

CLIMATE CHANGE ADAPTATION PLAN WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH)



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SNEP NETWORK TECHNICAL ASSISTANCE PROJECT

About the SNEP Network

In 2019, the US Environmental Protection Agency (US EPA) awarded a five-year cooperative agreement to the <u>New England Environmental Finance Center (New England EFC)</u> at the University of Southern Maine to establish the <u>Southeast New England Program (SNEP) Technical Assistance Network ("the SNEP Network"</u>) to support the work of multiple partner organizations that provide training and assistance to municipalities, organizations, and Tribes across the region. The purpose of the Network is to advance stormwater management, ecological restoration, and climate resilience within Rhode Island and southeastern Massachusetts, the ancestral homelands of the Wampanoag People. An important overarching component of the Network is to create sustainable revenue streams and financing processes in support of local implementation efforts into the future.

WTGHA Technical Assistance Project

In July 2021, the SNEP Network released a "Call for Participants' ' to offer direct technical, financial, and training assistance to municipalities, Tribes, and non-profits in the SNEP watershed. Through a competitive process, WTGHA was awarded technical assistance to develop a long-range strategy to manage its tribal lands in a manner that addresses both short-term stormwater management threats to the community and impacts to habitat as well as long-term management strategies to build reservation-wide climate resilience.

After multiple coordination discussions between WTGHA and SNEP Network partner organization <u>Throwe Environmental, LLC</u>, it was agreed that the product of the Tribe's technical assistance grant would build off existing efforts to develop a tribal Climate Adaptation Plan. Thus, this document serves as the culmination of the SNEP technical assistance project, as well as several years of tribal climate adaptation planning.

Resilience Action Framework¹

From Fall 2021 to Spring 2022, tribal staff held several bi-weekly meetings with staff from Network partner organization Throwe Environmental. Throwe used its "Resilience Action Framework" to guide these conversations, exploring how the Tribe's efforts to-date position it for sustainable action to address climate concerns. The Framework began with an assessment of the Tribe's capacity to address its climate concerns through engaged leadership and community. Throwe worked with Tribal staff to analyze relevant climate hazards and identify at-risk assets and populations. Together, the group explored potential actions, as well as associated options to fund and implement priority projects.

¹ Graphic of Resilience Action Framework: Throwe Environmental, 2022

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KEY TERMS AND IMPORTANCE OF LANGUAGE

Adaptation (climate change): actions in response to actual or expected climate change and its effects, that lessen harm or exploit beneficial opportunities. It includes reducing the vulnerability of people, places, and ecosystems to the impacts of climate change.

Adaptation Plan: documents how an entity identifies and assesses the vulnerability of key concerns and planning areas that are likely to be affected by changing climate conditions; develops adaptation goals and actions to reduce vulnerability and increase resilience; and establishes a plan to implement and monitor success of adaptation actions.

Adaptive Capacity: the ability of a system to accommodate or adjust to the changes in climate with minimum disruption or cost. Generally, systems that have high adaptive capacities are better able to deal with climate change.

Climate: the "average weather", generally over a period of three decades. Measures of climate include temperature, precipitation, and wind.

Climate Change: any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period of time (decades or longer). Climate change may result from natural factors and processes and from human activities that change the atmosphere's composition and land surface.

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

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

Hazards: the direct effects of climate change, including changes in temperature, precipitation, extreme events, and water resource quality and availability.

Impacts: the effects on human and natural systems of climate change hazards; more vulnerable communities will experience more pronounced impacts of climate change.

Mitigation (climate change): actions that reduce the levels of greenhouse gasses in the atmosphere; includes reducing emissions of greenhouse gasses and enhancing sinks (things that absorb more greenhouse gasses than they emit) and management strategies that enhance resilience of resources impacted by climate change. Examples include switching to renewable energy sources and implementing energy efficiency measures.

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

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

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

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

Resilience: ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning; the capacity for self-organization and the capacity to absorb stress and change.

Risk: consequence of an impact X probability, or likelihood that the impact will occur.

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

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

Traditional Ecological Knowledge (TEK): An intimate knowledge of the environment acquired by indigenous peoples through direct interaction over many years, passed down from generation to generation.

Tribe: The Wampanoag Tribe of Gay Head (Aquinnah).

Vulnerability: the susceptibility of a system to harm from climate change impacts. It's a function of how sensitive the system is to climate and the adaptive capacity of the system to respond to such changes. Generally, systems that are sensitive to climate and less able to adapt to changes are considered to be vulnerable to climate change impacts.

EXECUTIVE SUMMARY

Planning Scope

WTGHA is a community of Indigenous people who have lived on Martha's Vineyard for thousands of years. The Tribe and its members rely on tribal lands and waters for cultural and spiritual nurturing, as well as for basic food and medicine sustenance. In short, the land is everything and water is life. Any planning for tribal lands must recognize and incorporate the Tribe's undeniable reverence for the land and waters.

Planning to protect tribal lands includes an assessment of vulnerabilities and mitigation measures for all of the Tribe's land area. However, there are tribal members living and working on lands and waters that are not tribally owned. Tribal members rely on sustenance resources found in, on, and around the lands and waters of the entirety of Martha's Vineyard. In order to adequately protect the lives, property, and livelihoods of all the tribal members on the Vineyard, it is essential to also review vulnerabilities and mitigation measures in the context of the Vineyard as a whole, as well as to identify actions and plan for partnerships that might support protection for those vulnerabilities.

Executive Summary of Findings

Increased precipitation, sea level rise, extreme storms, erosion, and rising temperatures are anticipated to be the Tribe's most challenging hazards. These hazards will likely impact every priority area the Tribe has identified, including natural resources, tribal lands, housing, water resources, emergency management, and social concerns and community amenities. However, given the Tribe's history with and knowledge of the island, they are uniquely suited to adapt to these challenges. Additionally, previous planning efforts complimented by findings in this report allowed the Tribe to identify actions to protect assets in each focal area.

Summary of Implementation Steps

This action plan represents opportunities for the Tribe to advance our climate adaptation goals and objectives towards implementation. In order to fully implement the goals of this plan, dedicated funding and capacity will be necessary. Recognizing this need, we will explore not only programmatic actions, but funding and investment opportunities as well.

Adaptation Actions

The Wampanoag Tribe of Gay Head (Aquinnah) plans to take the following actions to mitigate, adapt to, and recover from the climate hazards identified in this report:

• Mitigate shoreline erosion by investigating the feasibility of restoring shoreline with native plants and shrubs;

- Further research sea level rise and seek the consultation of local experts for possible ways of increasing resilience to the flooding that will accompany it;
- Reduce tribal carbon footprint through reduced dependency on fossil fuels and increased use of renewable energy programming, and energy audit all tribal buildings;
- Improve air quality through tribal ordinances pertaining to open burning and idling zones, lessening the number of trees cut down annually, and the planting of new trees;
- Encourage food security and food sovereignty through reestablishment of traditional food systems and community farming; and
- Establish an emergency management plan that includes response to extreme weather events.

Funding and Investment Actions

It is recommended that the Wampanoag Tribe of Gay Head (Aquinnah) take the following actions in order to successfully fund planned adaptation actions:

- Refine project priority list to include more specific details, including order of magnitude cost estimates, department responsible, design needs and specifications, etc.
- Further explore federal and state resources, including the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) to fund priority projects from project priority list
- Prioritize funding for an external contractor to develop the project priority list and/or support grant writing associated with applying for BIL, IRA, and other funding opportunities
- Begin coordinating with regional Tribes and Nations to implement longer-term funding and investment recommendations included in attached memorandum (**Appendix B**).

INTRODUCTION

The Wampanoag Tribe of Gay Head (Aquinnah): An Ancient History and Culture

The Tribe has inhabited the coastal island of Noepe (Martha's Vineyard) for over thirteen thousand years. Originally inhabiting circular, bark-covered wigwams called wetus, the Tribe's ancestral lands have always been on the southwestern end of the island. As hunters, agriculturalists, whalers and fishermen, all forms of sea-life (such as turtles, whales, seals, fin-fish and shellfish) were an integral part of their subsistence and represent a significant aspect of tribal culture and tradition. They hunted on land and sea and gathered shellfish, plants, fish, and fowl, including the heath hen and the passenger pigeon which are no longer found living on the Vineyard or anywhere else.

After the arrival of the English approximately 400 years ago, the Tribe's lands were drastically reduced in size. The settlers brought significant changes to the landscape, building more permanent dwellings, damming the few streams for mills to grind their corn and grain, and constructing wharves to accommodate their large watercraft. By the 1700's, there were English settlements over most of the Vineyard, and by the 1800's the Wampanoag influence was reduced to three remaining villages: Aquinnah, Christiantown (West Tisbury), and Chappaquiddick (Edgartown). The area from Nashaquitsa Pond to the Cliffs became an Indian District, eventually governed by three tribal overseers. In 1870, the Indian District was changed into the town of Gay Head by a vote of the Massachusetts General Court, over great objection from tribal members. Indian District Common Lands were then taken by the state and divided into private parcels, while some remained as Common Lands. This had a resounding impact on the Tribe.

Through it all, the Tribe adapted and persisted as a sovereign Tribe, and today still controls and inhabits some of the ancestral lands in Aquinnah. The enrolled membership of the Tribe exceeds 1,100, not all of whom reside on tribal lands or even on Martha's Vineyard. Approximately 130 residents inhabit tribal housing in Aquinnah today. Tribal members continue to be very active in town government, with the three town-elected selectmen positions filled by tribal members. In 1987, after two petitions and lengthy documentation, the Tribe obtained federal acknowledgement by an act of the U.S. Congress. The U.S. government acknowledged and took responsibility for inequities to the Tribe and granted partial restitution for land that was unjustly taken. In 1998, the name of the town was officially changed from Gay Head back to its former Wampanoag name of Aquinnah by the state legislature.

Today, the Wampanoag Tribe is governed by a Tribal Council, as was traditionally done. Tribal Council consists of a chairperson, vice chairperson, secretary, treasurer, and seven council members. The Chief and Medicine Man are traditional members of the Tribal Council and hold

their positions for life. Tribal Council is elected by enrolled members of the Tribe by popular vote and represents the tribal community in all tribal affairs.

Tribal Lands

Noepe (Martha's Vineyard)²

The Wampanoag Tribe of Gay Head (Aquinnah) is located on the island of Noepe (Martha's Vineyard) off the coast of mainland Massachusetts. Martha's Vineyard is approximately 20 miles long and nine miles wide, with an area of roughly 100 square miles. It is the largest island-estuary system in the State of Massachusetts. The majority of tribal lands are on the



westernmost peninsula of the Island in the town of Aquinnah. Tribal lands consist of approximately 505 acres on unconsolidated deposits, mostly glacial in origin, which gave rise to sandy-to-loamy soils. These lands consist of dune, wetland, upland, and forest mixed land types. Tribal lands are mostly undeveloped. Tribal land types consist of 57% wetlands, 29% forested uplands, 7% conservation lands, 5% developed, and 2% designated marine commercial use. The



² Map of Noepe (Martha's Vineyard): <u>https://biamaps.doi.gov/indianlands/</u>

lowest elevation on tribal lands is sea level and the highest is approximately 150 feet above sea level.

The climate is temperate maritime, the topography hilly to rolling, and the hydrology characterized by a number of small, surface water streams and upland swamps draining into large tidal ponds or the ocean. Vegetation is dominated by hardwood forest in the interior areas and scrub or grasslands near the coastline. The Island of Martha's Vineyard is a sole-source aquifer as designated by the Environmental Protection Agency in 1988. Tribal lands encompass and abut a number of water resources vital to the health of the surrounding watersheds and ecosystems.

All of the island of Martha's Vineyard owes its origin to glacial activity, with resultant hilly, morainal areas of boulders, gravel, sand, and clay, drained by a few streams. Apart from the hilly morainal areas, the remainder of the land mass of the Vineyard consists of outwash plains spreading out from the hills. The outwash plains are flat or gently sloping lands made of highly porous sand and gravel. A number of great ponds are found where the outwash plains meet the sea, most fronted by barrier beaches.

The Tribe owns land in Aquinnah, West Tisbury (Christiantown), and miscellaneous small fee simple holdings elsewhere on Martha's Vineyard.³ Of the 505 acres of landholdings in Aquinnah, 325 acres are restricted from development. These restricted lands consist of three areas known as the Aquinnah Cliffs, Herring Creek, and the Common Lands (Cranberry Land). These lands are currently managed by the Tribe for the purposes of natural resource conservation, sustenance, and cultural heritage. The remainder of the Tribe's land is the 199.8-acre Commonlands.

Aquinnah (Gay Head) Cliffs⁴

The Aquinnah Cliffs are composed of one hundred and fifty feet of sediment from six glaciers, including red and white clays, green sands, white quartz, black organic soil, and lignite. They tell the story of the past hundred million years one colorful layer at a time. According to Wampanoag tradition, Moshup created Martha's Vineyard and the neighboring islands by dragging his toe across Vineyard Sound. The streaks of red in the Cliff are from the blood of whales that Moshup would drag onto the Cliffs to cook. The discarded remains from his table are now fossilized deep in the clay. To the Tribe, the Aquinnah Cliffs are a sacred spot for the very reason that Moshup chose this special place as his home; they are a watchful place of great bounties. In this case, the legend is consistent with the scientific explanation of the tectonic moraine, where the action of three glaciers created the hills at this western edge of the Vineyard, and upon their retreat left behind the colorful folded layers of clay that we see today.

³ Map of WTGHA landholdings (BIA, 2022): <u>https://biamaps.doi.gov/indianlands/</u>

⁴ Image of Gay Head Cliffs: <u>https://wampanoagtribe-nsn.gov/</u>



Before there was even a paved road, the Aquinnah Cliffs were a destination for tourists traveling by land or sea. From far and wide people came to see the colored cliffs and the famous lighthouse with its Fresnel Lens. In the late 1800s, visitors came into Aquinnah (then Gay Head) by ship and then were driven in ox carts to see the lighthouse or dine in one of the many restaurants offering lobster dinners. The allure of the area is no less today than it was then. One hundred years later, visitors are still coming from faraway places to see the unmatched beauty of the Aquinnah Cliffs. All businesses located on the Cliffs are owned by tribal members and continue to serve visitors and provide for their needs from April to November.

The Cliffs represent a unique landscape feature for the

island. The exposed cliff faces reveal the site's soil formations and the numerous colors of clay within the seams. The area above the cliffs consists of salt tolerant grasslands that are exposed

to frequent high winds and salt spray driven by storms. Typical vegetation consists of rose, wax myrtle, and numerous forbs and grasses. The bottom of the cliffs contains a narrow sandy beach with frequent rock outcroppings. This shoreline plays an important role for harbor seals during the winter months, as well as several species of over-wintering waterfowl. A small portion of the site provides commercial use to the Tribe as a tourist destination. In addition to the Cliff's unique natural assets, the site is



strongly linked to the Tribe's history and continues to serve an important cultural and economic role.

Herring Creek and Menemsha and Squibnocket Ponds⁵

Herring Creek (9.0 acres) is a small tributary that connects Squibnocket and Menemsha Ponds. This creek performs critical ecological functions for the watershed. It serves as the main conduit of water between the two ponds. This hydrological connection allows the high-quality freshwater from Squibnocket Pond to drain to Menemsha, thus increasing its flushing and water quality. The

⁵Image of Herring Creek: <u>https://wampanoagtribe-nsn.gov/lands</u>

freshwater marshes of Squibnocket and Herring Creek also increase Aquinnah's biodiversity by supporting an additional habitat type and related organisms. Lastly, Herring Creek serves as the primary entrance for the annual run of anadromous fisheries that use Squibnocket Pond as their spawning grounds. Historically, this fish run was, (and still is) an important source of sustenance for the Tribe. Currently the Tribe uses this site as the home for an environmental testing laboratory and as access for a shellfish hatchery in Menemsha Pond.



Common Lands and Cranberry Bogs

The Common Lands (230.0 acres) represent a large area of contiguous coastal wetland habitat. These lands extend from the beach, across a matrix of dune and interdunal wetlands, to Menemsha Pond. This matrix of interdunal wetlands supports a great diversity of plants and wildlife, including many species that have long played a role in supporting the Tribe. Cranberry bogs, rabbit, deer, and beach plum are

abundant throughout the Common Lands and continue to supply sustenance to the Tribe.

Trust Lands

The 199.8-acre Trust Lands are broken into two, non-contiguous parcels. This acreage consists of upland oak forest, upland wetlands, and tribal development. The upland forest canopy is dominated by oak species including scrub oak (*Quercus ilicifolia*), while the mid-canopy is generally open with the exception of regenerating oak saplings. The ground layer within the forest is densely vegetated and dominated by fruiting shrubs such as black huckleberry (*Gaylussacia baccata*) and blueberry (both *Vaccinium corymbosum* and *V. angustifolium*). The dominant species of this forest type provide a variety of important forage (acorns and berries) for wildlife throughout the year and support populations of mammals such as deer that provide sustenance to the Tribe.

The wetlands of the Trust Lands are formed by springs and surface flow drainage patterns that occur on the landscape. These wetlands and their drainage ways support a high diversity of specialized wildlife such as common yellowthroat warblers, and spotted salamanders. They are also the home to a variety of plants used by tribal members such as skunk cabbage (*Symplocarpus foetidus*), jewel weed (*Impatiens capensis*), and watercress (*Nasturtium officinale*). The wetlands and their drainage systems create an interwoven network that allows for the movement of wetland species and territories for their offspring. An additional service the tribal wetlands provide is the filtering of water as it slowly drains to Squibnocket and Menemsha Ponds. This filtering helps protect valuable shell- and fin-fisheries that provide sustenance and economic benefits to the Tribe.

Interior Lands

The Interior Lands are host to 33 homes, all developed by the Tribal Housing Authority. In this area, there is a Tribal Community Center and administration building. Site utilities include centralized wells and a common wastewater treatment facility.

Planning Process

Climate Change and Tribes

The effects of climate change, which include altered precipitation patterns, changes to local ecosystems and culturally important plant and animal species, and more frequent and severe extreme weather events, disproportionately impacts Native American Tribes for multiple reasons (National Wildlife Federation, 2011). For example, the distribution of some native plant and animal species, which are significant components of tribal traditions, may be particularly vulnerable to climate change. Similarly, tribal lands can also be especially susceptible to weather extremes such as floods, droughts, and wildfires. Tribes often depend on the land for sustenance, economic development, and maintaining cultural traditions, and existing economic conditions may hinder the response of Tribes to weather and climate extremes. Finally, tribal land boundaries may restrict the ability to adapt to changing conditions such as weather extremes and sea level rise.

However, despite these unique challenges, Tribes also have the advantages of traditional ecological knowledge (TEK), political sovereignty, community ties, and responsive leadership that can enhance their adaptability and resilience (Grossman and Parker, 2012). Climate planning can enhance these advantages. This Climate Adaptation Plan offers a method to explore, develop, prioritize, and implement actions to address potential impacts of climate vulnerabilities in a sustainable and practical manner.

About this Plan

This plan was developed by the Wampanoag Tribe of Gay Head (Aquinnah) ("WTGHA" or "the Tribe") to document the current conditions of tribal lands that have been impacted by the changing climate, and to identify alternatives and resources to help address these concerns.

Given the Tribe's location on the island of Martha's Vineyard (Massachusetts), WTGHA is well aware of the effects that ocean storm surge can have on its lands. Tribal lands are as valued as the waters to the Wampanoag people. From the lands come food, medicine, and other useful materials. The threats of shoreline erosion, sea level rise, and saltwater intrusion are concerns clearly expressed by tribal members. Along the shoreline, sea level rise and beach erosion have contributed to a noticeable loss in sand dunes that are home to beach plum, rose hips, beach pea and other valuable plants. The Wampanoag people have lived on the island for innumerable generations and mass relocation is not a realistic option; the people are inherently tied to the land. The Wampanoag Tribe of Gay Head (Aquinnah) is planning for adaptation, in an effort to be proactive rather than reactive. The future is unknown, but planning can mitigate the extent of loss and damage.

Development and Implementation of Plan

In an effort to educate the community on current climate change issues, the Natural Resources Department of the Wampanoag Tribe of Gay Head (Aquinnah) has researched the issues and participated in trainings, workshops, webinars, and meetings, including the Climate Change Adaptation Planning Workshop (Presque Isle, ME) through the Institute for Tribal Environmental Professionals (ITEP); USET Climate Adaptation Writing Retreats and Tribal Climate Resilience Camps; the Tribal Climate Leadership Exchange hosted by the Southeast New England Program (SNEP) Network⁶; webinars presented through the Northeast Climate Adaptation Science Center; discussions with Tribal Elders; and participation in municipal and state committees on climate planning.

WTGHA's Natural Resources Department, which has led the development of this plan, will also lead the efforts to implement the plan. They will actively work with other tribal departments and committees, such as Health, Planning, Education, and Governance, to review the plan and identify the key areas in which each department/committee is needed for implementation. The plan will be reviewed regularly and revised as necessary. Each action item will be reviewed and delegated to the appropriate entity for implementation, including the seeking of outside consultants when deemed necessary. Reasonable timelines and target dates for these efforts are currently under development.

⁶ The SNEP Network's Tribal Climate Leadership Exchange was offered by Network partners during an in-person Clean Water Act Section 106/319 training event hosted by the Wampanoag Tribe of Gay Head (Aquinnah) and offered by the USEPA Regions 1 and 2 during May 2022.

BACKGROUND

Community & Leadership Engagement

Traditional Ecological Knowledge

An important aspect of this report is the Tribal perspectives and cultural representation contained within its pages. The Wampanoag Tribe has lived on Martha's Vineyard for thousands of years. During this time, the Tribe has collectively gained unparalleled amounts of traditional ecological knowledge (TEK) that has been passed down for generations. While outside experts provided support for this report, its true value comes from this internal knowledge and its future application. Over the course of the last 6 years, Tribal staff and leadership have made concerted efforts to engage Tribal members in order to document this generational ecological knowledge and identify opportunities to safeguard the Tribe's lands and ecosystems into the future. This will ensure that all mitigation and adaptation strategies resulting from this report are culturally appropriate and relevant.

Recent Climate Planning Efforts

Engagement at all levels of our community is critical for tribal climate planning efforts to successfully reach action. Early, frequent, and continued engagement with a broad group of tribal members and leaders will ensure that the recommendations that stem from this planning effort and others have strong support.

The tribal community has been involved in climate planning efforts across the island. The Tribe completed its most recent <u>Hazard Mitigation Plan (HMP) Update</u> in 2019. The HMP includes an assessment of vulnerabilities and mitigation measures as related to natural hazards, making it a highly relevant document for the Tribe's climate planning efforts moving forward. In 2020, WTGHA participated in the Town of Aquinnah's Community Resilience Building Workshop as part of the Massachusetts Municipal Vulnerability Program (MVP). The Final Report, which serves as the Town's 2020 MVP & HMP Update, provides additional detail on regional climate concerns. Since 2020, the Tribe has also been involved with island wide climate action planning efforts led by the Martha's Vineyard Commission. Other plans like the <u>Commonlands Management Plan</u> (2019), the <u>Nonpoint Source Management Plan</u> (2019), and the <u>Bay Scallop Cooperative</u> <u>Management Plan</u> (2017) are also useful resources in considering climate vulnerabilities and mitigation actions associated with some of the Tribe's most critical natural resources.

Throughout these recent planning efforts, the Tribe has engaged with regional initiatives while simultaneously producing its own internal documents. Tribal members and staff have been very involved with these processes, all of which have culminated in the development of this Climate Adaptation Plan. This plan is the Tribe's first document solely dedicated to climate change.



Climate Leadership Development

The Natural Resources Department continues to lead climate planning efforts throughout the Tribe. Most recently, these efforts led the Tribe to apply for, and be successfully awarded, technical assistance through the SNEP Network's 2021 Call for Participants. Leadership development was a key component of the SNEP technical assistance project, culminating in WTGHA participation in a two-part Climate Leadership Exchange.

Along with a Leadership Exchange workshop, Tribal staff and leaders were featured in a series of podcast episodes as part of the SNEP Network's <u>"The Leadership Exchange Podcast."</u> Tribal Elders, Council Members, staff, and community members shared their perspectives on various climate-related issues. These conversations were captured on recording, and edited into podcast episodes that WTGHA can share as audio case studies from the community. Given the importance of the Tribe's perspective for this report, you'll find excerpts from our conversations woven throughout. For a preview of what to expect from the Tribe's engagement on The Leadership Exchange Podcast, see **The Leadership Exchange Podcast**.

⁷ Timeline of Recent WTGHA Climate Planning Activities, (Throwe Environmental, 2022)

"The Leadership Exchange Podcast"

"We were given instructions. . . Take what you need, you use what you take, you never take the last of anything, and you always leave things the way that you found them." - Wampanoag Tribal Council Member and Elder, Kristina Hook. Season 2, Episode 1.





Vulnerability & Risk Analysis

While climate change is a global phenomenon, WTGHA will experience climate-driven hazards in unique ways. As a result, the assets and systems in our community will face *their own* unique risks and vulnerabilities. Robust climate planning builds on community engagement with an assessment of community-specific climate hazards. A hazards assessment helps consider the unique risks and vulnerabilities of community infrastructure and systems in the face of climate hazards. An understanding of vulnerability and risk allows the community to identify priority areas for which different action options can be explored.

Climate Hazards and Projections⁸

New England will undoubtedly continue to face significant region-specific impacts from climate change. Many climate hazards to date are water-driven, and will only intensify as sea levels continue to rise and storm events become more frequent, intense, and concentrated. Other hazards like extreme temperatures, severe erosion, and poor air quality, also pose significant

⁸ USGCRP, 2018

challenges for the Northeastern US. The primary climate hazards affecting WTGHA include the following:

Precipitation: While total annual precipitation may not change drastically across the region, the rainiest months are expected to get rainier by 2100. Estimates project that the Northeast could see an additional inch or more of rain from December through April by the end of the century.⁹ Paired with overall warmer temperatures, this will likely mean more rain and denser snowfalls in the winter months. Shifts in precipitation patterns means flooding and drought events could become more common and more intense. Lower summer precipitation rates and higher temperatures could concentrate pollutants in waterways, leading to harmful algal blooms. Longer dry periods can decrease water availability and provide an opportunity for non-native species to take hold and decrease the size and health of existing wetlands.

Extreme precipitation events (rainfall exceeding 1 in.) are expected to increase 20%-40% by the middle of the century. Extreme rain events can wash excess sediment into sensitive wetland habitats or strip vegetation from the landscape.¹⁰

Sea level rise:¹¹ Sea level has already risen by approximately 11 in. in New England over the last century.¹² By 2100, some areas of Martha's Vineyard could see between 45 in. and 56 in. of sea level rise.¹³ ¹⁴ Combined with storm surge and high tides, sea level rise is expected to cause more frequent and more intense flooding events, coastal erosion, loss of and change in habitat, and saltwater intrusion.¹⁵

Extreme storms:¹⁶ Martha's Vineyard is no stranger to severe weather. Hurricanes rarely make direct strikes, but can inflict extensive damage in a few short hours. Nor'easters strike more frequently, last longer, and are responsible for more overall damage and shoreline erosion and

⁹ 4th National Climate Assessment, Northeast Chapter

¹⁰ "Massachusetts Climate Change Projections." Resilient MA Climate Change Clearinghouse for the Commonwealth (Resilient MA). Accessed May 2018.

¹¹ Map of projected sea level rise scenarios: <u>https://vineyardgazette.com/news/2014/08/21/mvc-maps-chart-projected-sea-level-rise-island</u>

¹² K. Kunkel, 2017

¹³ Results Chapter, MV ERA01-04 Cumulative Data

¹⁴ NOAA Tides & Currents, Aug 2018

¹⁵ Map: Gombos, M., Elivin, A., and Seidel, C. Climate Change Adaptation Context 2020 Aquinnah, Martha's Vineyard Commission, Oak Bluffs, MA. 2020.

¹⁶ Map of Hurricane Inundation Areas in Aquinnah:

https://www.mvcommission.org/sites/default/files/docs/Aquinnah%20Climate%20Change%20Context%202020%20FINAL.pdf



Map of Hurricane Inundation Areas in Aquinnah

modification. WTGHA lands, located on the southwestern portion of the island with Vineyard Sound to the north and the Atlantic Ocean to the south, are especially vulnerable to disturbance from major storm events due to their position at the sealand interface.

Erosion: A primary concern for WTGHA is the loss of lands to erosion from coastal processes. Dune loss at

Lobsterville that originally occurred from Superstorm Sandy and subsequent storms is progressively getting worse. Erosion puts many rare plant species, sustenance foods, and natural medicines at risk when sand-trapping beach grass rhizomes are compromised.

Erosion at the culturally significant Gay Head Cliffs over the years has been drastic and staggering.¹⁷ In 2015, a \$3.4 million effort moved the existing lighthouse further inland by 129 feet, protecting it from another century of erosion.

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"People do not realize it but you can actually see the dunes receding back into the land. There's a house called Rainbow House, and they have a really large dune before the beach. [The water's] getting closer and closer to that house." - **Historic Preservation Officer, Bettina Washington. Season 2, Episode 1.**



Increasing temperatures: Average temperatures across New England have risen by 2°F since 1970 and could rise by more than 10°F by 2100.¹⁸ ¹⁹ Warmer temperatures, particularly during the summer where temperatures are projected to increase up to 5°F by the 2050s, can lead to

¹⁷ Image of Gay Head Light relocation: <u>http://www.gayheadlight.org/about-the-lighthouse/history/</u>

¹⁸ Mass.gov, 2017.

¹⁹ Karl et al., 2009

increased evaporation and evapotranspiration. This can lead to agricultural/ecological and hydrologic drought, loss of wetland area, and degraded water quality (Stults et al., 2016).

While extreme temperatures can refer to extreme heat *or* cold, the most frequent extreme temperature events on Martha's Vineyard are anticipated to be in the warmest summer months when more days are expected to be above 90°F. Overall, warmer temperatures are changing growing and migration cycles that have been largely consistent for centuries.²⁰ Rodents may also thrive in warmer temperatures, serving as a vector for disease.

Meanwhile, milder winters are leading to an earlier breakup of winter ice on lakes and rivers, resulting in earlier peak river flows. Milder temperatures also increase survival or forest pests. This increased survivorship can change the dynamics of existing forest health concerns attached to the impact of these forest pests.

Water temperatures and conditions: By 2080, stream temperatures across New England are expected to increase by 3°F over 1980 averages. This will likely change spawning and migration patterns.²¹ When paired with concentrations of pollution due to lower summer precipitation levels, warmed stream temperatures can cause algal blooms that threaten other species living within waterways by limiting light penetration and hindering O² levels.

Changes to coastal waterways threaten eelgrass beds, which serve as valuable breeding and nursery grounds for lobsters, crabs, and scallops; stabilize sediments and particles; filter toxic pollutants; and attenuate wave energy. Worsening storms and eutrophication, as well as unchecked recreational activities, will continue to put eelgrass beds at risk. Between 1996 and 2017, overall distribution of eelgrass in Menemsha Pond declined by more than 26%. According to recent MassGIS data, MassDEP Eelgrass Mapping Project, in 1995 eelgrass coverage in Menemsha Pond was 426.45 acres. In 2017, eelgrass coverage was 314.76 acres^{22 23}

Air quality: Climate variables such as temperature, humidity, wind speed and direction all contribute to and are expected to influence air quality.²⁴ For example, the formation of ozone, which can have significant respiratory effects, increases with greater sunlight and higher temperatures. Levels of PM2.5 (a complex mixture of solid and liquid particles of less than 2.5

²³https://www.google.com/url?q=https://mvmagazine.com/news/2021/04/28/getting-deepseaweeds&sa=D&source=docs&ust=1678471768647382&usg=AOvVaw26P0hRdVGSp8F5OltPlgji

²⁰ Frumhoff et al., 2007

²¹ Mass.gov, 2017.

²² MassGIS, Mass DEP, 2017, WTGHA Natural Resources Department

²⁴ Rosenzweig 2011

millionths of a meter in diameter that can lead to a number of adverse health outcomes, including heart and lung disease) are also likely to increase with climate change.^{25 26}

Observed and Expected Impacts

Given the diverse range of climate hazards expected to impact the Tribe into the future, it is almost certain that climate change will affect most, if not all, of the Tribe's priority areas — either directly or indirectly. The following section surveys observed and expected climate impacts across the Tribe's various priority areas and resources.

Natural Resources - Flora: Local flora are critical to the Tribe as they provide culturally significant sustenance foods and essential natural medicines. In addition to this, they also provide important climate resilience and water quality benefits, stabilizing dunes and filtering polluted runoff before it can reach nearby waterways. Native plant species may be especially vulnerable as historic temperatures and precipitation patterns begin to shift as a result of climate change.

- <u>Medicine Herbs.</u> The accessibility and availability of traditional plants, roots, and other resources may change as distributions and habitats of species shift.
- <u>Berries.</u> The cranberry lands face a high level of vulnerability to the effects of climate change as increasingly warmer winters hinder the cranberry's ability to flourish. The propagation of invasive species within the bogs has also negatively impacted this important sustenance crop. Other fruiting species include blueberry both high bush and low bush, beach plum, blackberry, raspberry, huckleberry and rose hips can be vulnerable to sea level rise and salt water intrusion, each having sustenance qualities as well as medicinal properties.
- <u>Vegetation</u>. Vegetation on tribal lands predominantly consists of herbaceous vegetation with a few scattered shrubs. The herbaceous layer is dominated by Cranberry (*Vaccinium macrocarpon*) and Sphagnum moss (*Sphagnum sp*.). Two rare herbaceous plants are found in the Common Lands, Rose Pagonia (*Pagonia ophioglossoides*) and Grass Pink (*Calopogon tuberosus*). Rose Pagonia is considered rare on the island in general; however, it is locally abundant in the Common Lands. On the island, Grass Pink has only been recorded at five other sites. Other herbaceous plants found in these bogs include Woolgrass (*Scirpus cyperinus*), Soft Rush (*Juncus effuses*), Cinnamon Fern (*Osmunda cinnamomea*), Royal Fern (*Osmunda regalis*), Downy Broome (*Bromus tectorum*), Steeplebush (*Spirea tomentosa*), and Cottongrass (*Eriophorum sp*.).

One rare shrub species, Nantucket Shad (*Amelanchier nantucketensis*), is common within the larger cranberry bogs. This shrub is considered occasional on the island; however, it

²⁵ Hogrefe et al., 2006

²⁶ Rosenzweig 2011

is designated as a Species of Special Concern within Massachusetts because its global range is restricted to the islands of Nantucket and Martha's Vineyard. Other shrubs found in this area include: Highbush Blueberry (*Vaccinium corymobsum*), Arrowwood (*Viburnum dentatrum*), Bayberry (*Myrica pennsylvanica*), Sweet Pepperbush (*Clethra alnifolia*), Sheep Laurel (*Kalmia angustifolia*), Swamp Azalea (*Rhododendron viscosum*), Willow species (*Salix sp.*), Chokeberry (*Aronia sp.*), Beetlebung (*Nyssa sylatica*), Pitch Pine (*Pinus rigida*), and Bear Oak (*Quercus illicifolia*). All of these species are considered important for cultural and/or sustenance purposes to the Tribe.

Natural Resources - Fauna: Native fauna are also at increasing risk as a result of climate change. Warming temperatures and precipitation changes will alter the survival, distribution, and seasonality of some wildlife and game species. Additionally, as the climate becomes more extreme, summer months will become longer and winters shorter. Migration changes will have huge impacts on wildlife, from migratory birds to fish and whales to beetles and butterflies. Rising temperatures and increased precipitation may result in the pollution of local air and waterways, as well as the spread of vector-borne disease, all of which will negatively impact local fauna and the Tribe.

• <u>Herring and Herring Creek.</u> Herring Creek is critically important culturally and ecologically, in part because it serves as the only passage for Blueback herring (*Alosa aestivalis*), Alewife (*Alosa pseudoharengus*) and American eels (*Anguilla rostrata*) and is a spawning area for Atlantic Horseshoe crabs (*Limulus polyphemus*). Populations of these species are in dramatic decline. Warming stream temperatures are adversely affecting migratory and spawning patterns. Herring, an important cultural resource to the Tribe, make the journey from the Atlantic Ocean into Menemsha Pond to spawn every spring. Warmer stream temperatures and lower summer flows are expected to have contributed to a decline in the number of herring in recent years, as these factors can alter migration and spawning timing; range and distribution; growth rates; and vulnerability to toxins, parasites, and diseases. Conversely, increased winter high flows scour the streambed, increasing egg mortality.

"The Leadership Exchange Podcast"

"What was once millions upon millions of herring coming through the run every year is now in the tens of thousands. We've been tracking and counting the population as a program for the Tribe for maybe seven years. We're only talking about tens of thousands of fish annually." - Tribal Ranger and Keeper of the Gay Head Light, Chris Manning. Season 2, Episode 1

Fish contamination. Fish on Martha's Vineyard are at increased risk of mercury contamination. USEPA Region 1 has identified the level of mercury in fresh water fish within ponds on Martha's Vineyard, within the traditional harvest area of the Wampanoag Tribe of Gay Head (Aquinnah). This information is critically important to the Natural Resources Department and Tribal Membership due to the relationship between particulate deposition and sustenance foods on and near Tribal Trust Lands. Based on current air monitoring data and the absence of industrial activities on or near tribal properties, the link between air deposition and bioaccumulation of metals and particulate matter in fish and shellfish warrants investigation.

In addition to the increase in mercury, run off from extreme rainfall events can cause pesticides and other chemicals to be washed into the water bodies where they can be ingested by fish which, when consumed, ultimately expose humans and animals to contaminants.

- <u>Birds.</u> Over 80 species of birds are found up-island, two of the most well-known being the piping plover and the osprey. These and other coastal nesting birds are some of the most threatened by climate change. Statewide, 43% of birds are highly vulnerable and 15% are likely vulnerable to climate change. Locally, 30% of our breeding birds are already on the decline. Past storms have had devastating effects on nesting sites, such as Lobsterville Beach. Overwash of dunes at these sites, as well as flooding, leaves no place for shore birds to nest. With increased precipitation, even the osprey (a bird that nests on telephone poles and other high areas) will face hardships from the flooding.
- <u>Bay scallops, quahogs and other shellfish.</u> The bay scallop (*Argopecten irradiens*) is of special importance as tribal sustenance food and for its economic value. The quahog (*Mercenaria mercenaria*) is vital not only an important food to the Tribe, but also the principal material for making shell wampum. The Wampanoag are known historically for the manufacture and use of wampum as a trade item. Wampum belts were sacred and

an important cultural property. Intricate trade patterns are documented through Wampum found great distances inland, as evidence of trading. Today, many tribal members are adept in the making of wampum replicas, generally as jewelry that is traded or sold.²⁷ All shellfish species are at risk from climate change, as rising sea levels reduce the extent of estuarine beach habitats. Where shorelines are armored, it can be impossible for intertidal zones to shift and adapt, thereby reducing habitat for shellfish species that depend on these zones. Increased bacteria also threaten the survival of traditionally harvested shellfish, while ocean acidification degrades the ability of shellfish (scallops, quahogs, oysters, crabs, etc.) to form and maintain their shells, which is vital to their survival.

- Land Mammals. Climate change has the potential to change species' ranges and to flood ancestral lands. Many tribal members rely on traditional food sources, and members fish and hunt species that may be vulnerable to climate change. White-tailed deer, rabbits, squirrel, otter and raccoon are among the many species on the island that will be impacted by climate change. On the island of Martha's Vineyard, there are very few apex predators to control an increase in population, especially deer. With the milder winters comes an increase in pathogens that use these animals as one of the vectors for disease, such as ticks and mosquitos (see below).
- <u>Marine Mammals.</u> One of the most common responses of marine mammals to temperature changes is shifts in their migratory patterns, which could result in alterations of the ranges of the species. Changes in water temperatures could alter the life cycles of their preferred food and thus disparity between the abundance of prey and those of marine mammals. This situation could be particularly critical for migratory species that travel long distances between feeding and breeding areas, such as the Right whale, and species that depend on prey as a source of protein for lactation or for weaned calves²⁸. The increase in ocean temperatures could also affect the reproductive success of marine mammals, as has been reported for female sperm whales, which have lower conception rates after long exposure to higher sea surface temperatures than usual. Finally, increases in ocean temperatures, as well as other factors such as increases in acidity and decreases in salinity, can have direct impacts on the survival rates of marine mammals by increasing the potential of an increase in pathogens as ranges shift. Despite the large potential

²⁷https://www.google.com/url?q=https://wampanoagtribe-

nsn.gov/wampum&sa=D&source=docs&ust=1678471768659597&usg=AOvVaw0M5Y6D6WNmpRxMo7qyRBTj

 ²⁸ Albouy, C., Delattre, V., Donati, G. et al. Global vulnerability of marine mammals to global warming. Sci Rep 10, 548 (2020). https://doi.org/10.1038/s41598-019-57280-3

impacts of ocean warming on marine mammals, the global vulnerability of marine mammals to global warming is poorly understood²⁹.

- <u>Domesticated Animals.</u> Not only are wild animals impacted by climate change, but domesticated animals are as well. Extreme weather events such as hurricanes and tornadoes frequently displace or even kill household pets. Meanwhile the rising costs of grain as a result of climate change has caused abandonment and starvation of many horses and other grain-dependent animals. Diseases spread by invasive species and heatrelated illnesses are also increasing with the changing climate, exposing domestic animals to diseases they would not otherwise have been exposed to.
- <u>Ticks.</u> Climate change is predicted to lead to new challenges with insect and disease management as longer growing seasons and warmer winters benefit insect populations and invasive species.³⁰ Similarly, vector species such as mosquitoes, ticks, midges, and other biting insects respond considerably to small changes in temperature. Tick-borne diseases such as Lyme, babesiosis, alpha gall syndrome, and ehrlichiosis are spreading and moving northward as temperatures increase.³¹ The life cycle and prevalence of deer ticks are strongly influenced by temperature and humidity (they are most active above 45°F and in 85% or higher humidity). Warming temperatures are projected to increase the physical range of suitable tick habitat, and shorter winters could extend ticks' annual period of activity. Unlike some other vector-borne diseases, tick-borne diseases are less influenced by short-term weather changes than longer-term climate change.
- <u>Mosquitoes.</u> Tidal marshes on tribal lands are typically filled with stagnant water and are unable to flush due to damaged culverts. The stagnant water has become a breeding ground for mosquitoes, leading to a growing fear of the possibility of West Nile Virus.

Tribal lands - Wetlands:³² The wetlands found on the reservation, which are managed by the Natural Resources Department, are predominantly coastal wetlands or salt marshes (also known as shrub wetlands, scrub-shrub, scrub swamp, or bog wetlands), vernal pools or bogs, and forested wetlands. Collectively, these wetlands compose 57% of tribal land area and play a vital role in the health of area watersheds. Wetlands provide critical habitat for many fish, shellfish, amphibian, waterfowl, insect, medicinal plant, migratory bird, and mammal species — all vital to the Tribe. They also protect and enhance water quality by buffering shorelines from wave action, stormwater runoff, and erosion; provide recreation and aesthetic value; and can serve as

 ²⁹ Albouy, C., Delattre, V., Donati, G. et al. Global vulnerability of marine mammals to global warming. Sci Rep 10, 548 (2020). https://doi.org/10.1038/s41598-019-57280-3

³⁰ Rosenzweig, 2011.

³¹ Rosenzweig, 2011.

³² Defined as a body of water with a depth of less than two meters.

important cultural sites.³³ Tribal wetlands are designated as Critical Natural Landscape by the Massachusetts Division of Fisheries and Wildlife (2012) based on their potential to support inland migration of coastal marshes under rising sea levels. They are also valuable nesting habitats for federally-listed threatened piping plovers (*Charadrius melodus*) and foraging habitat for the federally-listed endangered roseate tern (*Sterna dougallii*).

<u>Coastal wetlands.</u> Coastal or shrub wetlands tend to be dominated by woody vegetation, deciduous and evergreen shrubs, trees stunted by environmental conditions, and young trees less than 20 feet tall.³⁴ Shrub wetlands are found along the perimeter of waterways and are usually waterlogged during the growing season. These wetlands provide important flood retention value as well as serving as an important habitat for a variety of plants, fish, and larger mammals, including deer.

Shrub wetlands are particularly sensitive to precipitation patterns, increased runoff, and warmer temperatures. Wet periods expand and elevate water levels in the wetlands, increasing water depth and affecting the plant species. Extended dry periods reduce wetlands' overall size, drying out soils and stressing plants adapted to wetter soils. Warmer summer temperatures and increased evapotranspiration degrade the health of the wetlands. Future climate-driven land use changes could significantly affect the ability of the wetlands to utilize their flood absorbing capabilities, leading to more flooding, salt intrusion into freshwater bodies, greater erosion, and increased road runoff.

The predominant area of contiguous coastal wetland habitat on tribal lands is known as the Common Lands (230-ac.). These lands extend from the beach, across a matrix of dune and interdunal wetlands, to the Menemsha Pond Complex. This matrix supports a great diversity of plants and wildlife, including many species that have long played a role in supporting the Tribe. In the Common Lands, the majority of the degradation to wetlands comes from road/trail runoff, stormwater, invasive species, and coastal storm surge, all of which are expected to worsen with climate change.

 <u>Vernal pools and cranberry bogs</u>: Cranberry bogs are relatively rare wetlands that exist only in depressions in coastal dunes that are low enough to be inundated by groundwater. Thus, water levels in bogs fluctuate with the surrounding groundwater as their soils are relatively thin layers of organic materials underlain by sand. For more information on the impacts of climate change on cranberry bogs, see below.

³³ Stults et al., 2016.

³⁴ Cowardin et al. 1979

The Cranberry Bogs and Climate Change³⁵

On the second Tuesday in October, we celebrate Cranberry Day, a recognized holiday established to harvest. Children are excused from school to gather in the bogs with hand scoops to celebrate the year's bounty. We celebrate Cranberry Day at the start of harvest season each year, highlighting the important cultural role of the cranberry.

The cranberry bogs on tribal lands have been the site of these celebrations for hundreds of years, despite many changes in the landscape and bog productivity. Over the past few decades, reductions in cranberry production within these bogs have provoked plans for bog restoration. Tribal land includes bogs that in the 1800s produced enough to export barrels (100s of pounds) of cranberries off-island (Elvin, 2014). Today,



Photo Credit: Olivia Ramsay

the bogs produce only a fraction -- just enough to provide for tribal members on Cranberry Day.

Reasons for the decline in production are poorly understood. Flooding and subsequent bog modification from Hurricane Sandy, increases in percent cover of invasive plants, and growth of overstory plants have all been implicated as possible reasons for declines in production (Howard et al., 2012; Natural Resources Department, Wampanoag Tribe of Gay Head, 2013). It is possible that climate change — which is expected to lead to flooding, more frequent and intense storms, and greater prominence of invasive species — could further hinder bog productivity.

• Forested Wetlands. Another land type commonly found on tribal lands is the Forested Wetland. The dominant subsistence species in this area include Sassafras (Sassafras albidum), Blackberry (Rubus allageniensis), Highbush Blueberry (Vaccinium corymobsum), Swamp Honeysuckle (Rhododendron viscosum), Black Chokeberry (Photinia melanocarpa), Goldenrod (Solidago sp.) and Hazelnut (Corylus americana). The area of focus for projects in the Forested Wetland is the subsistence food collection areas surrounding the Tribal Administration Building and Tribal Housing Cluster. Over the last 5 years the Tribe's Natural Resources Department has begun to develop trails for subsistence food collection to prevent erosion issues associated with these activities within the forested wetland ecosystem surrounding this area.

Housing: Livability of existing housing units is a primary concern that could be worsened by climate change. WTGHA's Housing Authority operates 33 affordable units housing 130 members

³⁵ Image of Cranberry Bogs: <u>https://wampanoagtribe-nsn.gov/lands</u>

on tribal lands, all of which are currently occupied and connected to the wastewater treatment facility. These units are rent controlled with some rates determined by income. Several of these units deal with water-related issues (e.g., mold) that could be worsened by climate change.

Additional concerns exist around affordability and availability of new housing units. Similar to other tribes, our population's housing crisis has been critically exacerbated due to COVID-19. The COVID-19 pandemic and the rising costs associated with building and purchasing homes have significantly constrained the market for new affordable housing. Housing is a limiting factor for the Tribe, and additional housing units would allow more tribal members to return home, increasing the size of WTGHA's workforce and allowing for better-supported community programs and infrastructure. The Tribe has already identified potential sites for new units that would fit within the existing character of existing housing.

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"Long-term, year-round rentals are a big concern. The rental that we have is seasonal, where we only can rent there September through May. Then it becomes a summer rental with a weekly rent more than we pay for the monthly rent in the off season." - **Tribal Ranger and Keeper of the Gay Head Light, Chris Manning. Season 2, Episode 1.**



Water supplies: There is a small subset of tribal homes that are dependent on untreated groundwater to meet their needs. While saltwater intrusion is a real possibility in the future, this threat is not thought to be as immediate as some of the others, and is less widespread. The Tribe has a small wastewater treatment plant and common wells shared between homes within the Tribal Housing Authority.

Emergency Management: Traditional emergency management balances mitigation, response, and recovery. The hazards associated with climate change will impact how the Tribe is tasked with practicing emergency management. While there is no "correct" way to balance mitigation, response, and recovery, it is up to the tribal community to determine how to tolerate and manage climate risks. To be truly effective, tribal emergency management should be informed by climate projections and deliberate in how it responds to those projections.

• <u>Mitigation</u> refers to the Tribe's proactive efforts to minimize the expected climate impacts. Mitigation can be in response to a hazard that is impending in the short-term, or it can be more forward-looking by considering the likelihood of future hazards.

- <u>Response</u> refers to the Tribe's short-term efforts to react to the immediate aftermath of a natural disaster. Response efforts are event-driven and are limited by the extent to which we can coordinate post-disaster response in advance. The better prepared the Tribe's response is prior to a disaster event, the more efficient its response post-storm.
- <u>Recovery</u> refers to the Tribe's mid- to long-term efforts to restore conditions in the aftermath of a natural disaster. Recovery efforts will last weeks, months, or even years (see *Superstorm Sandy, Nor'easters, and Lobsterville*). To be most effective, WTGHA can couple recovery with future mitigation to take advantage of post-disaster momentum and build back stronger than before.
- <u>Sheltering and Evacuation</u>. In 2019, the Tribe joined with the Town of Aquinnah to form The Community Emergency Response Team (CERT). The Aquinnah CERT team has worked diligently to make sure there is adequate sheltering for town residents in emergency situations. The Wampanoag Tribe has established a Red Cross-certified shelter at the Community Center, which will serve as the overnight shelter for anyone from Aquinnah who needs shelter in an emergency. The Town Hall will serve as the daytime shelter, providing electricity during mass power outages, and a place for people to touch base with emergency personnel, and get simple nourishment. Both shelters will accommodate the needs of the community when an emergency is declared.

Superstorm Sandy, Nor'easters, and Lobsterville³⁶

In 2012, Superstorm Sandy devastated Aquinnah's Northern Shore. Lobsterville Road was severely damaged when the dune was compromised and the main culvert draining a nearby wetland was damaged and clogged. The roadway dropped over three inches. Thousands of cubic yards of dune, vegetation, and stone were lost to the sea. Public access routes to the cranberry bogs, the boat launch, and major fishing locations were also destroyed. Seawater flooded the road for a second time in less than two years when a storm surge from a Nor'easter further eroded the North Shore dune.

The impacts to Lobsterville and West Basin beaches and dunes are evident a decade later, and the implications are stark. These lands produce over 90% of the wild cranberries and Beach Plums harvested by the Tribe. These features shield tribal lands from the ocean and are vital to the protection of the cultural and ecological resources within.



In recent years, the Tribe has worked with the town, state, Army Corps of Engineers, FEMA, EPA, NRCS and U.S. Fish and Wildlife Service to assess, strategize, and plan for short- and long-term solutions to protect and restore this vital property. To ensure that ecological resources and critical infrastructure are preserved, multiple assessments are being completed (topography, storm dynamics, habitat, wildlife, wetland delineations, etc.). The Tribe used a 2016 SNEP grant to replace the severely damaged Lobsterville Road culvert. Most recently, the SNEP Network technical assistance project has assisted with prioritizing future action for Lobsterville.

Social Concerns and Community Amenities.

 <u>Community health.</u> Communities of Tribes and Nations are already disproportionately at risk of adverse health effects, and this disparity is expected to worsen. Negative impacts to community health will be inevitable as climate change brings about more extreme weather events, reduced air quality as a result of rising temperatures and wildfires, and increases in airborne allergens and vector-borne disease. These risks can include increased episodes of asthma, chronic lung disease and other respiratory illnesses, heart

³⁶ Image of compromised Lobsterville Road: <u>https://wampanoagtribe-nsn.gov/events-1/2018/4/29/beach-grass-planting</u>

disease, mental health problems, injuries, food- and water-related illnesses, and even death. Heat waves, changes in air quality, foodborne and vector borne illnesses, and other changes associated with climate change will be particularly dangerous to the health and safety of the young and the elderly, and those with existing health conditions.

- <u>Mental health.</u> Mental health is also impacted in humans as a result of mood and anxiety disorders, increases in strong emotions and stress, and a loss of connection to culture, homelands and social networks. Health risks include depression, anxiety, stress, fear, and post-traumatic stress syndrome.
- <u>Food security.</u> While agriculture is thought to be a minor concern as most plots are small
 personal plots, there is the potential for climate change to negatively influence tribal
 member's food security. Decreasing food security results from warming temperatures
 and extreme weather, which allows for the spread of insects, pests and disease amongst
 sustenance crops, food contamination and spoilage, and disrupted food supply
 distribution. Health risks include food poisoning, diarrhea, and reduced access to food.
- Livelihoods, income, and jobs. The economy is based traditionally on fishing and farming, but as the island became more popular, tourism plays an important role. The Aquinnah Circle is designated as a Massachusetts Cultural District, and is the town's economic center, providing access to the beach, cliffs, shopping, trails, parks, Aquinnah Cultural Center, and Gay Head Light. The shops up at the Circle are all Tribally owned and operated. Economic inequality on the Island is a reality. With the extreme increase in real estate prices, a lack of affordable housing, and high costs of living are a major issue on the island. The major concerns of climate impact are already making themselves known. Cost of living increases (housing, insurance, and food), shocks from extreme weather events (storms, flooding, heat, wildfire), loss of business due to "life-line infrastructure" interruptions from storms, flooding, and erosion are all factors here that have a direct impact on the Tribal community and the community as a whole.
- <u>Culture.</u> Climate change has the potential to change species' ranges and to flood ancestral lands. The Tribe's identity is strongly tied to ancestral practices, many of which are associated with the specific flora and fauna found on ancestral land and in the Vineyard Sound. For example, the Tribe extensively uses plants in cultural practices. Huckleberry, blueberry, cedar, cranberries, among others, all found in the Commonlands, are used for food, tea, and medicine and in ceremonies. Many tribal members rely on traditional food sources, and members fish and hunt (primarily deer) in the Commonlands and areas throughout the island. Traditional fisheries include shellfish, herring, and eel. The Tribe also uses ancestral land for recreation and for ceremonies.

"The Leadership Exchange Podcast"

"Scalloping really saved our lives...I have a Master's Degree and a Bachelor's Degree. One of the reasons I have those two diplomas is because I used to come home and go scalloping in the winter and that gave me money to pay for school." - **Retired Tribal Member, Barbara Gentry.** Season 2, Episode 2.

Project Priority List

Climate change will require WTGHA (and every community across the United States) to dramatically shift how it operates. These shifts will occur in two ways — directly and indirectly. First, communities across the country must make direct investments to respond to climate change with on-the-ground projects (e.g., sea walls, living shorelines, etc.), as well as new programs to support that infrastructure. Second, communities will also be tasked with adapting their existing day-to-day operations to account for the additional indirect costs associated with climate change; for example, natural resource departments will have to manage complex ecosystem disturbances while economic development offices will see fluctuations in tourism cycles. For tribal communities to adequately meet the challenges posed by climate change, they must address both the direct and indirect impacts of climate change in conjunction.

A project priority list that orders actions is an effective way for the Tribe to target and coordinate its efforts to address climate change. A robust project priority list should consider both the onthe-ground (i.e., infrastructural) and programmatic (i.e., operational) actions that can be taken to address long-term climate change.

Building on What Has Been Done

While the Tribe is already undertaking a number of programs that will help to build resilience, additional action will be needed to protect resources, infrastructure, and people as the climate continues to change. Tribal staff therefore developed a shortlist of potential adaptation measures for further consideration and evaluation. These options are presented at the end of each section, and they fall into five broad categories:

- 1. Implement protection, restoration, and management practices
- 2. Provide education and guidance
- 3. Reevaluate policies, plans, and protocols
- 4. Gather additional information
- 5. Leverage partnerships

TRIBE

Guiding Principles³⁷

The WTGHA Climate Adaptation Plan project priority list embraces the following guiding principles recommended by The Interagency Climate Change Adaptation Task Force (2010):

- <u>Adopt integrated approaches.</u> Adaptation plans should be incorporated into core policies, planning, practices, and programs whenever possible. For WTGHA, this means aligning this plan with past efforts, as well as carrying the core components of this plan forward in future planning, programmatic, and policy development efforts.
- <u>Prioritize the most vulnerable.</u> Adaptation plans should prioritize helping people, places, and infrastructure that are most vulnerable to climate impacts and be designed and implemented with meaningful involvement from all parts of society. This adaptation plan helps WTGHA target resources to help those community assets and populations that are most vulnerable.
- <u>Use the best available science</u>. Adaptation plans should be grounded in the best available scientific understanding of climate change risks, impacts, and vulnerabilities. WTGHA will continue working internally and externally to gather scientific data and base decision-making off of the best available science.
- <u>Build strong partnerships.</u> Adaptation plans require coordination across multiple sectors and scales and should build on the existing efforts and knowledge of a wide range of public and private stakeholders. The Tribe has been largely successful at collaborating internally and developing partnerships externally. We intend to continue building these relationships in a way that is collaborative *and* honors the sovereignty of the Tribe.
- <u>Apply risk management methods and tools.</u> Adaptation planning should incorporate risk management methods and tools to help identify, assess, and prioritize options to reduce vulnerability to potential environmental, social, and economic implications of climate change. This plan embraces a risk management approach, highlighting areas for concerns and targeting implementation action towards those areas.
- <u>Apply ecosystem-based approaches.</u> Adaptation plans should, where relevant, take into account strategies to increase ecosystem resilience and protect critical ecosystem services on which humans depend to reduce vulnerability of human and natural systems to climate change. Ecosystem-based or nature-based solutions have long been part of the Tribe's culture and traditions. We intend to continue prioritizing natural solutions wherever possible to strengthen critical ecosystems and our connection with the land,

³⁷ The Interagency Climate Change Adaptation Task Force (2010), <u>https://www.epa.gov/sites/default/files/2015-</u> <u>12/documents/castellan_presentation_1-13-2011.pdf</u>

waters, and living beings on the island. The Tribes traditional ecological knowledge will be key in ensuring the success of such approaches.

- <u>Maximize mutual benefits.</u> Adaptation plans should, where possible, use strategies that complement or directly support other related climate or environmental initiatives, such as efforts to improve disaster preparedness, promote sustainable resource management, and reduce greenhouse gas emissions including the development of cost-effective technologies. With limited tribal capacity, the Natural Resources Department intends to continue coordinating efforts to make the most of existing and future resources.
- <u>Continuously evaluate performance.</u> Adaptation plans should include measurable goals and performance metrics to continuously assess whether adaptive actions are achieving desired outcomes. As with all tribal plans, the Natural Resources Department will revisit this plan periodically to assess progress and update as necessary.

Project Priority: Natural Resources

Proposed actions from the Cooperative Resource Management Plan for the Bay Scallop are denoted with [CRMPBS]. Proposed actions from SNEP/WTGHA project discussions are denoted with [SNEP].

Eelgrass: Eelgrass beds benefit the surrounding ecosystem and the Tribe by providing valuable breeding and nursery grounds for lobsters, crabs, and scallops, stabilizing sediments and particles, filtering toxic pollutants, and attenuating wave energy. As such it is imperative that the Tribe protect and restore the declining eelgrass beds through proactive mitigation and restoration activities.




- Recent actions. In September 2017, an area that was identified as previously supporting eelgrass (but at the time was devoid of it) was planted with approximately 2000 eelgrass plants with targeted experimental approaches. Biodegradable grids (BDGs) and ceramic weights were used to support eelgrass as they took root and spread. Over time, the BDGs and ceramic weights degraded, leaving only the rooted eelgrass behind.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities of eelgrass:
 - Undertake a review of practices that may directly damage eelgrass beds (e.g. moorings, scallop dredges, propeller damage, excess nutrients from upland sources) to determine the short and long-term nature and significance of those impacts, and explore methods to minimize impacts. [CRMPBS]

Herring: The resilience vision for the herring and Herring Creek focuses on sustenance and food, cultural usage of the land, and environmental health. To that end, sustaining and improving on these resources is of utmost importance.

- <u>Recent actions.</u> A number of actions to protect and improve upon the herring and herring creek have been proposed and/or implemented thus far; they include the following:
 - In an effort to facilitate migration and reverse the effects that years of sedimentation have had within the watercourse, the Tribe opted to dredge selected areas within Herring Creek in 2021. Removal of the accumulated sediment helped to increase tidal flushing within the creek and create adequate water depths that promote the fish run/passage of river herring (alewife and blueback herring) as well as other important species identified to have spawning run and/or critical life stage habitat in Herring Creek American eel (Anguilla rostrata), white perch (Morone americana), and Atlantic tomcod (Microgadus tomcod). The project also promoted other wildlife and recreational uses within the creek and connected ponds.
 - In 2019-2021, the Tribe stabilized and restored approximately 100 feet of stream bank along the Herring Creek using erosion control methods of coir logs and jute matting planted with native grasses and shrubs.
 - When the Tribe recognized the steep decline of the herring fishery in Aquinnah, all commercial taking of herring was put on hold until the numbers of fish improved and herring became more abundant. In 2016, the Natural Resources Department began to monitor Blueback Herring in hopes of restoring the population.

- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities of the herring population and Herring Creek:
 - Continue to prepare herring run for advancing storm vulnerability and sea level rise through continued monitoring, dredging, and revegetation. [SNEP]
 - The Tribe has considered permitting to put in jetties/groins to mitigate sea level rise, however permits were never actively pursued. The Tribe will look into this option further and, if deemed appropriate, actively pursue the necessary permits. [SNEP]
 - Continue to monitor and repopulate the herring population. [SNEP]
 - Improve built structures around Herring creek, including a new structure at the mouth of Herring Creek to prevent sand from flowing back into the Creek. [SNEP]

Shellfish and Scallops: The Bay Scallop and other shellfish are a critical sustenance food and economic resource for the Tribe. Resilience of these species must focus on sustaining and enhancing habitat and propagation to ensure long-term survival.

- <u>Recent actions.</u> The Tribe maintains programs to protect and enhance the scallop fishery, including a certified water quality laboratory that tests surface water within the Menemsha Pond Complex on a weekly basis. The laboratory assesses the presence and concentrations of various water quality criteria and contaminants to help maintain the physical, chemical, and biological integrity of these waters and identify water quality trends that could impact the natural resources within the Complex.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities of shellfish and scallop populations:
 - Potential for Shellfish hatchery to expand and collaborate further. [SNEP]
 - Develop a strategic plan for the shellfish hatchery. [SNEP]
 - Support research activities, regulatory management changes, public education initiatives, capital improvements, and related fund-raising activities aimed at reducing nutrient inputs from anthropogenic sources. [CRMPBS]
 - Conduct or support research to better understand the links between shellfish habitats, population dynamics, and anthropogenic activities that introduce chemicals to Menemsha waters. [CRMPBS]

- Develop a better understanding of the sources and impacts of HABs on shellfish and their habitat. [CRMPBS]
- Support or conduct research to address potentially harmful blooms in local waters. [CRMPBS]
- Develop and implement a strategy to track the effectiveness of scallop propagation activities in terms of supplementing the commercial and recreational harvests. Strategy should (1) Identify locations best suited for larval release (e.g. areas with larval retention), (2) Examine the timing of larval release in terms of survival, and (3) Conduct post-set release and associated monitoring for survivability. [CRMPBS]
- Continue current scallop propagation efforts such as the larval release program and, based on results of the study of propagation effectiveness, consider pursuing opportunities to expand propagation activities, including expansion to different species (e.g. oysters). [CRMPBS]
- Develop seed management protocols for transplanting seed. Protocols should include (1) Outline criteria for seed sanctuaries, and (2) Review of the effects of protocols and adapt as appropriate. [CRMPBS]
- Continue to develop scallop spawning sanctuaries, through the use of spawning cages, to increase larval survival, and monitor impacts of sanctuaries. [CRMPBS]
- Ensure stable funding for sufficient staffing of all management activities, including research, water quality testing and analysis, propagation, enforcement, and the use of interns and seasonal employees. [CRMPBS]
- All personnel involved in the management of shellfish resources and enforcement of shellfish regulations should attend periodic joint-training sessions (facilitated by fishermen and managers together) to ensure consistency of enforcement. [CRMPBS]
- Develop and implement an outreach strategy to educate the public about how land and water-based activities can affect shellfish habitat. [CRMPBS]
- Provide information on "best fishing practices" for recreational fishermen, including tips on how to identify legally harvested scallops, where to access the water, how to be safe while harvesting, and how to minimize impact on the habitat. This includes (1) Improving outreach to let people know that recreational permits are required to harvest shellfish, (2) Using the outreach opportunity as a way to improve community awareness of the issues facing the shellfisheries, and (3) Including information about

how the money raised by license sales helps the fishery and the island economy. [CRMPBS]

Invasives: Invasive species pose a threat to a number of important Tribal assets, including the cranberry bogs, local flora and fauna, and the community's overall health. Resilience on this front will focus on mitigation and control.

- <u>Recent actions.</u> A biologist looked at the invasive species Spotted Knapweed in 2020 and found that the Tribe would end up losing more sand and dune during removal in areas where it is extremely prolific. For these reasons, priority has shifted away from removal and towards mitigating proliferation.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities associated with invasive species:
 - Review BMPs to reduce the risk of spreading invasive species and pathogens within and across waterways. This includes implementing educational campaigns for boaters regarding biological security. [NPS]

The following table prioritizes the aforementioned actions to address natural resources in terms of high, medium, and low priority.

Natural Resources				
Priority	Priority Action	Sub- category	Notes/ Justification	Potential Funding Source
High	Continue to prepare herring run for advancing storm vulnerability and sea level rise through continued monitoring, dredging, and revegetation.	Herring	Herring protection and repopulation was cited as the Tribes top natural resources priority due to the important cultural and economic implications.	National Oceanic and Atmospheric Administration Fish Passage Grants
High	Continue to monitor and repopulate the herring population	Herring	Herring protection and repopulation was cited as the Tribes top natural resources priority due to the important cultural and economic implications.	TBD
High	Continue and expand current scallop propagation activities	Scallops and Shellfish	To enhance the scallop population which contributes to the Tribe's social, cultural, and economic well-being	NOAA Fisheries Regional Aquaculture Pilot Projects

				Grant Program
High	Continue to implement watershed nutrient mitigation strategies	Native ecosystem restoration/ resilience	To ensure that our watersheds and single source aquifer are protected against the increasing pressures of climate change and population growth	US EPA grants, BIA grants, others TBD
High	Ensure stable funding for sufficient staffing of all management activities	Scallops and Shellfish	To promote healthy ecosystems	Bipartisan Infrastructure Law Funding - Aquatic Ecosystem Restoration and Protection Projects Program
High	Collaborate with entities island-wide to create regulations to protect the single- source aquifer	Watershed Protection	To ensure that our watersheds and single source aquifer are protected against the increasing pressures of climate change and population growth	TBD
High	Create Guidelines to promote native vegetation on municipal and private lands	Native ecosystem restoration/ resilience	To ensure that natural resources and biodiversity on Martha's Vineyard are cooperatively managed and protected to maintain and promote habitat health, connectivity, and resiliency	TBD
Medium	Improve or construct built structures around Herring Creek.	Herring	There is a need for a built structure at the mouth of the creek to prevent sand from flowing back in. Unfortunately, due to funding and capacity challenges, and challenges with neighboring landowners, likelihood of completion is low.	TBD
Medium	Undertake a review of practices that may directly damage eelgrass beds and take steps to minimize impacts.	Eelgrass	To reduce the negative impact of humans on aquatic ecosystems	TBD
Medium	Develop a strategic plan for the shellfish hatchery	Scallops and Shellfish	To enhance the scallop population which contributes to the Tribe's social, cultural, and economic well-being	TBD
Medium	Develop a better understanding of the sources and impacts of HABs on shellfish	Scallops and Shellfish	To reduce the negative impact of humans on aquatic ecosystems	TBD

Medium	Support or conduct research to address harmful algal blooms, their sources, and impacts on shellfish	Scallops and Shellfish	To promote healthy ecosystems and minimize disruptions	TBD
Medium	Develop and implement a strategy to track the effectiveness of scallop propagation activities	Scallops and Shellfish	To enhance the scallop population which contributes to the Tribe's social, cultural, and economic well-being	TBD
Medium	Review BMPs to reduce the risk of spreading invasive species and pathogens within and across waterways	Invasive Species	To promote healthy ecosystems and minimize disruptions	BIL funding - Direct Federal Spending for Invasives
Low	Reduce nutrient inputs from anthropogenic sources through research, education, and regulations	Scallops and Shellfish	To promote healthy ecosystems and minimize disruptions	TBD
Low	Host periodic joint- training sessions for all personnel involved in the management of shellfish resources	Scallops and Shellfish	To ensure uniform enforcement and sustainable management	TBD
Low	Develop and implement and outreach strategy to educate the public about how land and water activities impact shellfish	Scallops and Shellfish	To ensure informed, sustainable land and water uses and minimize impact on aquatic ecosystems	TBD
Low	Provide information on "best fishing practices" for recreational fishermen	Scallops and Shellfish	To ensure sustainable fishing practices	TBD

Project Priority: Tribal Lands

Proposed actions from earlier drafts of the Climate Adaptation Plan are denoted with [CAP]. Proposed actions from SNEP/WTGHA project discussions are denoted with [SNEP].

Cranberry Bogs. The cranberry has significant cultural relevance for the Wampanoag people. Resilience for this important crop will mean preserving it now and for future generations. The Tribe has already conducted a number of notable projects to restore the bogs, and even more are planned.

- Recent actions. While the roadway itself is owned by the Town of Aquinnah,³⁸ lands to either side and below the roadway are Tribal Trust lands. The Natural Resources Department contracted George Sourati from Sourati Engineering to design a plan that assures safe roadway travel, reduces direct runoff flowing into the bogs, and treats the runoff however possible. The benefit of these catch basins is that storm water enters the grate and flows into the first chamber, which funnels the water below. The sediment circulates and settles at the bottom of the chamber. Oils and fluids which are lighter than water will rise in the water column and be trapped in a chamber within the unit, while the remaining water flows out to the cranberry bog. These units are intended to reduce roadway pollutants by over 85%.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities of the cranberry bogs:
 - Collaborate with local, state, and federal wetland management organizations to identify, monitor, and track wetlands in the Common Lands. [CAP]
 - Use USGS to gather data about water levels and analyze water resource conditions in streams. [CAP]

³⁸ Lobsterville Road exists within an easement provided during the 1987 Federal Tribal Settlement



Installation of catch basins in 2013

- Restore plant communities that fit site conditions or promote vegetation sources that fit current and expected project site conditions. [CAP]
- Consult with agencies on permitting decisions to ensure that wetlands are not negatively impacted. [CAP]
- Educate the community on the importance of the wetlands and the species that live there, including the ecosystem services they provide. [CAP]
- Resize new and existing culverts to ensure they can handle projected changes in precipitation. [CAP]
- Use invasive species control best management practices. [CAP]
- Work to maintain species diversity within and across wetlands on the landscape. [CAP]

- Develop wetland restoration plans for all tribal wetlands. [CAP]
- Continue monitoring wetland water quality and quantity throughout the landscape.
 [CAP]
- Develop an annual monitoring program for invasive plant and animal species and develop responses in the event that shrub wetland habitat begins to be degraded. [CAP]
- Combine all the historical data that exists (from monitoring and assessments) and use it to model projected changes in wetland location and conditions. [CAP]
- Enhance production of cranberry bogs by removing weeds and other plants causing overcrowding, enhancing pollination rates, and clearing edges of bog to expand habitat. [SNEP]

Tribal Lands							
Priority	rity Priority Action Sub- category Notes/Justification Potential Funding						
High	Resize new and existing culverts to ensure they can handle projected changes in precipitation	Cranberry Bogs / Tribal wetlands	Will enhance the resilience of all Tribal lands, including cranberry bogs	National Culvert Removal, Replacement and Restoration Grant			
High	Continue monitoring wetland water quality and quantity throughout the landscape	Cranberry Bogs / Tribal wetlands	Will allow the Tribe to react more quickly to threats to natural resources impacted by poor water quality	EPA PPG; Other funding TBD			
High	Restore plant communities that fit site conditions or promote vegetation sources that fit current and expected project site conditions	Cranberry Bogs / Tribal wetlands	Will reduce pollutants entering waterways and wetlands and strengthen the overall wetland ecosystem	TBD			
High	Enhance production of cranberry bogs by removing weeds, enhancing pollination rates, and clearing edges	Cranberry Bogs	Cranberries are the main sustenance crop of WTGHA and hold important cultural value	TBD			

	of bogs to expand habitat			
Medium	Work to maintain species diversity within and across wetlands			TBD
Medium	Use invasive species control best management practices	Cranberry Bogs	Will strengthen the overall wetland ecosystem and increase cranberry production	Direct Federal Spending for Invasives
Medium	Develop annual monitoring program for invasives and develop responses in the event that shrub and wetland habitat degrade	Cranberry Bogs	Will strengthen the overall wetland ecosystem and increase cranberry production	Direct Federal Spending for Invasives
Medium	Combine all the historical data that exists and use to model projected changes in wetland locations and conditions	Cranberry Bogs		TBD
Medium	Consult with agencies on permitting decisions to ensure wetlands are not negatively impacted	Cranberry Bogs	Will reduce pollutants entering waterways and wetlands and strengthen the overall wetland ecosystem	TBD; USGS; USDA
Low	Collaborate with local, state, and federal wetland management organizations to identify, monitor, and track wetlands in the Common Lands	Cranberry Bogs	Will allow the Tribe to react more quickly to threats to natural resources impacted by poor water quality, pollutants, and other climate hazards	TBD
Low	Educate the community on the importance of the wetlands and the species that live there	Cranberry Bogs		TBD
Low	Develop wetland restoration plans for all tribal wetlands	Cranberry Bogs		TBD

Project Priority: Housing

Proposed actions from SNEP/WTGHA project discussions are denoted with [SNEP].

Affordable Housing. The Tribes affordable housing goal (25%) is not adequately represented in the Aquinnah Housing Production Plan (AHPP) which has an affordable housing goal of just 10%. There are multiple approaches the Tribe can take in order to more adequately address our unique needs.

- <u>Recent actions.</u> The Tribe has recently made significant progress increasing access to affordable housing on Tribal lands and giving Tribal members the opportunity to come home.
 - Engineering and design plans were developed for affordable housing units subject to frequent flooding. While the Tribe has been unsuccessful in securing grant funding to address this issue in the past, they're hopeful that the engineering and design plans will make grant proposals more competitive moving forward.
 - Funds were received for the purchase of two new housing units that will be tied into the existing wastewater treatment plant. A third unit located in town and surrounded by Tribal lands was also purchased.
 - A 150 resident building was purchased in New Bedford that will serve as a satellite office building for the Tribe. This building will serve to counteract challenges associated with needing employees to "come home" in order to work. It also opens the door for affordable housing units located on the mainland near the office building.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities associated with affordable housing.
 - Update the AHPP with meaningful input and participation from the Tribe to ensure that it is up-to-date and adequately represents the Tribe's interests. [SNEP]
 - Develop and disseminate a housing survey to assess the demand for additional tribal housing. [SNEP]
 - Develop additional affordable housing units on tribal lands connected to the existing Wastewater Treatment Plant. [SNEP]
 - Seek out funding and financing mechanisms to implement engineering plans designed to reduce flooding of existing housing units. [SNEP]

• Seek out funding and financing mechanisms to improve air quality and reduce mold in existing housing units. [SNEP]

			Housing	
Priority	Priority Action	Sub- category	Notes/ Justification	Potential Funding Source
High	Seek out funding and financing mechanisms to implement engineering and design plans designed to reduce flooding of existing housing units	Housing	To protect community health and increase resilience	Weatherization Assistance Program
High	Seek out funding and financing mechanisms to improve air quality and reduce mold in existing housing units	Housing	To protect community health	Weatherization Assistance Program
Medium	Develop and disseminate a housing survey to assess the demand for additional tribal housing	Housing	To determine the need for additional housing units and ensure dollars are spent efficiently and effectively.	TBD
Medium	Update AHPP with meaningful input and participation from the Tribe	Housing	To ensure the plan is equitable and just	TBD
Low	Develop additional affordable housing units on tribal lands connected to the WWTP	Housing	New buildings just purchased	TBD

Project Priority: Water Resources

Proposed actions from the Hazard Mitigation Plan are denoted with [HMP]. Proposed actions from SNEP/WTGHA project discussions are denoted with [SNEP]. Proposed actions from the Nonpoint Source Management Plan are denoted [NPS].

Tidal Great Ponds. Management of tidal great ponds (Menemsha and Squibnocket) helps to protect dunes and water quality, enhance shellfish health and production, understand climate impacts, and support sustainable harvesting.

- <u>Recent actions.</u> Through the Tribe's routine surface water testing, staff gather data on chlorophyll, nitrogen, and various chemicals to provide a clearer picture of algae growth within the Menemsha and Squibnocket Pond complex.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities of the tidal great ponds:
 - Ongoing management of Menemsha and Squibnocket, including other activities such as water quality and shellfish monitoring, sustenance, etc.
 - Maintain access to Menemsha through dredging so boats can access the pond. This is a low priority overall because the Tribe has no direct control.

Stormwater, Runoff, and Nonpoint Source Pollution: Heavily reliant on the health of the surrounding ecosystem, runoff from extreme rainfall events can be detrimental to the Tribe's way of life. Runoff has the potential to introduce pesticides and other chemicals into local water bodies which then exposes humans and animals to dangerous pollutants.

- <u>Recent actions.</u> In addition to surface water testing and monitoring discussed in the Tidal Great Ponds section above, the Tribe has recently repaved the road surface at the Lobsterville Road stream crossing. During the repaving, the crossing was adjusted to divert as much runoff as possible into roadside vegetation. Roadside revegetation occurred concurrently with the road repavement, and monitoring is ongoing.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities associated with stormwater, runoff, and nonpoint source pollution:
 - Along with Dukes County Towns, plan to size stormwater facilities and other infrastructure and facilities according to the 25-year rainstorm rather than 10-year rainstorm volume. [HMP]
 - Reduce flood impacts by identifying and correcting discharges from Town and Commonwealth roadways where they cross streams, including but not limited to: Black Brook in Aquinnah and a culvert on Lobsterville Road, where flooding is a known problem. [HMP]

- The Road surface at each crossing should be adjusted during repaving to divert as much runoff as possible into roadside vegetation before it reaches the road crossing. [HMP]
- Review erosion and sediment control procedures for construction activities. [NPS]
- Develop guidance for reviewing site plans and construction activities to ensure minimization of NPS pollution. [NPS]
- Review final site stabilization methods after construction activities have been completed. This includes developing guidelines for post construction site review to ensure minimization of NPS pollution. [NPS]
- Review and implement low impact development techniques. This includes identifying projects for implementing LID techniques in now and/or retrofitted development. [NPS]
- Review and implement structural stormwater management BMPs. This includes identifying projects for implementing stormwater BMPs including new projects and inspection and maintenance of existing projects. [NPS]
- Develop and maintain a public outreach program for stormwater related issues. This includes implementing and continuing public outreach campaign(s) using available communications platforms (newsletter, website, social media, etc). [NPS]
- Complete a wastewater nitrogen loading study. This includes (1) evaluating nitrogen loading in tribal watersheds due to the Tribe's wastewater treatment plant and developing a nitrogen loading report, and (2) reviewing nitrogen impacts from new tribal development and evaluating the total nitrogen impacts when considering treatment plant upgrades and other new development. [NPS]
- Review onsite wastewater system management techniques. This includes (1) researching wastewater management BMPs for onsite treatment systems and developing a management program for these systems, and (2) developing and disseminating outreach material for the public regarding onsite wastewater treatment systems. [NPS]
- Review and implement practices that protect water quality and shorelines from the effects of hydromodification. This includes (1) continuing to address coastal erosion through preservation and restoration programs, (2) reviewing BMPs for slope stabilization and erosion and runoff control for protection from

hydromodification, and (3) identifying projects for implementing hydromodification BMPs including new projects and inspection and maintenance of existing projects in riparian and shoreline areas. [NPS]

- Complete activities outlined in current year 319 Work Plan and submit new 319
 Work Plan outlining specific activities for the NPS program. [NPS]
- Identify and complete stormwater infrastructure and coastal erosion projects as feasible per BMPs. [NPS]
- Annually review tribal policy to plan for NPS management and identify potential projects for NPS management. [NPS]

Water Resources				
Priority	Priority Action	Notes/ Justification	Potential Funding Source	
High	Review and implement low impact development (LID) techniques	To protect the Tribe from flooding and impacts to water quality	TBD; EPA 319 program	
High	Review and implement structural stormwater management BMPs	To protect the Tribe from flooding and impacts to water quality	TBD; EPA 319 program	
High	Complete activities outlined in current year 319 Work Plan and submit new 319 Work Plan	To protect the Tribe from flooding and impacts to water quality	TBD; EPA 319 program	
High	Identify and complete stormwater infrastructure and coastal erosion projects as feasible per BMPs		TBD; EPA 319 program	
High	Annually review tribal policy to plan for NPS management and identify potential projects for NPS management	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance	TBD; EPA 319 program	
Medium	Ongoing management of Menemsha and Squibnocket Ponds	To protect important sustenance resources	TBD	
Medium	Maintain access to Menemsha through dredging		TBD	

Medium	Plan to size stormwater facilities and other infrastructure and facilities according to the 25-year rainstorm		TBD; EPA 319 program
Medium	Review erosion and sediment control procedures for construction activities	To reduce erosion and protect important structure and ecological resources	TBD; EPA 319 program
Medium	Develop guidance for reviewing site plans and construction activities to ensure minimization of NPS pollution	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance	TBD; EPA 319 program
Medium	Review final site stabilization methods after construction activities have been completed	To reduce erosion and protect important structure and ecological resources	TBD; EPA 319 program
Medium	Develop and maintain a public outreach program for stormwater related issues	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance	TBD; EPA 319 program
Medium	Review onsite wastewater management techniques		TBD; EPA 319 program
Medium Medium	Review onsite wastewater management techniques Review and implement practices that protect water quality and shorelines from the effects of hydromodification	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance	TBD; EPA 319 program TBD; EPA 319 program
Medium Medium Low	Review onsite wastewater management techniques Review and implement practices that protect water quality and shorelines from the effects of hydromodification Reduce flood impacts by identifying and correcting discharges from Town and Commonwealth roadways where they cross streams	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance To protect the Tribe for the impacts of flooding and increased precipitation	TBD; EPA 319 program TBD; EPA 319 program TBD; EPA 319 program
Medium Medium Low	Review onsite wastewater management techniques Review and implement practices that protect water quality and shorelines from the effects of hydromodification Reduce flood impacts by identifying and correcting discharges from Town and Commonwealth roadways where they cross streams Adjust road surfaces during repaving to divert as much runoff as possible into roadside vegetation, plant native vegetation for natural filtration	To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance To protect the Tribe for the impacts of flooding and increased precipitation To reduce the amount of NPS pollution entering streams and waterways, thereby reducing pollution to flora and fauna the Tribe relies on for sustenance	TBD; EPA 319 programTBD; EPA 319 programTBD; EPA 319 programTBD; EPA 319 programTBD; EPA 319 program

Project Priority: Emergency Management

Proposed actions from the Hazard Mitigation Plan are denoted with [HMP].

Emergency Response. "Climate change will [ultimately] require communities to be able to perform all aspects of emergency management [(i.e., mitigation, response, or recovery)], at least to a certain degree." While this may be the case, some communities may prefer to invest more heavily in one aspect of emergency management over another. Therefore, a resilient emergency management system for the Tribe will depend on the balance of each aspect that works best for them. What this balance looks like should be determined by Tribal members and leaders as soon as possible, ideally before any further planning and implementation takes place, to ensure dollars are spent effectively and efficiently.

- <u>Recent actions.</u> Staff currently perform a number of roles to keep the Tribe safe during emergency events. This includes providing a sheltering spot in the case of power outages and extreme cold. The Tribe is also working closely with the Town of Aquinnah to plan for emergencies.
- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities associated with emergency response:
 - Install dry hydrants to pump pond water for firefighting. Required for some new subdivisions. Encourage elsewhere. If there is no pond nearby, install a water source. [HMP]
 - Generators, storm shutters, electrical surge protection systems, and other retrofits for critical facilities including the Administration Building and Community Center, wells and wastewater treatment facility, and water testing laboratory / shellfish hatchery. [HMP]
 - Develop a dedicated on-Island fire cache that would allow prescribed fire teams to respond on very short notice and conduct preventive prescribed burns. [HMP]
 - Construct a shelter for emergency response equipment, in order to ensure that the equipment is in optimal condition in the event of a natural disaster. [HMP]

Emergency Management				
Priority	Priority Action	Sub- category	Notes/ Justification	Potential Funding Source
High	Install generators, storm shutters, electrical surge protection systems, and other retrofits for critical facilities	Emergency Management	Would protect the Tribe's most critical facilities while also providing a safe place for sheltering should it be necessary	TBD
Medium	Construct a shelter for emergency response equipment	Emergency Management	Would ensure equipment is easily accessible and in optimal condition in the event of an emergency thereby improving disaster response	TBD
Medium	Develop a dedicated on-island fire cache	Emergency Management	Would allow prescribed fire teams to respond on very short notice and conduct preventative prescribed burns to increase overall resilience to wildfires	TBD
Low	Install dry-hydrants to pump water for firefighting	Emergency Management	Would increase the Tribe's overall resilience to wildfires	TBD

Project Priority: Social Concerns and Community Amenities

Proposed actions from the Hazard Mitigation Plan are denoted with [HMP]. Proposed actions from the Fire Management Plan are denoted with [FIRE].

Community Health. Tribal members themselves are perhaps the single greatest asset of any Native Tribe, and protecting the health and well-being of these members will be an on-going priority for WTGHA. Similar to emergency response, protecting community health will involve proactive mitigation of, immediate response to, and long-term recovery from health-related hazards.

 <u>Recent actions.</u> The Tribal Air Program has been in operation since 2001, and the Natural Resources Department has administered the program under a Direct Implementation Tribal Cooperative Agreement for eight years. The Natural Resources Department has successfully operated and maintained a PM 2.5 program on tribal lands since 2003. Ambient ozone levels are continuously monitored throughout the year. Ozone data is exported in real-time to the state of Massachusetts ozone program for review and validation. The data collected through the Tribe's ozone monitoring program is of great importance to tribal and public health, without which ozone air quality for the entire Cape Cod region could not be validated. This data is uploaded to a national database where it becomes accessible to professional agencies and the general public.

- <u>Proposed actions.</u> The following is a list of proposed actions intended to address the climate vulnerabilities associated with community health:
 - Reinstate the DCR Firewise Program outreach and response person on Martha's Vineyard 24/5 to conduct outreach to groups and be available for response. [HMP]
 - Develop a defensible area around every building on Tribal Lands consisting of a zone of negligible fuels at least 30 feet around each building. [FIRE]
 - Mechanically manage fuels in the vicinity of the Housing Authority development, Tribal Headquarters, and other structures by removing or reducing concentrations of heavy, "flashy", or otherwise particularly hazardous fuels within 100 yards of any building. [FIRE]
 - Mitigate extreme fuel-loading hazards, especially those within 100 yards of buildings, caused by insects, disease, blow-downs, or previous fires, using appropriate methods, within 1 year of the event. [FIRE]
 - Conduct periodic prescribed burns of interior forest and scrub fuels for the purpose of reducing fuel loads. [FIRE]
 - Develop and distribute to tribal members an educational brochure or fact sheet regarding wildfire awareness and safety to assembled tribal members. [FIRE]

Shellfish, Sustenance, and Livelihoods. The Tribe is heavily reliant on shellfish for sustenance and economic prosperity. Unfortunately, climate change poses severe threats to this important resource. Therefore, the Tribe must take proactive measures to mitigate anticipated impacts and strengthen our economic and cultural resilience.

- <u>Recent actions.</u> Annually, the Wampanoag Environmental Laboratory takes part in the following activities:
 - Bay scallop and quahog enhancement activities include purchasing seed from the Martha's Vineyard Shellfish Group, Inc, and using grow-out methods to protect and enhance the bay scallop and quahog fishery in Menemsha Pond.
 - Predator control to help protect the shellfish by trapping and removing the invasive green crabs, among others.

- Recent (2022) collaboration with the Martha's Vineyard Shellfish Group to find funding to conduct research on the quahog (*Mercenaria mercenaria*). The purple pigmentation in the interior of the northern quahog occurs in a limited geographic range in the northeastern U.S. and little is known about how or why it is produced. The purple coloring in the quahog shell is important to the Tribe culturally, both in artistic and traditional practices. In recent years, members of the Tribe have reported both weaker, thinner shells and a decline in the amount of purple coloring found in the shell. Weaker shells make the clams more difficult to open, more difficult to craft into culturally and economically important wampum beads, and more vulnerable to predators. The purple shell color is important in the production of shell jewelry that has become a valuable additional product of the quahog fishery for the Tribe.
- <u>Proposed actions</u>. The following is a list of proposed actions intended to address the climate vulnerabilities associated with shellfish management as related to livelihoods and sustenance foods:
 - Implement the steps needed to institute the adaptive management section of the Bay Scallop Cooperative Management Plan (2017). As a first step, the Town should establish a Shellfish Management Plan Implementation Committee responsible for developing specific rules about adaptation. [CRMPBS]
 - Develop and implement a public outreach strategy to highlight the significance of shellfishing both from a cultural and an economic perspective. [CRMPBS]

Social Concerns and Community Amenities				
Priority	Priority Action	Sub- category	Notes/ Justification	Potential Funding Source
High	Implement the steps needed to institute the adaptive management section of the Bay Scallop Cooperative Management Plan (2017)	Shellfish, Sustenance, and Livelihoods	To increase the economic and cultural resilience of the Tribe	TBD

High	Establish a Shellfish Management Plan Implementation Committee	Shellfish, Sustenance, and Livelihoods	To increase the economic and cultural resilience	TBD
High	Study the Northern Quahog to understand the possible decline in the purple shell pigment that is vital to the creation of wampum	Shellfish, Sustenance, and Livelihoods	To increase the economic and cultural resilience of the Tribe by increasing awareness about the origin of the shell pigmentation	TBD; Saltonstall- Kennedy Grant
Medium	Reinstate the DCR Firewise Program outreach and response person on Martha's Vineyard	Community Health	To mitigate risk of and improve overall response to fire emergencies	TBD
Medium	Mitigate extreme fuel- loading hazards, especially those within 100 yards of buildings	Community Health	To mitigate risk of and improve overall response to fire emergencies	TBD
Medium	Develop and distribute to tribal members an educational brochure or fact sheet regarding wildfire safety and awareness	Community Health	To mitigate risk of and improve overall response to and recovery from fire emergencies	TBD
Medium	Mechanically manage fuels by removing heavy, "flashy" or otherwise particularly hazardous fuels within 100 yards of any building	Community Health	To mitigate risk of and improve overall response to fire emergencies	TBD
Medium	Develop and implement a public outreach strategy to highlight the significance of shellfishing	Shellfish, Sustenance, and Livelihoods	To increase the economic and cultural resilience of the Tribe by increasing public understanding	TBD

Low	Develop a zone of negligible fuels around every building on Tribal land	Community Health	To mitigate risk of and improve overall response to fire emergencies	TBD
Low	Conduct periodic prescribed burns of interior forest and scrub fuels	Community Health	To mitigate risk of and improve overall response to fire emergencies	TBD, NCRS

Sustainable Funding & Investment

Sustainable project implementation and long-term investment requires significant groundwork. The previous three sections of this plan describe the foundation that the Tribe has built to support climate action. The following section, then, explores how WTGHA can proactively pursue funding and investment opportunities to promote sustainable and effective action.

Current Funding Mechanisms

WTGHA actively pursues funding from a variety of federal sources, including the US Environmental Protection Agency, the US Department of Agriculture, and the Federal Emergency Management Agency. However, Tribal staff have limited ability to go after funding opportunities from these and other funders. Staff face competing priorities, and grant applications are time-consuming and information-intensive.

"The Leadership Exchange Podcast"

"Historically, I grant-funded most of the programs that I've run for 28 years. That's a source of income . . . It's not a reliable source of income . . . We work very hard to get funding that is intended for the Tribe from federal agencies . . . It's amazing how much work you have to do to get what is intended for you in the first place. It's a full-time job." - Acting Chief of Staff, Bret Stearns. Season 2, Episode 4.

"The Department of the Interior generates over \$300 billion a year in revenue. The DOI's lands upon which they make that revenue are Indian lands. There is no reason why we should be scrapping and battling for crumbs off the plate of a Department that is built upon the natural resources and the lands of Indian country." - **Chairwoman**, **Cheryl Andrews-Maltais. Season 2, Episode 4.**

"[The funders] do not live here. They are not affected by the change... I would make everybody that had to write a grant, that had anything to do with any Native person... come here in the winter...Don't sit in a nice, clean, tidy office and tell me how I can't expend this money the way that I know it needs to be expended to solve the problem." -Wampanoag Tribal Council Member and Elder, Kristina Hook. Season 2, Episode 4.

Immediate Funding and Investment Opportunities

With the recent passing of the Bipartisan Infrastructure Law ("BIL", <u>Public Law 117-58</u>) and Inflation Reduction Act ("IRA", <u>Public Law 117-169</u>), the Tribe has the opportunity to capitalize on unprecedented levels of federal funds, many of which are positioned to benefit tribal communities directly. Detailed below are the highest priority, short-term funding opportunities within each package, as well as some additional funding opportunities worthy of consideration.

Bipartisan Infrastructure Law (BIL). The Bipartisan Infrastructure Law (BIL) offers perhaps the single greatest potential for federal investment in all communities, including Tribes and Nations, in a generation. However, the BIL's immense scale makes it extremely challenging for communities to navigate the countless programs that it funds. Through conversations with other Tribes and Nations, regional partners, and consultants, WTGHA understands how much of an opportunity and challenge the BIL funding poses. In order to be truly competitive in pursuing BIL









dollars, Tribal staff must have a strong understanding of the program's range of funding opportunities, as well as a simple way to target grant applications to meet the Tribe's highest priority needs.

The highest priority funding opportunities identified for the Tribe within the BIL³⁹ are detailed below. Additional opportunities are available in **Appendix A.**

- The Tribal Transportation Facility Bridge Program is a set aside of the new Bridge Investment Program within the BIL. This is a new competitive grant program that will invest \$200 million over the next few years (the larger Bridge Investment Program will invest \$12.2 billion over the same period). The goal of the program is to improve bridge and culvert conditions, safety, efficiency and reliability on Tribal lands. Eligible projects include those to replace, rehabilitate, preserve, or protect one or more bridges on the National Bridge Inventory as well as those to replace or rehabilitate culverts to improve flood control and improve habitat connectivity for aquatic species.
- The National Culvert Removal, Replacement, and Restoration Grant Program is another new competitive grant program established by the BIL. This program will invest \$1 billion to replace, remove, and/or repair culverts or weirs that meaningfully improve or restore fish passage for anadromous fish, such as herring.
- The **Energy Efficiency and Conservation Block Grant Program** is a new program that will invest \$550 million in an effort to reduce energy use and fossil fuel emissions and improve energy efficiency. A number of activities are eligible for funding under this program.
- The new **Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Grants** will invest \$1.4 billion in coastal communities to support planning, strengthen resilience improvements, and improve evacuation routes.
- New **Grants for States and Tribes for Voluntary Restoration** will provide \$400 million for voluntary restoration projects. Further details on this funding opportunity are forthcoming.
- The Aquatic Ecosystem Restoration and Protection Projects Program will provide \$250 million in new grants and direct federal spending for projects that design, study, and construct aquatic ecosystem restoration and protection to improve habitat.
- The BIL includes an additional \$100 million in **Direct Federal Spending and Grants for Invasives**. Eligible projects include programs for invasive species detection, prevention,

³⁹ <u>A Guidebook to the Bipartisan Infrastructure Law for State, Local, Tribal, and Territorial Governments, and Other</u> <u>Partners</u>

and eradication, including conducting research and resources to facilitate detection at points of entry.

- While the **Tribal High Priority Projects Program** already existed, the BIL invests an additional \$45 million into the competitive grant program. This program provides additional funding for Tribes and Nations whose annual allocations are insufficient to complete the Tribe's highest priority project.
- The Weatherization Assistance Program, an existing formula grant, will receive an additional \$3.5 billion in funding. The purpose of this funding is to increase the energy efficiency of residences owned or occupied by low-income persons, reduce energy expenditures, and improve health and safety. Funds from this program may be used to install weatherization materials as well as to improve the heating and cooling of residences.

Inflation Reduction Act.⁴⁰ The Inflation Reduction Act (IRA) will invest an estimated \$369 billion in energy security and climate change thereby reducing U.S. greenhouse gas (GHG) emissions by approximately 40% over a period of 8 years.⁴¹ The package will not only lower the current cost of energy bills, but will also make the transition to clean, renewable energy more feasible for many communities. The Tribe has expressed interest in converting to cleaner, more efficient sources of energy, and the following programs housed within the IRA provide an immediate opportunity to move towards this goal. It's important to note that at the time of writing this report, rulemaking has not yet concluded for the IRA. Therefore, deadlines, eligibility criteria, and other program specifics are not yet available.

- <u>SEC. 30002. IMPROVING ENERGY EFFICIENCY OR WATER EFFICIENCY OR CLIMATE</u> <u>RESILIENCE OF AFFORDABLE HOUSING</u>. This section will invest \$837,500,000 "for the cost of providing direct loans, the costs of modifying such loans, and for grants . . . to fund projects that improve energy or water efficiency, enhance indoor air quality or sustainability, implement the use of zero-emission electricity generation, low emission building materials or processes, energy storage, or building electrification strategies, or address climate resilience of an eligible property" (p. 581).
- <u>SEC. 50122. HIGH-EFFICIENCY ELECTRIC HOME REBATE PROGRAM</u>. \$225,000,000 will be invested for Tribes to develop and implement high-efficiency electric home rebate programs (593).

⁴⁰ All IRA language taken from the version of the Act available <u>here</u> as of September, 2022.

⁴¹ <u>https://www.democrats.senate.gov/imo/media/doc/inflation_reduction_act_one_page_summary.pdf</u>

• <u>SEC. 80003. TRIBAL ELECTRIFICATION PROGRAM</u>. The Tribal Electrification Program will invest \$145,500,000 for the provision of electricity to unelectrified Tribal homes through zero-emissions energy systems. It will also support the transition of electrified Tribal homes to zero-emissions energy systems, as well as the associated home repairs and retrofits necessary to install the authorized zero-emissions energy systems. No funds provided in this section will be subject to cost-sharing or matching requirements (726).

In addition to the energy-focused programs above, the following IRA programs can be used to address more general climate resilience goals.

- <u>SEC. 40001. INVESTING IN COASTAL COMMUNITIES AND CLIMATE RESILIENCE</u>. Section 40001 earmarks \$2,600,000,000 for the National Oceanic and Atmospheric Administration (NOAA) "to provide funding through direct expenditure, contracts, grants, cooperative agreements, or technical assistance to . . . Tribal governments . . . to enable coastal communities to prepare for extreme storms and other changing climate conditions" (p. 583).
- <u>SEC. 60201 ENVIRONMENTAL AND CLIMATE JUSTICE BLOCK GRANTS</u>. This section invests \$2,800,000,000 to carry out community-led air and other pollution monitoring, prevention, and remediation activities. This might include the installation of low emission, zero emission, and resilient technologies, related infrastructure and workforce development. It also spans activities aimed at mitigating climate and health risks from urban heat islands, extreme heat, wood heater emissions, and wildfire events, increasing climate resilience and adaptation, reducing indoor toxics and air pollution, and facilitating engagement of disadvantaged communities in State and Federal advisory groups, workshops, rulemaking, and other public processes. All activities funded under this section must benefit disadvantaged communities. An additional \$200,000,000 will be available to provide technical assistance (699).
- <u>SEC. 80001. TRIBAL CLIMATE RESILIENCE</u>. This section will invest \$220,000,000 for Tribal climate resilience and adaptation programs and an additional \$10,000,000 for fish hatchery operations and maintenance programs run through the Bureau of Indian Affairs. No funds provided in this section will be subject to cost-sharing or matching requirements (723).

Native Americans in Philanthropy and the America the Beautiful Challenge. "Native Americans in Philanthropy (NAP) promotes equitable and effective philanthropy in Native communities."⁴² They achieve this goal by supporting interwoven networks of Native Americans in philanthropy,

⁴² <u>https://nativephilanthropy.org/our-mission/</u>

Tribal leaders, Native youth, and Native nonprofit leaders. NAP's <u>Investing in Native</u> <u>Communities</u> platform gives funders an opportunity to learn more about working with Tribal communities. They've also developed the <u>Tribal Nations Initiative (TNI)</u>, which provides a centralized platform for collaboration, connecting Tribal Nations with the philanthropic sector. Through the TNI, in partnership with the National Fish and Wildlife Foundation (NFWF), NAP will be funding the match requirements for all Native Nation projects awarded under the <u>America the Beautiful Challenge</u> 2022 RFP. To that end, it is recommended that the WTGHA further pursue a relationship with NAP in order to advance shared goals.

SUMMARY OF OBSERVATIONS & RECOMMENDATIONS

Summary of Observations

The following sections summarize the Tribe's efforts to-date in each of the Resilience Action Framework areas, as well as the recommended goals and actions.

Summary of Observations: Community & Leadership Engagement

The Natural Resources Department has been very active in engaging tribal leaders and community members in the climate planning process. Broad participation from the entire community in tribal and regional planning efforts demonstrate a strong record of community and leadership engagement. This positions the Tribe to pursue its own climate planning initiatives, but also to provide critical support to other regional Tribes and Nations that are doing the same.

Summary of Observations: Vulnerability & Risk Analysis

WTGHA's assets and systems will face unique risks and vulnerabilities in the face of climate change. Yet while severe weather, sea level rise, and rising temperatures pose significant challenges to the Tribe's way of life, the Tribe is well equipped to adapt to these challenges given its history as part of the larger Island ecosystem for thousands of years. Some of the most at risk assets identified include local flora and fauna, namely herring, scallops, and cranberries, all of which have played a distinct role in shaping the Tribe's history and culture.

Summary of Observations: Project Priority List

Major project focal areas for WTGHA included natural resources, tribal lands, housing, water resources, emergency management, and social concerns and community amenities. The Tribe has taken a number of actions recently to address each core area. Future actions from previous planning efforts and discussions with the Tribe were also identified for the 6 focal areas. These actions were prioritized based on need and serve as a guide for future implementation.

Summary of Observations: Sustainable Funding & Investment

2022 saw unprecedented levels of federal funding dedicated to combating climate change and making communities more resilient to its effects. The Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) contain billions of dollars in climate- and energy-focused grants that WTGHA can use to advance our resilience goals. The Tribe should further pursue the specific opportunities outlined in the Sustainable Funding and Invest Opportunities section of this report, as well as other relevant opportunities contained within each package. Native Americans in Philanthropy could prove to be a beneficial ally in this pursuit of funds, as well as future endeavors.

Recommended Goals and Actions

The following section details the recommended steps the Tribe should take in order to advance our long-term climate resilience goals.

Refine Project Priority List. While this report offers a preliminary look at projects for prioritization, the Tribe should refine its project priority list to include more specific details, including order of magnitude cost estimates, department responsible, design needs and specifications, project timing, and so on. A more detailed project priority list would allow the Tribe to develop more competitive grant proposals and propel projects towards implementation. This list should include a combination of programs and on-the-ground projects that will move the Tribe towards its overall resilience goals.

Explore Federal and State Resources. The BIL and IRA contain billions of dollars in climate- and energy-focused funding opportunities that the Tribe can take advantage of. While this report offers an initial look into the various BIL and IRA resources that can be used to advance projects from the project priority list, further analysis of each funding package will be necessary. This may be done in-house or by an external consultant. Additionally, as priorities continue to shift and new funds become available, the Tribe will need to continuously revisit both State and Federal opportunities, ensuring they are capitalizing on every dollar made available.

Hire an External Contractor. The Tribe should consider prioritizing funding to hire an external contractor to develop the project priority list and/or support grant-related activities such as researching and identifying appropriate opportunities, gathering necessary application materials, and general grant writing. By hiring a contractor to handle these activities, the limited internal capacity of the Tribe could be dedicated to more pressing issues and would allow Tribal staff to handle larger priorities.

Coordinate Regionally with Other Tribes and Nations. WTGHA should begin coordinating with regional Tribes and Nations to implement longer-term funding and investment recommendations, included in attached memorandum (**Appendix B**).

CONCLUSION

Proactively adapting to and planning for climate change will allow the Wampanoag Tribe to be better prepared for the climate challenges they will face. Native Tribe's face unique challenges when it comes to climate change, but they also possess unique assets such as generations of traditional ecological knowledge and widespread community support that positions them to be resilient in the face of adversity. Adapting to a changing climate will require dedicated resources, coordinated capacity, and significant funding and investments. This plan lays the groundwork for such activities. The Tribe should continuously revisit this plan and treat it as a living document that will guide all of our future climate-related efforts.⁴³



⁴³ Image: Bret Stearns

APPENDICES

A. Bipartisan Infrastructure Law Funding Opportunities

			F ound to a	Funding				D				
Program	New Program?	Type of Funding	Funding Amount - Total	Amount - Annual (2022)	Set Asides?	Funding Cycle	Agency	Bureau or Account	Eligible Applicants/ Recipients	Purpose	Uses	Notes
							0, 1					
									* State			
									* Metropolitan planning organizations			
					Tribal				* Local gov't			
					Transportation				* Special purpose district or public		* Projects to replace, rehabilitate, preserve, or protect one or more bridges on the National Bridge	
Bridge					Facility Bridge				authority with a transportation function		Inventory	
Investment		Competitive			set aside (see		Department of	Federal Highway	* Federal land management agency	To support projects to improve bridge and culvert	* Projects to replace or rehabilitate culverts to improve flood control and improve habitat connectivity for	r
Program	Yes	Grant	\$12.2 billion		below)		Transportation	Administration	* Tribal gov't	condition, safety, efficiency, and reliability	aquatic species	
Transportation					Bridge						Inventory	
Facility Bridge		Competitive			Investment		Department of	Federal Highway		To improve bridge and culvert condition, safety,	* Projects to replace or rehabilitate culverts to improve flood control and improve habitat connectivity for	r
(Set-aside)	Yes	Grant	\$200 million		Program		Transportation	Administration	Tribal govt	efficiency, and reliability	aquatic species	
		Distributed										
		through the			201 1 1 1							
Tribal		Transportation			3% set aside of						* Planning design engineering or construction of bridges	
Transportation		Program (see		\$165 million for	Formula Funding		Department of	Federal Highway		* To protect, restore, and construct bridges on	* Replacement and rehabilitation of bridges	
Facility Bridges	No	below)	\$825 million	Tribes	program (above)	Jan. 15, 2022	Transportation	Administration	Tribes	public roads on Tribal lands	* Improvement of bridges in poor condition	
										To provide safe and adequate multimodal		
Tribal										transportation and public road access to and		
Transportation	No	Fermula grant	ć2.07 hillion				Department of	Federal Highway	Sovereign federally-recognized Tribal	within Indian reservations, Tribal lands, and	* Designs that support transportation safety, spaces and mobility in Tribal same writing	
Program	NO	Formula grant	\$2.97 billion		1		Transportation	Administration	gov ts	Alaska Native Village communities	* Projects that support transportation safety, access, and mobility in Tribal communities	
National Culvert											*Establish an annual competitive grant program to award grants to eligible entities for projects that	
Removal,											replace, remove, and repair culverts or weirs that:	
Replacement,		Compatibility					Deventories		* State	Provides supplemental funding for grants for	1) would meaningfully improve or restore fish passage for anadromous fish and	
Grant	Yes	grant	\$1 hillion				Transportation	Secretary	* Unit of local govt * Indian Tribe	projects that replace, remove, and/or repair	2) (weirs only) may include a) infrastructure to facilitate fish passage around or over the weir and b) weir improvement	
Grant	103	grant	ŞI DINION				Transportation	Secretary		Provides funding to Indian Tribes or a		
										governmental subdivision of an Indian Tribe		
										whose annual allocation of funding received		
										under the Tribal Transportation Program is		
										insufficient to complete the highest priority		
Tribal High										emergency or disaster occur on a Tribal		
Priority Projects		Competitive					Department of	Federal Highway		transportation facility that renders the facility	* Highest priority projects	
Program	No	Grant	\$45 million				Transportation	Administration	Sovereign federally-recognized Tribal govts	impassable or unusable	* Emergency or disaster related projects	
												Grantees may receive formula based
				1						To increase the energy efficiency of dwellings		weatherization retrofits with an
										owned or occupied by low-income persons,		average cost of up to \$8009 per
										reduce their total residential energy expenditures	,	dwelling unit in FY 22. Up to 10% of
				1		Estimated				and improve their healthy and safety. Especially		grantee and subgrantee spending may
Weatherization						appication	Department	Energy Efficiency	* States	low-income persons who are especially	* Installation of weatherization materials such as attic insulation, caulking, weather stipping, furnace	be for administrative expenses. Only 5%
Assistance	No	Formula Grant	\$3.5 hillion	1		opening date, 4th quarter 2023	Department of	and Kenewable	* Tribes	vumerable, including the elderly, the	encuency mounications, certain mechanical measures, and replacement of turnaces, boilers, and air conditions, in order to improve the beating and cooling of dwellings	or a local state grant may used for administrative expenses
			,	+		Huaiter 2023	LICIBY	LIICIBY		המהמוכמטטרים, מות כווות פון	* overall cost-effectiveness of energy generation, transmission, or distribution systems	
				1							* siting or upgrading transmission and distribution lines	
Energy										To increase environmental protection from the	* reducing greenhouse gas emissions from energy generation by rural or remote areas	
Improvement in				1				Office of Clean		impacts of energy use and improve resilience,	* providing or modernizing electric generation facilities	
Rural and	Voc	Cooperative	¢1 billion				Department of	Energy	* industry marked as *	reliability, safety, and availability of energy in	* developing microgrids	
Remote Areas	res	Agreement	η η η η η η η η η η η η η η η η η η η				Energy	Demonstration	"industry partners* utilities* national labo	rifuration remote areas of the US	· increasing energy efficiency	

			-	For all to a							
			Funding	Amount -				Bureau or			
Program	New Program?	Type of Funding	Amount - Total	Annual (2022)	Set Asides?	Funding Cycle	Agency	Account	Eligible Applicants/ Recipients	Purpose	Uses
Energy Efficiency and Conservation		* Block Grants						Energy Efficiency		To help states, municipalities, and Tribes reduce	 retaining technical consultant services to assist the eligible entity in the development of suc * conducting residential and commercial building energy audits establishing financial incentive programs for energy efficiency improvements * providing grants to nonprofits and governmental agencies for the purpose of performing er efficiency retrofits * development and implementation of energy efficiency and conservation programs for build facilities within the jurisdiction of the eligible entity, including: 1) design and operation of the programs 2) identifying the most effective methods for achieving maximum participation and efficiency 3) public education 4) measurement and verification protocols 5) identification of energy efficient technologies * development and promotion of zoning guidelines or requirements that promote energy eff development 4) development of infrastructure, such as bike lanes and pedestrian walkways 5) synchronization of traffic signals 6) other measures that increase energy efficiency and decrease energy consumption * development and implementation of energy difficiency and decrease energy consumption * development and implementation of building codes and inspection services to promote buil efficiency * application and implementation of energy distribution technologies that significantly incre- efficiency, including: 1) distributed resources
Block Grant		* Competitive					Department of	and Renewable		energy use, reduce fossil fuel emissions, and	2) district heating and cooling systems
Program	Yes	grants	\$550 million				Energy	Energy	* State govt* local govt* Tribes	improve energy efficiency	* activities to increase participation and efficiency rates for material conservation programs,
Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT)	Yes	Competitive Grant	\$1.4 billion				Department of Transportation	Federal Highway Administration	 * State * Political subdivision of a state * Municipal Planning Organization * local govt * Special purpose district or public authority with a transportation function * Tribes * Federal Land Management Agencies (applying jointly with state(s)) * Different eligibilities apply for at-risk coastal infrastructure grants 	To support planning, resilience improvements, community resilience and evacuation routes, and at-risk coastal infrastructure	 * to conduct resilience planning * To strengthen and protect evacuation routes * to increase the resilience of surface transportation infrastructure from SLR, flooding, wildfin weather events, and other natural disasters * highway, transit, and certain port projects are eligible
Preventing Outages and Enhancing the Electric Grid	Yes	Grant	\$5 billion			Estimated appication opening date, 4th quarter 2022	Department of Energy	Electricity	 * Electric grid operators * Electricity Storage Operators * Electricity Generators * Transmissions owners and operators * Distribution providers * Fuel suppliers * States * Tribes 	To prevent outages and enhance the resilience of the electric grid	 * Activities that supplement existing hardening efforts to: 1) reduce the risk of power lines causing wildfire 2) reduce the likelihood and consequences of disruptive events
Building Resilient Infrastructure and Communities	No	Grant	\$1 billion				Department of Homeland Security - Federal Emergency Management Agency	Disaster Relief Fund	* States * local govt * Tribal govt * Territorial govt	For hazard mitigation activities	 * Capability and capacity building activities which enhance the knowledge, skill, expertise, etc current workforce to expand or improve the administration of mitigation assistance, including 1) building code activities 2) partnerships 3) project scoping 4) mitigation planning and planning-related activities * Cost-effective mitigation projects designed to increase resilience and public safety, reduce i loss of life, and reduce damages and destruction to property, critical services, facilities, and ir from natural hazards and the effects of climate change * Financial assistance to reimburse the recipient and subrecipient for eligible and reasonable costs, direct administrative costs, and other administrative expenses associated with a specifi measure or project (up to 15% of the total grant award, 10% for the recipient and 5% for the recipient)
Wildfire Management - Fuels Management	No	* Direct Federal Spending * Interagency Agreements * Cooperative Agreements * Contracts	\$878 million				Department of the Interior	Office of Wildland Fire	 * Federal agencies * State agencies * Tribal govts * Businesses 	To protect vulnerable communities from wildfire while preparing communities and natural landscapes for changing climate	*Hazardous fuels management strategies, including: 1) mechanical thinning 2) precommercial thinning in young stands 3) timber harvesting 4) prescribed fire 5) installation of control locations such as fuel breaks

Uses	Notes
nsultant services to assist the eligible entity in the development of such a strategy I and commercial building energy audits incentive programs for energy efficiency improvements inprofits and governmental agencies for the purpose of performing energy	
lementation of energy efficiency and conservation programs for buildings and diction of the eligible entity, including: of the programs	
effective methods for achieving maximum participation and efficiency rates erification protocols ev efficient technologies	
elementation of programs to conserve energy used in transportation, including: nployees	
protion of zoning guidelines or requirements that promote energy efficient	
affic signals increase energy efficiency and decrease energy consumption lementation of building codes and inspection services to promote building energy	
mentation of energy distribution technologies that significantly increase energy	
, ooling systems participation and efficiency rates for material conservation programs, including	
planning otect evacuation routes nce of surface transportation infrastructure from SLR, flooding, wildfires, extreme her natural disasters rertain port projects are eligible	
nent existing hardening efforts to: wer lines causing wildfire and consequences of disruptive events	
y building activities which enhance the knowledge, skill, expertise, etc of the pand or improve the administration of mitigation assistance, including:	
nd planning-related activities ion projects designed to increase resilience and public safety, reduce injuries and damages and destruction to property, critical services, facilities, and infrastructure id the effects of climate change or reimburse the recipient and subrecipient for eligible and reasonable indirect	
tive costs, and other administrative expenses associated with a specific mitigation to 15% of the total grant award, 10% for the recipient and 5% for the sub-	Robert T. Stafford Act Section 203(i)
gement strategies, including: ing in young stands	
I IUCATIONS SUCH AS TUEL DEEAKS	

			Funding	Funding Amount -				Bureau or			
Program	New Program?	Type of Funding	Amount - Total	Annual (2022)	Set Asides?	Funding Cycle	Agency	Account	Eligible Applicants/ Recipients	Purpose	Use
Habitat Restoration	No	Competitive Grant	\$491 million				Department of Commerce	National Oceanic and Atmospheric Administration	 * Nonprofit 501(c) organizations * State govt agencies * territorial govt agencies * Local govts * Municipal govts * Tribal govts and organizations * Educational institutions * Commercial/For-profit organizations 	To restore marine, estuarine, coastal, and Great Lakes ecosystem habitats as well as to construct or protect ecological features that protect coastal communities from flooding or coastal storms, all with the goals of sustaining fisheries, recovering protected species, and maintain resilient coastal ecosystems and communities	Typical projects include removing dams and other barr coral and oyster reefs
Grants for States and Tribes for							Department of	Office of the	* Status	For the implementation of voluntary restoration	
Restoration	Yes	Grant	\$400 million				the Interior	Secretary	* Tribes	projects on private or public lands	Varies
Aquatic											
Restoration and Protection Projects	Yes	* Grant * Direct Federal Spending	\$250 million				Department of the Interior	Bureau of Reclamation	Open	To improve aquatic habitat	Projects that design, study, and construct aquatic ecos habitat
Ecosystem - Fish Passage	No	* Contracts * Cooperative agreements * Grants * Direct Federal Spending	\$200 million				Department of the Interior	Fish and Wildlife Service	Open	To remove barriers to and provide assistance for the National Fish Passage Program	To remove barriers to and provide assistance for the N
Pollution Prevention Grants	No	Grant	\$100 million				Environmental Protection Agency	State and Tribal Assistance Grants	* States * Tribes * State-sponsored Institutions * Tribal institutions	To reduce or eliminate pollutants from entering any waste stream or otherwise being released into the environment prior to recycling, treatment, or disposal	 * Technical assistance for businesses seeking informati funding for experts to provide on-site technical advice reduction plans * targeted assistance to businesses for whom lack of ir * Training in source reduction techniques (where such schools or other appropriate means)
Direct Federal Spending for Invasives	Yes	* Grant * Direct federal spending	\$100 million				Department of the Interior	Office of the Secretary	* States * Tribes	Invasive species control	Projects and programs for invasive species detection, presearch and providing resources to facilitate detection
Tribal Climate Resilience - Adaptation Planning	No	Contract/ compact	\$86 million				Department of the Interior	Indian Affairs - Operations of Indian Programs	Federally recognized tribal governments	To support climate resilient planning to help sustain Tribal ecosystems and natural and cultural resources, economies, infrastructure, human health, and safety	 Trainings and workshops Vulnerability and risk assessments Supplementary monitoring for climate-related decisi Scoping efforts adaptation planning travel support ocean and coastal management planning capacity building for adaptation planning relocation, managed retreat, or protect-in place asse Internships and youth engagement Funding is NOT for routine monitoring programs or re
Tribal Broadband Connectivity Program	No	Grant	\$2 billion				Department of Commerce	National Telecommunicat ions and Information Administration	 * Tribal govts * tribal organizations * tribal colleges and universities * the Department of Hawaiian Home Lands on behalf of Native Hawaiian community * Alaska Native Corporations 	To advance broadband planning and deployment in order to promote broadband adoption, increase access, and reduce costs	 Planning (e.g. feasibility) Broadband infrastructure deployment (e.g. construct broadband adoption, digital literacy, tech support, di engineering, arts, and math, Workforce Development) Devices/equipment public connectivity and computer access research and evaluation data and mapping Smart communities/ cities/ regions Telehealth
Temporary Water Crossing							Department of		* States		
Structures	Yes	Grants	\$50 million				Agriculture	Forest Service	* Tribes	TBD	TBD
							Department of	National Oceanic and Atmospheric	 * Nonprofits with 501(c)(3) status * State govt agencies * Territorial govt agencies * Local govts * municipal govts * Tribal govts * Tribal organizations * Educational institutions 	Restoring fish passage by removing in-stream barriers and providing technical assistance pursuant to section 117 of the Magnuson-Stevens Fishery Conservation Management and	 * On the ground fish passage restoration projects * Engineering and design * Future project development phases * building the capacity of new and existing restoration
Fish Passage	No	Grants	\$400 million		1	1	Commerce	Administration	* Commercial (for profit) organizations	Reauthorization Act of 2006 (16 USC 1891a)	faceted construction efforts

	Notes
ers, reconnecting coastal wetlands, and rebuilding	The NOAA Office of Habitat Conservation will provide technical assistance from project conception to completion, and explore ways in which this funding can be used to support underserved communities
stem restoration and protection to improve	
ational Fish Passage Program	The National Fish Passage Program is and existing program that relies on a network of Fish and Wildlife Service biologists and engineers stationed throughout the country
on about source reduction opportunities, including and assistance in the development of source	
formation is an impediment to source reduction raining may be provided through local engineering	
revention, and eradication, including conducting at points of entry	Total amount across entire program is \$905 million
on-making	
ssment, planning, and design	
on) gital skills training, (e.g. science, technology,	
partners to design projects and manage multi-	

B. Funding and Investment Memo


MEMORANDUM

TO: Bret Stearns and Beckie Finn, Wampanoag Tribe of Gay Head (Aquinnah)

FROM: Throwe Environmental, LLC

RE: Tribal Funding and Investment Recommendations

DATE: September 9, 2022

This memorandum augments the other deliverables associated with the SNEP Network's technical assistance project with the Wampanoag Tribe of Gay Head (Aquinnah) (WTGHA) — namely, the completed draft of the Tribe's Climate Adaptation Plan. While the Adaptation Plan takes a near-term focus related to the Tribe's imminent climate vulnerabilities and opportunities for action, this memorandum explores how the Tribe can build on these efforts to spur longer-term investment to support implementation of priority projects.

Building on Climate Adaptation Plan. In recent years, the Tribe's Natural Resources Department staff has diligently collected community-based information as the basis for a Tribe-wide Climate Adaptation Plan. This process was led by a Tribal Climate Change Adaptation Planning Team composed of Elders, Councilmembers, staff, and other key community members. Findings were regularly shared throughout the process, allowing all Tribal members to review and share their feedback.

Collaboration with other Tribes and Nations. In addition to internal community engagement, WTGHA staff also worked closely with representatives from other regional Tribes and Nations through <u>United South and Eastern Tribes, Inc.</u> (USET). USET is a nonprofit intertribal organization that serves 33 Tribal Nations across the Eastern and Southern US with the goal of "enhancing the development of Tribal Nations, improving the capabilities of Tribal governments, and improving the quality of life for Indian people."¹. Several USET Climate Change Adaptation Planning Workshops were held as a way to gather regional Tribes, Nations, and Tribal organizations for collaborative discussions and working sessions around the issues associated with climate planning. Through these workshops, WTGHA staff deepened their working relationships with representatives from the Shinnecock Indian Nation, St. Regis Mohawk Tribe, Pleasant Point Passamaquoddy Tribe, Houlton Band of Maliseet Indians, Aroostook Band of Micmacs, the Northeast and Southeast Climate Science Centers, and others.

Enhancing Tribal Capacity and Sovereignty. The relationships forged throughout the development of the WTGHA Climate Adaptation Plan offered a unique and powerful opportunity for intertribal collaboration around climate issues. More specifically, direct

¹ <u>https://www.usetinc.org/</u>

collaboration between the WTGHA and other regional Tribes and Nations has the power to enhance the following:

- <u>Capacity</u>. WTGHA staff and leaders routinely cite limited capacity as a key concern when dealing with climate issues. Natural Resources Department staff are responsible for a number of priorities that compete for time and energy. As a result, staff are unable to pursue action on all priority projects. Limited capacity is not a unique concern of WTGHA. In fact, Tribes and Nations across the Northeast have almost uniformly identified capacity as a limiting factor in their ability to pursue priority initiatives.² Intertribal collaboration, then, poses the opportunity for regional Tribes and Nations to leverage one another's capacity in the pursuit of shared goals.
- <u>Sovereignty</u>. Another key concern voiced by WTGHA members is the ability to maintain sovereignty over Tribal matters and resources something the Tribe has spent centuries reasserting. WTGHA staff have expressed that some funders oblige Tribes and Nations to form partnerships with outside organizations when pursuing grants a requirement that can undermine the status of Tribes and Nations as independent governments. In contrast, voluntary partnerships, especially with other Tribal entities, can actually *strengthen* the sovereignty of all. Because concerns around sovereignty are generally shared amongst Tribes and Nations, intertribal collaboration supports capacity-sharing that enhances access to funding opportunities, all without sacrificing the Tribes' or Nations' abilities to control their own decision-making.

Expand Capacity for Intertribal Partnerships. With the above concerns and opportunities in mind, the Project Team recommends expanding opportunities for intertribal partnerships in a way that advances the capacity of the participating Tribes and Nations (including WTGHA) to coordinate and execute climate infrastructure investments.

<u>Purpose</u>. In WTGHA and in Tribes and Nations regionally, additional capacity is needed to assess, plan for, and implement priority climate infrastructure investments. The purpose of our recommendation to expand capacity would explicitly target this gap. We suggest expanding existing partnerships in a way that develops the structure(s) and system(s) necessary to coordinate and execute climate infrastructure investments that would otherwise be infeasible for a single Tribe or Nation. In practice, this recommendation could take various forms — such as by expanding the role of an existing institution (e.g., USET), or by establishing a new organization entirely. For the sake of simplicity, we will hereafter refer to the body that leads this effort (be it new or existing) as "the organization." Regardless of structure though, the ultimate purpose of enhanced partnerships would be to expand capacity in a way that better facilitates intertribal climate action planning,

² SNEP Network Tribal Climate Leadership Exchange, May 2022.

vulnerability and risk assessments, project prioritization, funding applications, and construction and maintenance of on-the-ground infrastructure projects.

Intertribal Approach. Given the ability for intertribal collaboration to enhance the capacity of participating Tribes and Nations, we recommend that a regional, interjurisdictional effort be taken between multiple Tribes and Nations. This approach would allow an organization to operate at scale across the region, increasing the opportunities for funding, investment, and project implementation. An intertribal approach would codify existing collaborative efforts, giving each participating Tribe or Nation a tangible stake in the organization. However, it would *not* strip those Tribes or Nations of their sovereignty to manage climate issues how they see fit. On the contrary, a regional, climate-focused Tribal organization would actually enhance Tribes' and Nations' abilities to pursue projects that they themselves deem as key priorities — something that has proven difficult to-date given strict federal funding requirements and limited operating budgets of many Tribal governments. Moreover, each Tribe and Nation would retain the power to choose which matters are (and are not) delegated to the organization. To these ends, this memo focuses on an intertribal approach, with *Alternative Structures* explored at the end.

Regional intertribal organizations are not uncommon; in fact, more than two dozen such organizations, each with its own unique structure, exist across the United States. Moreover, the WTGHA has *already* entered into formal intertribal partnerships, including through the aforementioned USET. Another such example is the <u>Great Lakes Inter-Tribal Council</u> (GLITC), which allows member Tribes and Nations to "better develop and implement programs, seek outside assistance, and gain leverage in dealing with federal, state, and local government."³ Representing five sovereign Nations of more than 40,000 indigenous people, GLITC supplements the independent actions of member Tribes and Nations so that each community's individual needs are met. Both the USET and GLITC examples highlight how inter-tribal organizations can increase the capacity of the Tribes and Nations to accomplish shared goals, while supporting each Tribe's or Nation's sovereignty and individual needs. Additional examples of regional intertribal entities are available <u>here</u>.

Institutional Structure. Ultimately, it is up to the WTGHA community to determine what type of institutional structure best suits its needs. That said, a myriad of structures exist that could be adopted by the Tribe as a framework for regional action. One potential institutional structure could be that of an intertribal climate authority. Authorities^{4 5} are outside-of-government organizations with the sole purpose of furthering a predetermined public interest. The purpose of any authority (i.e., the *authority* of the organization itself) is set by the very government(s) that establish it, which retain control of the matters under the authority's purview and the ability to dissolve the organization entirely. Many authorities operate as 501(c)3 nonprofits with a Board of Directors and an Executive

³ Great Lakes Inter-Tribal Council

⁴ <u>capitalgazette.com/opinion/columns/ac-ce-joanne-throwe-2021601-20210601-cn2d7ewjfrbvnjk5nlonm5pbqy-story.html</u>

⁵ "What is a Public Authority?" Office of the New York State Comptroller.

Director. Should WTGHA deem this structure appropriate, the primary (if not sole) mission of the organization should be to find and allocate funding resources. We do not recommend the establishment of a financing authority, but rather an organization that can identify and pursue state, federal, and philanthropic funding opportunities.

Another structural option may be expanding on existing collaborative structures that have already proven successful in advancing WTGHA's climate efforts. USET offers a potentially exciting opportunity to explore how to explicitly develop an intertribal, climate-focused organization. To-date, USET environmental resource management and climate change programs have largely focused on capacity-building. To the Project Team's knowledge, USET efforts have not been directly involved with project implementation. However, USET *has* established other institutional structures that allow for direct investments by the nonprofit. The <u>USET Sovereignty Protection Fund</u> (SPF) actively engages on advocacy, litigation, and public policy issues to advance the sovereignty of member Tribes and Nations. While it was outside the scope of this project to do a full assessment of USET, WTGHA may consider engaging the organization in future conversations to determine if opportunities exist to mimic USET's SPF structure to advance shared climate resilience interests.

<u>Rules and Regulations</u>. While it is outside the scope of this project to conduct a thorough assessment of any potential legal restrictions associated with the establishment of an intertribal climate organization, it is critical to do so. More specifically, such an assessment should determine how such an organization, depending on its structure, would operate within the rules and regulations of all participating Tribes and Nations, as well as any applicable federal or state rules or regulations.

Identifying Projects. We recommend that one of the key responsibilities of such an intertribal organization be the identification of climate-related projects suitable for funding. The organization should thoroughly explore potential projects in order to determine key details associated with each (e.g., order of magnitude cost estimates, Tribe(s) and/or Nation(s) responsible, key contacts, design needs, maintenance requirements, timeline). Whereas, in some cases, it may be difficult for identified projects in one Tribe or Nation to benefit all of the others, the organization should seek to bundle projects together based on common outcomes, especially in cases of projects from different Tribes and Nations will demonstrate capacity to operate *at scale* — something that will be crucial in accessing funding and revenue, as explored below.

<u>Funding and Revenue</u>. Federal dollars are perhaps the most common source of funding for Tribal environmental programs. In some cases, federal funding is appropriated or earmarked. In others, funding is discretionary. In others still, Tribes and Nations must compete for grants, only some of which have Tribal set-asides. Simply put, it can be

extremely difficult and time consuming for Tribes and Nations to track, apply for, and/or secure federal funding. We recommend a key focus of an intertribal organization is identifying, prioritizing, and applying for federal dollars on behalf of participating Tribes and Nations. In some cases, this may happen collectively; in others, the organization may pursue funding for individual Tribes or Nations on a case-by-case basis.

It should be noted that, interjurisdictional organizations at times face challenges when pursuing funding for projects with extremely localized benefits. It can be difficult to make the case (to funders and participating jurisdictions alike) that projects in one jurisdiction carry real benefits for all member communities. To these ends, it will be essential that the organization is able to operate *at scale*. By identifying multiple projects across partner jurisdictions with common outcomes, the organization will be positioned to make the case for meaningful regional conservation and restoration impacts. Scaled efforts also enhance partners' buy-in by producing real results for participating Tribes and Nations.

<u>Procurement</u>. The framework of an intertribal organization should allow Tribes and Nations to outsource the time and resource commitments associated with procuring services for climate-related needs. As an interjurisdictional group, the organization should be positioned to retain services in a way that maximizes efficiency, achieving multiple goals for multiple Tribes and Nations concurrently. Thus, we recommend developing it with the ability to procure services and goods from outside contractors and vendors as appropriate to support the institutional mission.

<u>Cash Flow and Investment</u>. As the organization secures revenues, focus will be needed on opportunities for investment (i.e., funding on-the-ground projects on the lands of participating Tribes and Nations). While a full assessment is outside this project's scope, we recommend developing the organization with the following core tenets:

- <u>Efficiency</u>. The organization should invest in Tribal climate projects and initiatives in the most efficient manner possible. By doing so, limited funding dollars are stretched as far as possible.
- <u>Effectiveness</u>. Whereas efficiency is one half of the equation, effectiveness is the other. The organization should support projects that produce the greatest desired outcomes (e.g., pollution abated, water retention). Moreover, projects that achieve multiple outcomes should be high priorities.
- <u>Equity</u>. Equity and social concerns should be foundational to how the organization operates. Projects that directly enhance social resilience, public health, and promote social justice should be highly prioritized.

<u>Alternative Structures</u>. While an *intertribal* organization is the recommended approach given the benefits of enhanced capacity and shared administration, WTGHA may also consider

pursuing the development of an organization solely focused on making the Tribe's own lands climate resilient. In this case, we would recommend establishing an organization in a similar manner as described above, though with some key differences:

- <u>Governance and Staff</u>. The organization's governance should represent a diversity of perspectives across the Tribal community. It should be composed of individuals who will champion the institution's efforts and help connect the organization with the community members and external stakeholders necessary to advance its mission. Regardless of structure, the Project Team recommends that the organization operate separately from existing Tribal government. In short, Tribal staff currently manage countless priorities. Any new or expanded organization should minimize existing responsibilities of staff, rather than add to them.
- <u>Rules and Regulations.</u> Establishing an organization solely focused on WTGHA would require a less intense legal review. That said, it would still be imperative that Tribal, state, and federal policies are assessed to determine any restrictions.
- <u>Projects, Funding, and Investment</u>. One of the key benefits of an intertribal organization is the ability to leverage capacity in pursuit of common goals. That said, an organization solely focused on WTGHA would not have the ability to draw on the capacity of other Tribes and Nations. Moreover, it could potentially be more difficult for a WTGHA group to pursue projects at-scale given geographic limitations. This would likely make the pursuit of federal funding more difficult or, at the very least, would not address the challenges Tribal staff already face when pursuing grants. That said, the Project Team recommends that the Tribe consider more innovative options for investment (e.g., public-private partnerships) should it elect to pursue an organization solely focused on WTGHA.

Next Steps. The following recommended actions serve as "Next Steps" to advance the ideas presented above.

- <u>Commission a thorough institutional assessment to determine which structural approach best suits the Tribe's needs.</u> The main goals of the organization will be to expand WTGHA's capacity, stretch limited funding dollars, and increase tribal sovereignty over climate adaptation actions. While the Project Team recommends this be accomplished through a regional intertribal organization, it is ultimately up to WTGHA to determine (1) whether an intertribal organization is the most appropriate fit, and (2) what type of new or existing structure might be necessary to meet the Tribe's needs. Therefore, we recommend conducting an institutional capacity assessment to identify needs, opportunities, and barriers. Such an assessment could be completed internally or contracted out.
- 2. <u>Begin holding internal conversations with elders, Councilmembers, and members to</u> <u>gauge interest and discuss potential opportunities and barriers.</u> The next step in

pursuing the idea of an intertribal climate organization will be initiating conversations within WTGHA itself. Broad community and leadership support will be essential for the success of such an initiative. The Project Team would be happy to re-engage to discuss this topic further and answer questions as appropriate.

- 3. <u>Begin holding conversations with regional Tribal partners (such as USET) to gauge</u> <u>interest and discuss potential opportunities and barriers.</u> Assuming internal support for an intertribal organization, we recommend WTGHA staff begin holding discussions with regional Tribes, Nations, and partners (such as USET). We recommend that the WTGHA leverage ongoing USET climate planning discussions to present this idea to other tribal groups to gauge interest and coordinate follow-up.
- 4. <u>Work with regional Tribes, Nations, and/or partners to prioritize funding to hire an</u> <u>external contractor to explore potential barriers and develop an implementation</u> <u>plan for an intertribal climate organization.</u> Additional information will be essential as the Tribe considers next steps. That said, we recommend hiring an external contractor to determine opportunities and barriers associated with establishing an intertribal climate institution. While resources are limited, the Project Team feels as though this would be a worthwhile investment for the Tribe to make in the long-term.



This report was produced by the dedicated team at <u>Throwe Environmental, LLC</u> in the company's role as a core partner within the SNEP Network. Throwe Environmental is committed to developing climate resilience, environmental finance, and policy and governance solutions for its public, private, and nonprofit clients. As a SNEP Network partner organization, Throwe Environmental focuses on financing, training, and leadership development. Throwe Environmental is based in Bristol, RI and helps communities nationwide address their climate challenges.