as a portal for transferring this implicit form of knowing in cultural history, customs and life experiences of the fishermen and fisherwomen.

More importantly, I constructed examples in testimonials from the harvesters to elicit the aspects of holism conveyed through values about the environment in the storywork while relying on the uses of indigenous language to transfer abstract information and perceptions about the landscape. For instance, the Peskotomuhkati word that depicts the concept of holism as a descriptive term ‘Pomuhse’ in its literal sense means, “life flows through it or being alive.” Pomuhse in story circles serve as the incorporeal conveyance of holism and the impacts of indigenous experience in contemporary issues, such as the culturally important coastal fisheries. Research must take place in indigenous community that meet indigenous needs and benefit the indigenous community, collectively. Decolonizing methods offer a means to advocate for community and provide a more inclusive approach to research that places respect along its margins.

Worldviews of the indigenous peoples challenge the core of the predominant contemporary knowledge systems. However, the ontological and epistemological framework of indigenous culture underscores the purpose of contemporary research in understanding cultural differences may offer alternative forms of knowing about the environment in climatic changes. We will not know unless we try to bring these knowledge bases to the forefront in research. As Kovach (2010) contends, the lack of understanding
will persist in a society where cultural indifferences predominate so too must the aspects of indigenous research concepts enter the research dialogues, policy, and practices within academia. If we are to bring authenticity into research, we must make room for new knowledge paradigms that work concurrently to bring the truth forward into indigenous research discourse.

Grounded Theory in qualitative research provides an exploratory up-close picture of the issues or problems within the natural setting of the community under study (Creswell, 2013). In this case, the study of Peskotomuhkati fishers were contacted in their natural context with face-to-face interactions. An initial set of questions were administered to the tribal administration to get an overview of the fisheries issues that are impacting the Peskotomuhkati socially, politically, economically, and culturally included the following open-ended questions:

1) What are the tribal decision-making processes for closure on shellfish fisheries/management?

2) What influences advisories for closures? (i.e., H2O samples, Conditions (rainfall, bacteria, sewage, or historical factors)

3) What is the usual duration for closures?

4) Describe to me what the impact of closures has been on traditional Native fisheries overtime because of environmental advisories or closures by the state

The open-ended questions for harvesters consisted of a modified version of New England Sustainability Consortium (NEST) research questionnaire. Many of the original NEST project questions were not relevant to the socio-cultural aspects of the Peskotomuhkati and economic status. Various questions were reframed to address the cultural variations ontologically (Appendix C).
The data was manually and systematically analyzed through line-by-line open coding for overarching themes and major themes utilizing an inductive approach until a comprehensive set of themed categories emerged within each chunk of data. In-vivo codes were utilized to represent coding categories using the respondents’ own words throughout the script. Deductive information was gathered from the participants, their meanings, and diverse views each faced on the issues and problems (Tables 3.1–3.5). Axial coding was used to reduce the total number of categories produced through open coding until a manageable number of categories were evident and related by comparing data across all participants. The manual analysis was deliberate to capture the ontological and epistemological perspectives while providing an avenue of the making-meaning process through the selective coding narrative. The four major coding processes provided an emerging holistic account of the complex depiction of the fisheries situation at Peskotomuhkatik. The making-meaning process within the narrative provided a comprehensive understanding of the contextual nature of the ocean fisheries within the lives of the Peskotomuhkati from a socio-cultural lens. The overarching themes and major themes that emerged assisted in organizing the complex issues, trends, associations, and relationships into a cultural context of deeper meanings and experiences of the fishermen and fisherwomen, including the larger issues that impact cultural resiliency, social justice, and socio-ecological aspects of traditional economies.

The approach using constructivist grounded theory enabled the researcher to provide an adequate capture of the complexity of the fisheries from the voice of traditional and commercial harvesters that have since been incomplete or silenced. The richness and connections to other categories emerged as well as their pervasiveness across all
participants to form a conceptual framework. Multiple forms of data through the testimonials from various harvesters, individual discussions and evolving design of story circles provided an exploratory approach to indigenous circumstances surrounding traditional sustenance harvesting of culturally significant food sources in the fisheries, climate change implications on an ocean culture, impacts of state regulation and policy and the need for meaningful involvement in the regional fisheries networks.

The tribal Chief Moore and Vice Chief Francis were initially contacted and informed of the NEST project on shellfisheries and provided an overview of the goals and objectives of the project. Tribal officials were informed that the results would be returned to them for potential use in the administration of the fisheries program at Sipay’k, Maine. The tribal officials were both aware of my familial relationship to the community and kinship ties at Sipay’k. The Vice Chief and I had worked together previously on Native American Women’s Healing Circles and Leadership Programs. Both she and I had a genuine interest in providing a voice and better living standards for the indigenous women within the Waponaki regions. We believed this research was just one more step to assist in the possibility of better-quality living standards for the Native women and their children. We felt the prospects of indigenous women’s-based knowledge systems could provide important information about the ecology and a means of transmitting or sharing this knowledge on the traditional fisheries that was tribally centered. We were extremely excited on the prospects of bringing the knowledge forward to give women a presence in the ocean fisheries while engaging in future adaptation practices.

Once the study was approved by the tribal administration for use in tribal fisheries, scheduling of interviews and securing a convenient space for potential interviewees were
initiated through the administrative secretaries at the tribal building for one-on-one and small group interviews. Vice Chief Francis provided potential names of Native women fishers to interview from the community. The tribal preservation officer was contacted to assist in the recruitment and scheduling of the story circles of traditional and commercial harvesters at the museum.

The research design was a mixed method of indigenous protocol through sharing circles, individual interviews and data analysis using grounded theory line-by-line coding, axial, and selective coding for major categories. The consideration of indigenous epistemology was acknowledged throughout the process that was tribally centered. The atmosphere was casual. The interviewer provided a personal introduction of herself, her tribal affiliation and maternal connection to the Peskotomuhkati community. The participants were informed as to the purpose of the research and affirmed the information would be used to assist the tribe with greater voice and participation in policy decisions impacting the tribal fisheries in a culturally relevant context (Appendices A and B). Each participant was given a fifty-dollar gratuity and thanked for their time.

Many of the testimonials within the story circles consisted of single mothers of young children, young families with children, low-income or a combination of circumstances. Most participants’ primary concern was to have access to basic liberties, which included basic income, educational needs, clothing, and quality nourishment for their children. Patterns for evidence linking socio-ecological resiliency through food security utilizing the ocean fisheries were assessed including the ability to access the resources during the individual testimonies and story circles of the harvesters (Mihesuah & Hoover, 2019; Walsh-Dilley,Wolford & McCarthy, 2016). Verification for support systems
defined by WR management approach were also evaluated (Figure 21). Evidence of on-going food security/food sovereignty initiatives were assessed through testimony for access to culturally appropriate foods including the ability to define their own traditional food systems were evaluated with Peskotomuhkati participations (Wittman, 2009). Verification through demonstrations for individual agency in the development of fisheries projects, sharing knowledge through capacity building, and confirmation of inclusiveness in state decision-making processes were also evaluated to indicate evidence of policy reform and advocacy for socio-ecological justice (Capistrano, 2010).

**Intellectual property rights**

There has been on-going consensus for ethical research protocols and research relationships within Native communities and explain much of the resistance in indigenous participation in indigenous research studies. The ethical codes of conduct in researching indigenous groups have been geared toward individual rights or property rights and not toward the collective rights of a people and their cultural interest (Smith, 2012). For instance, the Indigenous Peoples of the Tropical Forest in 1993 provided a charter of rights in research that address the collective rights of indigenous people to intellectual and cultural property, co-participation in the management of research, and promotion of health systems, including the intellectual control over TEK. Further, all research and investigations must be under joint control, consent, and guidance with the people. The Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples of New Zealand 1993 have called on governments to develop policies and practices which recognize indigenous peoples as guardians of their customs, knowledge bases while protecting and controlling the dissemination of their traditional knowledge. The
indigenous people also could create new knowledges based on cultural traditions. Other indigenous communities have been well on their way to address the protection of intellectual property rights and include the Amazon Basin Declaration, the Karl Oca Declaration of 1993 that extend beyond individual consent and confidentiality. Ngahuia TeAwekotuku has developed a framework based on Kaupapa Maori practices for research in cultural terms:

- A respect for people
- Present yourself to people face to face
- Look-Listen-Speak
- Share and host people – be generous
- Be cautious
- Do not infringe on the Mana of people
- Do not flaunt your knowledge

For the Maori, the challenge has been the methodological and epistemological concerns of contemporary research centering on the techniques and presuppositions about knowledge that inform systematic outcomes into research (Smith, 2012). The research outcomes remain in question as to which knowledge base dominates in the articulation of research data and whose conceptualization prevail in its analyses. The Maori suggest that such research methodologies have distorted the social reality through its generalizations and ideology. It has been an arduous task for Maori women to deconstruct the colonial and ideological perspectives of what it means to be true Maori with traditional matriarchal roles.
Smith has developed strategies based on Maori research and design when approaching culturally sensitive research problems:

- Discourage the acts of avoidance, whereby the researcher avoids dealing with the issues within indigenous community
- Personal development, whereby the researchers prepare themselves by learning the indigenous language, and becoming more knowledgeable about indigenous concerns
- Seek consultation, where efforts are made to seek support and consent
- Making space where research organizations have recognized and attempted to bring more indigenous researchers and voices into their own organization

The goal of the strategies developed by Smith is to encourage more partnership and culturally relevant approaches to research at all aspects of indigenous community that are more ethically concerned with mutually beneficial outcomes of community wellness, support indigenous control over research and foster the opportunity to engage in the generation process of alternative knowledge bases.

**Data Collection and Analysis**

The method of data collection was completed using a mixed method research process of the exploratory nature of Social Constructivist grounded theory methods utilizing open-ended questions and the indigenous research approaches of storytelling. The participant were encouraged to share their personal perspectives of the fisheries or as conversational methods within a circle configuration (Creswell, 1994; Kovach, 2010). The Indigenous Research approach of the interview process was elicited using cultural protocols of the traditional talking circle with participant introductions. Each participant was encouraged to speak from their own point of view of the fisheries. The discussion convened with initial semi-structured questions that were open-ended in nature. The
talking circle soon took on its own characteristic’s customary to the oral tradition of the Waponaki. Each participant was allowed to finish their thoughts without interruption or prompting (Fitznor, 2010). The circles set the atmosphere for trust and familiarity that invited knowledge sharing and took on a tribally centered forum.

The analyses of the data involved the use of line-by-line open coding, axial thematic categorizing, selective coding and in-vivo coding proper to the methods of ‘grounded theory’ which was used in the organization and sorting of information generated throughout the story circles and individual interviews (Creswell, 1994; Kovach, 2010). The thematic patterns within the testimony were challenging and complex. Once the overarching themes were identified, the use of line-by-line coding was utilized for organizing the major findings as diligently as possible to carefully depict individual truths within the discourse. The arrangement of the overarching categories and major thematic categories have been organized and prioritized according to the frequency and magnitude of importance in the small group discussions and story circles (see Tables 3.1-3.5 for Overarching Themes).

The storywork was an attempt to provide truth and understanding from the epistemological views of the indigenous participants and to bridge the gap of understanding by the western world and academia. It was through the actual storywork of my dissertation script that brought forth the aspects of holism and traditional values through an epistemological perspective of making meaning. The process of making meaning was an attempt not to fragment and decontextualize the data. In my attempt to exemplify traditional decision-making processes in indigenous culture, I have created the ‘Seventh Generation Policy’ to foster a collective approach that leads to ‘woli-litu’ and is
beneficial for human and non-human aspects of the environment for true sustainability. Paramount is the inclusiveness of alternative knowledge bases as expressed by the fishermen and fisherwomen which may provide an avenue to social-environmental justice, a mechanism to foster individual agency and provide greater food security while synergistically building cultural resiliency. Foremost, while supporting the value of traditional harvester’s contributions, these initiatives could provide a means of co-partnerships that are mutually beneficial for fisheries conservation measures, the health and security of the Peskotomuhkati people, and State-tribal relationships.

Today numerous efforts by indigenous scholars have been made in indigenous research methodology to provide an avenue for building respectful protocols consistent with tribal community as an attempt to establish reciprocal relationships that are accountable to the indigenous communities. Protocols work to strengthen the overall ethics of any research project and provides transparency in human subject research. The development of indigenous ethics board may be the next step to develop a collective effort to control the dissemination and possession of research findings within Waponaki research. The organization of a potential Indigenous Advisory Research Committee or Tribal Ethics Review Board that addresses ethics and are in-line with tribal values while affording synergistic benefit to the people may provide an avenue to self-determine research efforts. The bottom line in indigenous research for the indigenous scholars is to conduct oneself in a ‘good way’ according to tribal values while researching tribal communities. The work is never about oneself, but about the community as a collective while simultaneously fostering activities to build internal capacity and space for indigenous research students.
CHAPTER 4: RESULTS

As a result of the collective voices at Peskotomuhkatik, there have been conflicting values and perspectives toward the marine resources with the State officials in relation to "take" and access. The State sanctions of "take", prolonged closures and open access by commercial fisheries indicate that these policies not only place the Peskotomuhkati culture at risk but impinge on the basic liberties of the tribal membership to food security through the ancestral fisheries. The tribal leaders feel the Peskotomuhkati values place greater emphasis on individual responsibility for management and conservation choices for harvesting, while State sanctions and misapplied authority places the perspective of "privilege" over and above tribal rights to practice their culture. State polices on "take" impinge on sovereign rights through mechanisms to self-determine fisheries policy and activities of tribal marine resources for its own tribal members. Largely, the Peskotomuhkati feel because of an open-access policy by commercial fisheries industry, places the fisheries at risk and are short-sighted in obtaining a true sustainable mechanism of the marine resources.

Numerous commentaries from tribal interviewees and tribal leaders were evident concerning the divergent perspectives of access for sustenance and cultural values as it pertains to the resiliency of the ocean resources. Primarily, there are concerns for the ability to access the traditional fisheries that will lead to food security for low-income families and single women with children. Also, there are the conflicting contextual interpretations of the MICSA of 1980. The reverberating message from the tribal leaders and the traditional harvesters are the need for "tribal people’ to sanction their own policies
in fisheries conservation and management that meet their culturally unique needs through self-determination mechanisms afforded to them as a federally recognized tribe.

Approximately 24 tribal members participated in the interviews for the fisheries study at Peskotomuhkati community located in Sipay’k (Peasant Point), Perry, Maine through 2015-2017. The participants consisted of tribal administrative staff, tribal environmental program staff, tribal fishermen and fisherwomen including sustenance and commercial harvesters. Each participant attended the session with an earnest and eager interest to provide their point of view on the fisheries issues at Pleasant Point. Prominently throughout the discussions, harvesters point out, they have had little to no input on the policymaking processes on the fisheries through tribal government or on the State level that impact their well-being. During the meetings with the fishermen and fisherwomen, the majority felt disenfranchised and threatened by the loss of access to many fishery resources that have long been a part of their cultural way of life as indigenous people of Maine. The resounding issue echoed throughout the conversation included the inherent right to access ancestral fishing territories which has dovetailed with many issues of food security, cultural survival, and environmental sovereignty as co-participants in the management of the ocean fisheries.

**Overarching Theme: Equity in Fisheries Distribution**

Overarching themes to emerge from the data included Equity in Fisheries Distribution, Tribal Identity, Values and Cultural Customs, Conservation and Management and Tribal Conservation and Management (*Table 4.1*).
Major themes for Equity in Fisheries Distribution discussed below include Co-participation in Decision-making through ‘meaningful involvement’ of the fisheries, State Accountability/Transparency, and Food Security (Table 4.2).

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<tr>
<th>Table 4.1 Passamaquoddy Fisheries Overarching Themes and Major Themes</th>
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<tr>
<td>Equity in Fisheries Distribution</td>
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<td>Co-participation in Decision-making</td>
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<td>State Accountability and Transparency</td>
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<td>Food Security</td>
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**Co-Participation and Meaningful Involvement**

The Peskotomuhkati leaders Moore, Francis and Lewey 2015, have reaffirmed throughout historic discourse with the State of Maine Department of Marine Resources (DMR) have not acknowledged tribal sustenance fishing rights and abandoned any form of meaningful involvement through discussions and co-participation with tribal governance. The tribal harvesters believe the State of Maine has failed in its collaborations concerning meaningful involvement with the tribes. For instance, the licenses issued by the tribe were
not acknowledged by the State of Maine in 2015. The actions by the State resulted in tribal harvesters having to dump pounds of glass eels back into the water or destroying eels because DMR shut down tribal access to the free markets. Most of the elvers died in the process and the harvesters were distraught over the waste of the lives of the fishery resources. Many harvesters felt that the lives of the fisheries were wasted due solely for the need of DMR to exert it regulatory precedence over tribal authority. Many felt that it was the responsibility of not only tribal management, but also DMR to assure the fishermen and fisherwomen to free market access. In addition, DMR blocked local buyers with threats of litigation for doing business with the tribal fishermen and fisherwomen. Tribal harvester GN observes,

“The state wouldn’t allow buyers to come. The state somehow got wind of what the tribe wanted to do. In the past, the buyers of the glass eels would go wherever they wanted to go with their trucks and pick them up and pay for them. Last year, the state decided, well, we are gonna limit this with the buyers - have to stay at their main location, which is their main building or office. And then the state went a little bit further...stating, these glass eels are illegally taken, so you do not have the right to buy them. You will get prosecuted if you buy these eels.”

The tribal fishermen and fisherwomen have been consistently diverted by State conflicts through the Attorney General Office for litigation matters and the lack of its fiduciary responsibility through the State legislative processes regarding the Maine Implementing Act of the MICS A of 1980. As early as 2015, the tribe has not had an opportunity to adequately plan and self-manage the fishery resources, since most of their administrative resources have been focused on State policy actions, litigation and regulatory issues surrounding fisheries.
The Peskotomuhkati leaders have acknowledged the tribe’s need for its own marine resource professionals to monitor and plan for tribal fisheries in conservation, restoration, and climatic changes in ancestral territories. Ultimately, the tribe feels more local control mechanisms are needed through tribal involvement in enacting responsible measures to managing ocean resources, while concurrently maintaining cultural customs and practices. Increasingly, the Peskotomuhkati will focus on the ocean resources and realizes the need for collaboration and partnership in adaptation planning for climatic changes in ocean habitat and extreme weather events within the local coastal areas.

Vice Chief Francis feels the fisherwomen carry important environmental knowledge on the fisheries that could assist in the planning, monitoring and implementation of effective conservation measures through their traditional knowledge in conjunction with the best science practices for the coastal fisheries. She feels more local control through ‘meaningful involvement’ of the tribal people are necessary to address the impact of climatic changes and the opportunity to build resiliency efforts for the fisherwomen. She maintains it is crucial for the tribe to adequately plan and self-manage to build resilient systems through the fisheries as opposed to the continual distractions of litigation and state agency conflicts.

In the recent past, the State has been unwilling to recognize co-partnership or tribal self-determination efforts in conservation and management. For example, there has been no sharing of data from water quality testing with the tribal water quality officials. The tribal officials would like to see more tribal involvement and cooperation with DMR in water testing and data sharing. William Nicholas, Water Quality Specialist states that the tribe is not involved in water quality testing for closure decision by DMR. He would like to
see better channels for communication through transparency with the state agency in coordinating and sharing data. He is unsure of tribal fish folk are getting closure announcements appropriately, since many do not have access to internet services. He feels better relationship through ‘meaningful involvement’ with the tribe is timely.

Overall, the tribal leaders, fishermen and fisherwomen would like to have better working relationship with the State agency. The DMR only consults with the tribe on larger shellfisheries such as lobster and scallops but does not involve tribal advisory committees in planning or conservation in comparison with other local non-native fishery groups within the coastal areas. DMR representatives do not attend the tribal advisory meetings, nor provides outreach to the tribal harvesters. All the outreach activities and regional hearings of DMR are held off-reservation. Many harvesters do not have access to travel to these areas or do not participate for various reasons. The tribal leaders recognize the need for better State-Tribal relations to ensure access to the fisheries that are equitable for all fishermen and fisherwomen in the State of Maine.

The traditional harvesters see multiple factors to ecological outcomes, with science and market indicators being only a portion of the equation within local and regional levels. Primarily, the tribal impressions of State enforcement practices have been focused on anthropogenic exploitation through revenue margins and market values of the marine resources in favor of commercial harvesters. Many tribal members feel the State official and commercial harvesting methods are detached from the various marine species and the ocean ecology that are unsustainable. The tribe will be looking for the implementation of tribal fisheries management through avenues of self-determination in water quality testing
procedures and decision-making regarding closures. They see the need for greater State accountability in the frequency and duration of fishery closures. Harvester JF has observed,

“I really don’t know why, but it’s like I said earlier, I know of a beach that was closed for almost 15 years. I didn’t think it needed to be closed for that long. Even say, five to eight years, it should be enough down there so you can go down and harvest. It shouldn’t have to stay closed that much longer, just because it’s so close to the reservation.”

For many traditional harvesters, closures appear prolonged and unnecessary in surrounding local areas, forcing members to seek more distant sites that often, places safety and livelihood of the harvesters in jeopardy.

**State Accountability and Transparency**

Tribal leaders feel the State of Maine Department of Marine Resources (DMR) need to be more accountable to the ocean resources in terms of legitimate sustainability. Chief Fred Moore 2015 views the management scheme of DMR, as flawed and consistent with the overburdening and overharvest of the scallop fisheries in favor of profits. Chief Moore and Vice Chief Francis 2015 point out that the settlers do not perceive the fisheries as exhaustible. The cultural difference of philosophy in the integration of indigenous knowledge of the environment and responsible management decisions are inconsistent with State policy and practices that compromise the health of the ecology.

Tribal leaders Moore and Francis reiterate the interpretation of the Maine State law of 1991 for ‘take’ conflicts with the tribe’s inherent sovereign authority to fish ancestral coastal territories for subsistence practices. Vice Chief Francis feels the state law of ‘take’ conflicts with the MICS A of 1980, the inherent rights to practice a coastal culture and the right to exercise tribal autonomy as a federally recognized tribe under Federal Indian Law. She states the State of Maine has neglected and abandoned tribal-state trust agreements of
‘consultation’ and ‘co-participation’ under the Maine Implementing Act (MIA) and Maine Indian Tribal State Commission (MITSC).

‘Access to the Fisheries’ has been described by tribal harvesters and illustrates the avenues of marginalization of Peskotomuhkati tribal harvesters in a number of ways. Further, the marginalization of Native harvesters throughout the discussion was described in various forms of overregulation through the ‘command and control’ mechanism by DMR. DMR’s actions consist of threats of litigation, excess fees/fines, frequent license checks, and the precedence of political and local influence and competition of non-Native commercial fishermen over Native fishermen including prolonged beach closures in and around the reservation system and ancestral territories poses immediate impacts through food insecurity with infringements on basic liberties. As of 2017, DMR officials have been entering tribal reservation territories to enforce State law and have flouted federal jurisdiction on reservation lands. Accordingly, the vibrio-based closure citations are brought to bear upon sustenance harvesters have only circumvented building trust relationships with tribal officials. These actions call into question the misuse of state authority, when it is clearly a matter of public health interventions, education, and awareness. These citations create financial hardships that hinder food security for tribal families who rely on mixed wages and traditional economies once fines are levied. The families feel the issues of closure should not be a matter for litigation for tribal members and should not be criminalized within the court systems.

The traditional harvesters have inferred inequity in ‘Access to Fisheries’ and manifest through the inability to pay the high fees for licensure due to local town ordinances, inability to travel the increased distances to open areas during winter months
due to the hardship of harsh weather conditions, travel costs, and difficulties to access clamming areas by foot during the winter months. As JN points out,

“last year, the only places that were open were Pembroke, and me and my husband, we didn’t have enough money to go and spend 200 dollars to go and get our licenses.”

The harvesters must travel longer distances to circumvent private landowners, who are frequently newcomers to the area and are not familiar with the local culture of the Peskotomuhkati.

The local towns of Eastport and Perry have implemented a lottery system for non-residents and does not guarantee access to the fisheries for tribal members. Furthermore, most harvesters do not believe they should be required to enter a lottery to fish the Peskotomuhkati ancestral territories. Consequently, many harvesters are not able to dig in the areas surrounding the reservation borders with 2.5 miles of ocean front. Prolonged closure of historic harvesting sites has been a problem for several years located adjacent to the reservation. Harvesters have been unable to exercise their basic liberties to a livelihood upon closures and often go without food, income, and basic living provisions. Many find it difficult to feed or cloth their families due to extreme poverty conditions for some of the harvesters. Growing children and pregnant women must go without sufficient quality protein sources, since there are no alternatives for the acquisition of fundamental resources for health and well-being. Harvester AN lament,

“not being able to feed your family, not being able to provide them with the basic necessities...that’s the biggie, and people get- if they don’t have enough, people get depressed.”

Reiterating JN states, “some people go out there and illegally dig clams and wrinkles just so
that they can try to provide for their family...we're not able to pay our bills, we can't go anywhere to be able to make money.”

Harvesters are also concerned that further zoning ordinances and seasonal limitations will impinge on future access to the resources and exacerbate an already difficult situation for sustenance acquisition.

The harvesters have described institutionalized racism by the State agency officials and feel DMR officials have an opposing attitude toward Native American harvesters. The tribal harvesters feel unnecessarily scrutinized with constant license checks, while non-Native harvesters are left alone to freely fish and harvest unmolested by agency officials. While harvesting in the local regions of Ellsworth, JN observed,

“DMR can be- I think their attitudes are different. They come down here to harass our people and constantly ask them for their license and what not, but when I was in Ellsworth, we’d see the DMR and all he did was drive by, you know. We didn’t get checked once up there for our licenses, yet down here, we got checked all the time, you know. So, it’s like a double standard for Natives, then it is for non-Natives or however you say it.”

Most tribal harvesters feel they are being marginalized because of their race, poverty levels and the hardship of excess fines imposed by DMR. Harvesters have expressed a situation of ‘catch twenty-two’ with not being able to provide sustenance and fundamental security for their families and the inability to meet financial obligations and responsibilities. Ultimately, these adversities leave many families with feelings of hopelessness and desperation with conditions of food insecurity and hunger. These external factors are compounded not only with threats of litigation because of accepting fines for sustenance harvesting, but those harvesters who do not have the ability to pay these fines, results in a forfeiture of licensure to access the fisheries until these fines are
paid in full. The harvesters believe that the regulatory actions by DMR have been deliberately imposed to cause economic and psychological hardship which have hobbled many tribal members. Further, non-Native harvesters appear to be infringing and competing with the Native harvester’s access to fishing areas and clam beds by monitoring the harvesting activities of tribal members. Tribal harvesters have suggested that non-Native harvesters complain to DMR agency officials that results in a forced shutdown to these areas. Finally, DMR official have infringed on tribal liberties with the confiscation of fishing equipment leaving tribal harvesters with the inability to obtain sustenance and a means to access the fisheries for food security.

Newell Lewey, Tribal Planner 2015 restates the local areas for clamming are closed for an inordinate period that is not necessary and prevents tribal fisherwomen and fishermen access to annual fisheries harvest. Newell pointed out,

“So, what I plan to do is to have a biologist to take some of the clams from that area because it’s closed. Perry said Its closed! Why is it closed? ...So, some of our people have to go elsewhere. And if you’re taking people from ‘X’ number of areas and putting them in one area then that place becomes depleted. It has to close to replenish or be reseeded.”

He says the tribe must take control of their own water quality testing in these areas to check state agency accountability for its decision-making. He feels these exceptionally long periods for closures in one area cause overharvesting in other areas. He reiterates that more reseeding and restoration of these harvesting areas should be on-going. Further, he echoes Chief Moore, in that, ‘open harvest’ to scallop areas have resulted in the collapse of the fisheries. These local collapses of the larger shellfisheries have put tribal member’s safety in jeopardy by forcing fishermen to venture further out by boat to get to an alternative harvesting site where ocean conditions can be dangerous.
Historically, tribal officials have made persistent efforts for open channels of communications with local municipalities and state agency officials with little redress. Additionally, tribal harvesters perceive DMR’s constant monitoring of tribal plans for harvest have led to deliberate sabotage of markets to sell catch. Further, since buyers were no longer able to enter the reservation to buy tribal products, have placed undue hardship for many harvesters to travel to outside locations to sell their catch. Tribal officials Moore, Francis and Lewey 2015 realize the need for better State-Tribal relations will ensure access to the fisheries that is *equitable* for all fishermen and fisherwomen in the State of Maine.

**Food Security**

Paramount is the need for tribal inclusivity in the local decision-making processes to address food security and hunger that embrace the public health policy of greater access to traditional food sources for quality protein, essential fatty acids, and trace minerals. These nutrient sources contained in the fisheries are crucial during important growth cycles such as childhood and pregnancy. Vice Chief Francis views traditional fisheries as an important food source for food security and for the health of the Peskotomukati people. She feels the DMR must make better efforts to seek out more input from the tribe in local decision-making process that impact the tribal fishermen and fisherwomen. She acknowledges the fact the tribe needs to better monitor and manage the coastal resources. Francis contemplates,

“It’s more of a self-management and not a management on the resource. Because how can you manage a resource…I mean, how can you manage a fish? We manage ourselves!”

She sees the tribe implementing a fisheries management plan soon to enforce tribal fisheries laws including the hiring of marine resource professionals. She foresees the tribe
will be in a better position to monitor and plan for fisheries conservation, restoration, and sustenance efforts possibly through traditional fishery aquaculture projects.

From a cultural perspective, there are divergent perspectives of the tribe versus the State policies that pose a host of problems that lead to unequal distribution to the fisheries that, ultimately give rise to food insecurity and hunger for tribal families. Most prominently, fisherwomen who rely on the resource as a supplementary income and foremost for food security with access to quality protein sources for themselves and their children. Harvester BT believes the State is infringing on cultural rights to sustenance in the fisheries and states,

“I mean we should be able to use that sustenance to go and do the stuff, but they’re regulated. You can’t go down there and pick a bucket full of lobsters or scallops to feed your family, but I mean they’re so regulated - we should be able to do that, because it’s our inherited right to go out there and pick for our food for our family. Even if you have a sustenance license, you still cannot do that. And that’s a big thing where the tribe should stand up and make that right available for us.”

Overarching Theme: Tribal Identity, Cultural Values, and Cultural Customs

Major themes to emerge under the overarching theme of Tribal Identity, Cultural Values, and Cultural Customs include Valuation of the Fisheries, Tribal Stewardship and TEK, and Harvesting Methods (Table 4.3).

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Valuation of the Fisheries

The tribal harvesters view the State Fisheries Management Plan as unsustainable and exploitive of the marine resource. Many of the tribal fishermen and fisherwomen
believe a sustainable indigenous environmental model incorporates an interdependency through responsible approaches to conservation and restoration that are disregarded with anthropogenic approaches to decision-making. Fishermen and fisherwomen see the commercial industry harmful to the ecology, while traditional harvesting activities of the coastal fisheries culture are being disregarded by DMR with the valuation of marine resource acquisition by commercial harvesters based solely on profit margins. The harvesters see the newcomers’ perspectives are fostered by wealth and profit of the resource as being inexhaustible, superficial, and privileged based. Moore 2015 contends that, “the biggest problems with the state or with newcomer approach to resources management, it is that resource management by newcomers has its origin – it’s born of the concept of privileged exploitation.” Whereas the native cultural perspectives are based on being in relationship with the ocean environment each day. The traditional harvesters feel native epistemology values the aspects of reciprocity and responsibility as important to sustainability. Moore cites, “They are so detached...the newcomer society doesn’t have the same connection as indigenous people do to the land- to the spirits of the environment. They don’t have the same appreciation for a spiritual connection to the environment...being respectful of living creatures in that we don’t engage in wholesale destruction of one species in pursuit of another ...that’s called, bi-catch.”

Chief Fred Moore 2015 views the State perspectives are divergent of the tribal perspectives in that the State feels the marine resources need to be managed from the economic valuation of the resource. Whereas, through traditional knowledge of the ecology (TEK), the tribes’ cultural values of responsibility and reciprocity are from the perspective of individual management and choices for harvest (Figure 30). He feels sustainability cannot
be reached by privileged behavior and exploitive motives of the resource. He believes this approach places the fisheries at risk and the outcomes become flawed in their approach. He points out the collapse of the scallop fisheries as a prime example of poor Marine Resource Management by DMR. Moore states, “We vacated a fishing area in 2010 or 2011. A group of us tribal scallop fishers got together and said, these scallops are coming up small, we need to leave them alone. We left; many other boats stayed there – we know what they were doing - they were cutting. Cutting up small scallops and many of them got cited for it! We suggested the area ought to get closed down (to DMR) but it didn’t!” Moore views the origins of Natural Resource Management was based on exploitation of the resource without regard to balancing the harvest with the recovery capacity of the fisheries. He further says, “The tribe actually took action to reduce harvesting of species independent of the State.” Laughing, he suggests, “those actions were a year or two ahead of other jurisdictions...who ended up taking those actions after we pointed out the problem. ...we were able to make decisions based on observations, which is a form of science.” Moore feels the state plan is detached from the marine resource and ecology (ocean) including its exhaustibility. Whereas the indigenous model incorporates a direct connection to the resource as tribal members being integrated as co-participant and cohabitants in the life cycle of the ocean fisheries.
Chief Moore exclaims the tribe is in the process of developing its own philosophy for fisheries literature. He says, "In terms of the health of the animals the tribe needs to take more active role in understanding the health of the resources. People in culture are heavily dependent on them. Their (marine animals) health is actually a reflection of our own!" Fred feels the tribe has potential to become renowned for its stewardship approaches. Although, the tribe lacks scientific data on the fisheries, he believes science is only part of the conservation equation to sustainability. There are various knowledge bases that need to be included in rebuilding the resource through observational knowledge i.e., Traditional Ecological Knowledge (TEK) overtime provide key factors in conservation and restoration.
efforts. He acknowledges the need for tribally trained personnel and professional staffing in Marine Resource Management within the tribe. He feels optimistic DMR will eventually respect tribal knowledge and cultural perspectives that includes the complementary knowledge base of best science practices for marine resources.

For tribal harvesters, the activity of fishing is a cultural practice that has defined the very core of Native society in and around Passamaquoddy Bay for at least 13,000 years. The fishermen see the policy of State imposed fines or fees are placing a price on the practice of cultural customs that have ensured the resiliency of the Peskotomuhkati for thousands of years during environmental uncertainty. The transmission of ancestral knowledge through the language is being interrupted and at risk of extinction due to the inability to speak the living language of fishing traditions and pass on the knowledge of the coastal culture to the younger generation.

Tribal harvesters feel native people had their own methods of fishing and harvesting the resource. They see the fish weirs as indigenous technology and science. They further feel native people need to be able to interact with the marine resource 100 percent in order to sustain the ecology and maintain their cultural identity and customs. Vice Chief Francis believes, "when we’re accessing and we’re accessing that together...we start to learn things and we start to share information and grow knowledge together and all the sudden we have a new technology that we created. We can’t create the new knowledge without the full 100% participation". She contends TEK needs to be maintained and shared. The fishermen and fisherwomen see interactions with the resource as being a responsibility to ensure species survival and health of the ocean as paramount. The traditional harvesters presently view all fishery species at risk. Francis contends, “We need to maneuver ourselves to that kind of theme
of how we act and interact with the species, environment and habitats. The shellfish and vegetation even... so we have those well into the future. It’s our responsibility.” Many harvesters feel they could contribute their knowledge of the ocean to sustain the resources (relatives) for the future if there was more co-participation of tribal harvesters in planning and monitoring of the fisheries. Traditional elder fisherwoman affirms, “It’s not like we want all the fish for ourselves. All we want is to make a basic living and feed our families. We would like to help them (DMR) understand the fisheries better.”

Holistically, the traditional harvesters see the maintenance and recovery of the seaweed paramount in the protection of various ocean species and their habitat. Fisherwoman LD fears for the ecology of the fisheries and is troubled with Rockweed harvesting in the area and frets, “They’re harvesting the habitat....and I mean by the tons. They’re just ripping the habitat out and - it’s a business. It’s a poor county. A lot of people do it, cause people need money. But it’s just destroying the habitat for the wrinkles, the clams. They don’t have the nutrients to feed on that they need.” They feel more monitoring of the rockweed harvest is necessary due to the lack of responsible harvesting. Other management factors such as, water quality planning have become significant for the preservation of the tribal namesake, Peskotomuhkati ‘People Who Spear Pollock.’ Restoring the keystone species such as the alewives are believed to be at risk due to pollution and the obstruction of their ancient migratory pathways are of considerable importance to the tribe.

Ultimately, the tribe feels more local control mechanisms are needed by enacting responsible management strategies for the fisheries resources, while concurrently maintaining cultural customs and practices. Fisherman GN advises, “And you really need to bring new generations, this generation now into the fishery to kind of help fix it.” The
Peskotomuhkati realize the need for collaborative partnership in adaptation and mitigation planning with the State agencies for the local coastal regions. They feel the cultural practices of respect and responsibility will balance themselves in the long run as supportive measures for sustainability in the fisheries. They further claim that “no one owns or has title to the marine resources.” Marine resources are not a commodity to be exploited and their continual assurance of survivability is important to Peskotomuhkati identity, customs, and for future generations.

Moore states Peskotomuhkati tribal custom and lifeways have been centered around the fisheries for a very longtime, but DMR has virtually ignored this fact and is steadfastly reluctant to acknowledge tribal management plans of conservation. Traditional harvesters feel multiple factors infringe on cultural customs to transfer traditional knowledge through gender-based knowledge systems that are destructive to the Peskotomuhkati. KL a woman harvester views family lineage as being disrupted and states, “Well, I think that, specifically in my family, our fisheries, it’s in our lineage. Its who we are. It’s how my mother was raised, fed, clothed, everything! And I take great pride in that. It’s part of my heritage. It would be a shame if that wasn’t continued through the generations and our kids were given that to hold onto. It’s part of who we are.”

As custom dictates, fisheries act as a way for establishing social cohesiveness and kinship ties within the community. The inability to having equitable access would be destructive to the Peskotomuhkati way of life. Harvester BM points out, “I think culturally we would be devasted as a community...it’s a way of life for a lot of people still. But I would hate to see any of that severed, because we rely on it, like, for ceremonial days, for events in the community. Elders ask for these things sometimes and people just have to go out and get
it.” The loss of the language due to inability to transmit culturally important knowledge of the fisheries to sustain and foster cultural identity has been a primary concern for the Peskotomuhkati. LD sees the destruction of elder relationships being compromised by the inability to transmit teaching of the fisheries through the wisdom of the elders utilizing the Native language within the community. LD conveys, “It’ll destroy them. It would destroy – usually, fishing is a family thing. You your grandfather taught your father, and your father teaches you and you pass it on. And you do that in Passamaquoddy. So, the language suffers when the industry (fisheries) goes down.”

**Harvesting Methods**

The tribal harvesters view the methods of ‘take’ from the larger commercial fisheries destructive and disrespectful to the ecology and ocean habitat. The harvesters see the displacement of sea life through dredging, bi-catch and uncontrolled fishing allowances through open access has contributed to the origin of unsustainable harvesting practices. In Moore’s viewpoint, "the problem is in the philosophy. We don’t say that the management mechanisms are inadequate simply to establishing contrast or it’s inadequate because it doesn’t allow us to participate or set limits – the entire approach is inadequate! It’s the wrong approach; we suggest it’s a directionally flawed approach...reducing the technology down to something more conducive to interaction between the harvester and the resource is the key to creating a more responsible management. It our impact upon those resources that need to be managed!” Chief Moore 2015 claims the state agencies do not acknowledge tribal ecological knowledge of the sea and disregarded tribal warning of fishery collapse due to commercial ‘take’ and bi-catch.
Further, Chief Moore suggests DMR policies are based on inadequate science that discount local indigenous knowledge bases. He views the Maine State Plan as directionally flawed through its harvesting methods and flouts the cultural belief of reciprocity and respect of the wildlife and destroys the ecology for the fisheries that are contradictory to sustainability. He sees modified gear types to ‘take’ (catch) as necessary to sustain the scallop fisheries to reduce bi-catch and minimize the damage to the ecology. Moore reasons,

“So, if you put down a dredge which weighs several hundred pounds, tow that along the bottom that was once a pristine green environment that dredge is shearing off everything that gets in front of it, killing hundreds of creatures, catching dozens more, traumatizing them, destroying them, injuring them, killing them and discarding them over the side.”

He feels traditional tribal harvesters are innately adaptable to sustain the resource. He sees science solely justifies DMR’s actions under the ‘status quo’. He has experienced Native fisher knowledge being disregarded in this instance and challenged on a regular basis. He believes there are multiple factors to outcomes in the anthropogenic implications of environmental change that does not only include science. He feels the tribe has been absent in the policy making processes as legitimate knowledge carriers of the fisheries and ocean ecology.

**Overarching Theme: Conservation and Management**

Major themes to emerge for the overarching theme of Conservation and Management include Equal Access of the Fisheries, Infrastructure, State Agency Accountability and Transparency and Social-Ecological Health (**Table 4.4**).
Table 4.4 Conservation and Management Major Themes

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**Equal Access of the Fisheries**

The tribal fishermen and fisherwomen feel the conservation and management policies do not provide equitable access to the fisheries including the ability to access culturally significant food sources for health and well-being of Native families. Chief Moore (2015) feels the State of Maine has taken the coastal resources for granted and the exploitation of the resources are increasingly becoming a factor in the decision to close access to tribal members for various marine resources. He recognizes the need for tribe’s involvement in the decision-making processes particularly in the scallop fisheries and the need for regulatory power through tribal autonomy in ancestral fishing territories. Further, he views the uses of traditional ecological knowledge by traditional harvesters as a form of science for decision making for closures.

Chief Moore (2015) believes DMR staff are good at monitoring shellfish flats, but there has not been any involvement of the tribal advisory committee members to these fisheries. He feels more effort needs to be made by DMR to include tribal shellfisheries. From Chief Moore’s viewpoint, the State Plans are inadequate from the sustainability perspective by allowing open access. He has witnessed the State check its management approach based on observations of tribal approaches to management. However, he states DMR needs to acknowledge tribal stewardship, particularly of the larger shellfisheries. He feels the State could benefit from tribal conservation efforts since the tribe is able to assist...
with a more robust conservation plan through federal support. He is not opposed to DMR reasons for public health closures. He postulates that tribal public health education and awareness through interventions need to continue an individual and community level. The tribe has since adapted the State Risk Management Plan for closures.

**Infrastructure**

The tribal administration officials acknowledge the present infrastructure as outdated and cannot accommodate heavy rain events during extreme weather patterns. Vice Chief Francis (2015) states the tribe has been overburdened with costs for flooding homes and infrastructure upgrades. The need for better filtration systems that can redirect flooding events before entering the waterways are necessary. Thus, toxins entering the waterways provide extra risks to tribal health and well-being including risks to the fisheries. She advocates for open dialogue with staff in water quality testing at DMR. She insists that the tribal harvesters are monitoring events through observation, but there are no collaborations with State authorities or planners for coastal erosion issues or potential remediation’s for alternative buffering systems to mitigate these problems.

**State Accountability and Transparency**

Chief Moore (2015) asserts, the traditional harvesters shut down their own scallop fisheries harvests in 2010. During the tribal closure, the State agency ignored the tribe’s authority and allowed open access to continue on for commercial harvesting that resulted in the collapse of the fisheries in 2011. Chief Moore reflects on the previous mismanagement incidences of the fisheries by the State DMR officials. He contends DMR did not act quickly enough prior to the fisheries collapse and ignored the warnings by the traditional harvesters. He states, “the tribe actually took action to reduce harvesting of species independent of the State.” .... Laughing, Moore contends “those actions were a year or
two ahead of other jurisdictions...who ended up taking those actions after we pointed out the problem." He feels non-native commercial fisheries have overharvested the area and a percentage of these fishermen are currently breaking fishery laws. He contends that the coastal regions in Cobscook Bay are one of the largest areas for scallop harvesting and has observed numerous commercial boats from outside regions harvesting until the scallops are exhausted. He asserts, “Boats come from 100 miles away. The problem is there are about 100+ boats in this area. ...you can only do that for so long when the next year came those boats were on this scallop ground and the fleet was done by noon. There was nothing left!”

Tribal officials Moore and Francis (2015) feel the State policies on 'take' fall short and are inadequate in terms of conservation and sustainable management as it relates to commercial harvesting. Many attempts have been made by tribal administration to converse with DMR officials involving co-participation through meaningful involvement. However, attempts for collaboration and tribal engagement are often terminated with dismissive responses by the state officials. On the other hand, the DMR is quick to check their management approaches based on the Passamaquoddy Fishery Management Plan. Consequently, the tribal leaders feel DMR should be acknowledging the tribal role in stewardship and enforcement efforts. The tribal officials also see a need to police their own tribal membership particularly on tribal lands and ancestral territories due to the unique circumstances within tribal fisheries culture and sustenance activities.
**Socio-ecological Resiliency**

The socio-ecological health of the fisheries and its impact on tribal health has been a major concern for traditional harvesters. The harvesters feel the socio-ecological impacts of the current environmental challenges has compromised the resiliency for both human and non-human relatives at Peskotomuhkat. As previously mentioned, Chief Moore (2015) believes the current state of marine health reflects tribal health and well-being. As an example of epistemological and ontological aspects of holism, Moore deems the Peskotomuhkati as nothing more than a co-participant and co-inhabitant within of the marine lifecycle. Chief Moore emphasizes the tribal administration need to take more responsibility in monitoring and understanding the health of the fisheries and educating tribal members to the harmful impacts to health because of ‘red tide’, ocean acidification, pollution, and extreme rainfall events. The tribe has adapted the States policies for health risks for shellfish contamination, although tribal members may still fish unknowingly for sustenance purposes negating potential health risks for paralytic shellfish poisoning (PSFP). Many tribal members hold onto the idea it is due to seasonal changes and may pass it off the symptoms as ‘overeating.’ PSFP is caused by a vibrio species of bacteria that flourishes with increasing water temperatures and is found in bivalves such as the clams, oysters, or mussels. The risk of food borne infections can include wound infections, primary septicemia, and gastroenteritis. All afflictions may become lethal especially for individuals with preexisting health conditions (MDMR, 2018).

Vice Chief Francis (2015) believes it is essential for the tribe to take more initiative in utilizing TEK to better monitor these important tribal food systems. She is concerned with the situation of food insecurity and conditions of hunger have forced tribal sustenance
practices of the fisheries to continue during these high-risk events despite health risks. She has observed a small percentage of tribal members’ exhibit symptoms of low-grade to mild symptoms of PSFP that includes stomach upset or late onset symptoms. Many tribal members do not report illnesses because of consuming shellfish and many cases go unreported. She recommends the tribe must take control over water quality testing in and around the reservation, since they have daily contact with the fisheries resource. Additionally, alternative fisheries projects may provide some relief for the harvesters to offset the impacts of closures. Many tribal harvesters feel there have been too many instances where closures have been unnecessary with no other alternatives for sustenance harvesting. She reiterates, once these local areas are reopened there are too many harvesters in one area, which ultimately leads to depletion of the marine resource. The tribal council has advised the community in the past not to consume certain marine species during extreme rain events and particularly the porpoise due to heavy metal toxicity. Most importantly, tribal officials Moore and Francis contend of social-ecological health of the fisheries and harvesters are an issue for public health interventions and not one for litigation.

As stated previously, the issue of food security and hunger has been a primary concern for families on the reservation. Vera Francis, Vice Chief (2015) point out these closures impact Native fishermen and fisherwomen immediately and places undue burdens on poverty-stricken families and harvesters who supplement fisheries for income that only serve to exacerbate food insecurity and hunger. Vice Chief Francis (2015) asserts there are no other alternatives to income generation and healthy food sources in the area for tribal members. She points out that these regulatory policies are predominantly a result of
anthropogenic factors such as ocean acidification, ocean warming and extreme rain events including red tide in which the tribes are now required to bear the burden.

**Overarching Theme: Tribal Conservation and Management**

Tribal Conservation and Management has been treated independent of the overarching theme of Conservation and Management due to the cultural uniqueness and tribal governing processes (Table 4.5). There were three major themes that emerged under the overarching theme of Tribal Conservation and Management which include Tribal Self-determination, Co-participation through Meaningful Involvement, and Outreach, Education and Communication.

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**Tribal Self-determination**

The predominating concerns for the traditional harvesters are the need for effective tribal management systems through self-determination mechanisms for restoration and conservation activities of the ocean fisheries, habitat and rivers including the remediation of coastal and river fronts due to erosion. There have been many remarks within the discussions from harvesters who indicate tribal administrative officials and fisheries commission need to take a more progressive lead of its own fisheries management and indigenous fishing territories to ensure cultural survival of the Peskotomuhkati.

Tribal harvesters would like to see restoration efforts of culturally significant species, alternative fisheries, and aqua-cultural projects with the participation of tribal fishermen and fisherwomen as co-scientists. As KM recommends, "I think a combination of
traditional knowledge and scientific knowledge to develop and plan for better harvesting. Maybe, for example, types of farming, shellfish farming, like mussels and stuff like that on rope or maybe some lobster pens out here or something so we could raise little lobsters and grow them up and sell them....” Tribal fishermen and fisherwomen have observed over the past two generations a rapid decline in ecosystem habitat, fisheries resources and harvesting areas in and around the traditional fishing territories at Peskotomuhkatik. Shellfish (periwinkles) have been negatively impacted by overharvesting particularly the ‘maters’ in prime reproductive habitat and lose the capacity to replenish and recover the resource. Moreover, many harvesters feel the increasing ocean temperatures, declining habitat, and the impacts of pollution on culturally important species are beyond their control. Remarkably, the harvesters feel a deep sense of responsibility to ensure the sustainability of the ocean fisheries future and tribal descendants yet to come. The fishermen and fisherwomen would like to see the inclusion of the traditional harvesters in areas of stewardship and the use of indigenous knowledge (IK) of the ecology that will complement scientific approaches. Collectively, the harvesters believe they can ensure the future of the fisheries with greater collaboration with research scientists and tribal administration as an avenue to self-determination.

The fishermen and fisherwomen acknowledge the value in TEK as an adaptive strategy to sustain the fisheries through their meaningful involvement as indigenous scientists. Many feel the value of tribal harvester’s traditional knowledge on the fisheries is significant and should be acknowledged and valued in the restoration and conservation efforts. The tribal harvesters feel the tribal administration should initiate more leadership in self-determination for marine resource management with greater focus in sustaining the
cultural important fisheries. Harvesters have expressed concern that the tribe should be exerting its’ sovereignty in the inherent rights to fish within its’ ancestral territories. Fisherman GN expresses his concern for tribal management initiatives of the fisheries/wildlife by exercising inherent tribal sovereignty through its management and decision making, he states, “Everything is the same as the state. Why? Why you know, why bother? So, when we’re sovereign and then we turn around and take on all the state laws and then turn around and take all the state handouts and everything else, then (laughs) where does the sovereign part come in?” A few fishermen believe the Tribal Fisheries Management adoption of State Management and Authority weakens self-determination efforts of the tribe and is contrary to implementing its own rules for tribal management and tribal sustenance fishing.

The fishermen and Fisherwomen state the board should consist of fishermen and Fisherwomen not tribal administration. JF states, “they should be more educated to help the fishermen more instead of not really knowing anything about it and just saying, I don’t know what you mean by this, or I don’t know if you can even get that. When they should know!” The fishers feel the fisheries board should play a more active role in sovereignty issues. They see harvesters are better able to manage the fisheries and can provide valuable input through ecological knowledge of the fisheries more effectively.

Since the management of the fisheries has been strictly through the DMR, harvesters feel the state no longer serves the needs of the tribal fishers through necessary quotas or by providing adequate access to the culturally significant food sources found in the fisheries. Collectively, there has been an on-going need to incorporate better monitoring systems of the fisheries through co-participation and meaningful involvement of the
harvesters with the tribal fisheries administration, public health officials and through reciprocal relationships with the State agencies. Although the State of Maine DMR feels the tribal fisheries remain within their jurisdiction, little has been done on the State level to remediate and mitigate coastal erosion of the ocean front territories or reseeding harvesting areas within the reservation boundaries or traditional harvesting sites. Many harvesters feel that more conservation, restoration, and monitoring efforts are needed to sustain the resources that includes training the tribal harvesters in reseeding efforts and tribal initiatives for stewardship.

There have been observations of environmental damage to the ecosystems because of anthropogenic impacts including manmade obstructions such as dams and alterations of the waterways due to sport fishing, pollution, ocean warming, and overharvesting by commercial industry. The tribal harvester’s testimony concerning fisheries resource composition and abundance in Passamaquoddy Bay was plentiful approximately 40 years ago. Harvesting activities during this time required little fishing gear and included handmade baskets, nets, spears, fish weirs and canoes. Native technology is no longer utilized to a great extent and harvesters reflect the fisheries composition and abundance has significantly changed or diminished compared to previous observations. However, the tribe has been contemplating efforts to restore traditional native technology by reestablishing the use of fish weirs as their ancestors once utilized and exploring various aquaculture projects as an alternative food security method.

Economic security through providing basic needs have been a concern for tribal families who are dependent on mixed subsistence lifestyles involving the fisheries. Many feel the marine resources have diminished substantially since their childhood. Many
culturally important species are no longer accessible or have been extirpated that include flounder, pollock, alewives, lobster, scallops and codfish from the ancestral fishing territories and local coastal shores. The harvesters have speculated the use of unsustainable practices have led to the loss of habitat from pollution, particularly through industry and runoff which have compromised the reproductive capacity and resiliency of the fisheries. The implication of anthropogenic mechanisms has resulted in limited access to the fisheries as the marine resources become constrained.

Further, the harvesters feel conservation methods have been forced on them by the State of Maine due to the impacts of commercial overharvest with extraordinarily little of the culturally significant marine resources left for family subsistence. Many families do not have alternatives for high quality food sources that the membership once enjoyed and relied upon to exist and thrive. For many, closures pose an immediate impact on food security and leave them no alternatives for adequate food sources leading to food insecurity for families and growing children. As KM points out, “we’re in a time now, the economy is bad, people are depending more and more on the natural resources to make a living, so therefore, we’re kind of forced into these conservatory measures.” Harvester’s feel the state has been regulating traditional lifeways and their rights to practice Peskotomuhkatik culture through threats of litigation that may result in loss of access accompanied with the inability to pay the fines. The fishermen and fisherwomen feel the need for designated conservation areas for sustenance harvesting and include quotas for families who rely on sustenance fishing to provide greater food security and quality of life for their children.
The harvesters believe sustenance activities should take place throughout the year unimpeded by state regulation. The culturally significant species such as scallops and lobster are highly regulated by the state and require expensive licenses and equipment to access the resource. The sustenance harvesters feel the tribal fishermen and fisherwomen should have access to these fisheries for sustenance purposes during closed season. Many feel there should be policies for family quotas or should not require the use and costs of a license that many harvesters cannot afford to pay. The tribe would be in a better position to manage these licenses and sustenance activities within these conservation areas. Harvester KM believes, “I don’t think there should be any penalties for living according to the way you were meant to live, your way of life. It is an infringement from the Europeans upon our life - what we’ve been doing for thousands of years. And there shouldn’t be no penalty.” Most importantly, the harvesters feel the urgency to transfer cultural knowledge of these fisheries through the language to the younger generations. These cultural learning activities on the fisheries are rare to non-existent due to regulation and inability to access these culturally significant species.

**Co-Partnerships through Meaningful Involvement**

The fishermen and fisherwomen are unaware of the contents of the Tribal Fisheries Plan but would like to become more involved in its implementation and on-going development. They believe more information concerning its’ implementation needs to be shared with the harvesters. They hope the plan will help protect the harvesters from racism and discrimination from the State DMR while providing for the culturally unique needs of the tribal members to harvest. The traditional harvesters have expressed the concerns of overharvesting shellfish such as clams and periwinkles in areas around the
reservations by tribal members. The fishermen and fisherwomen have observed the need to reseed, but many are not trained. Harvesters feel the tribe needs to offer training in reseeding areas to ensure a supply of the shellfish for the future. The fishermen and fisherwomen are concerned about the status of the beaches and coastal areas that need remediation from storm damage, run-offs, and land-use changes. Many harvesters volunteer to participate in monitoring and restoring the coastal areas to help improve habitat and reproductive capacity of key species. The harvesters see the value in the resources to cultural viability and sustainability for the next generations of young fishers.

The harvesters have expressed an interest in becoming more involved in the sustainability of the fisheries and feel the Peskotomuhkati knowledge base should be included to complement scientific data as a baseline and as an iterative process. Many harvesters see a mutually beneficial relationship in the restoration efforts and conservation practices through years of observational knowledge of the fisheries and ecology. Many feel sciences approaches have become detached from the marine resources and the harvester could assist in informing and improving the interrelationship of the fisheries.

**Outreach/Education/Communication**

Many of the tribal harvesters desire a better partnership with scientists and DMR on the preservation of the fisheries. They would like to start with improved avenues of communication and education by DMR, rather than the feckless ‘command and control’ methods that have been implemented on the local tribal citizenship by the State agency. Further, the fishermen and fisherwomen have raised concerns of institutional racism being practiced by the State agency with its present management approach of inequity of access to the fisheries and its access to free markets. The harvesters feel the equal distribution of
the fisheries for tribal harvesters is imperative for their well-being and basic liberties. Many feel DMR should be striving for co-management approaches rather than undermining tribal management structures that are in place. Many tribal harvesters believe they are only trying to exert basic liberties for a better quality of life within their cultural and economic means.

The harvesters have been cited for digging in restricted areas, unknowingly. The harvesters feel maps or apps should be made available to the harvesters and regular updates with current information that can be easily picked up at the tribal office. The information should include the local areas that are open for harvest and licensing requirements for each town. Presently, DMR has not been sharing that information for restricted areas or closures. Many would like to see more effort by DMR to outreach tribal harvesters and provide fisheries information that a lay person can understand such as, the status of the fisheries, zoning strategies for conservation with improved monitoring systems of catch to offset overharvest by commercial industry. Many of the fisherwomen foresee mutual beneficial outcomes by working cooperatively with the local towns and state agencies that foster true sustainability measures for the fisheries. Fisherwoman BT suggests, “They should be right here, like us, showing the scientists what really goings on and what’s really there and actually present that to the DMR – you know what I’m saying ...that could be the real biggest help from the scientists - is them being there and us showing them, so they can see what’s really going on.” The fisherwomen further suggest measures for estimated projection should reflect the fisheries status based on data collected from previous years to conserve fishery species. This data should be shared with the harvesters to gauge
their ‘take’ beforehand and not as an afterthought of management. The fisherwomen feel they could provide valuable information in this regard to help conserve the fisheries.

Further, the traditional harvesters have little input in the fisheries board that appear to be occupied by non-harvesters who have little to no experience in fishing. Harvester KM point outs, “No, not even in our tribe, we’re not even included in what goes on with the management thing. They have people who are making decisions who have never ever really fished. If you’re related to someone or you know someone, they’ll be the ones who get the permits….” LD echo’s these sentiments, “there was a limited number of licenses. Who got most of them? The people that already had jobs. And the poor people, the people who really have nothing weren’t able to, weren’t able to fish because the people that work at the tribal office were first in line”. The traditional fishers feel the committee does not provide an informed voice for primary issues that confront harvesters because of the inexperience in the fisheries. Many feel there needs to better equity in fisheries licensing for low-income families as a priority by the board.
CHAPTER 5: DISCUSSION

The testimonial evidence depicted by the Peskotomuhkati fishermen and fisherwomen convey the urgency that cultural survival depends on the ability to engage in cultural activities and enable food security, while fostering tribal resiliency for the next seven generations. The concept of 'take' (property) by the regulatory agencies are contrary to the Waponaki values and perspectives of the ocean relatives. Most urgently, all closures have an immediate impact on food security for the sustenance harvesters and their children living in poverty conditions. It is crucial to establish and provide access to alternative fisheries for tribal uses during high-risk events such as extreme precipitation and red tide. The prevalence of hunger in children at all levels and ages associated with critical growth and development at Peskotomuhkatik must be determined. Water quality monitoring and public health education on the implications of vibrio on human health must also be established and on-going.

The Peskotomuhkatik have sought through treaty agreements, the inherent right to access ancestral fishing territories via its historic context as established in the Don Marshall, Jr.'s. case before Maine achieved statehood. The context of the wampum belt readings established these contextual understanding through an epistemological lens. Since the negotiations of the original treaties of Friendship and Peace in 1760-61 of the Waponaki and early colonial establishment, it is evident the contextual understandings by the oral conveyance of the wampum belts have not been properly comprehended or acknowledged by colonist and settler-states. The ancient contextual framework of the wampum belts to early governance or ancestral laws of the land and water - still stands under treaty obligations and will continue in the hearts and minds of the Waponaki people in perpetuity.
The precedence of colonial written interpretations of treaty injected the primary purpose and intentions it served while assuring access to the richness of indigenous lands and water resources for economic dominance. Today, the courts, legislative bodies and regulatory frameworks have held onto the dubious interpretations of early negotiations, the erosion of the MICS of 1980 and through court decisions based on false assumptions of conquest while securing their opportunistic objectives of hierarchal and economic dominance over the original people of Maine – the People of First Light. These actions are evident the Waponaki people have not been treated equally, but speculatively in terms of social justice. The humble approaches of the early Penobscot envoys depicted one of integrity and faith in diplomatic relationship that has been the characteristics of Waponaki leadership. The ancient system of diplomacy and decision-making was not only rendered to neighboring community leaders, but to *t’olonapemkowakk* while ensuring peaceful relationship with all life, human and non-human as the Wampum Belts have conveyed for millennia.

The ability to exercise sovereign activities to manage as co-creators and co-participants of the greater ecology is paramount to cultural survival of the Peskotomuhkati. Furthermore, the State of Maine has the responsibility within its constitution to ensure the Waponaki people equitable distribution of the fisheries as well as free market access as any other Maine citizen for both traditional and non-traditional economic security. As its early Waponaki envoys understood, the Peskotomuhkati can look to opening a tribal 'truck house' in which to provide a trade option for harvesters that is local and supplements wage labor. The tribe must exert its own sovereignty to ensure access to its own ‘free market trade’ for their catch. The hiring and retention of tribal marine professionals who provide
direction to the tribe in ocean resources is the next step for implementing an informed approach to sovereign activities. The need to plan, conserve, restore, and monitor the ancestral fisheries utilizing cultural relevant approaches are necessary for a robust ocean economy for tribal members.

There has been an obvious need to change the conventional and convenient organizational hierarchy of colonial constructs within Peskotomuhkati fisheries. Conservation policies, regulatory aspects of access and sustenance harvesting must be acknowledged by State regulatory officials for the achievement of food sovereignty much like the conservation areas of the Native Hawaiians. Internal tribal regulatory matters must be acknowledged through cooperative channels with DMR to meet the unique needs of the cultural fisheries resources at Peskotomuhkatik. Paramount are the need for policies that meet food security needs that are culturally relevant to the Peskotomuhkati within the ocean community at Sipay’k. Principal is the need for the transformation of organizational frameworks into one that eliminates dividing lines of isolated individuals through the attainment of ‘Woli-litu’ for the collective health and well-being of the Peskotomuhkati. Tribal participation utilizing traditional knowledge bases will foster an atmosphere for co-creating and co-partnering with mutual support, including the holistic value of kinship whereby individual problems become a community problem. The paradigm shift in policy must be within the concepts of resiliency thinking in socio-ecological systems holistically while sustaining the vision of ‘Woli-litu’ and taking steps toward ‘Wolankeyutomuk’ in its management approach. Under this framework, TEK will be retained, rediscovered, and renewed into a community-based cultural resurgence and reawakening that is growing and evolving daily.
Collectively, the aspects of holism have been the foundational framework in which indigenous societies operate in their interconnection and interdependency concerning the ecology. The incorporeal concept of Pomuhse infers the collective relationship of all life and links the people as co-creator to the environment -Nikuwosskiktamik as evident in the storywork. The restoration and revitalization of traditional approaches to adaptation through ancient instructions may foster resilient systems of ‘Woli-litu’ in management and ocean ethics. It is through the ontological and epistemological aspects of ‘Woli-litu’ that will compel the need for interrelationship to the greater ecology. Most importantly, the enhanced ability to access fisheries will foster the efficacy of human agency through the active harvesting of culturally significant food sources for food security for the Peskotomuhkati ocean culture.

The acquisition of cultural food sources, utilitarian and medicinal harvesting activities while utilizing Native language define the foundations of Waponaki culture and identity. The ability to practice culture while utilizing the indigenous language will restore knowledge transfer systems and cultural permanency for the Waponaki people. The continuation of the future generations will depend on the ability for relationship with the human and non-human relatives, as asserted in the ‘Seven Generation Policy’ through mutually derived decision-making that considers all citizens. Finally, it is critically important to establish co-management structures within the Tribal-State relationship in caring for our relatives holistically as conveyed within the original Peace and Friendship Treaty.
Conclusions

The undertaking of the concepts of resilience thinking and development in SES concepts in fisheries restoration and conservation have been with good intentions for ecological sustainability. Fishery policies and regulations must implement culturally sensitive polices that link human-ecological relationships in marine development projects and its cultural interdependency of indigenous coastal people. Most importantly, the State acknowledgement of sustenance practices within the coastal fisheries policies are paramount. Human rights investigators have underscored the paradigm shift must address potential strengths of governance through actions of community rights to access the fisheries. The lesser amount of focus on illegal and unreported fishing through state actions becomes the quintessential path forward in equity distribution for greater food security. Hence, crisis as shown in local SESs with strong cultural beliefs such as the Peskotomuhkati will require state agencies to work toward enhanced supportive measures for resiliency within its negotiations for better tribal-state relationship. These measures may include access to basic outreach services, supportive politics, technical capacity, and enabling environment for transformational change in responsible fisheries management that will ensure equitable access to the coastal fisheries that are essential for building resiliency in the impoverished community at Peskotomuhkatik. Further, the Peskotomuhkati people must have the assurance and opportunities to participate in community-based knowledge systems for adaptive capacity building that can meet the upcoming challenges posed by climate change.

The outcome of this research suggests the social aspects of power in the State of Maine have led to the vulnerability of the Waponaki communities and impeded the ability to build resilient systems through traditional economies to supplement wage labor. Today,
privileged societal values within the fisheries industry continue to override conditions of
hunger and have replaced the right for the Peskotomuhkati to access culturally significant
food sources while practicing their culture within the confines of their original fishing
territories. The need for policy reform that includes the Peskotomuhkati in its decision-
making processes are paramount to cultivate supportive mechanisms for fisheries
knowledge transfer and ultimately the survival of an ocean culture.

The ability to practice culture and transmit TEK to younger fishermen and
fisherwomen safeguards their existence and assures cultural permanency of the
Peskotomuhkati. While the research contends for indigenous food sovereignty to occur, the
Peskotomuhkati fishermen and fisherwomen need to control production, quality, and
distribution of their own cultural food systems through better planning models that foster
community stewardship within the fisheries. The opportunities for enhanced harvesting
activities through designated conservation areas for stewardship and subsistence activities
is vital for food security and will offset conditions of hunger at Peskotomuhkatik. Future
areas for study may include participatory action research approach involving how
adaptation is achieved through local knowledge systems using indigenous language
instruction. These initiatives may open the door for better understandings of alternative
knowledge bases within human and non-human relationships that foster sustainability in
the fisheries. The harvesters highlight their eagerness to cultivate healthy relationships
through co-management structures with the State of Maine. The state support and
encouragement of individual agency of traditional fishermen and fisherwomen may
provide the foundational framework for alternative knowledge bases in the restoration and
revitalization practices for the fisheries in climate change. Thus, reevaluating the current
system may spur opportunities to recombine sources of experiences and knowledge for learning, innovation, and cooperation in government-to-government relationships for mutually beneficial outcomes that includes all Maine citizens. The utilization of culturally relevant models within management planning and strategy would provide more meaningful involvement of tribal harvesters as co-partners.

Native perspectives as co-participant and co-inhabitants in its interface with the ocean ecology may provide a basis for which policy is made and carried out by the fishermen and fisherwomen and lead to better ocean ethics for the fisheries. The need for trained tribal members and staff utilizing citizen science initiatives will assist in building efficacy for a more robust fisheries. The citizen science initiatives in reseeding clam beds by harvesters will assist in data collection for monitoring of ocean conditions, species habitat and to establish baseline data for habitat changes. These quantitative scientific activities may also provide STEM opportunity for youth involvement in water and soil testing in and around the ocean front. Tribal youth involvement can have powerful influence by presenting the information to parents and the community during school events while creating an awareness for anthropogenic and public health impacts. Recommendations for future research efforts utilizing indigenous research methodology in socio-ecological relationships in Waponaki culture, particularly within gender roles may hold the key to greater understanding holistically, while lending to new perspectives in alternative knowledge systems for adaptation. Lastly, the inclusion of holism in planning may provide new insights in adaptation, an avenue to live in balance as co-participants and may provide the impetus of true sustainability for t’olonapemkowakk (all our relations) as taught in the Peskotomuhkati language.
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GLOSSARY

**Adaptation** – a change or the process of change by which an organism or species become better suited to its environment.

**Anadromous fish** – migrating from the sea into rivers to spawn i.e., salmon, river herring (Alewives, Blueback)

**Catadromous fish** – born in saltwater then migrates into freshwater systems for most of their lifecycle, then migrate back to sea to breed i.e., eels

**Codified agreement** – a process of collecting and restating the law of a jurisdiction in certain area, usually by subject forming a legal code

**Cosmology** – based on religious mythology of a specific tradition. Process of creation

**Deference** – condition of a court yielding or submitting its judgment to another legitimate party

  **Example:** Executive Branch to EPA accepting the agencies interpretation of agency’s rules, polices and authority

**Environmental Justice** – the fair treatment or meaningful involvement of all people regardless of race color national origin, income with respect to the development, implementation, or enforcement of environmental laws.

**Environmental Self-Determination** – right to exercise stewardship, sustainability, and utilization of natural resources critical to tribal sovereignty without interference of tribal priorities, principles, norms and values.

**Epistemology** – the theory of knowledge, nature of knowledge, justification and rationality

**Fair Treatment** – No group racial, ethnic or socioeconomic group should bear a disproportionate share of negative environmental influences from industry, municipal, commercial operation or the execution of federal, state, local and tribal programs or policies.

**Food Security** – is achieved when all people, always, have physical social and economic access to sufficient safe and nutrition food to meet their dietary needs and food preference for an active and healthy life.

**Food Sovereignty** – political approach to food security within agrarian social movements to address poverty, underdeveloped communities and domination of global agricultural policies (La Via Campesina 1996). Precursor to Food Security.

**Gross Domestic Product** – GDP is the total value of goods produced and services provided in a country in 1 year

**Ground fish** – Live in or near the bottom of the body of water they inhabit, i.e., cod, flounder, halibut and sole

**Indian Self-Determination and Education Assistance Act 1975**- tribe began seeking control of their own resources, programs, law enforcement, health services, education,
cultural resource protection on reservation land and management. Became the door to self-rule in Indian Nations.

- Hunting/Fishing. Rights
- Child Custody
- Protection/Control/ over Native American remains (Repatriation Act)
- Trust Obligations of Federal Government – reserved rights of Culturally significant resources would be protected
- Tribal Courts

**Inter-American Human Rights System** of Indigenous Rights– Ancestral lands and natural resource right to communal property of and that links to their oral traditions, expressions, customs and language, art rituals, TEK, Food, customary law, dress, philosophy and values.

*Fundamental to physical, cultural and spiritual vitality and economic survival that is based on relationship to the land.

**Hegemony** – Leadership or dominance by 1 country or social group over others. Dictates the internal politics or social character of subordinate states.

**Keystone species** – a species on which other species depend in order to survive and prosper

**La Via Campesina** – WFS 1996-goal was to reduce globalization of food trade
  - Re-orientate to local food production
  - Grounded in agro-ecological principles

*Main objective was to convey promote social justice/dignity to peasant farmer and agricultural workers in small-scale food production and sustainability.

**Marxism** – a method of social economic analysis that views social conflict using material interpretation – socialism

**Nation Building** – Rebuilding institutional capacity for effective self-governance, reorganizing relationships with other governments, reduce dependency on federal government and strengthens tribal sovereignty to improve economic and community welfare.

2 factors of Success

- Defacto Sovereignty
- Effective institutes of self-governance – from a reactive to proactive government

**National Environmental Justice Advisory Council (NEJAC)** – Indigenous Peoples Subcommittee designate under the EPA

**Meaningful Involvement** – the opportunity to participate in decisions about activity that effects the environment in which they live.
• Public contributions that influence the regulatory process/decisions
• All participants are involved in the decision-making process

• Decisionmakers seek out and facilitate the involvement of those effected by the regulatory actions.

*Communication-Consultation-Participation* – encourages agencies to for fill trust responsibilities via meaningful participation in the decision-making process i.e., power-sharing capacity

NOTES: NEJAC recognizes that tribal members suffer disproportionate environmental impacts. Tribes are often overburdened, underserved, underfunded, and suffer high risks from environmental impacts that impacts public health.

• Involves tribal values of due process through public participation within the cultural context, social norms and fair treatment. Incorporates native concepts of equity and justice through communication and cooperation.

• Tribes are often focused on basic needs such as education, housing, food/nutrition, clean water and reducing exposure to environmental contaminants and influences tribal attention to public involvement on issues.

• Tribes need training/education on areas of public participation and due process on issues of equity and justice.

• Tribe must acknowledge the political commitment to build institutional capacity.

**NEPA 1974**—establishes a comprehensive environmental review of federal actions (EIS) prior to taking any major federal action significantly affecting the quality of the human environment.

Federal agencies are required to seek out cooperation of state and Native American tribes of the action that may impact native community or impact outside the reservation may affect cultural resource or off reservation treaty rights.

**Nutritional colonialism** – describes values and practices of the dominant food system that negates subsistence lifestyles, focuses on monetary profit, fosters cultural suppression or marginalization, dependence and food insecurity through authoritarian control over resources, creates environmental degradation, health disparities and chronic diseases and lacks responsibility to the original food acquisition systems of its original people. Products of nutritional colonialism contribute to sedentary lifestyles, require cash, contain suboptimal nourishment and are culturally insignificant.

**Polemic**- contentious rhetoric that is intended to support a specific position by aggressive claims and undermining of the opposing position. Belligerent, war-like

**Promulgate** – enact, implement or enforce

**Example:** Executive branch will promulgate environmental laws through the EPA and are given broad discretionary authority in its interpretation of policies or executive decrees.
**Reification** – is the process by which social relations are perceived as inherent attributes of the people involved in them or attributes of some product of the relation, such as a traded commodity.

**Resiliency** – the capacity of a system to experience shocks while retaining essentially the same function

**Statutory Law** – Statutes, laws, written law set down by a body of legislative or legislator
* National, state or local municipalities i.e., traffic laws,

**Sovereignty** – the status, dominion, rule, power of a sovereign
* Tribes have the power to self-rule, enforce laws establish courts for their tribe and reservation.

**Substantive Law** – set of laws that govern how members of society are to behave i.e., rights and responsibility in civil law, crimes, punishments

**Example:** NA group’s ability to participate as decision makers with enforceable rights are often ambiguous regarding their cultural resources and can become commentary rather than substantive.

*Notes:* often see government to government relationships, but with no enforceable laws against the U.S. as a disclaimer on executive order – *see Clinton Exec. Order No. 13,084, 1998

*Input from tribes on regulatory practices that uniquely effect the – EPA duty to consult with and seek participation to promote healthy ecosystems.

**Trust Doctrine** – rooted in the treaties between Indian tribes and the U.S. government where land was ceded to the government in exchange for protection for the land/tribal rights, trust lands and sovereign rights.
APPENDIX A

Focus Group/Individual Interview Consent Form

New England Sustainability Consortium (NEST): Safe Beaches and Shellfish

Darren Ranco, PhD—Co-Principal Investigator
Natalie Michelle—Researcher, Co-Principal Investigator

Introduction
This consent form explains the research study you are being asked to join. We are doing this work as researchers from the University of Maine. The purpose of the research is to help make more inclusive decision making for beach and shellfish closures. Ask any questions you may have about the study before you agree to join. You are invited to ask questions at any time during the study.

What will you be asked to do?
If you agree to participate in this study:

You will participate in one or more individual or group interviews. During these interviews, we will ask a series of questions about how you engage beach and shellfish resources and your knowledge about how the decision to close these resources are made.

The interviews will take approximately two to three hours each. The interviews will be digitally recorded, and transcripts of those recordings will be made. With the permission of all participants present, some interviews may be audio and video recorded. Before we use any of the information you provide in a report or any scholarly publication, we will contact you for your further consent.

Compensation
You will not be compensated for your interview time—we may be able to compensate you for your travel.

Risks
If any question should make you feel uncomfortable, we can skip it. You can stop your participation in a group interview at any time. You can decide to leave the project at any time. Your interview records will be handled as confidentially as possible. Your name will not be used in any reports or publications that result from this research unless you give your written permission to do so.

Benefits
You may get no direct benefit from participating in this study. However, the information you provide will add to community knowledge of how to protect shellfish resources and beaches in a way that is more inclusive.

Confidentiality
We will encourage group interview participants to keep focus group discussions within the group. We cannot guarantee that your focus group responses will remain confidential. The only people who will have direct access to the information you provide will be those who participate in the group, and others who may help with typing or organizing the information. Your name or
other identifying information will not appear on records of the information you provide. We will label the data files and transcripts of the tapes with a code number only. We will record the names of group interview participants, code numbers, and your contact information on a separate form. All information that could identify you will be secured at the University of Maine. We will destroy the identifying information at the end of the project in 2018. The information gathered in the project including audio, photographs and video records will be kept indefinitely by Darren Ranco, and Natalie Michelle.

Voluntary Participation
Your participation in this research project is completely voluntary. You have the right to withdraw from the research study at any time. Your compensation will end when you withdraw from the study. If you have any questions, comments, or concerns about participation in this study, you can talk to Darren Ranco at any time. You can also contact Gayle Jones, Assistant to the University of Maine Protection of Human Subjects Review Board at 581-1498 (or e-mail gayle.jones@umit.maine.edu) with any questions you may have about this research study.

Persons to Contact
If you have any other questions about the study, you can call the principal investigator, Darren Ranco 207-581-1801. We will answer your questions related to the study.

If you have read this document and agree to participate in the project, please sign below.

Your signature below indicates that you have read and understand the above information. You will receive a copy of this form.

_____________________________________  ________________
Signature       Date
APPENDIX B

Focus Group/Individual Interview Consent Form (Participant Copy)

New England Sustainability Consortium (NEST): Safe Beaches and Shellfish

Darren Ranco, PhD—Co-Principal Investigator
Natalie Michelle—Researcher, Co-Principal Investigator

Introduction
This consent form explains the research study you are being asked to join. We are doing this work as researchers from the University of Maine. The purpose of the research is to help make more inclusive decision making for beach and shellfish closures. Ask any questions you may have about the study before you agree to join. You are invited to ask questions at any time during the study.

What will you be asked to do?
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You will participate in one or more individual or group interviews. During these interviews, we will ask a series of questions about how you engage beach and shellfish resources and your knowledge about how the decision to close these resources are made.

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You will not be compensated for your interview time—we may be able to compensate you for your travel.

Risks
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**Voluntary Participation**
Your participation in this research project is completely voluntary. You have the right to withdraw from the research study at any time. Your compensation will end when you withdraw from the study. If you have any questions, comments, or concerns about participation in this study, you can talk to Darren Ranco at any time. You can also contact Gayle Jones, Assistant to the University of Maine Protection of Human Subjects Review Board at 581-1498 (or e-mail gayle.jones@umit.maine.edu) with any questions you may have about this research study.

**Persons to Contact**
If you have any other questions about the study, you can call the principal investigator, Darren Ranco 207-581-1801. We will answer your questions related to the study.

If you have read this document and agree to participate in the project, please sign below.

Your signature below indicates that you have read and understand the above information. You will receive a copy of this form.
APPENDIX C

Tribal Harvesting Related Scoping Questions

Thank you for taking the time meeting with me today. This interview is part of a larger project being conducted within the New England Sustainability Consortium’s (NEST-SSI) project at University of Maine and focuses on safe beaches and shellfish. Our intent right now is to learn as much as we can about the tribal fisheries in order to make the project more useful. We plan to integrate your thoughts and concerns about tribal shellfisheries.

Background
How long have you been working in/with the shellfish harvesting?

What kind(s) of shellfish do you harvest?

Threats and Information Needs.
In your opinion, what is the most significant threat facing tribal shellfish harvesting today?

What other issues are you and other shellfish fishermen concerned about? Please Explain.

How new, serious or controversial/sensitive are these?

How do you think these future issues or threats will impact tribal traditional lifeways?

Do you have any opinions on what is needed to address some of these threats or concerns?

Can you think of any old threats or concerns that are no longer an issue for the tribal harvesters?

   What happened – Why do you think they are no longer a concern? How were they resolved?

What do you think are the most important information or knowledge gaps related to managing shellfish in tribal waters?

Do you have suggestions for research that scientists should be doing to help the shellfish?

We are especially interested to know more about shellfish closures.

   What kinds of closures are most common in the areas where you work? Which have the most impact on tribal harvesters?

How predictable are these closures?

How do you find out/receive information about closures?

In your opinion, what are the primary factors that lead to these closures?

In your opinion, what can be done about these closures?

Do you have any alternatives for harvesting when you anticipate a closure on the shellfisheries?

Prompt; Dig both tides?
We are interested in your opinions about the management systems in the State of Maine (DMR) and tribal management systems.

Do you participate in the management of clams/shellfish in your area? Explain. What town/area?
How often are there meetings?
How often do you attend them? When/if you do – what is the attendance like?
Does a large portion of the fishermen in the area attend?

In general, how well do you think the management system is working comparing DMR vs Tribal Management Plan?

What kinds of tribal conservation rules or regulations do you think are most important or helpful to the fishery? DMR's?

Do the tribal harvesters participate in conservation activities in your area, and do you think it is working?

What aspects of management could be improved tribally or through the DMR?

In what ways is science used in the management process?
In what ways is traditional knowledge used in the management process?

Do you trust the science that is available?
Prompt; For example, water quality monitoring, closures, etc.

Are you familiar with the co-management systems found in other fisheries where fishermen have some say in the state management process, i.e., lobster and sea urchin zone councils?
Do tribal members participate in co-management processes with the state or tribal management systems?

How does tribal clam management systems compare to those fisheries?

Do you feel enforcement is adequate? Do you think penalties are fair to tribal harvesters?

Are there any issues with harvesters not being able to access certain productive and open fishing/harvesting areas, other than closures (i.e., property rights issues?)

Are there any issues/concerns regarding the licensing or permitting system, specifically as it relates to shellfish/clams?

Wrap up:
Any other issues related to shellfish management that you think state and local managers or scientists, or even the general public, should be paying attention to that we have not discussed?
BIOGRAPHY OF THE AUTHOR

Natalie Michelle grew up on Indian Island and is a member of the Panawapskwei (Penobscot) Nation. Her parents are the late Dr. Theodore N. Mitchell from Panawapskwei, Old Town Maine and Eleanor M. Mitchell from Peskotomuhkati (Passamaquoddy), Sipay’k, Perry, Maine. Her diverse background includes Nursing, a BS in Human Nutrition and an MA in Public Administration. She received the Pi Alpha Alpha in Public Administration with a concentration in Environmental Management and Sustainability. She was a Research Fellow with EPSCOR NEST-SSI Program, a Regional Research project examining coastal areas and shellfisheries in Maine and New Hampshire. The goal of her research studies was to assess Climate Change impact (Human and Non-human induced) and environmental trends of Passamaquoddy Bay and its impact on culturally significant food sources at Peskotomuhkatik. Her interest and concentration have been sustainable practices in natural resources utilizing traditional indigenous knowledge of the environment and bringing Native Women’s voice to the forefront in environmental issues and climate change on gender-based knowledge impacts. Her interests are in areas of Climate Change Impacts on Cultural Practices, Food Sovereignty, Indigenous Women’s Environmental Knowledge Systems, Indigenous Research Methodology, TEK and Indigenous language as an adaptive strategy for biodiversity. She is a candidate for the Doctor of Philosophy degree in Interdisciplinary Studies from the University of Maine in December 2021.