



IMPACTS OF CLIMATE CHANGE ON THE AMAH MUTSUN TRIBAL BAND

Drought, wildfire, and sea level rise, as well as loss of native plants and animals, are threatening the physical, cultural, and spiritual health of the Tribe, its habitats, and ecosystems.

Background

The Amah Mutsun Tribal Band (AMTB) is a continuous and historic Tribe composed of the descendants of the Indigenous peoples whose villages and territories were taken over by Missions San Juan Bautista (Mutsun) and Santa Cruz (Awaswas) during the late 18th, 19th, and early 20th centuries (AMTB, 2021). The Indigenous people were baptized as legal wards of the Franciscans and forced into labor building the missions, farms, and ranches of the colonizers (Madley, 2017). The AMTB represents the surviving descendant families of these groups. The AMTB is recognized by the State of California as a Tribal Government but lacks federal recognition. Consequently, the AMTB holds no tribal lands, nor receives financial assistance from either the Federal or State governments.

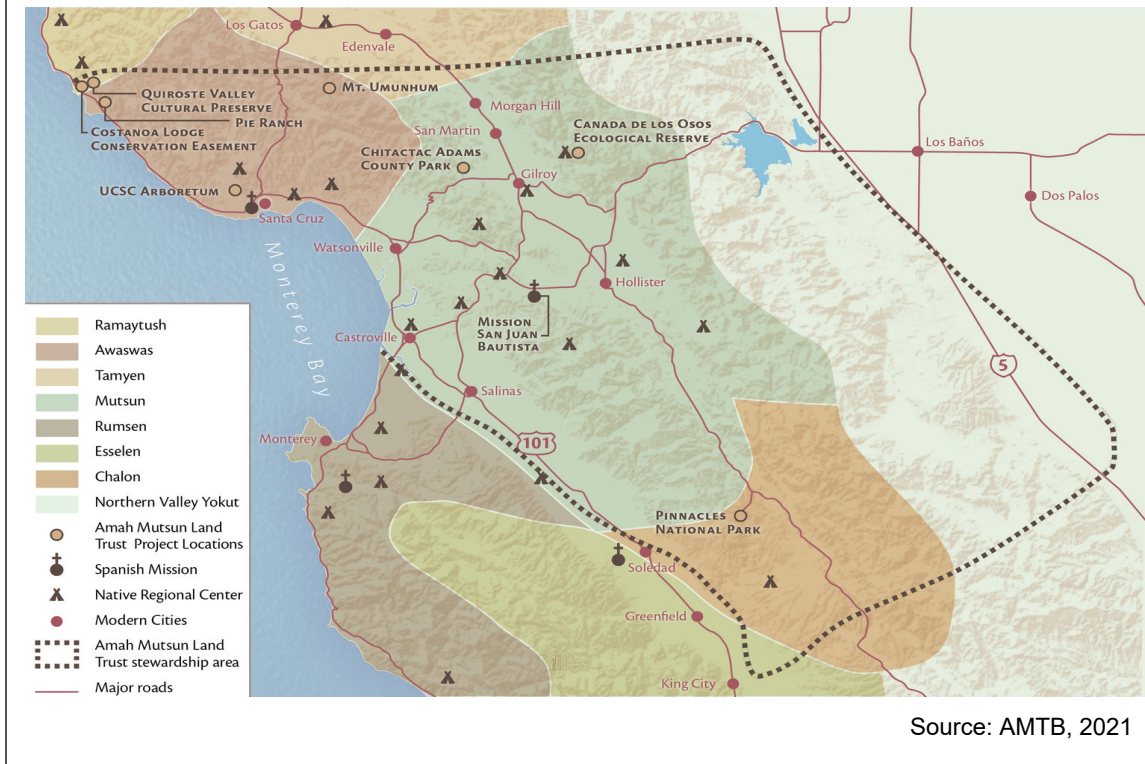
Prior to European contact, the Amah Mutsun community was made up of approximately 20 to 30 contiguous villages stretched across the Pajaro River Basin and surrounding region. These villages were united by shared cultural practices and traditions. Most significantly, Amah villages were distinct from tribes outside their valley because of their unique language. While the Costanoan/Ohlone language family was made up of eight separate languages, including Mutsun, each language was different. Mutsun was one of the first American Indian languages extensively studied in North America (AMTB, 2021).

The Amah Mutsun Tribe was drawn to the abundant resources in the triangle of land formed by the Monterey Bay and the Pajaro and San Benito Rivers by the abundant resources. These lands later attracted other settlers who drastically changed the lives of the Amah Mutsun. While the traditional territory of the Amah Mutsun encompasses all or portions of the current Counties of San Benito, Monterey, Santa Cruz, Santa Clara, and San Mateo, the high cost of living in the San Francisco and Monterey Bay areas, combined with a lack of treaty or tribal trust land, has resulted in over 80 percent of Tribal members living outside of their ancestral territory. Many members live in Fresno, Madera, Hanford, Las Vegas, and Lake County, and other areas outside of California (AMTB, 2021).

Through three periods of brutal European colonization (Spanish, Mexican Republic, and United States) (Madley, 2017), the Tribe's traditional ecological knowledge and physical connection to their ancestral lands were disrupted.



Figure 1. Amah Mutsun (Awaswas and Mutsun) historic lands and neighboring Tribes



The AMTB continue to maintain a sacred obligation to continue in the footsteps of their ancestors, stewarding the lands and waters of their traditional homeland. In 2013, the AMTB created the Amah Mutsun Land Trust (AMLT) to help achieve this vision.

AMLT is a Native-led, non-profit organization. Through the AMLT, the AMTB is restoring Indigenous stewardship to the Mutsun and Awaswas-speaking peoples' ancestral lands and waters, which stretch from Año Nuevo Point to the Monterey Bay, and inland to include the Pajaro and San Benito watersheds (see Figure 1 above). AMLT focuses on education, stewardship, research, and cultural revitalization, in addition to land acquisition. AMLT brings an Indigenous perspective to resource management that models constructive relationships between people and place, where active engagement with the land contributes to more diverse, resilient, and meaningful landscapes. AMLT engages a Native Stewardship Corps (NSC), made up of AMTB members plus an array of state, county, University and Tribal partners, to bring Indigenous stewardship to lands that are already in conservation. Because the Tribe is currently unrecognized by the federal government, the NSC functions much as an environmental department would.

Cultural and spiritual health

Historically, the Amah Mutsun ensured a sustained yield of plant and animal foods by careful management of the lands. Controlled burning of extensive areas of land was carried out each fall to promote the growth of seed-bearing annuals.



When the Tribe speaks of “cultural resources,” they look all around at the mountains, the meadows, the waterways and wetlands, the air, and scenic vistas – as well as those buried beneath them, and those who inhabit them. Those are the Amah Mutsun cultural resources – all holds value to the Amah Mutsun Tribe (AMTB, 2021).

When non-indigenous people think of California Indian culture and cultural resources, they often look at tangible objects such as basketry, housing, clothing, food, and dance regalia such as feathers, whistles, skins, clapper sticks, etc. These are all important manifestations of Amah Mutsun culture, but to understand the culture of the Amah Mutsun Tribe, one must also understand two important axioms.

Axiom I: There is no natural hierarchy in the Amah Mutsun culture that categorizes plants, animals, minerals, or humans as being above any of the others. It is the Tribe’s belief that the Creator made all beings – therefore we are all equal. Men, women, and children were all created equally and are respected equally. The Amah Mutsun are a matriarchal society. Women can bring life – possessing the strength to bear the burden of two souls within them. Men possess physical strength to provide and protect – creating balance in the family and community. The Amah Mutsun believe human beings were gifted with a higher level of intelligence and reasoning for the express purpose of protecting and caring for all other life.

Axiom II: The Creator, using infinite wisdom, placed the Amah Mutsun in the lands of “*Popeloutchum*”, the homeland, as the protectors and stewards of the lands, waters, plants, and other creatures of this place. The Creator blessed the Amah Mutsun with these magnificent lands with a mild climate, bountiful foods from the land and sea, and a landscape that is considered among the most beautiful in the world.

As Amah Mutsun ancestors worked to fulfill their obligation to protect the plants and animals of the land, they also studied their non-human relatives for thousands of years. The Bear Clans, Bird Clans, etc. were given the responsibility to learn all they could about those creatures. The knowledge they collected was shared with their Tribe and their descendants.

The Amah Mutsun, never felt that they owned the land – rather that they belong *to it*. When the Amah Mutsun talk about “our land” – or “*makke pire*”, they are referring to the land to which *they belong*...rather than the land which they “own.”

Because the Amah Mutsun have a responsibility to care for our finned and winged brothers, they must protect and conserve the rivers (water quality) and the sky (air quality). The Tribe must help ensure that their populations can move and interact (habitat corridors) to maintain healthy and resilient populations (AMTB, 2021).

Impacts

The impacts and future threats resulting from climate change in Amah Mutsun Territory are drastic and rapidly compounding, both on land and in the sea. On land, the



increasing destructive wildfires are followed by higher rates of erosion and landslides. Culturally important plant and bird species are being impacted by drought, wildfire, and increasingly variable rainfall. Tribal members living in the inland areas report drier, hotter summers, less annual rainfall, low water tables, lakes and creeks drying up, poor air quality, and more intense, more frequent wildfires. These changes, along with development and urban sprawl, impact housing and intensify destructive land-use practices. In the sea, the coast has become more vulnerable to coastal erosion resulting from high energy storms and swell events with the collapse of kelp forests that had acted as buffers. This erosion, along with sea level rise, are threatening cultural sites along the shoreline. Loss of ocean biodiversity, drastic reductions of certain species and overpopulation of others, and marine harmful algal blooms (HABS) also threaten Tribal resources.

Land

The most recent and high-profile impacts of climate change are evidenced by the August 2020 CZU Complex fires, started by lightning in an area that historically had a very low number of lightning strikes. The CZU Complex burned for over a month, torching 86,509 acres in Santa Cruz and Santa Clara counties, destroying 1,490 structures, and damaging 140 (CALFIRE, 2020). These fires led to the evacuation and displacement of the NSC, loss of a month's work, loss of necessary field equipment, and an overall unstable, uncertain, disrupted work and life flow. Heavy rain four months after the fires led to another evacuation because of potential landslides, putting the NSC in yet another high-risk situation.

Droughts brought about by climate change are making oak woodlands more susceptible to death from pathogens and pests. Wildfire in areas with these dead and dying trees will tend to form crown fires that spread from treetop to treetop. Once removed by wildfire the woodlands may be replaced by shrubland and other vegetation types that are unable to support native plant, animal, and bird species.

Catastrophic fires impact watersheds, water and air quality, rangelands, wildlife, culturally significant sites, infrastructure, croplands, and of course, the Amah Mutsun's way of life. These fires are intense due in part to unmanaged fuel loads. The CZU Complex is also a prime example of how the compounding impacts of fire suppression, poor land management, and climate change can result in widespread, destructive wildfires. The Tribe believes that fire can be managed more effectively if Indigenous stewardship and cultural knowledge around Indigenous peoples' use of fire are more widely accepted and implemented by land managers.

Recent eco-archaeological research in the area provides evidence that Amah Mutsun people had regularly practiced cultural burning as a landscape management strategy prior to European colonization. Informed by traditional ecological knowledge, cultural burning by Indigenous people protects ecological and cultural resources and builds wildfire resilience. Cultural burns are properly timed, low-intensity fires that move slowly



through a segmented management unit of land and promote the abundance and health of many culturally significant native plants.

Figure 2. Amah Mutsun controlled burn



Source: AMTB, 2021

The Amah Mutsun have great respect for fire as a land stewardship tool. As Chairman Valentin Lopez explains:

“We see fire as a gift from Creator. Like all gifts, it is important to respect and recognize it in that way. Fire is sacred and used as a prayer. A spiritual fire is placed in the middle during ceremonial dances and carries our prayers up to Creator. Fire is used as a light, and as a land management tool. Our ancestors divided the land into management units, they then burned segments when needed, on a rotating cycle, until the cycle was complete. This allowed for consumption and reduction of fuel loads and control of encroaching brush, aiding the ecosystem. Coastal prairie grasslands have diminished due to outlawing the practice of Indigenous burns. Fire has a critical role in maintaining the coastal grassland prairie. The coastal prairie



grassland was one of the most viable landscapes and rich in biodiversity in North America before Europeans arrived.”

“Cultural burns help control pests, reduce buildup of heavy fuels, and aid native plants that require fire to germinate. We have a responsibility of taking care of plants, birds, and feeding the animals by taking care of native seeds. The first year of the burn cycle aids in seed and seed bed preparation. The second year after the burn, plants strengthen reproduction, and shoots are soft and nutritional for grazing wildlife. The third year, there is increased fruit productivity. The fourth year yields strong plant fibers which are utilized for crafts and housing materials. A special ceremony is held when cultural burning in oak woodlands. Smoke helps purify the trees. Smoke chokes out pests in trees, and therefore aids in the production of acorns. Insects are choked out and fall down, and then are consumed in fire. Therefore, fire and smoke aid with insect infestation in trees and killing of pests such as ticks in grasses.”

Wildland fire knows no boundary and taking care of Mother Earth requires a coordinated effort, and as Honorable Chairman Valentin Lopez says, *“Indigenous stewardship must lead the way.”* Indigenous stewardship practices like cultural burning are gaining traction among land managers as effective methods of building resilience in natural systems.

To restore ecological health and resilience to the Amah Mutsun by bringing back small-scale fire as a tool to mitigate the impacts and threats of destructive wildfires, the AMLT works with:

- California State Parks and University of California (UC) campuses at Berkeley and Santa Cruz to understand the historic extent of fire as a Native landscape management tool.
- California State Parks and CALFIRE to remove thick stands of Douglas fir to create fuel breaks and restore grasslands.
- California State Parks and UC researchers in Quiroste Valley, an area east of Año Nuevo State Park to research and re-introduce traditional resource and environmental management, including cultural burning, as practiced in the valley before the arrival of Europeans. The uplands above the meadow and riparian valley contain dense Douglas fir, and coyote brush stands with little to no understory. These stands have encroached upon the open coastal prairie grassland. Due to the dense canopy cover, little sunlight reaches the forest floor, allowing little to no grasses and forbs. This reduces biodiversity and threatens the coastal prairie, which was once much more widespread.
- Inter-Tribal Fire Network to better relationships with federal and state land management agencies and with other tribes throughout California.
- A grant from the California State Coastal Conservancy, which has provided funding (cap-and-trade funds from California Climate Investments) to aid in the



development of a Cultural Burns program, where the Tribe can strive to best steward ancestral lands.

- A cooperative Habitat Restoration Project with Pinnacles National Park using an integrated approach to habitat restoration and research by incorporating traditional Native American land management practices with contemporary techniques to restore and protect the natural and cultural processes.
- The Karuk and Yurok Tribes, which host Prescribed Fire Training Exchanges (TREXs). These trainings emphasize the stewardship of cultural resources and build key working relationships and coordination with many land management organizations. Tribal members are currently becoming National Wildfire Coordinating Group Firefighters, Type 2 certified, and are gaining experience with prescribed fire.

Bird species important to the Tribe have also been impacted by climate change. The condor is a culturally important species to the Amah Mutsun and the Tribe has worked with Pinnacles National Park reintroducing the birds and providing an understanding of the cultural meanings of the California condor (AMTB, 2021). These newly released birds were again threatened when the CZU Complex burned in nesting areas with fledgling birds, unready to fly to escape (NPR, 2020).

Along with exacerbating wildfire risks, climate change has also impacted the availability of certain native plant species of ethnobotanical importance to the tribe. These are species traditionally used for building, basketry, and food. Members of the NSC have reported that many culturally important coastal prairie and woodland plants are becoming rarer and more difficult to restore, while invasive plants like Jubata grass, poison hemlock, and thistles are incredibly difficult to eradicate in grasslands.

Figure 3. Amah Mutsun Tribal members and Land Trust propagate plants



Source: AMTB, 2021



Part of AMLT's land restoration work includes:

- Working with UC Santa Cruz arboretum to propagate ethnobotanically important plants.
- A coastal grasslands propagation project at Quiroste Valley. This California Proposition 68 funded project intends to directly plant 30,000 native plants at Quiroste Valley.
- An additional 90,000 native plants at a neighboring location, which will provide additional seed to be sown directly into the Valley in subsequent seasons. Despite ongoing impacts of COVID-19 and the August 2020 CZU fire complex in the Santa Cruz Mountains impacting water supplies, the program has remained on track to meet the ambitious goal of returning culturally important grassland plants.
- Tending a permanent source of grassland seed for gathering and restoration. This is even becoming more important since AMLT can propagate and plant drought-tolerant native grasses, like Purple Needlegrass, the state grass of California.

Sea

The Amah Mutsun have lived and interacted closely with the coast since time immemorial. Their ancestors stewarded the sea through resource management practices that maintained abundant, healthy coastal waters. The rich and biodiverse kelp forests provide habitat for fish, marine mammals, and invertebrates. The sandy and rocky shorelines are filled with a myriad of seaweeds and animals. This depth of knowledge lives with the Amah Mutsun Tribal Band elders. It is further documented in ethnographic records and evidenced in archaeological sites along the coast.

Today, the Amah Mutsun witness a wide range of impacts on local coastal waters. Sea level rise is eroding ancient cultural sites from the shoreline. The loss of kelp forests due to the rapid spread of purple sea urchins because of the mass wasting of sea stars, their main predator, is leading to significant losses in biodiversity. Ocean temperatures affect the availability of food for sea lion pups and pregnant sea lion mothers. Warmer waters can reduce the abundance of phytoplankton and other organisms that make up the base of the marine food chain along the California coast. Changes to the availability of these organisms affect higher levels of the food chain, including sea lions (OEHHA, 2018). Unusually warm ocean temperatures can also amplify harmful algal blooms that periodically occur along the California coast. Certain algae species produce toxins such as domoic acid that enter the marine food web and ultimately harm sea lions (OEHHA, 2018). Harmful algal blooms are especially abundant and widespread within Amah Mutsun territory and can render many culturally important resources toxic and inedible. Rising ocean temperatures and increased carbon levels make it difficult for many native species to survive, especially considering the competition of encroaching invasive species that crowd them out. By monitoring these resources throughout the year, the Tribe can better understand the issues affecting them and contribute to protecting and managing them.



Figure 4. Amah Mutsun youth and UC Berkeley researchers getting ready for a day at the beach.



Photo courtesy of Rob Brodman

At the direction of Tribal leadership, the Amah Mutsun are now looking to build the capacity of AMTB members as ocean stewards by developing and implementing a new AMLT marine stewardship program. Work includes:

- Participating in the Tribal Marine Stewards Network (TMSN) pilot project, along with four other Tribes/Tribal organizations, who received funding from the Ocean Protection Council in 2020.
- Developing a coastal monitoring program that will return traditional resource stewardship to the coast within Mutsun and Awaswas territories. This program builds upon previous work that combined archaeological and ethnographic information to restore and revitalize resource stewardship on the land, such as fire to manage coastal grasslands.
- Partnership with the California Indian Environmental Alliance, Tolowa Dee-ni' Nation, Resighini Rancheria, Kashia Band of Pomo Indians, and Ecotrust to form a Tribal Marine Stewards Network. The Tribal Marine Stewards Network pilot project received generous funding from the Ocean Protection Council in 2021. The Amah Mutsun Tribal Band's participation is further supported by a grant made through the Sustaining California's Ocean Program of the Resources Legacy Fund.



- Monitoring other significant natural and cultural resources, especially kelp forests, rocky intertidal zones, and seagrass beds, which provide habitat for a diverse range of species and are essential for maintaining productive marine ecosystems.

Each of these projects will build the capacity of AMLT Native Stewards as stewards of the marine environment by creating opportunities for Tribal members to learn and practice new skills. These projects will also contribute new data that will be shared with the State and aid in the management of California's Marine Protected Areas. The community outreach project will be focused on revitalizing and building upon the AMTB tribal communities' traditional ecological knowledge about coastal and marine resources and how to steward them.

Other impacts

The creeks, streams, and rivers within AMTB historic lands have also been impacted by climate change in a myriad of ways. Rising temperatures and drought have decreased water flows and led to warmer waters in culturally important fish habitat and unfavorable spawning conditions.

Salmon populations are impacted by nutrient availability, drought, temperature, and freshwater/saltwater interfaces, all of which are affected by climate change. To gain more insight into managing habitat conditions to favor salmon populations, AMLT collaborates with:

- Researchers at Michigan State University to study ancient and modern salmon and steelhead genetics within their traditional territories.
- Researchers at UCLA to develop an environmental DNA monitoring program for species of ecological and cultural importance, many of which are influenced by climate change. As part of this research AMLT is actively working on a dam removal project in their territory geared towards salmon restoration.

Summary

Climate change is causing a loss of native plants and animals, causing droughts, wildfires, landslides, sea level rise, and increasing marine harmful algal blooms. These impacts are threatening the physical, cultural, and spiritual health of the Amah Mutsun Tribe.

Neither the lack of a permanent land base, nor the lack of federal recognition has prevented the Amah Mutsun Tribal Band from fulfilling their continuing obligation to protect the plants and animals on their Tribal homelands. The AMTB are reaffirming their role as environmental stewards of Mutsun and Awaswas territories by using innovative research, partnerships, and Tribal community education to relearn traditional ecological knowledge and apply it to the most pressing issues in natural resource management and conservation. AMLT continues to successfully apply this approach to terrestrial ecosystems, using archaeology and modern ecological science to affirm the



utility of ancient traditional resource management practices to restore balance and resilience to the diverse ecosystems in AMTB territory.

The Tribe relies on historical ecological data preserved in coastal archaeological sites. These sites contain information regarding past stewardship practices and traditional ecological knowledge of coastal resources. The archaeological record is a non-renewable resource with specific windows of opportunity for the Tribe to engage. Unfortunately, due to climate change-related sea-level rise, these windows are rapidly closing as artifacts are exposed and destroyed, as they are washed out to sea or collected by treasure hunters for sale. Many of these sites are being impacted by rising seas and high energy storms, both directly linked to climate change. Without adequate monitoring and protection of these sites, this vital historical dataset for the Amah Mutsun Tribal Band could be lost forever, impacting the conservation science. Indigenous knowledge and evidence from the archaeological record hold information regarding human relationships with marine ecosystems over thousands of years.

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