

Informing the North Coast MPA Baseline: Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems

**A Collaborative Project Among:
Tolowa Dee-ni' Nation
InterTribal Sinkyone Wilderness Council
Cher-Ae Heights Indian Community of the Trinidad
Rancheria
Wiyot Tribe**

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North Coast MPA Baseline Project #R/MPA-39

A Collaborative Project Among:

Tolowa Dee-ni' Nation (lead)

InterTribal Sinkyone Wilderness Council (co-lead)

Cher-Ae Heights Indian Community of the Trinidad Rancheria (co-lead)

Wiyot Tribe (co-lead)

With Digital Support from Ecotrust

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Executive Summary

Introduction

As longstanding resource managers with unceded inherent rights and responsibility to continue to steward and gather marine resources within their ancestral waters, it is critical that Tribal nations play an integral role in the manner in which data about the health of the marine environment is gathered, analyzed, disseminated, and used to inform policy and management. As keepers of Tribal/Indigenous Traditional Knowledge, Tribes and Tribal citizens continue to hold and practice a unique epistemology and understanding of the species and ecosystems within their ancestral territories, as they have since time immemorial.

This project, *Informing the North Coast MPA Baseline: Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems*, applies Tribal/Indigenous Traditional Knowledge (T/ITK) to inform the baseline characterization for State Marine Protected Area (MPA) monitoring. This project represents the first time that T/ITK has been gathered under the State MPA Baseline Monitoring Program. It contributes a highly relevant and groundbreaking study that utilizes T/ITK to develop a baseline characterization for key nearshore marine habitats, and provides significant historical context for that baseline. The project also provides information on essential consumptive and non-consumptive uses by several North Coast Tribes, as well as areas where Tribal citizens are concerned about a particular threat to marine resources and/or habitats. This information is critically important because Tribal citizens constitute a vital “front line” user group with extensive marine knowledge and stewardship practices that span countless generations.

Tribal Community Research

This project uses tribal community based participatory research to develop a baseline of ecological features and species observations, identify areas of concerns/threats for long-term monitoring, and to inform ocean policy and adaptive management. Five (5) keystone species types are the primary focus of the research related to species observation and ecological features. The five species types included are: abalone, clams, mussels, seaweed, and smelt (surf fish and night fish). This project was conducted by three federally-recognized Tribal nations: the Tolowa Dee-ni’ Nation (formerly Smith River Rancheria), the Cher-Ae Heights Indian Community of the Trinidad Rancheria, and the Wiyot Tribe, as well as a Tribal consortium of ten (10) federally-recognized Tribal nations known as the InterTribal Sinkyone Wilderness Council (Project Partners). Each of the Project Partners was responsible for gathering the T/ITK from within their respective communities and Tribal territories.

Tribal Archival Research

This project includes archival research of over one hundred and twenty (120) sources, the earliest from 1850. Archival materials included the following Tribal groups: Tolowa, Yurok, Wiyot, Mattole, Sinkyone, Cahto, Coast Yuki, Northern Pomo and Central Pomo. A relational database schema was created to store archival data and provide for data standardization. The project also includes interviews with sixty-nine (69) Tribal citizens from the Project Partners’ communities. The Tolowa Dee-ni’ Nation conducted the most interviews (26), followed by InterTribal Sinkyone Wilderness Council (23), Cher-Ae Heights Indian Community of the Trinidad Rancheria (10) and the Wiyot Tribe (10). Tribal citizens known to harvest from the ocean were

selected to interview, using a chain referral method. The Project Partners, in collaboration with the contracted firm Ecotrust, created a digital data survey to standardize both the spatial and aspatial aspects of the Tribal interviews.

Overview of Project Results

Tribal citizens have and continue to rely upon the marine environment for consumptive and non-consumptive uses. Table ES-1. Marine-Related Activities (below) demonstrates the marine-related activities conducted by interviewees (n=69). There were 208 places documented in archival materials, as related to the project’s five (5) keystone species types. And from only sixty-nine (69) interviews regarding harvesting of just five (5) nearshore species types, the entire North Coast Study Region coastline was nearly covered with identified harvesting locations, as evidenced in Figure ES-1. “Heat Map” of All Areas of Concern for All Threats (following page). This underscores the intimate knowledge and use by Tribal citizens of the marine environment along entire coast and the continued importance of gathering in places where familial, village and/or tribal connections continue to inform traditional values and important stewardship practices.

Table ES-1. Marine-Related Activities

Marine-related Activity	Number of Interviewees	Percent of Interviewees
Ceremony	45	65%
Commercial fishing from shore	8	12%
Commercial fishing offshore	6	9%
Customary fishing and/or gathering offshore	35	51%
Customary fishing and/or gathering from shore	69	100%
Customary hunting from shore	22	32%
Customary hunting offshore	5	7%
Processing	48	70%
Training	32	46%
Other: enjoy ourselves/beach	2	3%

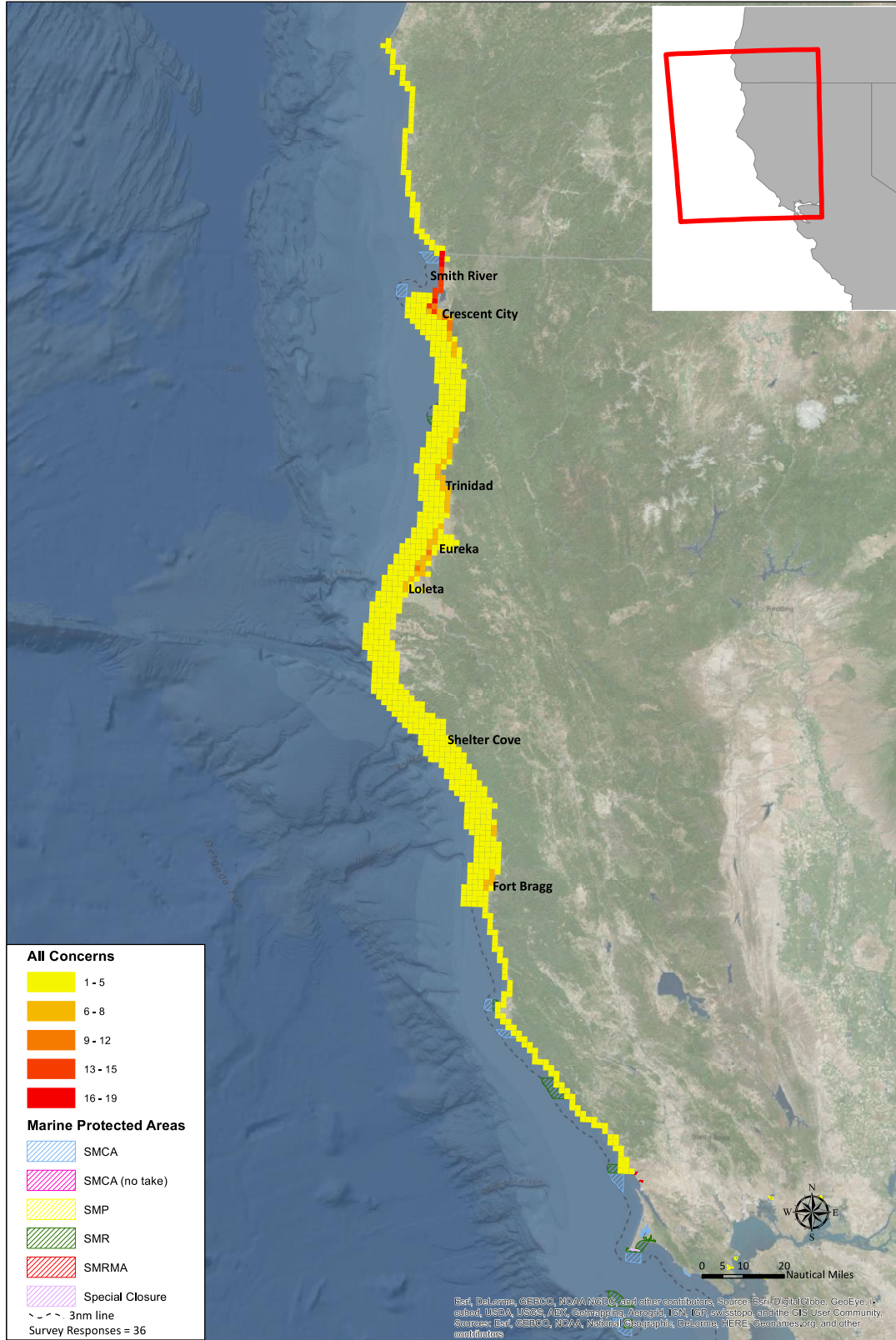
Since time immemorial, Tribal nations have developed and utilized highly sophisticated and effective marine stewardship practices and principles designed to support healthy marine ecosystems. During the course of the Project work, the following key themes were expressed that provide a framework for summarizing these general practices and principles:

- 1) Live in a good way, ask for what you need, and give thanks—prayer
- 2) Don’t take more than you need and can care for—don’t waste
- 3) Inter-connectivity and inter-reliance of everything—community/responsibility to more than self
- 4) Abide by teachings passed down through generations—protocols and laws
- 5) Manage in a way than ensures species health and abundance that sustains Tribal citizens—maintain balance

Figure ES-1. "Heat Map" of All Areas of Concern for All Threats

North Coast Tribal Marine Areas of Concern

InterTribal Sinkyone Wilderness Council, Tolowa Dee-ni' Nation, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe



There are also specific Tribal stewardship management techniques that may be categorized as spatial, temporal, socially-based, hydrological, technological, seasonal, taxonomic, demographic and morphological.

Based on perceived threats to marine resources and/or habitats, interviewees characterized the ocean as becoming warmer, being impacted by varying pollutants, and facing overharvesting. Interviewees identified eight (8) MPAs they considered as directly impacting Tribal uses. Pyramid Point was the MPA identified most frequently. Tribal citizens interviewed are witnessing the most serious declines in species abundance for abalone, smelt and clams (specifically quahogs and razors). It appears that seaweed may be experiencing less of a decline, although certain seaweed locations have been severely impacted. The final species, mussels, have remained steady in population, as documented by Tribal citizens interviewed.

Despite the public nature of the California Marine Life Protection Act Initiative (MLPAI) process to designate North Coast MPAs, the majority (54%) of interviewees who responded to the survey question (n=67) on this topic said they had not participated in the MLPAI process. Eighty-eight percent (88%) of respondents (n=66) said they would purchase Tribal fishing/harvesting licenses, if their Tribal nation issued them. This finding helps support the approach for developing Tribal/State co-management as a viable and likely means for increasing Tribal citizen compliance with licensing requirements, as well as an effective way to develop Tribal collaboration in monitoring and management of marine resources, including the MPAs.

Key Points from Discussion Section

In order to protect the confidential and proprietary nature of the project's cultural information, the report's Discussion and other sections present generalized summaries of such information and findings. Project data was gathered and analyzed with the intent of informing an accurate characterization of North Coast MPAs. Toward that end, the project's results will significantly contribute to the existing baseline of North Coast MPAs, help inform greater understanding of the "shifting baseline", and provide historical context by which to inform and gauge the current baseline.

Data on the project's five species types is discussed under sections covering four habitat types ("Ecosystem Features"): rocky intertidal; soft-bottom intertidal and beach; kelp and shallow rock; and offshore rocks and islands. Tribal importance attributed to each of the five species types is discussed in the context of historical and current practices including: consumptive uses, trade, general gear types, intertribal agreements, and a variety of other customary cultural/social lifeways conducted within the four marine ecosystem types. The Discussion section references the practice of specialized Tribal stewardship and management practices and techniques relative to spatial, temporal, hydrological, technological, seasonal, taxonomic, morphological, and demographic aspects of each of the five species types. Many of these traditional uses, practices and techniques are specific to particular Tribes and regions, while others are practiced widely throughout the North Coast.

Historical as well as current conditions relating to the relative health and abundance of these species types and their habitats is discussed under each of the four ecosystem types, as is the relative degree of importance accorded to the five species types based upon the harvesting

practices of North Coast Tribal peoples. Observed impacts to the five species types and to Tribal peoples' use of the marine environment are discussed relative to over- and incorrect commercial and recreational harvesting by non-Native people, declines in species populations, mismanagement, pollution, climate change, and other problems.

The report's Discussion section also provides summaries of Areas of Concern and Threats; the MLPAI Process; Archival Materials in General; and Interviews in General.

Policy and Management Recommendations

An important purpose of the project was to develop policy and management recommendations emanating from the T/ITK data gathered. This report includes a total of 26 specific policy and management recommendations that discuss appropriate ways in which T/ITK can be accessed and utilized, and how Tribal/State relations can be supported and strengthened. The recommendations were designed to help achieve the shared Tribal/State goal of improving marine resource management. The following is a sampling of four key recommendations.

- Establish State policy acknowledging the ways in which T/ITK can be utilized to inform State marine resource management and the importance and necessity of the Tribes taking the lead in defining how that knowledge is to be accessed and applied.
- Establish State policy acknowledging the inherent, sovereign Rights of Tribal Nations and the inherent Rights of Nature as a basis by which to consider and craft marine and coastal initiatives.
- The State should work with willing Tribal nations to develop and enter into Co-Management Agreements that provide a legal structure for enhanced management and regulatory enforcement that recognizes the governmental authority and natural resources management role of each sovereign.
- The State and Tribal nations should collaborate to incorporate key traditional stewardship into management of cultural keystone species through the California Fish and Game Code, and through public outreach and education efforts by the CDFW, to improve resource health, abundance, and ecosystem balance.

Long-term Monitoring Recommendations

The report also includes 14 long-term monitoring recommendations, which were developed to help inform effective, long term monitoring that leads to enhanced co-management of MPAs. The following is a sampling of three key recommendations.

- Additional analysis of the T/ITK data gathered should be conducted to better understand species population trends in terms of chronology and geography—through initiatives authorized and administered by individual Tribal nations. This could include georeferencing archival data records, transcribing all audio recorded interviews, entry data records into database from interviews, and conducting further qualitative, quantitative, and geospatial trends analysis.

- Continue/Expand surf fish and night fish assessment (e.g. beach egg counts, habitat availability, catch per effort, offshore fishing pressure, genetic diversity, Walker scale to estimate population size).
- Kelp and seaweed assessment on region-wide productivity and availability (population monitoring), as well as impacts from varying harvesting techniques (e.g. traditional/customary, recreational and commercial).

The process for including T/ITK in the State's data-gathering phase for the North Coast's MPAs provides an excellent start for developing a new approach for effective, long term monitoring and management of the marine environment. If the principles informing the collective wisdom of countless generations of Tribal/Indigenous traditional place-based practices and knowledge pertaining to the function, balance, and stewardship of marine ecosystems are to be effectively applied, then the Tribes and the State must in good faith work to further develop mutual understanding and trust so that meaningful Tribal engagement will be realized for the benefit of all.

I. Introduction

a. Background Information

The project, *Informing the North Coast MPA Baseline: Traditional Ecological Knowledge of Keystone Marine Species and Ecosystems*, seeks to apply Tribal/Indigenous Traditional Knowledge (T/ITK) in developing a scientific baseline of the nearshore marine ecosystems, including how Tribal citizens (also known as members) interact with and understand those ecosystems. The project seeks to create a baseline of ecological features and species observations, to identify areas of concerns/threats for long-term monitoring of State of California Marine Protected Areas (MPAs), and to inform ocean policy and adaptive management. To do this, the project relied upon community-based participatory research lead by Tribes with traditional ancestral territories that span the entire North Coast Study Region, as defined under the State Marine Life Protection Act Initiative (MLPAI). The five (5) keystone species selected to be a primary focus of the research related to species observation and ecological features include abalone, clams, mussels, seaweed, and smelt (surf fish and night fish). These keystone species were selected because of four important factors: 1) each is a known biological indicator or biological keystone species; 2) each is a cultural indicator or cultural keystone for many North Coast Tribes¹; 3) each is considered a nearshore species likely to benefit from MPAs²; and 4) each are part of the monitoring metrics developed by the State MPA Baseline Program under several important Ecological Features.

Leading the overall management and coordination of the project is the Tolowa Dee-ni' Nation³ (formerly Smith River Rancheria), a federally-recognized Tribal nation. Project co-leads include two federally-recognized Tribal nations, the Cher-Ae Heights Indian Community of the Trinidad Rancheria⁴ and the Wiyot Tribe,⁵ as well as the InterTribal Sinkyone Wilderness Council,⁶ a Tribal consortium comprised of ten (10) federally-recognized Tribal nations. All four (4) of these Tribal entities are located within the North Coast Study Region. Ecotrust (Contractor),⁷ a non-governmental organization headquartered in Portland, Oregon, was contracted to provide a distinct technological tool and related datasets for the interview portion of the project. Ecotrust

¹ Cultural keystone species may be defined as those species that play an integral role in the identities, rituals, beliefs, stories, social relationships, and food systems of a particular group of people. Input on cultural keystone species comes through Tribal testimony provided during the MLPAI process, documentation provided by Tribes during the MLPAI process, and from extensive consultation with Tribal Councils, Tribal governmental representatives, Tribal Culture Committees, Tribal Fish and Game Committee, several inter-tribal forums, and individual conversations with interested Tribal citizens.

² The methodology and specific, "Species Likely to Benefit from MPAs in the North Coast Study Region" were presented by the MLPAI North Coast Master Plan Science Advisory Team on December 17, 2009 in Eureka, CA.

³ Project Lead on behalf of the Tolowa Dee-ni' Nation was Megan Van Pelt, Consultant, with research conducted by Rosa Laucci, Marine Biologist and Jaytuk Steinruck, Tribal Resources Specialist.

⁴ Project Co-Lead and researcher for the Trinidad Rancheria was Rachel Sundberg, Tribal Programs Director/Tribal Heritage Preservation Officer, with archival research contributions from Sabra Comet, Marine Resources Researcher and Jennifer Ben, THPO Intern.

⁵ Project Co-Lead for the Wiyot Tribe was Dr. Tom Torma, Cultural Resources Director/Tribal Historic Preservation Officer, with research conducted by Ted Hernandez, Tribal Chairman/Cultural Resources Specialist.

⁶ Project Co-Lead for the Sinkyone Council was Hawk Rosales, Executive Director, with archival research contributions by Jerry Rohde, Consultant and Megan Van Pelt, Consultant, as well as community based participatory research by the Sinkyone Council's member Tribes.

⁷ Primary project contact and oversight conducted by Dr. Cheryl Chen, Consultant, with data tool development by Drew Seminara, Software Developer.

has extensive experience in gathering human uses data, including specifically for the California MPA design and monitoring process in the other study regions, notably Scholz et al. (2004; 2005; 2006; 2008; 2010; 2011). They were able to leverage their expertise, survey instruments and methodology already developed, to create a data survey tool that can be used by the Tribes/Nation/Tribal organization for this project.

The Tolowa Dee-ni' Nation is a self-governing sovereign Tribal nation of Tolowa Dee-ni',⁸ with headquarters on their Reservation in Smith River, California. The Reservation lands of the Tolowa Dee-ni' Nation are located directly on the Pacific Ocean coast. Since time immemorial, the Tolowa Dee-ni' have lived in the area of northern California and southern Oregon. Ancestral territory includes the lands and watersheds of Wilson Creek to the south, the Sixes River to the north, east to the Applegate watershed in the Coastal Range, and west to the Pacific Ocean horizon, all sea stacks including Point St. George Lighthouse, and all usual and accustomed places (Tolowa Dee-ni' Nation Constitution, 2015; Drucker 1937; Gould 1968; Hudson 1981). Their ancestral territory now includes two (2) State MPAs designated under the MLPA; the Pyramid Point State Marine Conservation Area (SMCA) and the Point St. George Reef Offshore SMCA, as well as two (2) Special Closures, Southwest Seal Rock and Castle Rock. Today, the Tolowa Dee-ni' Nation is the only Tribe in California that has federal trust land in the ocean.

The Cher-Ae Heights Indian Community of the Trinidad Rancheria (Trinidad Rancheria) is a federally recognized, sovereign tribal government, headquartered on the Trinidad Rancheria near Trinidad, California. The Trinidad Rancheria is located directly on the Pacific Ocean coast. Though they have ties to several other tribal groups in the region, their membership is primarily of Yurok descent. Specific to their Yurok heritage, Tribal citizens descend from several villages along the Klamath River as well as the coastal villages within ancestral territory including present day Stone Lagoon (Cha-pekw) south to the village of Chue-rey (Tsurai), at the present day town of Trinidad. Their ancestral territory along the coastline extends from Little River in the south to Damnation Creek in the north. This now includes two (2) State MPAs, Reading Rock SMCA and Reading Rock State Marine Reserve (SMR), as well as a Special Closure at False Klamath Rock. The Trinidad Rancheria also owns and operates the Trinidad Pier and Harbor, which is an important recreational and commercial fishing port for the North Coast Study Region.

The Wiyot Tribe is a federally recognized, sovereign tribal government headquartered at the Table Bluff Reservation



Figure 1. Ancestral Lands of Tribes Involved (Note: Tolowa territory extends into Oregon)

⁸ This includes the Tolowa, Chetco, and Tututni.

near Loleta, California. The Table Bluff Reservation is located adjacent to south Humboldt Bay and the Pacific Ocean coast. Their ancestral territory ranges from the Bear River Mountains in the south, to the Little River in the north. Their eastern boundary is formed by the first ridgeline going east, and extends west into the open ocean. Most Wiyot ancestral villages are largely to be found on the shores of Humboldt Bay and on the lower stretches of the Eel and Mad Rivers. Their territory now includes two (2) State MPAs, the Samoa SMCA and South Humboldt Bay State Marine Recreational Management Area (SMRMA).

The InterTribal Sinkyone Wilderness Council (Sinkyone Council) is a 501(c) (3) non-profit Tribal consortium founded in 1986 that is focused on land and water protection, with headquarters in Ukiah, California. The Sinkyone Council is comprised of ten federally-recognized, sovereign Tribal governments that are headquartered in Mendocino and Lake Counties. The member Tribes of the Sinkyone Council are: Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians. The governing body of the Sinkyone Council is comprised of tribal representatives appointed by each respective member Tribe of the Sinkyone Council. Each of the Sinkyone Council's member Tribes have Tribal citizens who maintain important ancestral territorial connections to the coastal environment and marine and estuarine waters within the southern portion of the North Coast Study Region, extending from the Mattole River south to Alder Creek. Collectively, this area now contains twelve (12) State MPAs, including: Sea Lion Gulch SMR; Big Flat SMCA; Double Cone Rock SMCA; Ten Mile SMR; Ten Mile Beach SMCA; Ten Mile Estuary SMCA; MacKerricher SMCA; Point Cabrillo SMR; Russian Gulch SMCA; Big River Estuary SMCA; Van Damme SMCA; and Navarro River Estuary SMCA, as well as two (2) Special Closures at Rockport Rocks and Vizcaino Rock. Several distinct tribal groups originally inhabited the coastline from Alder Creek (southern boundary of the North Coast Study Region) to the vicinity of the Mattole River, including (from south to north): the Central and Northern Coast Pomo, Coast Yuki, Sinkyone, and Mattole peoples. The territories of these coastal peoples extended from the coastline to many miles inland. Inland Tribal groups, including the Nongatl, Lassik, Wailaki, inland Yuki, Cahto, and inland Pomo peoples often traveled seasonally to the ocean to gather marine species, and to trade and socialize with the Tribes indigenous to this coastline. The tribal memberships of the Sinkyone Council's ten tribes include descendants of these and other indigenous coastal and inland Tribal peoples of the region.

Situated along the coast between Wiyot and Mattole ancestral territories is the traditional territory of the Ni'ekeni' (Bear River). Two State MPAs are located in this stretch of the coastline: South Cape Mendocino SMR and Mattole Canyon SMR. This area also contains two Special Closures: Sugarloaf Island and Steamboat Rock. Although some archival information was gathered for the Mattole, the Ni'ekeni' (Bear River) were not included in the research. The Bear River Band of Rohnerville Rancheria is the federally-recognized Tribe most associated with the Ni'ekeni' (Bear River); however, this Tribe was not included as a Project Partner and no interviews were conducted with their citizenship. Therefore, there is a small stretch of the coast that is not represented in this project.

Table 1. SMCAs and SMRMA Associated with those Tribes Participating in the Project – According to the Current State Regulation

Pyramid Point SMCA	Tolowa Dee-ni' Nation
Point St. George Reef Offshore SMCA	Tolowa Dee-ni' Nation
Redding Rock SMCA	Cher-Ae Heights Indian Community of the Trinidad Rancheria
Samoa SMCA	Wiyot Tribe
South Humboldt Bay SMRMA	Wiyot Tribe
Big Flat SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians
Double Cone Rock SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians
Ten Mile Beach SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians
Ten Mile Estuary SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians
Big River Estuary SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians
Navarro River Estuary SMCA	Cahto Tribe of Laytonville Rancheria; Coyote Valley Band of Pomo Indians; Hopland Band of Pomo Indians; Pinoleville Pomo Nation; Potter Valley Tribe; Redwood Valley Band of Pomo Indians; Robinson Rancheria of Pomo Indians; Round Valley Indian Tribes; Scotts Valley Band of Pomo Indians; and Sherwood Valley Rancheria of Pomo Indians

Tribal citizens represented by the Project Partners reside within their ancestral lands and the Tribal governments in which they are enrolled maintain tribal trust lands (i.e. Reservations, Rancherias) and also own fee title to other lands within the North Coast Study Region. Although each of these Tribal groups has been relegated too much smaller areas of land in which they retain full jurisdiction, their citizens continue to practice traditional life ways throughout their entire ancestral territories. As their ancestors have since time immemorial, these Tribal citizens continue to be active and integral stewards to these marine, estuarine and coastal ecosystems throughout all seasons of the year. They continue to gather, hunt, fish, and otherwise harvest for a wide range of marine and estuarine species for customary purposes. The cultural identity, wellbeing, and very survival of these Tribal nations are deeply connected to numerous places throughout the entire North Coast Study Region (and beyond). These Tribes maintain inherent and unceded rights and responsibilities to ensure Tribal access to a healthy and vibrant marine environment. And their respective Tribal governments and environmental programs work to protect the ecological health of these marine ecosystems and the legal rights of their citizens to maintain their customary uses of these areas.

“I have traditional permission to gather—that’s all I need.”

-- North Coast Tribal citizen

Since 2009, the Project Partners have been actively involved in the California Marine Life Protection Act Initiative process on the North Coast. The leadership, representatives, and citizens of these respective Tribes/Nation/Tribal organization continue to engage the State of California to ensure Tribal ocean governance and gathering rights are recognized and not infringed upon and to protect and care for the marine environment. They continue to build capacity and leadership in marine initiatives on various levels, which is complemented by this work conducted under the North Coast MPA Baseline Program. Through strong advocacy, key legal arguments, common platform, solution-orientated approaches, and persistence by these and other Tribes in the North Coast, the MPA network was shaped through a historically unique—albeit challenging—process wherein the State of California took initial steps to formally recognized Tribal rights relating to the marine environment. Although the State’s 2012 administrative action remains imperfect with regard to the Tribal use regulation for North Coast MPAs, because it does not address all of the Tribes’ needs and concerns, the creation of a separate category of use and regulatory exemption for the applicable Tribes is a positive step. The MLPAI process has been a catalyst for enhanced communication, coordination and co-governance between North Coast Tribes and the State of California. During the MLPAI process, North Coast Tribes and tribal citizens also strongly advocated for the recognition of T/ITK/TEK as an epistemology that informs sustainable management, as well as ensures abundant, healthy and biologically diverse ecosystems. As a result of this advocacy, as well as the progressive position of the State, TEK was recognized as a form of science in the MPA Baseline Monitoring Program for the first time on the North Coast. This project provided an important opportunity for a tribally driven initiative to introduce T/ITK to scientists and resource managers, and to demonstrate why T/ITK is a highly credible and effective body of knowledge and practices that can and should substantively influence and inform North Coast MPA Baseline, and the long-term monitoring of MPAs and the region as a whole.

TEK, the most commonly used term by academics and federal/state resource managers, is defined within academia as a cumulative body of scientific knowledge, passed through cultural transmission, that evolves adaptively through time as a result of Indigenous Peoples living in and observing the local environment for many generations; it is a form of adaptive management. (Berkes 1999; Berkes et al. 2000). This form of knowledge can contribute significantly to understanding the complexity of an entire ecosystem, providing for example, information that is location specific, varies across time and/or space, ecological features, environmental linkages and processes, species taxonomies, species geographic patterns, the role of humans, conservation of biodiversity, and sustainable resource use. It also provides the worldview, including ethics, values, and social institutions of a particular indigenous group (Berkes and Berkes 2009; Drew 2005) (Jones and Williams-Davidson 2000; Jones et al. 2010; Mymrin et al. 1999; Noongwook et al. 2007; Gadgil et al. 1993; Berkes 1999; and Schmink et al. 1992). Areas of new scientific research and management can also be informed by TEK, which can document areas where ecological changes and threats are evident (Carter and Nielsen 2011). TEK is what informs customary management by Indigenous Peoples, (i.e. spatial, temporal, gear, effort, species, catch, morphological, etc.), which has been developed over countless generations and can ensure sustainable resource use (Cinner and Aswani 2007; Hunn et al. 2003; Menzies and Butler 2007).

Along with these elements attributed in academia as TEK, there are ceremonial, spiritual and/or other cultural and religious beliefs and practices that may not “scientific,” but that provide the unique epistemology that informs how Tribal citizens interact with, understand and care for their environments. These spiritual and other cultural values relate to the laws, teachings and protocols that guide the stewardship of these resources and places. Combined with TEK, this more holistic “ways of knowing” by Tribal citizens is what the Project Partners refer to as Tribal or Indigenous Traditional Knowledge (T/ITK). Although it may not be a term commonly used by Tribal citizens, T/ITK is the term preferred by the Project Partners for this work and of late, if being used more widely within tribal communities.

b. Project Justification

As resource managers with unceded inherent rights and responsibility to continue stewarding and gathering marine resources within their ancestral waters, it is critical that Tribes play an integral role in the manner in which data about coastal resources and habitat health is gathered, analyzed, disseminated, and used to inform policy and management. This includes what may be referred to as “Western ecological knowledge” (WEK) or “Western science” and T/ITK. Tribal citizens who customarily steward, gather, harvest, and process marine species have an intimate knowledge and understanding of certain places and the ways in which these places and the resources therein may be changing. Tribal expertise in sound stewardship of coastal and marine ecosystems is based upon the longstanding, practical application of T/ITK. Over countless generations of adaptive management, each Tribe has developed its own expertise that combines extensive traditional instructions with practical experience about complex interrelationships within nature. This T/ITK and practices require that these resources be cared for and harvested in a sustainable manner that ensures availability for future generations.

Tribal governments also have the skills and capacity for gathering WEK that is used to inform policy and management. In fact, several Tribes are Co-Leads in other WEK-based North Coast

MPA Baseline Program projects.⁹ Together, this knowledge system (WEK and T/ITK) is what informs management by Tribal citizens within an individual, familial, and village context, as well as at a Tribal governmental level. For federal and state managers, and others outside of indigenous communities, T/ITK is increasingly becoming a recognized valid field of scientific expertise, and a source of valuable information to inform conservation management and decision-making (Ramos et al. 2016; Cirone 2005; Flaster 2005; Hunn et al. 2003; Hunn et al. 2005; Jollands and Harmsworth 2007; Jones et al. 2010; Lazrus and Sepez 2005; McIntosh 2005; Mitchell 2005; and Wheeler 2005).

T/ITK gathered under the project serves not only as the baseline at the time of MPA placement, which may be used to assess the effectiveness of MPAs; it also provides a deeper context for assessing the “health” of the baseline itself. The project examines the condition and presence of marine species prior and subsequent to the arrival of the first non-Native people, thereby providing a better understanding of how Tribal stewardship and use practices have influenced the occurrence and condition of marine and estuarine species. This can avoid and/or inform what is commonly referred to as the “shifting baseline syndrome” (Thornton et al. 2010). T/ITK can provide a deeper context for the current baseline, as well as identify possible shifts and changes in habitats over long periods.

When applying T/ITK to understand historical and/or baseline conditions, this knowledge may be utilized in parallel with what is often referred to as “Western science” or “Western Ecological Knowledge”. T/ITK should not be perceived as a knowledge base that can be “incorporated”, “integrated” or otherwise appropriated for serving the interests of Western science. Such an approach perpetuates a cultural bias and deference to Western science, means that scientific understanding remains essentially unchanged and fundamentally preeminent to Tribal paradigms, and limits the potential for Tribes to be full participants in resource monitoring—and ultimately resource management. Rather, implementing the understanding that both epistemologies provide valuable and crucial contributions to effective resource monitoring, will increase the opportunity for making collaborative, well-informed management decisions. Many researchers have concluded that both the more qualitative (T/ITK) and quantitative (WEK) ways of knowing are together more powerful to understanding ecological features and systems than either are independently (Berkes and Berkes 2009; Foale 2006; and Knopp 2010).

Because T/ITK encompasses complex knowledge and belief systems, it is important to understand that T/ITK cannot be distilled down to discrete pieces of “data”. Rather, T/ITK encompasses entire worldviews that incorporate knowledge, teachings, practices and beliefs that operate in iterative and holistic ways of life that have emerged across generations since time immemorial. This knowledge is not solely comprised of ecological observations, but also incorporates elements of spirituality, ceremony and belief that play an integral role to understanding and interacting with the natural environment, as well as provide for the laws and protocols for stewarding these resources and places. Additionally, meaning and value are rooted in place and cannot be extrapolated from Tribal peoples’ relationship to, and connection with, those places. T/ITK provides a contextualized and qualitative understanding of place and

⁹ Tolowa Dee-ni’ Nation (R. Laucci) is a Co-Lead on both the *Baseline Characterization of Rocky Intertidal Ecosystems* and *Baseline Characterization of Sandy Beach and Surf-Zone Ecosystems*. The Wiyot Tribe (S. Kullman) is a collaborator on the *Baseline Characterization of Estuarine Ecosystems*.

interaction among human and other species and elements over time, and often cannot be quantified. The temporal scope of T/ITK is also unique. T/ITK can: a) capture a baseline of conditions, defined as the current point in time from which monitoring will commence; b) include information from pre- and early contact with non-Natives; c) include information that is multi-generational and multi-disciplinary, extending back to time immemorial; d) identify information that is not time-bound in terms of years; e) provide information that may be cyclical; and f) may provide information about the future.

There are several challenges that must be acknowledged in gathering, accessing and utilizing T/ITK for federal, state, and sometimes even Tribal management purposes. In general, these challenges may fall under four broad categories. Several examples are provided.

- Political: who defines the laws and policies; historical and contemporary conflicts between/among indigenous communities and governmental entities; other power dynamics; underlying agendas; issues pertaining to trust; unforeseen consequences; who is funding the project; what information may be legally accessible; intellectual property rights concerns; and/or legal or institutional barriers.
- Epistemological: varying worldviews; different ways of knowing; different ways of sharing knowledge; varying levels of accessibility to cultural knowledge; and/or importance of spirituality/ceremonial beliefs and practices.
- Sociocultural: cultural differences; historical and contemporary conflicts between indigenous communities and non-Native society; other power dynamics; intellectual property rights; connectivity with/within Indigenous community; issues pertaining to trust; communication styles and jargon; language used; analysis and interpretation of information; appropriate compensation for information shared; who has access to information; purpose for doing work; and/or publishing interest.
- Technical: institutional barriers; data and metadata standards; peer review or publishing standards; data sharing protocols; reporting; and/or funder requirements (modified from Ramos et al. 2016 citing Cronin and Ostergren 2017; and Fairley 2012).

To assist in addressing and, wherever possible, overcoming applicable challenges, the Tribal group in which the information is to be gathered from/about, should lead the project. Although there are some very rare exceptions, most T/ITK research has been driven by outside (i.e. non-Native) researchers and/or interests (Fienup-Riordan 1999; Berkes 1999; Berkes and Berkes 2009; Berkes et al. 2000; Ayers et al. 2012; Carter and Nielsen 2011; Mymrin et al. 1999; Noongwook et al. 2007; Hunn et al. 2005; Lazrus and Sepez 2005; and Wheeler and Craver 2005). This project is especially unique in this one very particular and important way; it is completely innovated and driven by the Tribes/Nation/Tribal organization in all its phases. Perhaps most importantly, Tribes advocated for the opportunity to conduct this work and the manner and intent for which it was to be carried out. And while the project seeks to inform the North Coast MPA Baseline Program and State marine management, the core of the project is to advance Tribal resource management and capacity-building. It also supports cultural preservation and Tribal self-determination. The project has been developed, approved, and implemented through a collaborative inter-Tribal approach, in consultation with and approved by participating Tribal Councils, the officially recognized governmental bodies of sovereign Tribal nations. This is of extreme importance for several reasons, the foremost of which is intended to address many of the aforementioned challenges.

Including the requirement that the Tribes themselves design and implement the project has also been critical in terms of determining which information should be shared, and how the information should be protected. Individual Tribal knowledge holders and tradition keepers have a responsibility to and for the health and wellbeing of the world – a world which is meant to be in balance. This is the responsibility of each individual at a very fundamental level, outside of the ceremonial responsibility of medicine people and other spiritual leaders. Several of these Tribes—the Tolowa Dee-ni', Yurok, Wiyot, and Sinkyone—are “fix the world people.” The Pomo and other Tribes in the southern part of the region practice have their own unique spiritual beliefs and ways to help keep the world in balance. The concept is a central foundation of many ceremonies and practices of all the Project Partners—keeping/returning things to balance. Individuals, familial- and village-units have a responsibility for caring for particular places, which may be conceptualized as a type of nature- and culture-based ownership-rights. Even if an individual has exclusive right to access resources at a particular location, they are responsible to ensure continued productivity of the resource at that location for the generations to follow – the inheritors of those rights.

These and other cultural responsibilities require that Tribal individuals and Tribes take measures to protect T/ITK, including traditional teachings, practices, uses, and places—as well as individual Tribal citizens and families—from incursions, appropriations, misrepresentations, and other damaging acts that compromise the sanctity and privacy of these indigenous ways of life. This key principle of protecting T/ITK is a common theme among the Tribes, and one that was repeatedly emphasized throughout the project’s development and implementation. Ideas and discussions relating to these themes assisted the Project Partners in outlining a process by which the Tribes will protect project information, and share limited types of project information. This led to the development of the data standards document, *Considerations and Guidelines for Accessing and Applying Tribal Traditional Knowledge under the North Coast MPA Baseline Program*, which details how certain types of project information might be accessed and by members of the public.

Tribes have a responsibility to protect individual and collective cultural heritage and T/ITK from appropriation and misuse. Tribal research includes information about specific places, cultural beliefs and practices, and other information that is sensitive and holds high cultural value to the Tribes. Often these practices and beliefs convey important information to Tribes that is culturally sensitive, and thus are not made available to the public. Accessing and applying or otherwise utilizing information without first obtaining official Tribal consent and agreement on how that information may be interpreted and shared puts T/ITK into non-Tribal intellectual property systems that may operate counter to the interests and sovereign rights of the Tribes, and the health and welfare of Tribal citizens. Tribes have an interest in supporting and/or conducting research and information sharing that can promote co-management, as well as public education to protect and enhance marine resources and a healthy ocean. However, this must be done in a culturally-appropriate manner. The intent is to ensure T/ITK is fully respected and protected, and in no way inappropriately infringed upon, and that information is shared and applied ethically and in the utmost good faith so Tribes and Tribal citizens are not harmed in any way.

Additionally, locations of certain Native American cultural places, as well as sensitive information about their nature and uses, are confidential and legally protected from public

disclosure under various State and Federal laws, including the federal Freedom of Information Act (5 U.S.C. § 552) this and the California Public Records Act (Pub. Resources Code, §§ 5097-5097.993). Protecting confidential information is of utmost importance to the Tribes and is recognized in government-to-government consultation protocols and guidelines.

The best way to resolve some of these challenges is for each Tribe to be meaningfully and actively involved in a manner that ensures that it will collect and control the particular information within its respective Tribal community. For the interviews that were conducted, this allowed not only the interviewee (tier-one) to determine what was appropriate to be shared with the Tribe in which he or she is a citizen, but it also allowed the Tribe/Nation/Tribal organization (tier-two) to determine what was appropriate to share with entities outside of the Tribe. The third-tier Project Partners-level, allowed for information to be assessed again in order to determine what was culturally (and in some instances politically) appropriate to share. Additionally, in some instances, data aggregation was used to further anonymize participant- and Tribal-specific information.

c. Objectives, Components and Activities

The goal of the project is: to use T/ITK to create a baseline of ecological features and species observations, to identify areas of concerns/threats for long-term monitoring of MPAs, and to inform ocean policy and adaptive management. To meet that goal, the following objectives were developed:

- 1: Gather T/ITK through published archival and gray literature research, as well as Tribal community participatory research.
- 2: Gather T/ITK in a manner that is culturally appropriate, ensures the protection of sensitive information, and provides analyses that can inform the baseline.
- 3: Create a baseline of ecological features, species observations, and areas of concerns/threats obtained from T/ITK-informed data.
- 4: Document community perspectives on the potential effects the North Coast's new "Tribal Take" regulation may have on traditional subsistence, ceremonial, and customary Tribal gathering, harvesting and fishing within MPAs in order to directly inform policy, long-term stewardship, and adaptive management.

To address these objectives, the project involved activities that can be compartmentalized as:

- a. Project Management and Coordination;
- b. Archival Research;
- c. Community Based Participatory Research; and
- d. Data Synthesis and Analysis.

i. Project Management and Coordination Methods

Project management and coordination was conducted on two tiers. The first tier was overall project, grants and contract administration, reporting, and coordination of the four (4) Project

Partners and Contractor, which was led by the Project Lead for the Tolowa Dee-ni' Nation. The second was the project-specific management at a Tribe/Nation/Tribal organization level, which was conducted by the Co-Lead for each Tribe/Nation/Tribal organization. At the first tier level, the Project Lead convened thirteen (13) in-person meetings of the Project Partners throughout the duration of the project.¹⁰ Moreover, there were countless discussions and email exchanges between and among the Project Lead and Co-Leads to share information, asked specific project and grants administration questions, conduct general check-ins, get/provide status updates, to provide technical support, brainstorm ways to overcome any unforeseen challenges that arose, and the like.

Initially securing approvals and signatures on the grants and contract in order to begin the project consumed the first five (5) months of the project. This was in part because the funder, California Sea Grant, typically awards individuals within academic institutions. This was the first time they had ever awarded a Tribe/Nation/Tribal organization. Thus, their standard forms, Conditions of Award, and Award Acceptance Letter had to be modified, based on the particular circumstances of the grantees. A prime example is the ability of Tribes to utilize what is commonly referred to as "Indian Hiring Preference" in all employment practices and how that relates to the State requirements for what is commonly known as "Equal Employment Opportunity." Furthermore, due to the sensitivity of the information to be gathered and concerns over confidentiality, it was imperative that grant and contract language appropriately protected the ownership of this information by the Tribes/Nation/Tribal organization, clearly articulated that information that would be shared with the State, and ensured no one working on the project could disclose or retain the information outside of the specific terms of the grant and/or contract.

To assist the Project Partners in navigating the grant and contractual issues surrounding the concern for protecting the confidentiality of the information gathered, they requested and were granted assistance from the Tribal Legal Clinic at the University of California, Los Angeles (UCLA). Led by Professor Laura Miranda, JD, three (3) graduate-level law students conducted research on intellectual property, reviewed grant agreements and the contract, and provided informal legal guidance on how the Project Partners might best proceed. This was an opportunity leveraged for the benefit of the project and was not anticipated in the original project design, but proved essential. All Consultants were also required to have confidentiality language included in any project-related contracts and Project Team members were encouraged to sign confidentiality statements for their respective Tribe/Nation/Tribal organization, if they did not already have such language in their Personnel Policies.

Within each Tribe/Nation/Tribal organization, project management and coordination also occurred throughout the project. This included activities, such as hiring and managing necessary staff and/or contractors, as well as fiscal management and reporting. Another critical element to this work was continually updating and getting guidance from respective governing bodies (i.e. Tribal Councils), relevant Tribal Committees (e.g. Culture Committee), and Tribal staff not directly involved in the project. This guidance was implemented on a Tribe/Nation/Tribal organization project level, as well as shared with the Project Lead for implementation across the whole project. Information about the project scope, approach and intended benefits was also

¹⁰ Meetings were convened March 7, April 29, June 4, June 16, September 3, and October 10, 2014; January 7, January 29, February 25, March 9, and October 1, 2015; and May 6 and November 19, 2016.

shared with Tribal citizens via General Membership meetings, Newsletters, direct communication, and other means, as each Tribe/Nation/Tribal organization. All of these activities were conducted at the discretion of each Tribe/Nation/Tribal organization as they deemed appropriate.

ii. Archival Research Activities

To complete the archival research in a manner that would be useful for the project, as well as build the long-term capacity of the Tribes/Nation/Tribal organization, a relational database management system with potential to be geospatially-linked was used. As part of a separate project and then leveraged, the Tolowa Dee-ni' Nation worked with the consulting firm, Far Western Anthropological Research Group, Inc. (Far Western)¹¹, headquartered in Davis, California to develop the Marine Traditional Knowledge Ethnographic Database (MTKED) schema. Input from the Project Partners was garnered in the development. The final schema is a MS Access database that can be linked to an ESRI ArcGIS data file. Additionally, a User Guide was developed by Far Western and the Project Lead to supplement use of the database schema. The intention of the database schema was to create a centralized marine T/ITK archival data storage and retrieval system that could be accessed aspatially and spatially. It would also provide common terminology for keywords and maximize search ability by segmenting excerpts from archival information into discrete data records that were related by place, resource and activity. Each Tribe/Nation/Tribal organization was given the database schema for their individual use and information across Tribes/Nation/Tribal organization was not co-mingled. Rather, independent and separate databases were placed on each Tribes/Nation/Tribal organization server/workstation to protect the confidentiality of information within each separate Project Partner. However, the use of a common relational database schema ensured consistency in the way data would be analyzed, stored, and made accessible. It also ensured interoperability in the future, if that was ever a desire by the Project Partners. As part of this project, several trainings on the database schema were conducted. The first was conducted by Far Western for the all of the Project Partners. This took place in Smith River, CA on March 15, 2015; hosted by the Tolowa Dee-ni' Nation. Several subsequent one-on-one trainings and technical assistance sessions with the Project Lead and members of the Project Partners tasked with doing data entry then continued throughout Year 2 of the project, as necessary, to ensure proper use of the MTKED schema.

To gather archival information, Project Partners conducted independent research for their respective Tribe(s) and Tribal territory(ies). Published ethnographies, unpublished field notes, readily accessible gray literature and existing transcriptions of previous Tribal citizen interviews were targeted. This began with each Project Partner completing a search of the materials already in possession by their respective Tribe/Nation/Tribal organization. All have Tribal Archives, Libraries, have gathered archival materials and/or conducted Tribal citizen interviews over the years for other projects and purposes. Any materials thought to be useful to another Project Partner, were shared. Research for new materials was then conducted at university-based libraries, institutions and on-line systems known to have published materials on local Tribes. This included the Humboldt State University Library; Humboldt State University, Cultural Resources Facility; Humboldt State University, Center for Indian Community Development (CICD); Humboldt State University, Indian Tribal and Educational Personnel Program (ITEPP)

¹¹ Project Lead and Developer for Far Western was Paul Brandy.

Cultural Resource Center; University of California-Berkeley, Bancroft Library; University of Southern Oregon, Southern Oregon Digital Archives; Indian Action Council; Humboldt County Library; and the Humboldt Historical Society. General internet searches (e.g. Google Scholar and World Cat) were also conducted.

Once archival materials were gathered, Project Partner members read through the documents, noting/highlighting all relevant excerpts about the five (5) keystone species. Information was then entered into the MTKED schema for each respective Tribe/Nation/Tribal organization. For data entry, the excerpt was segmented into distinct records regarding the relationships between place, resource and activity. In addition, more detailed information about place, resource and activity was included. Lastly, the bibliographic citation and a link to the digital media (e.g. PDF document, audio file) was entered. Table 2. demonstrates the information that was pulled from each excerpt, as available, and entered into the MTKED schema.

Table 2. Details from Archival Information Entered into the MTKED Schema for a Single Record

Place Detail	
- Indigenous name	- Planning unit name
- English translation	- Primary habitat
- English name	- Tribe
- Alternative name(s)	- Tribe subunit
- Planning unit number	- Tribal government
Resource Detail	
- Common name	- Genus
- Indigenous name	- Species
- Alternative name(s)	- Broad species group
Citation Detail	
- Reference type	- Comments
- Title	- Series title
- Primary author	- Series volume
- Secondary author	- Interviewee
- Year	- Interviewer
- Publisher	- Year
- City	- Place of interview
- Description	- Prepared for
People/Person Detail	
- First name, Last Name	- Village(s)
- Year born	- Relationship to other people
Media Detail	
- Name	- Link
- Type	- Description
Place-Resource Event Detail	
- Part used	- Barter resources
- Season, Month(s)	- Excerpt describing place to resource relationship
Resource-Activity Event Detail	
- Activity type	- Technique
- Description	- Excerpt describing resource to activity relationship
- Participants	

iii. Interview Activities

Tribal interviews were also completed by each Tribe/Nation/Tribal organization independently, using a common tool for consistency in data entry and analysis. Ecotrust developed the data survey tool, including metadata standards, and Quality Assurance/Quality Control (QA/QC) procedures for standardization. Key elements requested of Ecotrust for the data survey tool was that it be able to be used offline since interviewees would not always have access to the internet when conducting interviews, and that the data entered for each Tribe/Nation/Tribal organization would be independent of one another. They developed a tool to fit these needs, as well as put it on handheld tablets to make the tool less cumbersome than packing a laptop around.

The Project Partners then collaborated to develop a series of interview questions, in which the data survey tool would be built on. This included questions that were aspatial and spatially-explicit. The Project Lead also reached out to Principle Investigator, Dr. Laurie Richmond, who is Co-Lead on the socioeconomic/human uses study on commercial and recreational fishermen for the North Coast MPA Baseline Program.¹² Ecotrust also developed a similar data survey tool for that project, as well. There was an interest to identify interview questions that both human uses projects could ask, in order to get a broader understanding of the baseline across all three user groups (i.e. Tribal customary, recreational and commercial). Several such questions were selected and included regarding MPAs that have a perceived effect on users, what that perceived effect was, changes in species abundance, involvement in and perceptions of the MLPAI process, and perceived threats to resources of interest.

The Project Partners spent significant time developing and refining the interview questions, working in consultation with Ecotrust to ensure clarity and certainty that the order and manner in which questions were asked would be compatible with the tool in terms of aspatial and spatial components. In general, questions fell under the following categories:¹³

- Interviewee Background;
- Marine Activity Specific;
- Resource Locations and Customary Harvest;
- Areas of Concern and Identified Threats; and
- State MPA Placement and State “Tribal Take” Regulation.

A Project Summary Handout and associated Informed Consent Form were also created by the Project Partners, to appropriately inform and gain proper consent from all Tribal interviewees. This informed consent included acknowledgement that no personal information about the interviewee would be shared and that they could withdraw from the interview or not respond to specific questions at any time.

Once the interview questions were completed, Ecotrust developed the data survey tool to document aspatial and spatially-explicit information. The beta-version of this Marine Traditional Knowledge Data Survey Tool was demonstrated to the Project Partners in January 2015 and then

¹² *Baseline Characterization of Human Uses and the Socioeconomic Dimensions of MPAs.*

¹³ All of the survey interview questions used will be provided as a data product.

finalized in February for use. Ecotrust then conducted a training on the data survey tool on February 25, 2015, which was hosted by the Tolowa Dee-ni' Nation in Smith River, CA. This training included a discussion of interview methods, detailed review of how the tool works, and time to complete mock interviews amongst attendees. Ongoing technical assistance was provided by Ecotrust, as needed. Additionally, the Project Lead conducted trainings with new interviewers as they came on board with the project for the Sinkyone Council. This included two (2) trainings in Ukiah and two (2) in Arcata during project Years 2 and 3.

Interviews were conducted by staff of each respective Tribe/Nation/Tribal organization for their own tribal community. The Sinkyone Council elected to have its member Tribes conduct the interviews (up to 3) for citizens of their respective Tribes. In total, there were seventeen (17) interviewers and sixty-nine (69) interviews completed. This exceeded the sixty (60) interviews proposed in the original project design. Interviews were conducted at the location of preference to the interviewee. Informed consent was garnered prior to each interview and interviewees could opt-out of responding to any questions they felt necessary for confidentiality or other concerns. Interviewee's were also provided compensation for their time and expertise. During the interview process, each interviewee was presented with a navigable map with options with a satellite view (e.g. Google maps) or a topographic map view. The interviewee could zoom in/out and move the map around to select square grids (1x1 nautical mile) to answer spatial mapping questions. Using the 1x1 nautical mile grid system allowed for interviewees to identify locations related to specific questions, without providing exact specificity. This method was used to enhance the interviewee's confidence in keeping the information private, which increased their likelihood for response. In addition to information being entered into the data survey tool, interviews were audio recorded. Some of the audio-recorded interviews were transcribed.

iv. Data Synthesis and Analysis Activities

Archival data was synthesized and analyzed by theme, seeking information about keystone species observations, ecological features, and stewardship practices. For the interviews, individual spatial data layers were combined to display the footprint of the spatial extent of the areas mapped for each spatial mapping question. For the areas of concern, a heat map was created by combining the individual spatial data layers from respondents and summarizing the number of time a specific square grid was selected by respondents. The resulting data set is a 'heat map' depicting the relative frequency that respondents indicated an area was of concern. All non-spatial survey data were exported from the data survey tool to an MS Access database and then imported into MS Excel files, which were then summarized into tabular format primarily using pivot table queries. For structured questions (e.g. answers were selected from a predetermined list), these data were then summarized by providing counts of the frequency of responses for a given survey questions. For open ended questions, the responses were compiled to record the full text of responses.

v. Project Wrap Up Activities

It is important to ensure that T/ITK data could be appropriately incorporated into the OceanSpaces platform managed by the California Ocean Science Trust (OST). This is the non-profit organization responsible for developing the MPA monitoring plan and coordinating the Statewide MPA Baseline Program, on behalf of the State of California. Given that this project is the first time T/ITK has been included in the baseline monitoring, it was important to ensure

there are standards, guidelines, considerations and approaches in place that are appropriate and necessary integrating, synthesizing, and sharing data and results from the T/ITK project. To accomplish this, a working group was developed among key members of the Ocean Science Trust staff, Project Partners, and Ecotrust.¹⁴ Several meetings were convened to develop language related specifically to T/ITK that could be integrated into the *Statewide Data & Metadata Standards* and a separate document, *Considerations and Guidelines for Accessing and Applying Tribal/Indigenous Traditional Knowledge under the North Coast MPA Baseline Monitoring*. This latter document should be appended to all T/ITK-related data products in OceanSpaces so that any person who downloads these related data products in the future would automatically receive this Tribally-approved document, which also includes contact information for those who may wish to inquire about the other data gathered under this project that are retained by the Tribes/Nation/Tribal organization. This working group and the products created were not proposed under the original scope of this project, however, developing these elements became critical as the project moved towards completion.

As a final project step, each Tribe/Nation/Tribal organization convened a luncheon or dinner, inviting all interviewees and families. The purpose was to provide the information gathered (e.g. printed maps, transcription, and digital files) back to each interviewee, demonstrate gratitude for their involvement, and provide an overview of how the information they shared in being used. The information is not only informing the outcomes of this project, but is also informing other marine governance and stewardship projects, as well as policy, of the participating Tribes/Nation/Tribal organization.

II. Methods

a. Geographic Coverage

The geographic extent of the project was determined by the southern boundary of the North Coast Study Area of Alder Creek and by the northern boundary of the ancestral terrestrial territory of the Tolowa Dee-ni' Nation at Sixes River, Oregon. In terms of the western/eastern extent, the project area included a portion of the ancestral marine waters of the Project Partners, which is the area the State of California also claims and defines as “State waters”—from the mean high tide mark out to three (3) nautical miles. The project’s geographic extent overlays the entirety of the North Coast Study Region, as defined under the MLP AI process.

b. Methods, Protocols and Data Analysis

The project’s approach was to recognize and support the political and cultural sovereignty of each participating Tribe and its community’s intellectual property, while maintaining consistency and standardization in the research methodology and data collection across the Project Partners. All of these factors were critical to developing a research design that provided for each Tribe/Nation/Tribal organization to conduct its own data collection and share only that information which it deemed appropriate, while maintaining the ability to provide regional data that was standardized in a manner that would inform the MPA baseline.

¹⁴ This working group included Marisa Villarreal, Program Manager, OST; Dr. Erin Meyer, Senior Scientist, OST; Megan Van Pelt, Consultant and Project Lead; and Dr. Cheryl Chen, Consultant.

The project relied heavily on community-based participatory research. Such an approach provided for an equitable involvement of the community—in this case the Tribes and Tribal citizens—in all aspects of the research process. All partners were provided the space and opportunity to contribute their own expertise and play a significant role in decision making and ownership of the project. This project was even more unique because the Project Partners (i.e. Tribes/Nation/Tribal organization) also acted as the “researchers”, which further enforced that equitable representation throughout all elements of the project. This empowered typically disenfranchised Tribal citizens to develop a research design and implement the project in a manner that would be of value to them first and foremost, while addressing the concerns of the Tribal community and building Tribal capacity throughout the entire process.

Each Tribe/Nation/Tribal organization lead the development of the research design, as well as determined who would be responsible to conduct the research. For the Tolowa Dee-ni’ Nation, this work was completed by the Project Lead, and staff within the Natural Resources Department. For the Trinidad Rancheria, this was completed by the Tribal Heritage Preservation Officer (Project Co-Lead), Marine Resources Researcher and THPO Intern. For the Wiyot Tribe, this was completed by staff of the Cultural Resources Department. And for the Sinkyone Council, Consultants were selected to complete the archival research, while for its interviews, eight (8) of its member Tribes participated by selecting their own interviewers, which included traditional culture-keepers, Tribal Council members, Tribal environmental and cultural resources staff, and Tribal citizens from their respective communities. Establishing relationships and community support for the project, and selecting project “researchers” (i.e. interviewers) were essential elements to the critical phase of identifying interviewees and getting them to agree to participate. These are additional reasons of just how critical it is that the research be conducted by Tribal community members, as well as led and implemented by that given Tribe/Nation/Tribal organization.

Archival information was synthesized by the themes identified in the original research design. In addition, grounded theory was used to identify other common themes that arose, for example, as related to stewardship practices. To identify interviewees, each Tribe/Nation/Tribal organization used the chain referral sampling method, also known as, the snowball sampling method. This method relies upon a couple of initial interviewees to then identify others who could potentially contribute and would be willing to participate in the study. The chain referral sampling method is a non-probability sampling technique. However, it is particularly useful when trying to reach populations that are often difficult for researchers to access and when researching sensitive topics where there are concerns for maintaining privacy and confidentiality. It can also help with overcoming some of the challenges with gathering T/ITK that were discussed previously.

For this project, the Project Partners sought Tribal citizens that are either a citizen of the Tribe conducting the interviews or closely connected through familial and/or social ties. They also needed to reside in the North Coast and conduct customary harvesting from the marine environment. There was also some effort placed in seeking interviewees that could potentially have customary harvesting experience both as a youth and an adult. Therefore, youth (e.g. under 21 years of age) were avoided. And in fact, no one under thirty-two (32) years of age was interviewed. There was also an effort to sample both men and women so that activities that may be allocated along gender divisions could be documented. Less of a consideration, but still

factored was the attempt to try and draw from, when possible, various extended families in a Tribe. This is important because particular areas may be recognized as the traditional use areas of a certain extended family and may not be recorded if members from that extended family are not interviewed. However, given the relatively small sample size within a given Tribe, this was not always possible. It is very important to underscore that this was a non-random sampling and that the information gathered, although rather extensive, must not be construed as statistically representative or in any way exhaustive. This is true with respect to geography, species, cultural beliefs and practices; individual interviewees, individual Tribes, Project Partners, and North Coast Tribes generally.

III. Results

a. Brief Overview of Analysis Results

i. Summary of Archival Research Findings

In total, 120 archival materials were located that were determined to contain information specific to the keystone species. Each source was reviewed. Table 3 shows the general and more specific keystone species that were identified in the archival materials. The scientific names included in this Table do not necessarily reflect the term used in the archival source, but rather, reflects the current commonly used term. Generally, the archival information related to the keystone species described how people interact/rely/use the ocean, harvest locations, harvesting practices, gear types/tools used to harvest, gear types/tools created from keystone species, indigenous place names, indigenous names for keystone species, techniques for processing keystone species, stories (also commonly mislabeled as “myths” by non-Native anthropologists), songs, ceremonial and/or spiritual practices, protocols and/or laws, ownership rights, species abundance, parts of the species used and purpose, bartering/trade systems, gender divisions, familial and village relationships, inter- and intra-tribal relationships, and stewardship practices. In terms of how these Tribes interact with the ocean, the archival materials enforce what Tribal citizens said throughout the MLPAI process; that their uses do not fall within recreational or commercial user groups. Notably, in the 120 materials reviewed, there were only two (2) references to what might be defined as “recreational” use, although indirectly at most. Both references were in respect to women using discs made from mussel shells for a “dice-like” game; one reference made in regard to Tolowa women and the other to Wiyot (Drucker 1937; Curtis 1924). Explicit “commercial” use between Tribes was never mentioned in any materials reviewed. There were, however, several excerpts related to “trading” of resources (an economic system) with inland Tribes and/or providing inland Tribes the opportunity to harvest at a particular coastal place. Such trading/exchange of goods and/or access to place(s) may indirectly be related to “commercial” use within this barter-dependent inter-tribal economic system, but these would be specialized types of culturally-based commerce. For example, the Coast Yuki and inland tribes annually visited and traded foods from their respective areas. The Coast Yuki would gather the sea products desired by the inland tribes, including mussels and surf fish (ITSWC Records System).

Table 3. Keystone Species Identified in the Archival Materials

Genus	Species	Common Name
Abalone		
<i>Haliotis</i>	<i>Rufescens</i>	red abalone
<i>Haliotis</i>	<i>Cracherodii</i>	black abalone
<i>Haliotis</i>	<i>Fulgens</i>	green abalone
<i>Haliotis</i>	<i>Sorenseni</i>	white abalone
Clams		
<i>Saxidomus</i>	<i>Gigantean</i>	butter clams
<i>Mercenaria</i>	<i>Mercenaria</i>	quahog clams
<i>Tresus</i>	<i>Capax</i>	horseneck clams
<i>Leukoma</i>	<i>Staminea</i>	common/Pacific littleneck/rock/hard-shell clams
<i>Saxidomus</i>	<i>Nuttalli</i>	Washington clams
<i>Siliqua</i>	<i>Patula</i>	razor clams
<i>Panopea</i>	<i>Generosa</i>	geoduck clams
<i>Venerupis</i>	<i>Philippinarum</i>	Manila clams
<i>Clinocardium</i>	<i>Nuttalli</i>	cockle, basket/ heart
<i>Mya</i>	<i>Arenaria</i>	softshell/mud clams
<i>Glycymeris</i>	<i>spp.</i>	bittersweet clams
<i>Macoma</i>	<i>Nasuta</i>	bentnose clams
Mussels		
<i>Mytilus</i>	<i>californianus</i>	California mussels
<i>Mytilus</i>	<i>trossulus</i>	bay mussels
Seaweed		
<i>Macrocystis</i>	<i>Pyrifera</i>	giant kelp
<i>Nereocystis</i>	<i>luetkeana</i>	bull kelp
<i>Pterygophora</i>	<i>californica</i>	stalked kelp
<i>Porphyra</i>	<i>spp.</i>	Seaweed
<i>Ulva</i>	<i>Lactuca</i>	sea lettuce
<i>Postelsia</i>	<i>palmaeformis</i>	sea palm
Smelt		
<i>Hypomesus</i>	<i>pretiosus</i>	day/surf fish
<i>Spirinchus</i>	<i>starksi</i>	night fish

The relationships between these places-resources-activities were a primary focus of the initial research and documented in the MTKED for each Tribe/Nation/Tribal organization. Table 4 notes the number of places documented and the number of archival materials reviewed by each Tribe/Nation/Tribal organization that had information about the keystone species. Beyond this, there are many records of a keystone species having a distinct relationship to a place and/or activity in the archival materials. For example, for the Tolowa Dee-ni' Nation, there are 433 such records for the keystone species and for the Sinkyone Council, there are 592. A much more robust data set was gathered from the archival materials, retained by the Project Partners.

Table 4. Archival Materials Reviewed Related to Keystone Species

Tribe/Nation/Tribal organization	Places Documented with a Relationship to a Keystone Species	Archival Sources
Tolowa Dee-ni' Nation	58	33
Trinidad Rancheria	31	43
Wiyot Tribe	41	25
InterTribal Sinkyone Wilderness Council	78	19
Total	208	120

ii. Summary of Interview Findings

In total, sixty-nine (69) Tribal members that practice traditional customary harvesting in the North Coast were interviewed. This exceeded the proposed research design of sixty (60) persons. Twenty-six (26) of these interviews were conducted by the Tolowa Dee-ni' Nation, ten (10) by the Trinidad Rancheria, ten (10) by the Wiyot Tribe, and twenty-three (23) by the InterTribal Sinkyone Wilderness Council. The following provides some basic general demographic information about the interviewees. Additional information was also gathered during the interview process, however, all of that information is retained by the Tribes/Nation/Tribal organization due to its identifiable nature.

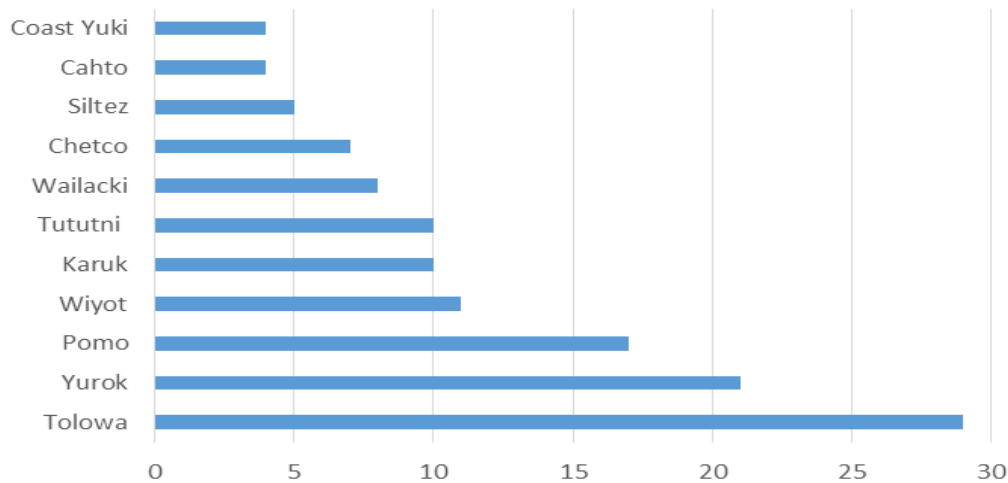
Table 5 identifies the Tribe in which interviewees are enrolled. Each interviewee could select a single Tribe or identify if they are not enrolled or have been dis-enrolled from a federally-recognized Tribe. Over 36% of those interviewed are enrolled citizens of the Tolowa Dee-ni' Nation. Eight (8) of the ten (10) member Tribes of the Sinkyone Council are also represented by interviewees enrolled in those respective Tribes, with only the Pinoleville Pomo Nation and the Robinson Rancheria of Pomo Indians not represented.

Table 5. Enrolled Tribe of Interviewee (n=69)

Tribe	Interviewees
Tolowa Dee-ni' Nation	25
Cher-Ae Heights Indian Community of the Trinidad Rancheria	9
Wiyot Tribe	8
Sherwood Valley Rancheria of Pomo Indians	4
Scotts Valley Band of Pomo Indians	3
Hopland Band of Pomo Indians	3
Redwood Valley Band of Pomo Indians	3
Coyote Valley Band of Pomo Indians	3
Dis-enrolled/not enrolled in federally-recognized Tribe	3
Yurok Tribe	2
Round Valley Indian Tribes	2
Potter Valley Tribe	2
Cahto Tribe of the Laytonville Rancheria	2
Total	69

Chart 1 includes responses regarding the Tribal groups in which at least four (4) interviewees identified as being of descent. Rather than referring to Tribal governments, this question relates to the cultural Tribal peoples that pre-date non-Native contact and remain the source for Tribal identification, cultural practices, and lifeways today. The fact that almost all interviewees identified as being a descendent of more than one (1) Tribal group, also highlights the extensive interconnections between Tribal groups through familial ties. This underscores the interconnections between Tribal governmental groups and the resultant difficulty of drawing hard political lines on where Tribal citizens from a particular Tribe (i.e. government) are eligible to harvest. To this question regarding descendency, interviewees could select up to four (4) ethnographic Tribal groups. This chart only shows those Tribal groups with at least four (4) persons identifying. It is important to note that all Tribal groups identified in the Chart are within the North Coast. Interviewees were also asked for the villages in which they descend.

Chart 1. Tribal Descendency (n=69)



The majority of interviewees also retain this knowledge, which stresses the deep connection many North Coast Tribal citizens have to their heritage and connections to specific places within their homelands. As stated, when selecting the interviewees, there was a concerted effort to select persons that had the potential for conducting customary harvesting both as an adult and as a child. Having this variance in the time period in which they harvested, could help inform the historical context for the existing baseline. Along a similar thought, there was an attempt to also interview people across generations. As Table 6 indicates, the youngest interviewee was thirty-two (32) years of age, as of 2016, when the interviews were conducted. The eldest interviewee was ninety-one (91). The average age of the interviewee was sixty (60) and the median age was sixty-one (61).

Table 6. Age of Interviewees (n=68)

	Year Born	Age (as of 2016)
Youngest Interviewee	1984	32
Eldest Interviewee	1925	91
Average Interviewee	1956	60
Median Interviewee	1955	61

The attempt to get both male and female interviewees proved important, particularly given the keystone species that were selected. For example, it was known during the research design, that in Tolowa Dee-ni' and Yurok cultural customs, women are prohibited from fishing for surf fish. Therefore, women interviewees from these Tribal groups may have chosen not to respond to questions about surf fish or smelt. Regardless of this fact, women do play a critical role in the processing of these fish, drying them on the beach in traditional fish camps in the case of the Tolowa Dee-ni'. As Table 7 indicates, there was more men interviewed, however, both genders were represented by over 40%. Also of note, the question provided an opportunity to respond as appropriate for those that may be transgender or chose not to select a gender identification. However, no interviewees selected that response; all responded as either male or female.

Table 7. Gender of Interviewees (n=69)

Gender	Number	Percent
male	40	58%
female	29	42%

Interviewees were also asked about the community in which they reside. Nearly all respondents (97%) reside in the North Coast. Only two (2) interviewees, reside outside of the ancestral territories of the Tribes comprising the Project Partners—Reedsport, Oregon and Cottonwood, California. Just over a third (31.3%) of interviewees reside on tribal trust lands (i.e. Reservations or Rancherias). Table 8 provides a more detailed breakdown of the community of residence of interviewees, including zip codes. The average number of persons residing the household of an interviewee is three (3) persons. Any null responses to this question, to which there were four (4), were changed to a single person, based on the question structure.

Table 8. Community of Residence (n=67)

Community	Zip Code	# of Interviewees
Bayside	95524	2
Blue Lake	95525	1
Brookings, OR	97415	3
Cahto Reservation	95454	1
Clear Lake	95422	1
Cottonwood	96022	1
Coyote Valley Rancheria	95470	3
Crescent City	95531	4
Eureka	95503	1
Fort Dick	95538	3
Fortuna	95540	1
Hopland	95449	1
Hopland Rancheria	95449	1
Howonquet (Reservation of TDN)	95567	2
Lake Earl	95531	1
Lakeport	95453	1

Laytonville	95454	2
Loleta	95551	2
McKinleyville	95519	4
Potter Valley Rancheria	95470	1
Redwood Valley	95470	1
Redwood Valley Band	95470	2
Reedsport, OR	97467	1
Round Valley Reservation	95428	2
Sherwood Valley Rancheria	95490	4
Smith River	95567	8
Smith River Rancheria ¹⁵	95567	3
Trinidad	95570	6
Ukiah	95482	1
Willits	95490	1
Wiyot Reservation	95551	2

Questions were also posed regarding how interviewees have used the ocean during their lifetime, according to the types of activities they conduct there. Responses here were categorized into pre-designated themes, which were also used to categorize archival materials (see Table 9). In summary, 100% of the respondents stated they use the ocean for customary fishing and harvesting from shore. This refers to any fishing and harvesting related to subsistence, ceremonial, cultural, and otherwise traditional purposes. Just over half (51%) interviewees stated they also conduct customary fishing and harvesting offshore, but only 7% conducted customary hunting offshore. These offshore fishing and harvesting activities may not, however, necessarily be captured in the species-specific mapping responses, due to the focus of the project on nearshore species. Traditionally, offshore hunting refers to seal, sea lion, sea otter, and for some Tribes, whale hunting. Hunting of marine mammals has been prohibited by federal regulation (i.e. Marine Mammal Protection Act) for over two (2) generations, since being legislated in 1972. Thus, this federal prohibition, as well as the inherent dangers of this type of hunting, has likely diminished such activity. Other uses of the marine environment that were conducted by the majority of respondents are ceremonial (65%) and processing (70%) of resources after harvest. As used here, training, refers to ceremonial/spiritual training and teaching others to conduct a particular ocean-related activity, of which 46% of interviewees confirmed doing. Although commercial uses are identified by a small percent of interviewees—9% for offshore and 12% from shore—it is minor in comparison to similar customary uses. Interviewees were also allowed the opportunity to identify other uses. Two (2) persons responded that they like to simply “enjoy ourselves” and “enjoy the beach”, which could be categorized as recreational uses. Again, this underscores the information found in the archival materials; that the ocean was rarely used by Tribal citizens solely for recreational purposes, as is common among the non-Native general public and regulated by the State through the Department of Fish and Wildlife.

¹⁵ This is the former name of the Reservation of the Tolowa Dee-ni’ Nation. This term was used at the time the data survey tool was developed and so it is preserved in this Table.

Table 9. Marine-Related Activities (n=69)

Marine-related Activity	Number of Interviewees	Percent of Interviewees
Ceremony	45	65%
Commercial fishing from shore	8	12%
Commercial fishing offshore	6	9%
Customary fishing and/or gathering offshore	35	51%
Customary fishing and/or gathering from shore	69	100%
Customary hunting from shore	22	32%
Customary hunting offshore	5	7%
Processing	48	70%
Training	32	46%
Other: enjoy ourselves/beach	2	3%

Interviewees were also asked how many years in which they have conducted each activity. Table 10 provides a summary of those responses by indicating the average number of years the activity was conducted and the median number of years across respondents. It should be noted that not all respondents that stated they conducted a particular activity, responded to the question regarding the number of years in which they have done that activity. Thus, the number of respondents for each activity is included in the Table, which may be referenced to the number of interviewees in Table 9.

Table 10. Number of Years for each Marine-Related Activity

Marine-related Activity	Ave. Yrs. Done	Median Yrs. Done	Number of Respondents
Ceremony	31	30	n=43
Commercial fishing from shore	18	20	n= 7
Commercial fishing offshore	13	7	n=6
Customary fishing and/or gathering offshore	30	34	n=34
Customary fishing and/or gathering from shore	44	45	n=66
Customary hunting from shore	30	30	n=21
Customary hunting offshore	30	30	n=1
Processing	41	45	n=43
Training	32	33	n=28
Other: enjoy ourselves/beach	Null	null	

b. Baseline Characterization

i. Archival Research Findings

Drawing direct correlations between inside/outside of the existing State MPAs and the information gathering through the archival data is difficult at this time. The original proposal submitted to Sea Grant, included relating archival information to spatially-explicit geographies.

However, when proposals selected for award, they were all asked to significantly cut their budgets to be awarded. Thus, the research design also had to be adjusted. One major element that was eliminated from this project was developing the spatial references for archival information and relating the archival data to the existing State MPAs and selected reference points. Thus, only information regarding the North Coast region as a whole may be provided in terms of the traditional knowledge gathered from archival materials. Additionally, the original proposal also stated that only a few examples of ecological features, species observations and stewardship practices drawn from T/ITK would be shared to demonstrate how T/ITK can inform the baseline. All other information would be retained by the Tribes/Nation/Tribal organization due to cultural sensitivity/privacy and confidentiality concerns.¹⁶ Thus, the following are a few key examples illustrative of what was found in the archival information regarding the research questions proposed for the region as a whole and/or discrete areas within the region.

Table 11. Examples of Pertinent Archival Information Located

Habitat/ Species	Example¹⁷	Tribal Group	Records System¹⁸
Nearshore, Beach/ Smelt	“Run of smelt it depends on beach- some may spawn on inside of shoal, or linger off breakers may have to wait 3 weeks for them to come in. Birds- shags, keep picking them up- pelicans too are signs of presence of smelts.”	Tolowa Dee- ni’	TDN
Beach	"How the Bay Became Salt" tells of now only how the bay became salty, but also how freshwater can be found when one digs along the shore.	Wiyot	WT
Coastal Stream, Beach/ Razor clams	Met-'e Naa-ghvt-xvlh Tr'ee-ghii~-li~ means “razor-clams-clean-creek”	Tolowa Dee- ni’	TDN
Offshore Rock/ Mussels	An offshore rock for gathering salt from deposits of salt crystals left by evaporated ocean spray. A place visited by Coast Yuki and inland tribes, it also is known for mussels.	Coast Yuki, Inland Tribes	ITSWC
Offshore rocks/ Mussels	“Mussels were most numerous shell-fish. Mussel rocks were public property. No rules pertained to first trip out- in winter even weather might be smooth enough for trip.”	Tolowa Dee- ni’	TDN

¹⁶ See Bibliography submitted via OceanSpaces for the list of all sources for identified archival information for the five (5) keystone species.

¹⁷ In order to preserve the exact manner in which species information was documented, the scientific names used in this Table are verbatim from the archival source and have not been altered to reflect common spellings and/or terms. As referenced, some of these examples are direct quotes and others are summary statements.

¹⁸ This refers to the related Tribe/Nation/Tribal organization’s records system (i.e. MTKED), which contains the excerpt information and bibliographic citation. Abbreviations relate to the Project Partners: Tolowa Dee-ni’ Nation (TDN), Cher-Ae Heights Indian Community of the Trinidad Rancheria (TR), Wiyot Tribe (WT), and InterTribal Sinkyone Wilderness Council (ITSWC).

Nearshore, Offshore rocks/ Abalone, Mussels, Seaweed	Several references to traveling within the nearshore and for some, out many miles to offshore rocks and the open ocean for harvesting, by swimming and canoe.	Wiyot, Northern Pomo,	WT, ITSWC
Nearshore, Offshore rocks/ Mussels	Mussels smaller along shore, than on offshore rocks – noted 10 inch mussels offshore in Yurok and Cahto gathering areas	TDN, Yurok, Cahto,	TDN, TR and ITSWC
Sandy beach, Rocky intertidal/ Clams	“Clams were found in the sandy beaches, and also in pockets of sand in crevices in the small rocks along the mouth of Smith River. They could be eaten the year round but could be gathered only at low tide. The two prevailing kinds were horse and razor clams [probably <i>Schizothaerus</i> and <i>Siliqua</i>].”	Tolowa Deeni’	TDN
Sandy Beach/ Clams	“Clams live in sand, mud, or fine gravel and are therefore in most characteristic use in our area among the Wiyot, whose entire ocean frontage is low and sandy, whereas other northwestern groups have beaches only in coves, bars, and other short stretches. The principal species of clams are the razor (<i>Siliqua patula</i>), bentnosed (<i>Macoma nasuta</i>), rock, hard-shell, or Tomales Bay clam (<i>Protothasa staminea</i>), horse-neck (<i>Schizothaerus nutallii</i>), basket or heart-cockle (<i>Clinocardium</i> , formerly <i>Cardium corbis</i>), and the Washington clam (<i>Saxidomus nuttallii</i>).”	Wiyot	WT
Sandy beach/Smelt	Night fish did not occur at most beaches in the traditional territory of the Coast Yuki, but they did occur at Usal Beach in the territory of the Sinkyone, who allowed the Coast Yuki to net night fish there.	Coast Yuki	ITSWC
Sandy beach/Smelt	“Abundant runs of smelt (<i>Spirinchus starksi</i> and <i>Allosmerus attenuatus</i>) appear on the beaches of northwestern California in late summer, although the size of these runs is known to vary considerably from year to year.	Tolowa Deeni’	TDN
Sandy beach/Smelt	“While each wave may bring him only a few fish, or at best a pound or two of them, he may stay on until he finally staggers back up the beach with twenty or thirty or even fifty wriggling pounds massed in the cone of his net...The smelt were in former times so numerous that a man often got his net so full that he had to have help to carry it ashore--sometimes even so full that it was	Tolowa Deeni’, Yurok	TDN and TR

	necessary to pour some of the fish back into the water for fear of tearing the net because of the weight of the fish... We thus see that all along the immediate shore line wherever it was sandy, surf-fishing with this V-frame net was a common practice. In fact, when the smaller species ran in to spawn, surf-fishing was the major occupation of the people dwelling on the coast. So much so, in fact, that they moved down directly onto the beaches and camped there for the purpose, and were joined by relatives and friends from inland, even those of other speech and tribe.”		
Rocky Reef	Taa-ghii~-'a~ means “land out there place”	Tolowa Dee-ni’	TDN
Abalone	For abalone, seldom was more obtained than to fill immediate needs. So not much was dried to trade with inland Tribes.	Coast Yuki	ITSWC
Abalone/ Mussels	Mussels (<i>Mytilus californianus</i>), and abalone (<i>Haliotis rufescens</i>) were the most important shellfish in the diet of the Coast Yuki.	Coast Yuki	ITSWC
Abalone	Red, green and black abalone: all were harvested in areas visited by the Cahto.	Cahto	ITSWC
Abalone	4 kinds of abalone were found in Central Coast Pomo territory: red, blue green, black and white. The same word was used to describe all four.	Central Pomo	ITSWC
Abalone	Provides habitat for barnacles, considered a great delicacy.	Coast Yuki	ITSWC
Abalone	Rare: 3 locations within Tolowa Dee-ni’ territory (CA portion only included) – red 2 locations within Yurok territory – red and black	Tolowa Dee-ni’, Yurok	TDN and TR
Mussels	High quantity of remnants are present in midden.	Yurok, Mattole, Coast Yuki, Sinkyone, Pomo	TR and ITSWC
Mussels	No taboo against gathering during "red tide." Rather, supposed that long cooking would remove the poison which was never severe but usually left a rash. Also believed that mussels taken high up on rocks when the sun and moon shone were the only poisonous ones and that mussels were not very good when there was. "fire on the water" i.e., when it was luminescent.	Wiyot	WT
Mussels	Mussels found low on the rocks not poisonous.	Sinkyone	ITSWC

Mussels	Mussels were safe to gather year-round, except in areas where they were exposed to sun. In those places, the mussels were poisonous.	Central Pomo	ITSWC
Mussels	Mussels were poisonous in August.	Coast Yuki	ITSWC
Clams	Della Prince describes digging several types of clams in the [Humboldt] Bay at low tide by searching for soft spots and protruding bunches of seaweed.	Wiyot	WT
Clams	“At Requa there used to be razor clams.”	Yurok	TR
Clams	Small clams called sêkwusa [quohog]. These do not occur on the coast in the vicinity of Big Lagoon, but are found only north of Omen.	Yurok	TR
Kelp	Kelp is a source of salt (by eating kelp directly or drying it to remove salt)	Mattole, Sinkyone, Coast Yuki, Northern Pomo	ITSWC
Seaweed	Seaweed is a source of salt (by eating)	Wiyot, Yurok, Tolowa Dee- ni’	WT, TR, and TDN
Seaweed	Stalked kelp <i>Pterygophora californica</i> is a ribbon-like seaweed with long thick streamers. The streamers and the stem have distinct names. The streamers are eaten after being cooked in coals.	Coast Yuki	ITSWC
Seaweed	Sea palm, sea lettuce, and seaweed were all used for food.	Cahto	ITSWC
Seaweed	The Coast Yuki word for sea palm (<i>Postelsia palmaeformis</i>) means “cormorant leaves.” The leaves were not used for food, but the stalks were cooked and eaten.	Coast Yuki	ITSWC
Seaweed	<i>Porphyra perforata</i> is a type of seaweed referred to as “rock leaves.”	Coast Yuki	ITSWC
Seaweed	“black stringy seaweed- lat....only kind eaten-don't eat kelp, eat "eel's sea-weed" occasionally...”	Tolowa Dee- ni’	TDN
Seaweed	siswa-'ya-pL means “black and hair like”	Wiyot	WT
Smelt	“At some points surf fish came in so thick that they were caught with the bare hands.”	Tolowa Dee- ni’, Yurok	TDN and TR
Smelt	“Oh, it's declined so much. When we went, what, three years, four years without any [smelt] fish that was caught...would get some down from Orick. He would buy it and bring it up for us so we would have fish, but it was about four years that we was without any fish at all from our ocean [in Tolowa Dee-ni’ territory].”	Tolowa Dee- ni’, Yurok	TDN

Smelt	First Smelt Rites, which required 10+ days between first catch and then allowance for all to catch and eat	Tolowa Dee-ni'	TDN
Abalone, Mussels, Smelt	Used as bait (varied by Tribe)	Tolowa Dee-ni', Yurok, Mattole, Coast Yuki, Northern Pomo	TDN, TR and ITSWC

ii. Interview Findings

Similar to the archival data, concerns for confidentiality by interviewees, as well as the Tribes/Nation/Tribal organization is paramount. Therefore, there was significant information gathered that is not shared in this final report or the data products given to the State. What is provided are those aggregated data sets in which the Project Partners and approving Councils felt comfortable sharing, in order to demonstrate some key findings of the project, without divulging sensitive information. Additionally, specific examples and general conclusions are provided in order to illustrate some of the major findings.

It must also be kept in mind that interviewees were asked and their responses recorded in the data survey tool about how they use the ocean. However, there were many responses given that included information about species observations and harvest locations used by family members or others they knew. This information was not captured in the geospatial data; it was only captured in the audio file and transcription of the interview. A prime example of this is in regards to abalone. Several persons interviewed by the Tolowa Dee-ni' Nation stated that others they were close to (i.e. family and/or friends) gathered abalone within the Pyramid Point MPA. However, none of the interviewees themselves did such gathering of abalone in this area. Therefore, this data is not captured in the geospatial data set. There could be an effort in the future, to include this other T/ITK data about what those close to the interviewees did, in order to develop a more robust data set. There were also questions about who the interviewee would go with to harvest particular resources (e.g. mother, father, grandfather, grandmother, uncle, etc...). Additional information could also be mapped and analyzed from these interview questions to develop a more robust data set that would also provide a deeper historical context. In addition, several interviewees were unwilling to map locales for their harvesting of the keystone species; for others, the data survey tool did not function as intended. In terms of the latter, there could also be an effort in the future to go through the audio files and/or transcriptions in the appropriate areas that interviewees noted.

As previously stated, a total of sixty-nine (69) persons were interviewed and asked to identify which of the five (5) keystone species they have harvested. Smelt (i.e. surf fish and/or night fish) was harvested across the North Coast Study Region as a whole, with ninety-one percent (91%) of respondents stating they use this resource. Clams and mussels were tied for the second most utilized resource at seventy-eight percent (78%). Seaweed is close behind with seventy-seven percent (77%) of interviewees harvesting this resource. And abalone came in last with just over half (52%) of respondents harvesting this resource. Due to the limiting factor of abalone availability in Tolowa Dee-ni', Yurok and Wiyot territories, as described in the archival and

interview data, this was not a surprising finding that abalone is harvested by the fewest number of interviewees.

Table 12. Interviewees that Harvest the Five Keystone Species (n=69)

Resource	Total Respondents	Percent of Respondents
Abalone	36	52%
Clams	54	78%
Mussels	54	78%
Seaweed	53	77%
Smelt	63	91%

Respondents were then asked to map where they harvest those keystone species they identified. Despite having a relatively small sample size (n=51) for the mapping of resource use and project focus on only five (5) keystone marine species, it is apparent through the aggregated geospatial data across the interviewees, that Tribal citizens of the Project Partners utilize nearly the entire North Coast Study Region coastline for customary harvesting purposes (see Figure 2). This includes areas inside and outside the existing State MPAs. This spatial data is also segmented by individual, resource and for each Project Partner, which is retained by the Tribe/Nation/Tribal organization.

For the keystone species harvested, interviewees were asked to assess how the resource had changed in quantity (i.e. number of catch/abundance) from last year (2015) to when they harvested in adulthood previously. Then they were asked to assess change from when they harvested as an adult to when they harvested as a child. Not all interviewees responded to both questions, depending on whether they had harvested during the time periods of inquiry. A pre-designated scale was provided to standardized results. Table 13 provides the details of those responses by general species. In summary, people have seen the most significant decline over the years for abalone and smelt, and the least decline in mussels. Further details about specific species within these general categories are continued within the audio and/or transcriptions of the interviews. For example, many respondents that identify as Tolowa Dee-ni' Nation citizens notice a significant decline in razor clams, in particular.

Figure 2. Aggregated Locations of Harvest of Five Keystone Species

California North Coast Tribal Marine Resource Use Areas
 InterTribal Sinkyone Wilderness Council, Tolowa Dee-ni' Nation, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe
 All Resources

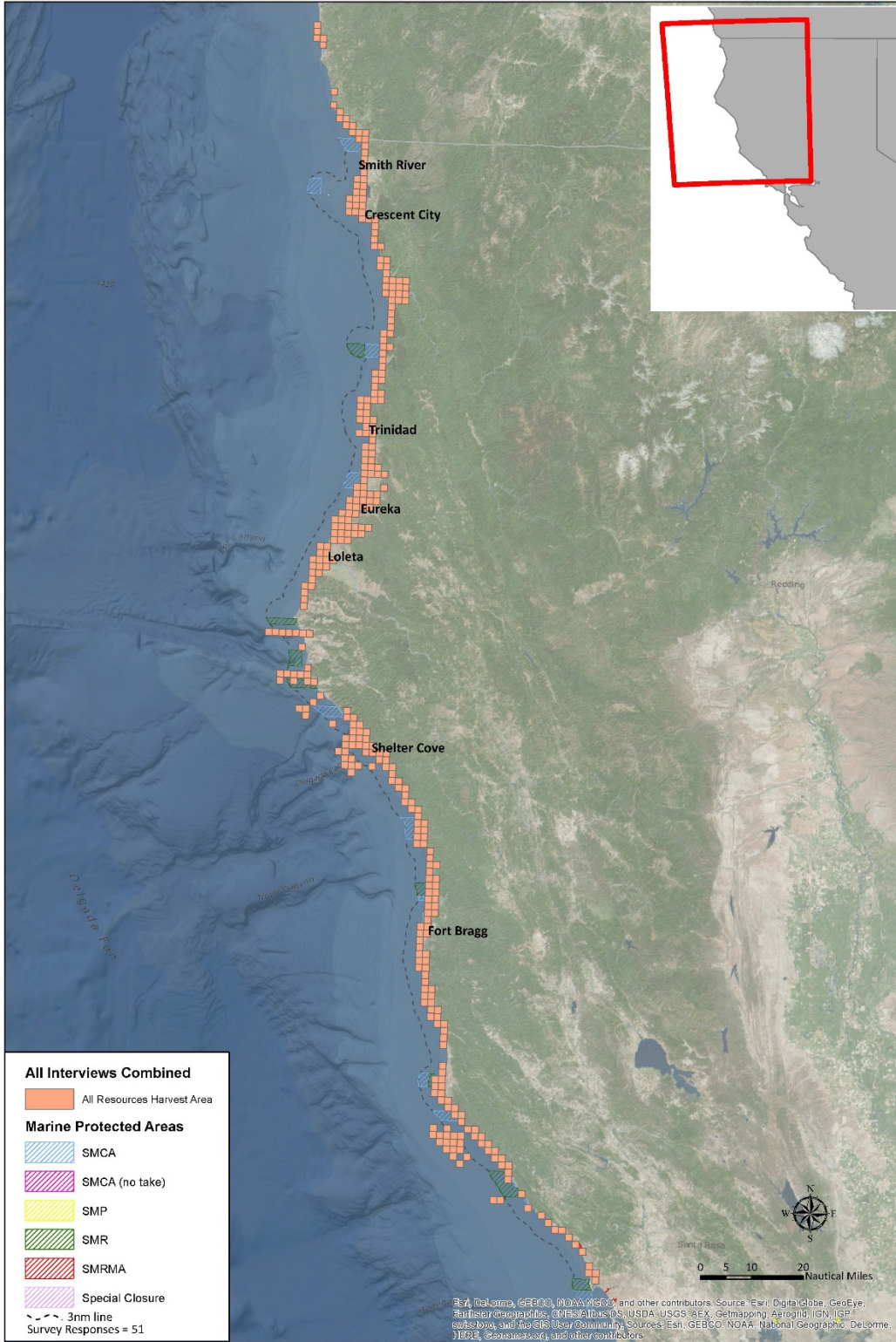


Table 13. Changes in Species Quantity

Abalone: Quantity Last Year to Adulthood		Abalone: Quantity Adult to Child	
Significantly better	1	Significantly better	0
Somewhat better	0	Somewhat better	0
Same	7	Same	3
Somewhat worse	7	Somewhat worse	8
Significantly worse	17	Significantly worse	24
n=	32	n=	36

Clams: Quantity Last Year to Adulthood		Clams: Quantity Adult to Child	
Significantly better	3	Significantly better	1
Somewhat better	4	Somewhat better	0
Same	11	Same	13
Somewhat worse	17	Somewhat worse	15
Significantly worse	8	Significantly worse	20
n=	43	n=	49

Mussels: Quantity Last Year to Adulthood		Mussels: Quantity Adult to Child	
Significantly better	2	Significantly better	3
Somewhat better	4	Somewhat better	3
Same	28	Same	23
Somewhat worse	9	Somewhat worse	13
Significantly worse	5	Significantly worse	10
n=	48	n=	52

Seaweed: Quantity Last Year to Adulthood		Seaweed: Quantity Adult to Child	
Significantly better	0	Significantly better	1
Somewhat better	2	Somewhat better	1
Same	22	Same	19
Somewhat worse	7	Somewhat worse	10
Significantly worse	12	Significantly worse	16
n=	43	n=	47

Smelt: Quantity Last Year to Adulthood		Smelt: Quantity Adult to Child	
Significantly better	0	Significantly better	1

Somewhat better	0	Somewhat better	0
Same	5	Same	5
Somewhat worse	13	Somewhat worse	7
Significantly worse	34	Significantly worse	44
	n= 52		n= 57

Many examples of stewardship practices were discussed by Interviewees, which underline management techniques carried out under specific protocols. In general, several themes arose that were consistent across the Interviewees, regardless of Tribal affiliation.

- 1) Live in a good way, ask for what you need, and give thanks—prayer
- 2) Don't take more than you need and can care for—don't waste
- 3) Inter-connectivity and inter-reliance of everything—community/responsibility to more than self
- 4) Abide by teachings passed down through generations—protocols and laws
- 5) Manage in a way than ensures species health and abundance that sustains Tribal citizens—maintain balance

There are also specific Tribal stewardship management techniques that may be categorized as spatial, temporal, socially-based, hydrological, technological, seasonal, taxonomic, demographic and morphological.

Table 14 provides some examples of stewardship practices specific to the five (5) selected species that was shared by Interviewees. These are not verbatim quotes. Rather, the comments captured reflect what was entered by the Interviewer, in the digital data survey tool, based on how the Interviewee responded. More elaborate descriptions and many other examples are captured in audio files and transcriptions.

Table 14. Examples of Stewardship Practices from Project Interviews

Species	Response Summary	Interviewee by Project Partner
Smelt	My grandfather taught us to “milk” the fish and put the eggs back in the sand at the beach so they’d wash out and return.	ITSWC
Smelt	Grandfather would go to the creek and pray and sing to ensure plentiful dips.	TDN
Seaweed	Don’t scrape it off the rocks. Just some in your hand like you’re giving it a haircut and leave the hard root there so it will grow back.	ITSWC
Seaweed	Pick properly. Leave some on rock. Offering and prayers. Go different places.	ITSWC
	Wouldn’t take it all from one spot.	ITSWC
Seaweed	Rotating harvesting spots	WT
Seaweed	We would only go to certain places and took little. Never took the whole thing, left more than we took.	TR

Seaweed	Never cut it with a knife, it won't grow back; pick it by hand; don't pick it all from one spot; leave some on the rock.	TDN
Seaweed	Don't pick where there are short blades – someone already harvested there	TDN
Seaweed	Pick in different patches (picked twice a year)	TDN
Mussels	We don't take the big ones, just the medium sized ones. And when they are limited, we move to another area.	ITSWC
Mussels	Yes, make sure right size. Check different areas...being selective. Like in a 1 foot area, if good cluster, then take 1 or 2.	ITSWC
Mussels	You never take them all. Certain sizes. I don't take like the gigantic one, and you don't take the small ones. You don't deplete the resources. Be thankful for what it provides for you.	TR
Mussels	Only take what you need; never take the larger ones; harvest ones that are in shadow to harvest year round.	TDN
Clams	Do not take from one area, move around at different years.	WT
Clams	Tried to put the littler ones back, dig a big hole and put it back in if it's not harmed.	TDN
Abalone	Take bigger...being careful as to not disturb smaller ones. Moved around, didn't over pick in a certain areas. Offering and prayer.	ITSWC

Questions regarding perceived threats and areas of concern elicited aspatial and spatially explicit responses. Aggregated across respondents, the top three (3) threats selected by interviews are overfishing, water pollution, and increased water temperature. Areas of concern expressed by the interviewees are depicted according to each threat in Figures 2-4. Figure 5 provides a “heat map” of the aggregated areas of concern for all perceived threats, which highlights areas where multiple respondents identified.

Figure 3. Areas of Concern for Overfishing (n=14)

North Coast Tribal Marine Areas of Concern

InterTribal Sinkyone Wilderness Council, Tolowa Dee-ni' Nation, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe



Figure 5. Areas of Concern for Increase in Water Temperature (n=15)

North Coast Tribal Marine Areas of Concern

InterTribal Sinkyone Wilderness Council, Tolowa Dee-ni' Nation, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe

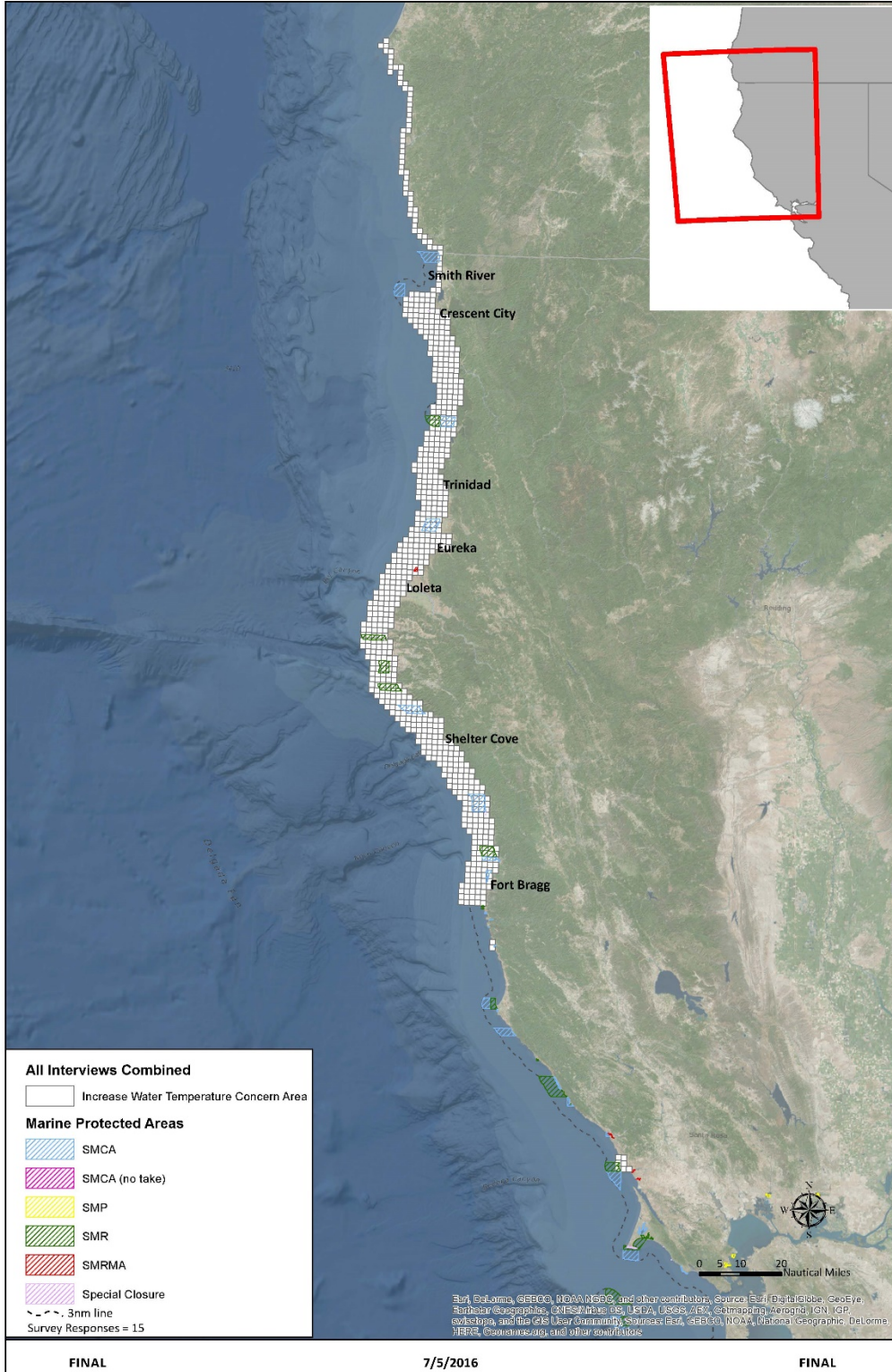
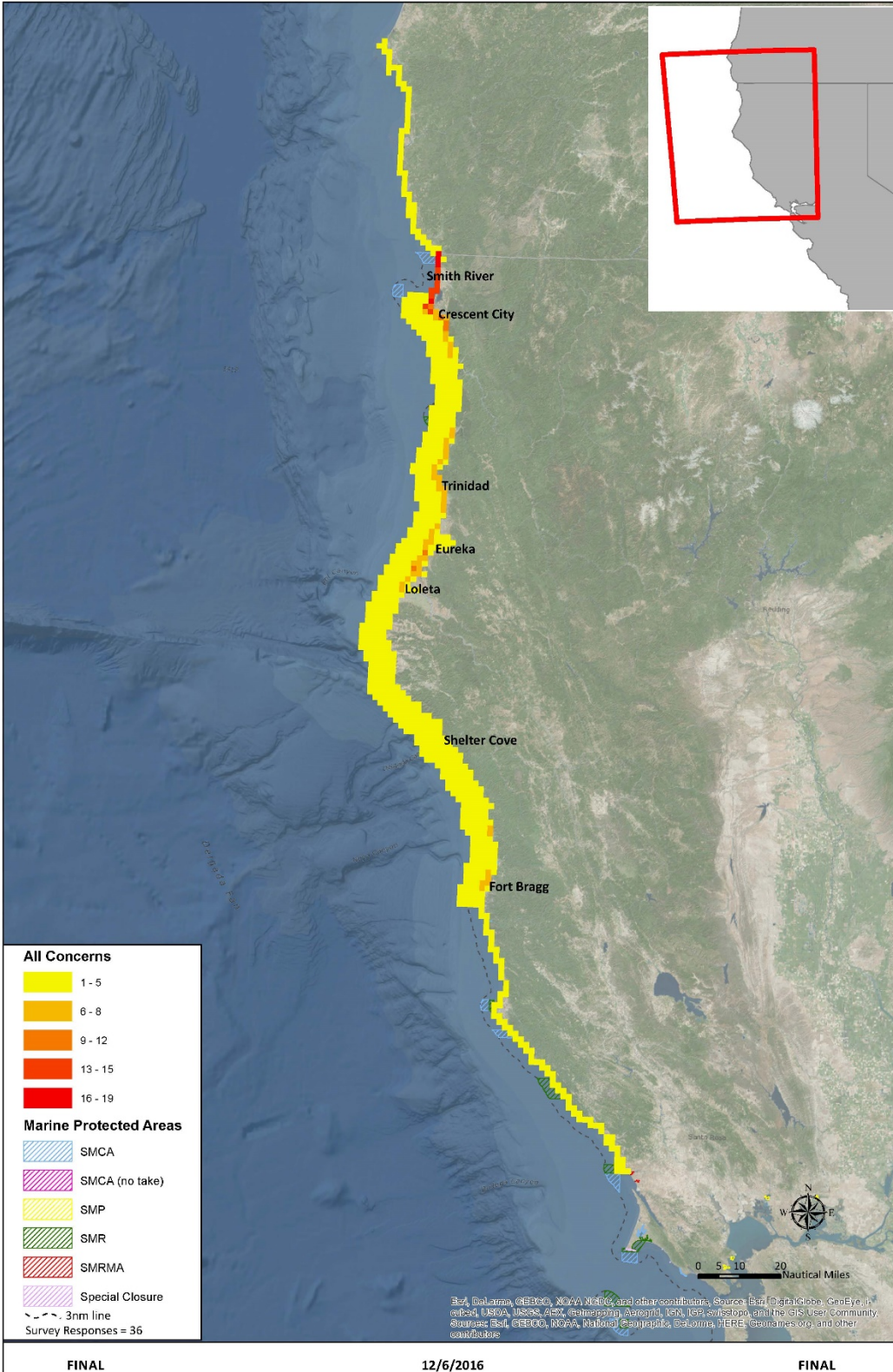


Figure 6. "Heat Map" of All Areas of Concern for All Threats (n=36)

North Coast Tribal Marine Areas of Concern

InterTribal Sinkyone Wilderness Council, Tolowa Dee-ni' Nation, Cher-Ae Heights Indian Community of the Trinidad Rancheria, Wiyot Tribe



Responses regarding level of involvement in the California MLPAI process found that the majority of Tribal customary harvesters that were interviewed (54%) had no involvement in the process (see Table 15). Only twenty-four percent (24%) participated directly either by attending public meetings and making comment or by submitting written comments. In fact, many responded that they either didn't even know what it was; or they had heard about it, but were not sure of what it entailed. Their level of understanding of the MLPAI process itself, including the regulatory outcome, likely impacted their responses to the remaining questions about the MLPAI.

Table 15. Level of Involvement in California MLPAI (n=67)

Levels of Involvement	Number of Respondents	Percent of Respondents
a. None	36	54%
b. Shared concerns with someone who was involved in the process	10	15%
c. Attended public meetings but did not make comments	5	7%
d. Attended public meetings and made comments	14	21%
e. Submitted written comments	2	3%
f. Other – fill in box	0	0%

Level of satisfaction with the inclusion of local input was mixed, although more people were dissatisfied or strongly dissatisfied (42%) than satisfied or strongly satisfied (34%).

Table 16. Level of Satisfaction with Inclusion of Local Input in MLPAI Process (n=50)

Level of Satisfaction	Number of Respondents	Percent of Respondents
i. Strongly satisfied	4	8%
ii. Satisfied	13	26%
iii. Neutral	12	24%
iv. Dissatisfied	15	30%
v. Strongly Dissatisfied	6	12%

Overwhelmingly, interviewees were not satisfied with the State requirement to possess a State fishing license to harvest within certain MPAs for Tribal customary harvest (i.e. non-commercial/non-recreational use). As Table 17 details, eight-two percent (82%) were either dissatisfied or strongly dissatisfied. Only two percent (2%) or a single person was strongly satisfied and the same is true for those being satisfied.

Table 17. Level of Satisfaction of the State Requirements to Possess State Fishing License to Harvest within MPAs for Tribal Customary Use (n=55)

Level of Satisfaction	Number of Respondents	Percent of Respondents
i. Strongly satisfied	1	2%
ii. Satisfied	1	2%
iii. Neutral	8	15%
iv. Dissatisfied	14	25%
v. Strongly Dissatisfied	31	56%

Overwhelmingly, (88%) of Tribal customary harvesters stated that they would purchase a Tribal fishing license to monitor the resources. However, only three (3) noted their Tribe issues them.¹⁹ This provides an opportunity for Tribal customary harvesters who—from the State’s perspective would be out of compliance—to obtain proper licensing through their respective Tribe. This would contribute to Tribal monitoring of resource use and related health and abundance. This supports a structure of State and Tribal co-management and could be an effective tool for long-term monitoring. This is particularly underscored in areas where Tribal citizens are the only persons legally able to use the resource because of restrictions in MPAs to non-tribal citizens.

Table 18. Would you Purchase a Tribal Fishing License to Monitor the Resources? (n=66)

	Number of Respondents	Percent of Respondents
Yes	58	88%
No	8	12%

Interviewees were also asked which State MPAs have directly impacted their fishing or harvesting. A total of thirty-four (34) persons responded to this question. By far, Pyramid Point SMCA, which is located adjacent to the Reservation of the Tolowa Dee-ni’ Nation, was identified the most often—twenty-two (22) times. Second was South Humboldt Bay SMRMA, which is adjacent to the Table Bluff Reservation of the Wiyot Tribe, with over half of Wiyot Tribal citizens interviewed (5 of 9) stating that this MPA has a direct impact on their fishing or harvesting. Other MPAs mentioned are identified in Table 19.

¹⁹ Hopland Band of Pomo Indians, Scotts Valley Band of Pomo Indians, and Sherwood Valley Rancheria of Pomo Indians.

Table 19. MPAs that Directly Affect Tribal Customary Fishing and/or Harvesting (n=33)

North Coast MPA	Number of Respondents
Pyramid Point SMCA	22
South Humboldt Bay SMRMA	5
MacKerricher SMCA	2
Point Cabrillo SMR	1
Reading Rock SMCA	1
Samoa SMCA	1
Ten Mile SMR	1
Ten Mile Beach SMCA	1

Dialing into this question a bit more, interviewees were asked to identify ways in which they have been affected, with the ability to select more than one reason. Table 20 indicates the list of potential selections and the related number for each answer selected.

Table 20. Ways in Which Tribal Customary Harvesters Have Been Affected by State MPAs (n=9)

Reason	Number Response Selected
Can or cannot fish in or go to traditional grounds/areas	7
Need to travel longer distances to fish/harvest in other areas	3
Shifted fishing effort into: less or more desirable areas	4
Shifted fishing effort into other tribal territories/areas (e.g. "owned" by another family)	1
Change in ability to fish as a family (e.g. Tribal enrollment tied to specific MPAs and many families have members recognized in different Tribes)	4
Other ways directly/indirectly impacted by MPAs (fill in)	Null

When asked whether they felt that their inherent rights as a Tribal citizen to utilize the ocean has been protected by the State "Tribal take" regulation, sixty-three percent (63%) said, "No." (see Table 21).

Table 21. Tribal Inherent Rights to Use the Ocean Protected by State "Tribal take" Regulation (n=60)

	Number of Respondents	Percent of Respondents
Yes	22	37%
No	38	63%

For those that responded, "No", a follow up question asking them to explain why they felt that way revealed several interesting answers. Examples to note are as follows.

- *Tribal members will continue to do what they've always done.*
- *State and federal laws, the licensing of access, and the limitation of take.*
- *We have less access to our gathering rights. The act limited access to all people, but if we as tribes can have tribal take, that allows us to have more access (but not for commercial reasons). The state law limits the Indian gathering rights to seaweed to a certain number of pounds. We had to show that what we do gather and it's dried there, it's less than when it's wet, and that reduces what we can take. But commercial harvesters don't have a limit.*
- *We have rules and already know how much to take.*
- *Should be able to go in the areas without regulations.*
- *It's our inherent rights, we never gave that up.*
- *Because they placed our gathering sites into these MPAs, our inherent gathering rights shouldn't require license. Other tribal people are not allowed to gather at certain places that they have always gathered at.*
- *Taking away areas where I used to gather freely and not worry about being prosecuted.*
- *Restrictions places, less quantity, not able to gather large amounts to share.*
- *Limits me from gathering.*
- *You used to be able to gather what you want. You now need a license, they tell you where and how much to gather.*
- *[State] Fish and Wildlife are not following protocol, need to work with Tribal Council more.*
- *Stricter on gathering rights.*
- *More strict regulations.*
- *A violation of cultural practice of fishing, State does not have jurisdictional rights over Tribes.*
- *I think all of the regulations imposed on Indian people has hindered our ability to meet our needs, including the licensing.*
- *I can't go to my usual and accustomed places...well legally anyway. That plus the fact that the State only recognized one Tribe as exempt from the regulation with the Tribal take, and it wasn't mine. Can't be a real Yurok if you aren't on the right roll?*
- *Used to be able to harvest at any time with or without a license.*
- *These are regulations that don't apply to Tribal culture.*

IV. Discussion

a. Baseline Characterization

The intent of this project was to inform the current baseline in terms of health of the selected species and the habitats for which they are considered keystone species. It was also the intent to inform our understanding of the “shifting baseline” and provide the necessary (pre-) historical context by which to inform and gauge the current baseline. To provide this critical context, the project sought to gain insight and knowledge from a “front line” community—Indigenous traditional resource harvesters.

The five (5) keystone species selected for the project, align with the State monitoring metrics for several Ecosystem Features, which have been selected to provide a baseline characterization, as well as be used for long-term monitoring. A brief summary of the information gathered

according to each Ecosystem Feature, as related to the selected keystone species, is discussed below. Information provided is general in nature, which is attributed to the underlining intention for respecting the Project Partners' concerns for confidentiality.

i. Rocky Intertidal

Abalone (*Haliotis spp.*): Abalone is an important species for customary purposes for coastal and inland Tribes throughout the study region. Abalone is eaten and used for bait. The iridescent shells are used in regalia and adornments, making them a high trade commodity. Abalone shell is also documented in several midden sites. As documented, abalone are more abundant south of Wiyot territory where habitat and other ecological factors are more ideal. This variance across the study region in abalone availability correlated to the variance in tribal customary harvest of this species. Abalone was the species gathered the least by interviewees among the five (5) keystone species. Fifty-two percent (52%) of interviewees harvested abalone in their lifetime and the majority of those respondents were from Tribal groups in the southern portion of the study region. Abalone are gathered in the rocky intertidal area, by diving in the nearshore shallow rock, and by accessing offshore rock areas by swimming or canoe/boat. For abalone, there are spatial, temporal, hydrological, technological, seasonal, taxonomic, morphological and demographic Tribal stewardship management techniques. In general, abalone abundance is significant declined as documented in archival materials and by interviewees. It is also important to note that abalone are a highly utilized recreational species by non-Natives.

Mussels (*Mytilus californianus*): Mussels is an important species for customary purposes for coastal and inland Tribes throughout the study region. Mussels are eaten and used for bait. The shells are also used for utilitarian purposes. Examples are spear point to harvest other species, scrap the inside of a basket when weaving, and for a spoon (for women only). Mussel shell discs were also used in a dice game by Tolowa and Wiyot women; the only such archival reference to a recreational marine-related activity. Mussels are abundant throughout the study region. Mussels are gathered in the rocky intertidal, by accessing offshore rocks by swimming or canoe/boat, and gathered from logs from which they have attached. Larger mussels were available at offshore sites in comparison to onshore. Mussel remnants are also abundant at several documented midden sites. Mussels were tied for second at 78%, as the most gathered resource by interviewees, of the five (5) keystone species. For mussels, there are spatial, temporal, hydrological, seasonal, taxonomic, demographic and morphological Tribal stewardship management techniques. In general, mussels seem to have remained somewhat steady in abundance as noted in archival materials and by interviewees. It is also important to note that mussels are not highly utilized recreational or commercial species by non-Natives.

Seaweed (*Porphyra spp.*): Seaweed is an important species for customary purposes for coastal and inland Tribes throughout the study region. It is eaten for sustenance and is a dietary source of salt. Seaweed came up frequently in the archival record and there seemed to be consistent use of the general term of "seaweed" as applying to a particular species (*Porphyra spp.*) across interviewees, despite Tribal affiliation. People living inland come to the coast to gather at particular places where they have a lineal and/or familial right, and/or have gained permission from or going with someone connected to that place. Or inland Tribal groups obtain seaweed through trade from coastal Tribal groups. Seaweed is gathered from the rocky intertidal and from

offshore rocks that may be accessed by canoe/boat. Seaweed is the second least gathered species among the five (5) keystone species, although over three-quarters of the interviewees (77%) harvested seaweed during their lifetime. For seaweed, there are spatial, temporal, hydrological, seasonal, taxonomic, demographic and morphological Tribal stewardship management techniques that have been documented. In general, seaweed abundance seems to be stable; however, particular areas are seeing noticeable decline, as documented by interviewees. Most interviewees attribute this to over- and improper harvesting by non-Natives. There is also a concern for commercial harvesting of seaweed, which appears to be unregulated by the State.

Sea lettuce (*Ulva lactuca*): Sea lettuce was only documented in the southern portion of the study region by one Tribal group. For sea lettuce, there are gear tribal management techniques documented.

Sea palm (*Postelsia palmaeformis*): Sea palm was only documented in the southern portion of the study region. The purpose of the customary harvest was to eat portions of the Sea palm. There are tribal management techniques documented for gear types.

ii. Soft-bottom Intertidal and Beach

Clams (*Bivalvia*): For the purposes of this discussion, the category of Clams includes Razor clams (*Siliqua patula*), Butter clams (*Saxidomus gigantean*), Quahog clams (*Mercenaria mercenaria*), Horseneck clams (*Tresus capax*), Common/Pacific littleneck/rock/hard-shell clams (*Leukoma staminea*), Geoduck clams (*Panopea generosa*), Washington clams (*Saxidomus nuttalli*), Manila clams (*Venerupis philippinarum*); Basket/Heart cockle (*Clinocardium nuttalli*); Softshell/Mud clams (*Mya arenaria*); Bittersweet clams (*Glycymeris spp.*); and Bentnose clams (*Macoma nasuta*). All of these species of clams were referenced in the interviews and/or the archival materials. As a general term, clams are available throughout the study region. These clam species like varying substrates, for example, Razor clams prefer areas of fine sand and Horseneck clams prefer areas of cobble. Several types of clams were identified in several documented midden sites throughout the study region. Clams are harvested for food and certain types of clam shells used for regalia and adornments. Tied with mussels, clams were the second most frequently harvested resource, of the five (5) selected keystone species, at 77% of interviewees having gathered clams during their lifetime. Tribal stewardship management techniques for clams include spatial, temporal, hydrological, technological, seasonal, taxonomic, demographic and morphological. As documented in archival materials and by interviewees, clams are significantly declining in population, most notably, Razor clams and Quahog clams. It is important to note that there is a significant Non-native recreational interest in clams.

Bay mussels (*Mytilus trossulus*): Bay mussels are available mostly in sheltered bay waters and are also documented to be found attached to logs. Bay mussels were only documented in the archival materials for two Tribal groups who used them for food. They were also found in documented midden sites. There are spatial- and gear-based stewardship management techniques associated with Bay mussels.

Smelt - Day/Surf fish (*Hypomesus pretiosus*) and Night fish (*Spirinchus starksi*): Day/Surf fish and Night fish will be discussed here together as smelt. Smelt are available throughout the

study region on sandy beaches with small gravel and freshwater outlet influence. In areas where smelt are not available, there are documented instances of agreements between Tribal groups that would allow for the harvesting of smelt within another group's territory. Smelt are harvested for food and to be used as bait to catch other species. The largest number of interviewees at 91%, claim to have harvested smelt during their lifetime. Smelt are gathered in the ocean at the breakers with some type of dip net. For smelt, there are spatial, temporal, socially-based, hydrological, technological, seasonal, and demographic Tribal stewardship management techniques. Smelt have seen a significant decline in abundance as documented in the archival information in comparison to interviewee data, as well as documented by interviewees' during their own lifetimes. It should be noted that non-Native harvesting of smelt for commercial and recreational purposes is prevalent. Commercial harvesting includes both an onshore and offshore fishery.

iii. Kelp and Shallow Rock (0-30m)

Abalone (*Haliotis spp.*): Refer to earlier section for this species under Rocky Intertidal.

Seaweed (*Porphyra spp.*): Refer to earlier section for this species under Rocky Intertidal.

Sea lettuce (*Ulva lactuca*): Refer to earlier section for this species under Rocky Intertidal.

Giant kelp (*Macrocystis pyrifera*), Bull kelp (*Nereocystis luetkeana*), and Stalked kelp (*Pterygophora californica*): As a general term, kelp is documented by Tribes throughout the study region. Only in archival materials from Tribal groups in the southern portion of the study region, were specific kelp species identified. Although varying by Tribe, uses for kelp include as a food source, salt source (eaten directly and dried and salt extracted from exterior), medicinal use, and as a tool, for example, as a grease container, fishing line, and to pull pinnipeds ashore.

iv. Offshore Rocks and Islands

Mussels (*Mytilus californianus*): Refer to earlier section for this species under Rocky Intertidal.

Seaweed (*Porphyra spp.*): Refer to earlier section for this species under Rocky Intertidal.

Sea palm (*Postelsia palmaeformis*): Refer to earlier section for this species under Rocky Intertidal.

v. Areas of Concern and Threats

Based on perceived threats, interviewees characterized the ocean as getting warmer, being impacted by varying pollutants, and facing overharvesting. The area within and adjacent to the Pyramid Point SMCA was the area of highest concern. Although this could also be attributed to the high percentage of interviewees being citizens of the Tolowa Dee-ni' Nation (36%). Other areas of concern include Crescent City, Trinidad, Eureka, and Fort Bragg; all of which are the general population centers for the study region.

vi. MLPAI Process

The MLPAI process attempted to have community-driven outcomes in designing a MPA network, within a highly regimented planning process and framework. Through this attempt to be community informed on a study region level, the MLPAI launched an intensive public outreach effort through public scoping and planning meetings, online live and recorded meeting access, website with all studies and planning documents, hardcopies of all materials sent to local libraries, Tribal governments and communities, and other areas to make it available to interested public, and outreach materials. Despite these efforts, the majority (54%) of interviewees that responded to this question (n=67) did not participate in the MLPAI at all. And many of these interviewees stated they were not even sure what the process was.

It is probable that this lack of understanding of the MLPAI process, related to the responses to the question regarding level of satisfaction of that process. There were seventeen (17) less respondents to the question about satisfaction. Of those that responded (n=50), forty-two percent (42%) were dissatisfied or strongly dissatisfied and twenty-four percent (24%) were neutral. Level of satisfaction with the State license requirements for the “tribal take” exemption is striking in that fifty-six percent (56%) of respondents (n=55) are strongly dissatisfied with the State license requirement for Tribal customary harvest within an MPA and twenty-five percent (25%) are dissatisfied. Only four percent (4%) of respondents were either satisfied or strongly satisfied. Couple this very low level of satisfaction with needing a State license for Tribal customary harvest with the finding that eighty-eight percent (88%) of respondents (n=66) would purchase a Tribal license, if their Tribe issued them. This helps substantiate the approach for Tribal/State co-management in terms of enhancing the potential for likely compliance with licensing requirements by Tribal citizens, as a means to monitor and manage marine resources and MPAs. From the interviews, there were eight (8) MPAs identified as directly impacting Tribal uses. Overwhelmingly, the Pyramid Point MPA was identified the most frequently. This is also the MPA that includes and is adjacent to the Reservation of the Tolowa Dee-ni’ Nation; the Project Partner with the most interviewees.

vii. Archival Materials in General

Archival information provides a strong context for the resources of importance to the Tribes included. There is information about ecological features, species observations, and how Tribal peoples harvested and processed marine resources. This is documented, for instance, in place-names, descriptions of activities, descriptions of gear types and usages, seasonality, and ceremonial rites. Some ethnographers identified the Tribal citizens’ names that were sharing information, although this was not the standard. Archival materials lacked a depth of discussion in the understanding. Most of the individuals that documented this archival information are anthropologists, archaeologists, ethnographers, and historians who are not Tribal citizens. They have their own epistemology and learned research approaches, which plays a significant role, for example, in how information is gathered, documented, interpreted, understood and shared. In some instances, there were also language barriers historically.

viii. Interviews in General

The Tolowa Dee-ni’ Nation had the highest percentage of total interviews conducted at 37%. This was followed by the ITSWC (35%) and then the Wiyot Tribe and Trinidad Rancheria, each

at 14%. Interviewees were all traditional customary harvesters and each described the many immediate and extended family members, and in a few instances close friends, from whom they learned. In summary, this transmission of knowledge was expressed as teaching/learning by doing alongside, observing, and then continued practice. Oftentimes this was cyclical in nature, teachers/learners transposed, and was intergenerational.

Shared was a strong connection and identification to certain places. Returning to the same places throughout their lives and observing changes in the resources, habitat and waters. Noting that these places were selected for their particular habitat, because the resource(s) was abundant there, the places were close by and/or easy to access, and/or because it is where their family has gone for generations (i.e. responsibility/rights). Also shared was an understanding of the ideal conditions needed to harvest, as well as the area within a habitat. For example, knowing that resources might be most accessible/available at very low, slack, or in coming tides. Knowing to look for a particular gravel size or type of sand bar based on the resource of interest. And similarly, knowing to harvest under and/or the shady side of a rock. A learned understanding of the seasons and the time of the year when resources are may or may not be taken.

b. Policy and Management Recommendations

An important outcome of this Project has been to generate policy and management recommendations. This Project provides the Project Partners a direct opportunity to provide recommendations to the State that are based on key findings emanating directly from T/ITK. These recommendations should by no means be considered exhaustive. Furthermore, the Tribes and California Department of Fish and Wildlife (CDFW) should collaborate in a formal process that effectively solicits Tribal recommendations regarding policy and management of MPAs. The below recommendations will briefly touch on potential issues and areas that can help inform development of policies and management objectives, but a more expansive process devoted to an in-depth exchange between the Tribes and the State is needed.

- Establish State policy acknowledging the ways in which T/ITK can be utilized to inform State marine resource management and the importance and necessity of the Tribes taking the lead in defining how that knowledge is to be accessed and applied.
- Establish State policy acknowledging T/ITK is the framework by which Tribal nations implement highly effective management regimes (i.e. seasonal, geographical, temporal, and morphological), and that when adhered to, those management regimes are key to ensuring balanced, healthy ecosystems and abundant and sustainable harvesting.
- The State should work with willing Tribal nations to develop recommendations for the manner in which Tribes may wish to gather T/ITK.
- The State should work with willing Tribal nations to develop effective ways to apply T/ITK in marine resource management.
- Ensure the continuation of long-term monitoring, to assess levels of recovery and robustness of species and habitats within and adjacent to north coast MPAs, in collaboration with north coast Tribal nations.

- Establish State policy acknowledging the inherent, sovereign Rights of Tribal Nations and the inherent Rights of Nature as a basis by which to consider and craft marine and coastal initiatives.²⁰
- The State should work with willing Tribal nations to develop and enter into Co-Management Agreements that provide a legal structure for enhanced management and regulatory enforcement that recognizes the governmental authority and natural resources management role of each sovereign.
- Each successive Governor of the State should affirm through proclamation the commitment to Tribal Consultation (currently expressed in California State Governor Executive Order B-10-11), as should the Secretary of the California Natural Resources Agency and Director of the CDFW through their respective Tribal Consultation Policies, for all actions that have the potential to impact Tribal nations in the State.
- Develop a category for “tribal traditional/customary harvest”²¹ within the existing CDFW regulatory approach, which currently only acknowledges “commercial” and “recreational” harvest.
- Develop a framework to make “tribal traditional/customary harvest” exempt from the existing CDFW regulatory approach.
- Enforcement by the State and/or Tribal nations of existing regulations within the region should be a priority.
- A program and agreements should be developed for those Tribes wishing to train and deputize Tribal law enforcement officers to assist State game wardens and rangers in enforcing State laws in the MPAs and on State coastal lands and waters.
- A Tribal Subcommittee of the California Fish and Game Commission should be formally enacted through State legislation and used as a body for enhanced Tribal/State communications regarding the identification, development, and implementation of policies, management objectives and projects important to the Tribes regarding fish and wildlife resource management.
- A Tribal Committee of the Ocean Protection Council should be formed to provide a space for enhanced Tribal/State communications regarding the identification, development, and

²⁰ In August 2014, the California Assembly and Senate jointly resolved through AJR-42 their endorsement of the principles of the United Nations Declaration on the Rights of Indigenous Peoples adopted by the United Nations General Assembly, and “recognizes the call for increased awareness, sensitivity, and respect for issues of sovereignty, sacred and historic sites and traditions, and other vital aspects of the heritage of Native Americans and indigenous peoples implicit in those principles...” Various municipalities throughout California, and in other states, have formally recognized the inherent Rights of Nature.

²¹ The term selected should be developed through a formal consultation process with Tribal nations.

implementation of policies, management objectives and projects important to the Tribes regarding the marine environment.

- Tribal representation on the Statewide MPA Leadership Team should be formally established to provide a space for enhanced Tribal/State communications regarding the identification, development, and implementation of policies, management objectives and projects important to the Tribes regarding the MPA network.
- At their discretion, Tribes should develop a Tribal Marine Taskforce for each marine region (or sub-region) of the State. Coastal Tribes within each region would have the ability to appoint Tribal representatives to their regional Taskforce. Each regional Tribal Marine Taskforce would meet to communicate and collaborate on marine-related initiatives, as well as engage State (and federal) agencies, as needed. Although, no regional Tribal Marine Taskforce would supersede or replace the autonomy or authority of any individual sovereign Tribal Nation.
- For all future efforts by the State to develop local or regional marine initiatives that may affect the Tribes, a plan of action should first be developed with regard to communicating with, and providing meaningful opportunities for the Tribes to participate as sovereign governments in all the planning and development phases of any such marine initiatives.
- The State and Tribal nations should collaborate to incorporate key traditional stewardship into management of cultural keystone species through the California Fish and Game Code, and through public outreach and education efforts by the CDFW, to improve resource health, abundance, and ecosystem balance.
- Licenses for Tribal members/citizens to gather, harvest and fish for marine and estuarine species should be issued by the Tribal government of the Tribal nation at which the individual Tribal member/citizen is enrolled.
- The regulations for State Marine Reserves (SMR) should be amended to allow for “tribal traditional/customary take”, given the stewardship management techniques in place by Tribes relying upon T/ITK, the ongoing tribal management that has been practiced in these areas since time immemorial, and the inherent rights of sovereign Tribal nations.
- Conduct consultation with Tribal nations associated with those particular MPAs and marine issues that are identified by the Tribes as having directly affecting Tribal traditional/customary fishing, gathering and/or harvesting, to determine ways to enhance and/or mitigate or alleviate those affects, as may be applicable.
- Water quality, pollution, and climate change impacts (e.g. increased water temperature) should be evaluated as key factors contributing to the ultimate success of the MPA network.
- The usual methods of the State for engaging with “the public”, as means to inform the various aspects of management, overwhelmingly does not reach tribal

traditional/customary practitioners. Alternative approaches must be developed, in partnership with Tribal nations.

- Commercial harvesting of Day/Surf fish (*Hypomesus pretiosus*) and Night fish (*Spirinchus starksi*) should be closed throughout the region, efforts should be made to assess population stocks, and recovery measures should be developed and implemented.
- Commercial harvesting of all kelp and seaweed species should be closed throughout the region and tribal management techniques of how to properly gather seaweed should be encouraged through outreach and education to recreational harvesters.
- Tribal nations should be notified early of all State efforts relating to public education about the MPAs and other marine areas and issues, as well as scientific studies and planning regarding coastal and marine areas of importance to the Tribes.

V. Long-term Monitoring Recommendations

Cultural, natural, social, economic, and political factors and forces, all of which constantly shift over time, will influence the development and effectiveness of community-based long-term monitoring and stewardship programs and initiatives. Environmental changes, societal trends, evolving community perspectives, awareness of and interactions within nature, a variety of increased threats, the growing rights-of-nature movement, and many other phenomena make the proposition of long-term monitoring and stewardship both challenging and exciting. We cannot rely solely upon previous, obsolete science-based models to truly understand and effectively help care for marine and coastal ecosystems.

In order for humans to respectfully and successfully interact with the ocean environment, and assist with maintaining and restoring its balance, we will need to use constantly evolving and innovative approaches that blend T/ITK with applicable aspects of WEK. It must be a constantly dynamic and adaptive engagement. This is especially true due to recent indicators of big and important changes—both current and future—relative to global climate change, unprecedented levels of human impact, and movements on a geo-political level. The need to prioritize, tailor and regularly adapt local marine monitoring and stewardship approaches to accommodate a multitude of constantly and rapidly changing dynamics must be balanced with our reliance on existing foundations of ancient and still-valid cultural values and systems of knowledge combined with more recently-acquired scientific data. It is these foundations, together with innovation, that will enable us to effectively determine, prioritize and implement long-term monitoring and stewardship programs and initiatives.

The Tribes and CDFW should collaborate in a formal process that effectively solicits Tribal recommendations regarding marine areas of concern—both geography-focused and topic-focused—that are in need of community-based long term monitoring and stewardship. The below recommendations will briefly touch on potential issues and areas that can help inform development of a comprehensive approach to long-term monitoring and stewardship, which are derived solely from the information gathered from this specific project scope and should in no way be considered exhaustive. A more expansive process devoted to an in-depth exchange

between the Tribes and the State is needed for long-term monitoring recommendations for MPAs and surrounding areas.

The process for including T/ITK in the State's data-gathering phase for the North Coast's MPAs provides an excellent start for developing a new approach for effective, long term monitoring and management of the marine environment. But if the principles informing the collective wisdom of countless generations of Tribal/Indigenous traditional place-based practices and knowledge pertaining to the function, balance, and stewardship of marine ecosystems is to be effectively applied and revitalized in a broad and holistic manner, then we must work to further develop mutual understanding and trust so that meaningful Tribal engagement in long term monitoring—leading to long term and successful co-management—will be realized for the benefit of all.

- Additional analysis of the T/ITK data gathered should be conducted to better understand species population trends in terms of chronology and geography—through initiatives authorized and administered by individual Tribal nations. This could include georeferencing archival data records, transcribing all audio recorded interviews, entry data records into database from interviews, and conducting further qualitative, quantitative, and geospatial trends analysis.
- Changes in Tribal marine uses, harvesting of the selected keystone species, and effects of MPAs on Tribal customary fishing and gathering should be assessed every five (5) years using the same survey questions and sampling method—through initiatives authorized and administered by individual Tribal nations.
- Conduct T/ITK interviews that gather information specific to the specific clam species identified in terms of changes in abundance—through initiatives authorized and administered by individual Tribal nations.
- Conduct follow up T/ITK interviews with each project interviewee, relying on open-ended, ethnographic interview techniques to assess success of various in research techniques (i.e. digital data survey tool) and provide interviewees to expand upon their responses given during the digitally-based interviews—through initiatives authorized and administered by individual Tribal nations.
- Tribal nations that participated in the T/ITK baseline project should develop a “lessons learned” document regarding the project and the gathering of T/ITK that could be shared.
- Measure the effectiveness and environmental impacts of select Tribal harvesting and stewardship practices in and around MPAs—through initiatives authorized and administered by individual Tribal nations.
- Monitor water quality (i.e. pH, dissolved oxygen, nitrogen, phosphorus) and temperature in and around MPAs.

- Georeference potential pollutant sources (e.g. permitted nonpoint and point source pollution discharges, pesticide applications, marine debris, derelict fishing gear) within coastal watersheds and ocean.
- Document enforcement contacts and citations, as well as human illegal uses occurring within and adjacent to MPAs.
- Assess potential variance in levels of PSP and domoic acid in mussels during biotoxin event, based on varied traditional and non-traditional gathering techniques.
- Monitoring long-term changes in populations and conditions of the five main species types researched for the Tribal Marine T/ITK project (abalones, mussels, clams, smelts, and seaweeds);
- Continue/Expand surf fish and night fish assessment (e.g. beach egg counts, habitat availability, catch per effort, offshore fishing pressure, genetic diversity, Walker scale to estimate population size).
- Kelp and seaweed assessment on region-wide productivity and availability (population monitoring), as well as impacts from varying harvesting techniques (e.g. traditional/customary, recreational and commercial).
- Baseline assessment of clam species of concern (e.g. Quahogs and Razors).

VI. Financial Report

a. Tolowa Dee-ni' Nation

	Budgeted (award)	Expended (award)	Budgeted (match)	Expended (match)
A. Salaries and Wages	\$106,688	\$106,688	\$11,833	\$11,524
B. Fringe Benefits	\$4,119	\$4,119	\$3,668	\$8,364
D. Expendable Supplies	\$2,157	\$2,157	\$44,000	\$44,138
E. Travel	\$2,000	\$844		
G. Other Costs	\$86,645	\$86,645		\$25,360
J. Total Direct Costs	\$201,609	\$201,609	\$59,502	\$89,385
K. Indirect Costs	\$26,791	\$26,791		
N. Total Project Costs	\$228,400	\$228,400	\$59,502	\$89,385

b. Cher-Ae Heights Indian Community of the Trinidad Rancheria

	Budgeted (award)	Expended (award)	Budgeted (match)	Expended (match)
A. Salaries and Wages	\$38,933	\$15,944		
B. Fringe Benefits	\$6,794	\$2,871		

D. Expendable Supplies	\$3,415	\$1,919	\$22,000	\$22,000
E. Travel	\$3,757	\$1,869		
G. Other Costs	\$1,500			
J. Total Direct Costs	\$54,400		\$22,000	\$22,000
K. Indirect Costs	\$13,600	\$5,464		
N. Total Project Costs	\$68,000	\$28,067	\$22,000	\$22,000

c. Wiyot Tribe

	Budgeted (award)	Expended (award)	Budgeted (match)	Expended (match)
A. Salaries and Wages	\$38,133	\$38,133		
B. Fringe Benefits	\$3,813	\$3,813		
D. Expendable Supplies	\$3,468	\$3,468	\$22,000	\$22,000
E. Travel	\$765	\$765		
G. Other Costs	\$1,500	\$1,500		
J. Total Direct Costs	\$47,680	\$47,680	\$22,000	
K. Indirect Costs	\$11,920	\$11,920		
N. Total Project Costs	\$59,600	\$59,600	\$22,000	\$22,000

d. ITSWC

	Budgeted (award)	Expended (award)	Budgeted (match)	Expended (match)
A. Salaries and Wages	\$60,687	\$60,687	\$9,793	\$9,793
B. Fringe Benefits	\$4,328	\$4,328	\$1,959	\$1,959
D. Supplies	\$5,503	\$5,503		
E. Travel	\$1,800	\$1,800		
G. Other Costs	\$11,683	\$11,683		
J. Total Direct Costs	\$84,001	\$84,001	\$11,752	\$11,752
K. Indirect Costs				
N. Total Project Costs	\$84,001	\$84,001	\$11,752	\$11,752

VII. List of publications and description of outreach efforts

The focus on outreach for the proposed project was the Tribal citizens of the Project Partners. There was significant outreach in developing the original research design and garnering Tribal leadership support for submitting a proposal for award consideration. Once awarded, there were meetings convened with the Councils of the Project Partners, pertinent Tribal Committees (e.g. Culture, Fish and Game), and General Membership meetings, which varied across the Project Partners. The purpose of these initial meetings was to provide an overview of the project and garner additional guidance on approach. Regular meetings occurred during the project to provide updates, garner guidance/approval, and solicit interviewees. Information was also shared through tribal newsletters and websites. Presentations were also shared at the MPA Collaborative North Coast Forum on November 17, 2015, as well as during several North Coast MPA Baseline Program-related meetings.

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