

Port Graham
Natural Resource Project:

**A Tribal Initiative to Promote
Collaborative Research and Restore
Marine Invertebrates in Port Graham Bay**

A Project Presented to the
Center for Cross-Cultural Studies

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SUMMARY

Kachemak Bay is home to three Alaska Native Tribes, including the two Sugpiaq (Chugach Alutiiq) Native villages of Port Graham and Nanwalek. From Russian colonization in the late 1700s, subsequent fur trading, commercial mining and fishing industries, and the influence of the Russian Orthodox Church, the Sugpiaq gradually moved away from their traditional semi-nomadic way of life to establish the permanent villages of Nanwalek and Port Graham. These changes led to a regional concentration of resource harvests, a gradual deterioration of traditional management practices, and the gradual decline of some local marine resources.

In 2003, the Port Graham Tribal Council started to collaborate with Western researchers and managers working in the Kachemak Bay area to restore depressed stocks of locally important benthic marine invertebrates (e.g., clams, crabs, cockles, and chitons). The Port Graham-Nanwalek Wisdomkeeper Workshop was held in September 2003 to promote understanding and share information on local natural resource issues, and identify collaborative projects to address these issues. Implementation of the sixteen collaborative projects was left to the initiative of meeting participants.

The current project is a tribally driven community-based participatory research project to continue this collaboration initiative. It evaluated accomplishments since the 2003 Wisdomkeeper Workshop, identified gaps and research needs, and developed a strategy to both improve cross-cultural communications and establish long-term tribal-researcher partnerships to address tribal natural resource issues. It also developed and tested a systematic approach to promote two-way learning, establish relationships, and develop collaborative Tribal-Western research partnerships. This process started with an update and collaborative assessment of research projects since the 2003 Workshop.

This effort revealed that substantial progress was being made in (1) unraveling the cause of the decline of several benthic marine invertebrates (the “Bidarki Project”), (2) evaluating environmental contamination and benthic habitat mapping (mostly by one agency), and (3) in documenting traditional knowledge and tribal natural resource management practices (completed by the Port Graham Tribe). However, many of the Workshop participants did not follow-up, and many of the research topics related to resource assessments, marine science, and oceanography studies were not addressed.

A survey and follow-up interviews with researchers revealed that there were many factors contributing to the low rate of response, including lack of a coordinated follow-up, more pressing work priorities, lack of funding, inability to hire new staff, and breakdowns in communication. A Research Advisory Committee was established to work with the Tribe to identify information gaps, research needs and priorities, and develop a research strategy to restore marine invertebrates. This effort resulted in the

identification of over a dozen collaborative projects that should be initiated in the next few years. Participants began to identify funding sources, identify specific actions to implement the recommendations, and develop partnerships.

The Port Graham Tribe and the project coordinator/facilitator (i.e., the graduate student) made a deliberative effort to build a project team of individuals and organizations with a sincere interest in building collaborative relationships with the Tribe and pursuing research of mutual concern. This systematic process was an effective approach in beginning to build relationships, understanding, mutual respect, and an overall commitment to work towards a common goal.

Both the Tribe and agencies began to understand the challenges each faces, appreciate the value of advanced planning for both researchers and tribes, and the need to build capacity and funding for the Tribe to participate in, support, and facilitate the development of tribal-researcher partnerships. This project should only be considered a start to address Port Graham's natural resource information and management needs. Substantial progress has been made, but the continued diligence of both the Tribe and researchers is needed to implement the recommendations and successfully address resource issues of mutual interest. The Tribe should continue to build on this initiative, including its role in coordination and facilitation, to more fully achieve its natural resource goals and objectives and support Tribal Natural Resource Management.

CHAPTER 1: PROJECT OVERVIEW

This chapter consists of five sections and provides background on the people and history of the Port Graham area. The first section, “Project Introduction,” presents the current Port Graham Natural Resource Project and its primary goals and objectives. The next section, History of the *Unegkurmiut*, is a summary of the history and effects of colonization on the Alaska Native communities of Port Graham and Nanwalek, providing the reader with a general understanding of the early history and events that led to the establishment of these permanent villages and their effect on the local natural resources. The following section, “Tribal Natural Resource Use and Management,” highlights changes in the pattern of natural resource usage over time, as well as more recent tribal natural resource management efforts and an overview of research projects leading to the current project. The final two sections summarize some of the benefits of the Port Graham Natural Resource project to the community and the general measures taken to safeguard indigenous and cultural property rights.

Project Introduction

Initially, as part of a research project for the University of Alaska Fairbanks (UAF) Master of Arts Cross-Cultural Studies program, my research interests were in supporting a community-based participatory research project to assist the communities of Port Graham and Nanwalek in addressing their priority natural resource issues. Although I envisioned a project with both Port Graham and Nanwalek, funding and time constraints necessitated that I focus on one community. Port Graham was chosen based on their past record of leadership in promoting community research collaborations and their desire to renew these efforts. Patrick Norman (hereafter referred to as “Pat” or “Pat Norman”), First Chief of the Port Graham Village Council, first expressed his interest in starting a natural resource project in November 2010. From January to September 2011, I worked with Pat to develop a community-based project that addressed the natural resource priorities of the Port Graham Tribe. The project will hereafter be referred to as the “Port Graham Project” or “Project.”

This collaborative research project builds on past efforts from the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop. As described by Henry Huntington (2003, p. 2), the purpose of that workshop was “to promote interaction between scientists and local residents,” and to help “communities gather information relevant to their interests, by helping scientists share their findings, and by allowing both groups to explore potential collaborative projects.” The Port Graham-Nanwalek Wisdomkeeper Workshop focus was on the communities’ desire to restore important marine invertebrate populations that have since declined over the last several decades. The species identified as being of primary concern were black leather chiton (*Katharina tunicata*), clams (butter clams, *Saxidomus giganteus*; cockles,

Clinocardium nuttallii; littleneck clams, *Protothaca staminea*; and Dungeness crab, *Metacarcinus magister*). The goals of the Port Graham Project are to continue efforts to address restoration, improve communication, and develop long-term partnerships between the Tribe and Western researchers. The project's geographic focus is on Port Graham Bay.

The Port Graham Tribe developed several long-term objectives to help guide this project. The Tribe would like to collaborate with the research community to (1) assess existing marine invertebrate populations in the Bay, identify important habitats, and more fully understand the natural processes that affect their distribution and abundance; (2) identify priority information needs and research projects that restore important marine invertebrates, (3) identify and initiate relevant education projects to educate and engage youth in natural resource research and management, and (4) to develop a research strategy to address these needs. Project objectives focus on the priority natural resource projects that can be initiated in the next one to two years. This research strategy is intended to be a living document that will continue to be updated and refined as collaborators continue to learn more about the region's natural resources.

History of the *Unegkurmiut*

The Alaska Native Villages of Port Graham and Nanwalek are primarily occupied by Sugpiaq¹ (*Chugach Alutiiq*) Natives. The Sugpiat of these communities are most closely related to the Chugach Alutiiq Natives of Prince William Sound (Cook & Norris, 1998; de Laguna, 1956; Moonin, 2007; Stanek, 1999; Stanek, 2004). Stanek noted in his *Ethnographic Overview and Assessment for Nanwalek and Port Graham* that there were six major groups of Native peoples in Southern Alaska: Central Yup'ik, Koniag Alutiiq, Dena'ina, Chugach Alutiiq, Ahtna, and the Eyak (Stanek, 1999, p. 7; also included on map in *Appendix A*). The Sugpiaq of the lower Kenai Peninsula coast traditionally lived a semi-nomadic way of life, with their base communities residing along the southern coast of the Kenai Peninsula. Frederica de Laguna (de Laguna, 1956) describes the Chugach Region as being divided into "territories" for which the Natives claimed hunting, fishing, and other rights. The Natives of the Southern Kenai Peninsula were called the Unixkuymiut (de Laguna, 1956) or Unegkurmiut (Stanek, 1999) (I use the Unegkurmiut spelling), occupying an area which was believed to extend from Puget Bay (a bay north and east of Resurrection Bay) to Kachemak Bay in lower Cook Inlet. Frederica de Laguna also reported that the Sugpiaq Eskimo once occupied Kachemak Bay, and that "the abandonment of Kachemak Bay to the

¹ Sugpiaq (singular), Sugpiat (plural). Also known as Lutiiq (or spelled Alu'tiq).

Tanaina probably took place only shortly before the Russian occupation of Cook Inlet in the last decades of the eighteenth century” (de Laguna, 1956, p. 35).

Stanek identified nineteen locations on the lower Kenai from Resurrection Bay to Port Graham that were given Sugt’sstun (the native language of the Sugpiaq people) place names and/or which there is “archaeological evidence of pre-contact or early historical occupation” (Stanek, 2004, p. 18; see also *Appendix B*). Interviews and past oral histories from the Port Graham and Nanwalek Sugpiat indicate that “nearly every bay, island, and beach has habitations such as barabaras, semi-subterranean houses, and were used for some aspect of survival (Stanek, 2004, p. 18).

Stanek (1999, p. 5) reports that recent archaeology studies reflect that the Unegkurmiut had a “strong orientation to a marine subsistence way of life. This included a highly specialized technology for hunting marine mammals like seals, sea lions, sea otters, and whales.” Evidence of bears, mountain goats, marmot, shellfish, and finfish were also found at some of the archaeological sites on the southern coast. Both the more “permanent semi-subterranean dwellings called *barabara* in Russian or *ciqlluaq* in Alu’utiq, and temporary, seasonal sites were found” (ibid). These findings supported a semi-nomadic life style predicated by the presence of marine mammals, shellfish, and salmon.

ASCG, Inc. summarized the early discovery and occupation of Nanwalek by Russian colonists (ASCG, 2006, p. 9) as follows:

Nanwalek’s rich history can be dated back to 1741, when Russian explorers noted Native occupation of the site. In 1781, a fur trader from Siberia named Gregory Shelikov first established the American Northeast Fur Company here, because the location was a strategic point for observing ships of competitive fur traders. He named the fort ‘Alexandrovsk.’ This site became the first Russian settlement on the mainland Alaska, and for nearly a hundred years provided an outpost for the Russians to observe the sea-going movements of rival fur traders.

Expansion of the lucrative sea otter hunting industry was the primary impetus for the Russian establishment of Fort Alexandrovsk. Cook and Norris (1998, p. 42) indicate that “by 1786, Russian hunting parties had clearly decimated sea otter populations in Cook Inlet, forcing native hunters to enter Chugach territory in Prince William Sound and push farther south towards Yakutat. Official estimates calculated a take of 3,340 pelts a year between 1743 and 1799.” Sugpiaq Elder Walter Meganack, Sr., described the experiences of his father, Affanasia Meganack, who was born in Yalik Bay (Meganack Sr., 1981):

My family came from great hunters. They were great hunters. They always hunted and took care of feeding people. Seal hunters, bear hunters, sea otter hunters. My dad hunted sea otters from [a] Russian schooner. They didn’t pay them, they just fed them and took care of them. They took them to the hunting grounds. So they took his kayak and turned them loose. They hunted way up in the Bering Sea. They hunted in the Gulf of Alaska, and some of them even went to Sitka.

Frederica de Laguna (1956, p. 36) reports that “in Port Dick ... Vancouver in 1794 met not less than 400 natives in two-man bidarkis [kayaks] ... The party seemed to be too large to represent one community, and was probably a fleet of sea otter hunters rounded up and set off by the Russians.”

Stanek (2004) indicated that the trading post and Russian Orthodox Chapel were established in the small Sugpiaq settlement of Yalik in Yalik Bay in the 1830s. Stanek (2004, p. 18) summarized the activities of the church as follows:

Church records provided lists of people who were christened and other activities of the clergy. In 1880, Yalik had a population of 32 people. Owing to the devout following of the Native people in the Russian Orthodox Church, and the difficulty serving such a distant and inaccessible locale by the clergy headquarters in Kenai, Yalik residents were requested to move to Alexandrovsk (later named English Bay and then Nanwalek).

Connie Hedrick (Hedrick, 1981, p. 1) noted that the a Russian Priest also “asked the people to move from Tatitlek, Seward, Yalik Bay, Aialik, Nuka Bay, Port Dick, and Windy Bay, to English Bay.” Karen Moonin, Port Graham Natural Resource Specialist and lead Council staff for the project (2007, p. 4), notes that “most of our people can trace their roots and heritage to the following Prince William Sound and Gulf of Alaska coastal villages: Koyuktolik (Dogfish) Bay, Port Chatham, Chugach Bay, Windy Bay, Rocky Bay, Port Dick, Nuka Bay, Yalik Bay, Nuchek, Aialik Bay, Resurrection Bay, Seward, and Tatitlek [sic].” Stanek (1999, p. 13) indicated that “the migration of many ancestors of present-day Nanwalek and Port Graham residents from Prince William Sound to outer Kenai Peninsula coast resulted from several factors, including depressed fur prices in the mid-1800s; warring activities of Native groups in the Sound; and the scarcity of resources caused by a large concentration of people at Nuchek (Golovin in Hassen 1997:1870).” Further, there was pressure from the priest in Kenai with the Russian Orthodox Church to consolidate the villages (ibid).

In 1909, a U.S. Geological Survey (USGS) “survey and mapping party” renamed Fort Alexandrovsk as “English Bay” (ASCG, 2006), after the name of the Bay initially given to the present day Port Graham Bay. The community of English Bay was more recently changed to “Nanwalek,” which in Alutiiq meant “place by a lake” (ASCG, 2006, p. 10).

The current Port Graham village site was believed to be a “seasonal hunting and food gathering site when it was first recorded in 1786 by Captain Portlock of the Cook party” (ASCG, 2006). Hedrick noted that British captains Nathaniel Portlock and George Dixon documented the first recorded sighting of Port Graham (Hedrick, 1981). There were thirteen barabararas where the current cannery in Port Graham is located, and another fourteen barabararas “up the bay where the creek is” which was believed to be a seasonal fishing camp (Hedrick, 1981, p. 1).

Unoccupied huts and a large coal vein were located on the north shore of Port Graham Bay in the late 1700s (Cook & Norris, 1998; Hedrick, 1981). Russian Peter Doroshin's visit to the area in the 1850s was the first to explore this seam. Connie Hedrick (Hedrick, 1981, pp. 1-2) provided a summary of the development of the coal mine:

He [Peter Doroshin] was instructed by the Russian-American Company to examine the seams at Coal Bay near Port Graham's entrance in 1851 and two years later returned to Russia to urge the company to develop the coal beds The Russian-American Company in search of new revenue hired Enoch Hjalmer Furuhielm, a Finish mining engineer, to manage the enterprise. Furuhielm arrived [in] Kenai in the spring of 1855 and assembled a crew of workers. The nearly 50 laborers, army personnel, and mining engineers arrived in Coal Bay in July of that year determined to build a settlement. Winter overtook their project by October and the building was held up again in May of 1856 when the first cargo vessel from California arrived, and m[e]n were forced to work the mine and load the ship. The 800 tons of coal was fairly easy to recover and the subsequent four years the mine yield[ed] 5,000 tons. By the spring of 1862, when Furuhielm left the Coal Bay colony it was the biggest Russian-American Company holding except for Sitka and Kodiak. But the company was failing miserably despite the success of Furuhielm's Coal Bay venture and the project was abandoned. At its end nearly 100 people were said to have lived at the site. The coal was used locally, into the late 1860's, by the small village of Alexandrovsk ... and a few straggling homesteaders and trappers in the area.

The Port Graham area also played a role in providing supplies to the Cook Inlet area in the late 1800s. Hedrick (1981) reported that the Alaska Commercial Company developed a warehouse at what is currently referred to locally as "A.C. Point," on the south shore of Port Graham Bay a few miles west of Port Graham. This facility functioned as fish saltery and later as a staging area for distributing supplies to other locations on the Kenai Peninsula (Stanek, 1999).

Moonin (2007) indicated that the community of Port Graham was established in 1897. In a 1981 interview, Walter Meganack Sr. indicated that Paul Ofkew was the first to settle in Port Graham in a barabara at the current site of the cannery (Meganack Sr., 1981). This site was later bought from Paul Ofkew by the Alaska Commercial Company for five dollars, who later sold the site in 1912 to the Fidalgo Island Packing Company which marked the beginning of the fish processing industry in Port Graham. As the fisheries developed, many people from then "English Bay" moved seasonally or permanently to Port Graham for employment in the developing fishing industry. The Sugt'stun name for the village site of Port Graham is "Paluwik," which means "where people are sad" (ASCG, 2006, p. 10); the Native people who settled in this community were reportedly sad because they were homesick and lonesome for their home villages. The first school in Port Graham was established in 1930 in a local log house. The Bureau of Indian Affairs (BIA) constructed a school in 1935, and later added an additional room in 1937.

The Port Graham Hatchery Program began in 1980 (ASCG, 2006). The hatchery program's goal was both to provide economic development opportunities for village residents and to enhance the runs of the

regional pink salmon and English Bay River sockeye salmon. This program continued until 2009 when it closed due to the lack of funding to support the hatchery operations. The Port Graham Village Council is currently exploring options to reopen the hatchery.

Effect of Colonization on the *Unegkurmiut* Way of Life

Russian and American exploitation and colonization forever changed the *Unegkurmiut* way of life. Traditionally, the *Unegkurmiut* lived in semi-permanent villages in the winter and moved seasonal camps in the spring, summer, and fall (Stanek, 1999). As discussed in the preceding section, during the mid-1950s the Russian Orthodox Church asked people in the outlying semi-permanent villages to move to Nanwalek. Over time, these villages transitioned to a more cash-dependent economy, and today are considered a mixed cash and subsistence economy (ibid).

Sugpiaq people were coerced by Russian colonizers in the late 1700s to hunt for sea otter (Cook & Norris, 1998; Meganack Sr., 1981; Salomon et al, 2011). Commercial sea otter hunting ultimately led to the regional extirpation of the Cook Inlet sea otter population – an important predator in the ecosystem – by the turn of the 18th century (Cook & Norris, 1998). Russian employment of the Sugpiaq people in sea otter hunting and coal mining was the initial impetus for regional consolidation. Fur trading and salmon fishing dominated the local economy in early and mid-1900s (Stanek, 1999). In 1912, the first cannery was established in the present community of Port Graham and in 1915, in Port Chatham – the fishing community known as “Portlock” – for cod and halibut and in 1928 for salmon. The neighboring community of Seldovia also became a fish processing center for herring, crab, salmon, and shrimp (Springer, 1997). Most of these fish processing facilities remained active until the mid-1950s to mid-1960s (Cook & Norris, 1998; Salomon et al., 2011; Springer, 1997). The fish processing activities were the predominant source of income for local residents in the early 1900s.

Salomon et al. (2007, p. 20) noted that “like the centralization of services by Russian missionaries and fur traders almost a century earlier, canneries had social impacts that may have directly influenced our local marine ecosystems.” Locals noted that some of their seasonal nomadic activities continued until the early 1900s. The canneries disrupted traditional hunting and fishing activities since these jobs were only available during the summer when local people traditionally processed fish for winter use. Moreover, traditional hunting and fishing activities became concentrated close to the villages, which had a “profound effect on local marine resources” (Salomon et al., 2011, p. 20). The impact of increased pressure on the limited natural resources and importance of developing a strong natural resource program was addressed by the Port Graham Council (Moonin, 2007, p. 4):

Our traditional use areas are being utilized by an increasing number of people relying on our natural resources. Elders often talk about our people harvesting for subsistence purposes in the upper Kachemak Bay areas and other areas south, but since the area is increasingly being populated by tourism and western civilization, we now have to adapt to western laws. So, in order for our tribe to have credibility to federal and state regulators that make laws that mandate our very own natural resources, we need to build a stronger local natural resource management program.

Moonin (2007) summarized one of their Elder Advisory Council meetings where they contrasted living a subsistence lifestyle in the past to the present. Elders highlighted the number of changes due to a larger population, more people harvesting a limited resource, and the introduction and use of modern preservation techniques (e.g., vacuum sealers, freezers, and dehydrators). Faster boats and more hunting and fishing tools purchased from local stores contributed to larger harvests. Traditional practices of sharing are applied less frequently. Marine resources have monetary values and they have to compete with commercial and charter fisheries. Some fisheries are enhanced, so they have regulations to abide by, and access is limited to their original harvest areas. Elders noted that “in the past we did not have these worries” (Moonin, 2007, p. 5).

Tribal Natural Resource Use and Management Efforts

The Sugpiaq inhabitants of the lower Kenai Peninsula have lived off the natural resources from time immemorial (Cook and Norris, 1988; Huntington, 2003; Kvasnikoff, 2011; Norman, 2011b; Salomon et al., 2011; Stanek, 1999). Sugpiaq people hold a spiritual relationship with their natural resources, and learned to respect and use these resources in a sustainable way. Pat Norman indicated that “our Elders have taught us to be responsible for maintaining healthy populations of our natural resources” (Norman, 2011c). He indicated that the decline of bidarkis (black leather chitons) was an example of how in recent years this responsibility has not been met.

A community-based participatory research effort led by Salomon et al. (2007), with the communities of Port Graham and Nanwalek, looked at the roles of natural factors and shoreline harvest in the recent decline of bidarkis. This study used both scientific studies and traditional knowledge to answer questions, and provided meaningful community participation in all aspects of the project, from planning research to analyzing and interpreting the results.

The study found that the decline was driven both by human exploitation and sea otter predation. They noted that “the timing of these declines was coincident with changes [in] human behavior (from semi-nomadic to increasingly permanent settlement patterns, improved extractive technologies, regional commercial crustacean exploitation, the erosion of culturally based season and size limitations) and with

the reestablishment of sea otters” (Salomon et al., 2007, p. 1785). Interviews with Elders and other community members in 2004 provided additional insights into the traditional management practices (Salomon et al., 2011, pp. 78-82):

“There are limits, limits of what you can harvest. Some go beyond it.” (James Kvasnikoff, Second Chief, Nanwalek)

“You have to ask yourself, ‘Can that beach sustain that?’ You have to think about these things if we want our kids to enjoy it.” (Walter Meganack Jr., Port Graham, 2004)

“If people keep going back, it will get picked out. If you leave it alone, you’ll see lots of the big ones.” (Vivian Malchoff, Port Graham, 2004)

“Our Elders taught us not to pick in the spring and summer. We never bothered with them in the summer time: clams, bidarkis. Early October we’d go after them, leaving them alone all summer. Our Elders used to tell us, ‘You will get sick if you eat them during the springtime.’ I think that was their way to scare us out of eating them during the time they were hatching.” (John Moonin, Elder, Port Graham, 2004)

“March was the month our Elders stopped us from hunting. The animals have little ones inside. If you want to see them in the future, leave them alone. New generations, it’s not that way, go out and get whatever they want whenever they want.” (Simeon Kvasnikoff, Elder, Port Graham, 2004)

“When I was growing up, if you were a resource user you had to be a resource manager, too. You pick only what you need and leave the small ones alone, you don’t pick a beach clean. You stayed away when things were scarce. That is what we were taught.” (Walter Meganack, Jr., Port Graham, 2004)

The Port Graham and Nanwalek Tribes are committed to the conservation and management of their natural resources and “to exercise more direct control over local management and conservation” (Huntington H. P., 2003, p. 8). These Tribes have worked together to submit various regulatory proposals to the State Board of Fisheries to address their collective community needs (Norman, 2011c). The Port Graham Tribe has developed a Tribal Natural Resource Management Plan and a Watershed Council, and has utilized its sovereign Tribal authority to manage its natural resources.

Both Tribes’ commitment to protecting the natural resources and promoting greater community and youth involvement in tribal natural resource management is further illustrated through the goals and objectives of the 2006 Integrated Resource Management Plan (IRMP) for Nanwalek and Port Graham (ASCG, 2006). The IRMP notes that “the strongest response received [in this survey] was to support natural resource management strategies that consider and enhance the traditional culture” (ASCG, 2006, p. 34). The vision of the IRMP is “to maintain and protect our cultural and traditional values, to guarantee our future, to promote our physical well-being and safety while striving to be socially and economically self-sufficient, developing the village, protecting our resources and continuing to advance our way of life.” The plan’s goals and objectives that are relevant to the current project are provided below:

Goal 1: To maintain and protect the biodiversity of our natural resources.

Objective A: Analyze and summarize all available local natural resource data.

Goal 3: To preserve our traditional relationship with air, sea and land.

Objective A: Develop a comprehensive record of traditional ecological knowledge regarding each species and resource of interest including each contributor's comments on historic populations and characteristics over time.

Objective B: Provide education for local children and others about our traditional ways and nature of dependence on our natural resources.

Objective C: Utilize local traditional ecological knowledge and cultural traditions to help develop a natural resource program that is meaningful and effective for our traditional lifestyle.

Goal 4: To facilitate and promote individual and village involvement in natural resource issues and management.

Objective B: Work with the school to provide quarterly classroom presentations and projects.

Objective C: Conduct community meetings and presentations to provide program updates and information as well as solicit and document input from all participants.

Objective D: Provide education, public information and community outreach to local citizens on natural resource issues and information.

Objective E: Record community input on flip charts at meetings or on community natural resource survey forms, summarize and enter into tribal natural resource database.

Objective F: Contribute information to the village newsletter about the natural resources and the salmon hatchery program.

Objective G: Coordinate the implementation of the IRMP with other village groups, government agencies and other stakeholders.

Objective J: Review the IRMP at least every five years and coordinate with other natural resource agencies and update as needed.

Objective K: Create and develop open channels of input and information sharing from village residents, Elders and others who are interested in natural resource issues or local traditional ecological knowledge.

Relevant to the current natural resources project, the IRMP provides a clear indication of the Port Graham and Nanwalek Tribes' interest in (1) more fully understanding their natural resources and collecting the information necessary to effectively manage those resources, (2) surveying, documenting, and sharing local and traditional ecological knowledge with the community and utilizing the information in natural resource management, (3) educating and engaging youth in the culture, traditional knowledge of natural resources, and tribal natural resource management, (4) engaging the community in important Tribal natural resource issues, and (5) in creating open channels for input and information sharing among residents, Elders, and others who are interested in natural resource issues, local and traditional knowledge, and other aspects of the Tribe.

In 2002, the Port Graham Tribe launched an effort to gather additional information through research and monitoring, in collaboration with scientists, to address the decline of important marine invertebrates (bidarkis, clams, cockles, and crabs). Port Graham joined efforts with Nanwalek and the Chugach Regional Resources Commission (a tribal non-profit organization) to hold the Port Graham-Nanwalek

Wisdomkeeper Workshop in Port Graham in May 2003 (Huntington, 2003). Approximately sixty people participated in the workshop, including Tribal Elders, school children from Port Graham and Nanwalek, researchers from several state and federal agencies and two universities, Native non-profits, educational groups, and several other groups.

The focus of the 2003 Workshop was to exchange scientific, local, and traditional knowledge about important marine invertebrates, and to begin to build research partnerships (Huntington, 2003). Community residents shared local and traditional knowledge of the natural resources and traditional management practices, as well as some of their concerns with the declining marine invertebrate resources in the Port Graham area. Researchers shared their knowledge of the marine environment and important Tribal invertebrates. Participants engaged in open discussions on issues related to climate change, the decrease in abundance of many marine invertebrates, traditional tribal natural resource management techniques, and other local and regional natural resource issues. The workshop resulted in a list of research projects, ideas, and who might be involved in following up on these efforts. The workshop report included a list of “Resources for Research and Management” of “agencies and organizations that can add to the capacity and committees that the Tribal Councils have already established in Port Graham and Nanwalek” (Huntington, 2003, p. 6).

The Port Graham Wisdomkeeper Workshop was a good start to developing good working relationships between researchers and communities. As summarized by Huntington (2003, p. 9):

Its ultimate success will depend on how the information that was shared at the meeting is put to use. Potential outcomes include improved local management efforts, collaborative research, and greater awareness by the communities and scientists of each other’s needs and interests. The conversation has been opened, and it is up to the participants to continue to find ways to work together.

Finally, the participants expressed an interest in holding another meeting about nine months later, in the spring of 2004 (Huntington, 2003). The groups suggested that a “Science Advisory Committee” be established, and that maybe the next meeting could be under the auspices of that committee. It was noted that continued interaction between the community and researchers would be needed to maintain and build on the effort’s momentum.

A Science Advisory Committee was never formed after the 2003 meeting. However, a smaller, more focused follow-up Wisdomkeeper Workshop was held in November 2004 (Seaman, 2004). That meeting resulted from a collaborative effort among the Kachemak Bay Research Reserve (KBRR), the National Oceanic and Atmospheric Administration’s (NOAA’s) National Centers for Coastal and Ocean Sciences (NCCOS), and the Port Graham Tribe. Several representatives from each of the organizations and UAF

participated in the Port Graham workshop with Pat Norman, several Elders and Tribal staff, and other community members. This workshop set the stage for several projects to begin to address specific community natural resource and environmental interests.

The Port Graham Village Council took the next step in acquiring funding in 2006 to further document traditional management practices and traditional ecological knowledge, and to continue the community-researcher collaborations through the Wisdomkeeper process (Moonin, 2007). An Elder Advisory Council was established to guide the project and assist in documenting traditional management practices and traditional knowledge. Youth were engaged in the project to interview Elders and assist in collecting information. Two Wisdomkeeper meetings were held in May and September 2007. Moonin (2007, p. 12) reported that “these meetings were designed to bring together natural scientists, natural resource managers, and the residents of Port Graham ... to exchange information and ideas on management issues and general concerns of natural resources in our traditional uses areas.” The project also developed conclusions and actions to further the efforts in Tribal Natural Resource Management. The conclusions are provided below (Moonin, 2007, p. 24):

Conclusion 1: The future of tribal natural resource management depends on younger generations acquiring the knowledge, skills, wisdom, and values that are the foundation for traditional Native stewardship. Simply stating the rules and enforcing them does not create the understanding that leads to proper behavior. Education of this kind will not happen by chance, but will require planning, effort, and partnerships with various organizations.

Conclusion 2: Port Graham Village Council should pursue participation in the advisory committee process as well as attendance at Board of Fisheries and Board of Game meetings. This will allow Port Graham to have a voice in the regulatory process and to learn more about how regulations are created and why.

Additional recommendations and Village Council actions include (1) further establish Village Council authority for natural resource management, (2) create a Natural Resource Committee, (3) appoint a representative to the Seldovia Fish and Game Advisory Committee, (4) document natural resource actions, ordinances, and other actions to show Port Graham’s record, and (5) continue to develop partnerships, research, and management with the “Kachemak Bay Research Reserve and others active in the area” (Moonin, 2007, p. 26). The report further recommended that the community “continue to develop and promote ways of getting Elders and youth together in conversations, projects, activities, culture camps, and so on,” and “promote partnerships and cooperation with the school, bring Elders to school to help teach, crafting assignments and projects to involve Elders or otherwise be relevant to the community topics, and involving teachers so they are aware of the range of local resources they can draw on.”

No additional Wisdomkeeper Workshops have been held in Port Graham or Nanwalek since 2007. The Port Graham Village Council has made progress in many areas, but would like to renew and step up efforts. This project was developed to meet that need.

Benefits to the Community

Pat Norman has emphasized in Project meetings that “our Elders have taught us to be responsible for our natural resources” (Norman, 2011b). The Sugpiaq people are closely tied to their natural resources and have been engaged in traditional forms of natural resource management. The community also realizes the value of collaborating with the science community to complement local and traditional knowledge to answer natural resource questions and better understand their environment.

Through a community-based research project on the bidarkis and other marine invertebrates (Salomon et al., 2007; Salomon et al., 2011), researchers and the community have worked together to better understand and explain the changes in the abundance of several marine invertebrates of importance to the community. As noted by Salomon et al. (2007, p. 1768), “this research showcases the insight ecologists can glean from delving into both ecological and social history ... by integrating Western science and traditional knowledge, we obtained an enhanced understanding of the causes driving *Katharina* declines and consequently are now better equipped to collaboratively develop an effective conservation plan for the nearshore.”

In the book “*Imam Cimiucia: Our Changing Seas*,” Pat Norman noted how the book “combines traditional observations knowledge and scientific research to a combined story about one of our most valued resources and our connection to the sea – past, present, and future” (Salomon et al., 2011, p. v). James Kvasnikoff, Second Chief of Port Graham, noted how “local people provided important information about how much gathering is done throughout the year and what the marine ecosystem was like in the past. Knowledge from the past is key to everything, in all forms of learning, whether it be scientific or passing down our traditions to younger generations. Other communities can learn from this project and the way we worked together” (Salomon et al., 2011, p. iv).

The benefit of this project to Port Graham may best be characterized in the context of the goals and objects in the 2006 Integrated Resource Management Plan (ASCG, 2006, pp. 31-33).

Goal 1 – To maintain and protect the biodiversity of our natural resources: Objective A addresses the analysis and summary of available local natural resource data. This project will help summarize available information on marine and oceanographic processes in the region, and help to identify the additional information needs.

Goal 3 – To preserve our traditional relationship with the air, sea and land: Objective A addresses “the development of a comprehensive record of traditional knowledge” (p. 32), which has largely been addressed by Moonin (2007). Objective B calls for providing education for “local children and others about our traditional ways and the nature on our dependence on our natural resources.” This project will help lay the foundation for future science and traditional natural resource education programs for youth. Objective C addresses the use of “local and traditional knowledge and cultural traditions to help develop a natural resource program that is meaningful and effective” for their traditional lifestyle. Through this project we hope to complement local and traditional knowledge with scientific knowledge to help the community address priority resource issues. The Tribal Councils will take the lead to develop tribal natural resource programs to protect and manage its resources.

Goal 4 – To facilitate and promote individual and village involvement in natural resource management: This project applies a community-based research approach to more fully engage individuals and the Port Graham Tribe in local and regional natural resource management. For this initial project, I will defer to the Tribe how to involve the community in the process. The strategy will also identify future projects and steps to engage the community in research projects and planning efforts.

Cultural and Indigenous Property Rights

Working together in the spirit of a community-based research project, the Village Council and I will safeguard the Tribe’s cultural and indigenous property rights. Pat Norman agreed to review this project report and facilitate any appropriate view by the Village Council before the release of local information. Pat Norman, participating Village Council and Environmental Committee members, and I will work together to identify potential property rights issues and take appropriate measures to protect those rights.

CHAPTER 2: COMMUNITY RESEARCH COLLABORATIONS

The success of this research project is tied, in part, to our ability to develop community research collaborations to help the Tribe restore bidarki, clam, cockle, and crab populations in Port Graham Bay. The focus of this chapter is to identify some of the main components of successful community research collaborations. Toward this goal, I have reviewed the literature and evaluated three case studies of community research relationships to tease out the main components of successful collaborations. The Tribe recognizes that the ability of researchers and educators to engage in community research collaborations is constrained by time, limited staff and resources, organizational challenges, and other limitations. It is the Tribes' and my hope that the researchers and educators working in Kachemak Bay and lower Cook Inlet will see the benefits of community research collaborations, and will strive to develop the capacity and meet the spirit and intent of effective community collaborations. The Port Graham Tribe has expressed interest in being able to work hand in hand with managers, researchers, and educators to help achieve this goal. Through such a collaboration and advanced planning, the Tribe can work with researchers and educators to overcome these challenges and develop research projects to the benefit of all.

Introduction

Over the past few decades we have seen increased attention by managers, researchers, and Indigenous communities to promote greater community collaboration in research (Berkes, 1999; Berkes & Jolly, 2001; Berkes, Mathias, Kislalioglu, & Fast, 2001; Ellis, 2005; Fernandez-Gimenez & Huntington, 2006; Gearheard & Shirley, 2007; Huntington, 2000; Krupnik & Jolly, 2002; Pearce, et al., 2009). More and more researchers are engaging communities in research and learning from local and traditional knowledge. Many tools can be used to collect local and traditional knowledge and involve the communities, including a semi-directive interview, a questionnaire, an analytical workshop, and collaborative field research (Huntington, 2000). Other researchers are seeking ways to include communities as full and equal partners in research, a process referred to as “community-based research,” “community-based participatory research” (St. Denis, 1992), “community research collaboration” (Pearce, et al., 2009), or generally as “community research relationships” (Gearheard & Shirley, 2007).

Community research collaborations range from the highly structured co-management regimes such as with co-management of marine mammals under the Marine Mammal Protection Act (Marine Mammal Commission, 2008) to the voluntary co-management regimes such as established through a working group to oversee the management of the Western Arctic Caribou Herd (Western Arctic Caribou Herd

Working Group, 2003). In places like Nunavut in the Canadian Arctic, “funding agencies, licensing bodies, and new regulatory agencies established under the Nunavut Land Claims Agreement require researchers to engage and consult with Inuit communities during all phases of research, to provide local training and other benefits, and to communicate project results effectively” (Gearheard & Shirley, 2007, p. 62). In Alaska, some research programs, such as the U.S. Fish and Wildlife Service’s Fisheries Research Monitoring Program, requires investigators to consult with affected Alaska Native and other rural organizations (Cannon et al., 2004). Other research funding programs, such as the North Pacific Research Board, provide funding incentives for researchers to work with communities, but do not require it (North Pacific Research Board, 2005). Many of the community research collaborations are voluntary, and represent an effort by researchers and communities to work together to improve community communications, to improve the research project (e.g., research is most likely to be effective with community collaboration), or due to ethical considerations (e.g., agencies or researchers feel that they have an ethical obligation to involve communities that are the focus of or are affected by the research) (Berkes, 1999; Pearce, et al., 2009). For the past ten years, the Port Graham Tribe has initiated several efforts to work collaboratively with the Western researchers in an effort to address the natural resource information and management needs of the Tribe. The current research project is a voluntary effort on the part of the Port Graham Village Tribe to continue this effort, promote further community research collaborations, strengthen relationships with the research community, and work together with Western researchers to implement a plan to address Tribal natural resource needs.

Figure 1: Considerations for engaging communities in collaborative research as described in Pearce et al. (2009, p. 16).



A wealth of projects and literature exist on the subject of community-based research. Pearce, et al. (2009) summarized many of the key considerations of engaging communities in research (see Figure 1). Community-based research projects include early and frequent communication to build relationships based on a foundation of mutual respect and trust (Gearheard & Shirley, 2007; Huntington et al., 2002; Nickels et al., 2002; Pearce et al., 2009). Indigenous communities should be involved in all aspects of research design and development (Fernandez-Gimenez & Huntington, 2006; Gearheard & Shirley, 2007; Huntington, 2002; Nadasdy, 2003; Nickels et al., 2002; Pearce et al., 2009). Wherever possible, scientists

should strive to fund community participation in research, help communities develop research skills and build capacity, and establish an ongoing community-researcher communication process (Berkes, et al., 2001; Canon, et al., 2005; Fernandez-Gimenez & Huntington, 2006; Nickels et al., 2002; Pearce et al., 2009). Finally, researchers and managers should involve communities in data analysis, presentation of research results to the communities and other stakeholders, and the development of new projects or expansion of existing projects (Huntington et al., 2002; Nadasdy, 2003; Pearce et al., 2009).

To set the context for this review, I refer to a paper by Pearce, et al. (2009) on community research collaborations related to climate change issues in the Canadian Arctic. The authors acknowledge that engaging communities in research and the integration of Western scientific and traditional knowledge in research “is difficult in practice” (Pearce, et al., 2009, p. 14). The authors continue:

The process of community engagement has proven to be complex, and researchers and communities face challenges when forging community research relationships. Key challenges include: local employment trends and attitudes, revolving membership and leadership of community organizations, concurrent activities at the time of research, cultural differences, poor historical research community-researcher relations, economic subtext of many community-research relationships, financial limitations, time constraints and communicating results to the stakeholders (Wiita, 2006; ITK & NR, 2007; Gearheard and Shirley, 2007; Wolfe et al., 2007). Some of these challenges are inevitably given to the contexts in which community-researcher relationships are often developed (e.g., government and university funding structures, timing constraints and academic programs, resource development pressures and new political arrangements). However, efforts are continually being made to reflect upon, and improve, the ways in which community-researcher relations are established and maintained.

As an Alaska Native Liaison for NCCOS, I have also personally observed similar situations in my work with the communities of Port Graham and Nanwalek and many researchers from Homer-based organizations and academic institutions.

The purpose of this chapter is to identify some key aspects of building successful collaborations and partnerships between Alaska Native entities and Western researchers that contribute to effective community-researcher relationships which could be applied to our efforts with Port Graham. I will do this by looking at several regional and community efforts in Alaska with the expressed purpose of improving communications and exchange of local and traditional knowledge and Western knowledge. I will also draw from the literature to learn from the experiences of others on community-researcher relations in Alaska and Canada. The case studies will be introduced first, followed by a description of the common themes for effectively engaging communities in research and summary of how these finds apply to the Port Graham project.

Case Study Selection, Review, and Evaluation

Three collaborative projects were selected: (1) the Western Arctic Caribou Herd Working Group; (2) the Alaska Beluga Whale Committee; and (3) the *Bidarki Project*. The first two groups were established under different authorities and initiatives, but both were established to improve coordination and collaboration among agencies, scientists, managers, and rural communities to improve research, management, and outreach. The *Bidarki Project* was a small-scale collaborative research project with the communities of Port Graham and Nanwalek. A general description of each group and the process for evaluating these case studies is provided below.

The *Western Arctic Caribou Herd Working Group* (WACH WG or “Working Group”) was established in 1997 with a mission “to work together to ensure the long-term conservation of the Western Arctic Caribou Herd and the ecosystem on which it depends, and to maintain traditional and other uses for the benefit of all people now and in the future” (Western Arctic Caribou Herd Working Group, 2010, p. 1). The WACH at its current population and distribution is used for subsistence by many villages from Norton Sound and the Yukon River to the North Slope Borough. The Working Group is advisory and makes recommendations to federal and state researchers and managers. This approach is considered a form of co-management, but the group has no binding authority over caribou research and management: it makes recommendations to the state and federal management entities that manage the lands and natural resources. The effort to establish the Working Group was initiated by the Alaska Department of Fish and Game (ADF&G) beginning in 1995, and later partnered with the three principal federal land management agencies, the U.S. Fish and Wildlife Service, National Park Service, and Bureau of Land Management. The WACH WG is an example of a group established as a *state or government initiative*.

The next case study, the *Alaska Beluga Whale Committee* (ABWC), was established in 1988 under an initiative by the North Slope Borough (NSB), Inuvialuit Game Council², ADF&G, and the villages in Western Alaska that hunt beluga whales (Adams et al., 1991; Fernandez-Gimenez & Huntington, 2006; Frost, 2011; Mahoney, 2011). Originally, it was a non-profit Alaska Native Organization (Mahoney, 2011); however, in 1994 an amendment to the Marine Mammal Protection Act was passed to authorize the National Marine Fisheries Service (NMFS) and Fish and Wildlife Service to enter agreements with Alaska Native Organizations for co-management of marine mammals (Mahoney, 2011). And five years

² The Inuvialuit Game Council is an Canadian village organization in Northwest Territories at the mouth of the Mackenzie Delta, a large summer use area for beluga whales in eastern Beaufort Sea. The Game Council was part of the ABWC for a few years before it dropped out and decided to establish its own group (Frost, 2011).

later, in 1999, the ABWC signed a Memorandum of Understanding (MOU) with NMFS to become an officially recognized co-management organization under the Marine Mammal Protection Act (National Marine Fisheries Service and Alaska Beluga Whale Committee, 2011). The initial purpose of the Committee was to maintain healthy beluga whale populations, protect subsistence harvests and traditional harvest methods, and conduct research for management of beluga whales (Fernandez-Gimenez & Huntington, 2006). The ABWC is an example of an organization that was established as a *local/community initiative* in close collaboration with state and federal agencies.

The *Bidarki Project* was a local project undertaken by a University of Washington doctoral student (Anne Salomon) and social scientist (Dr. Henry Huntington) in collaboration with the lower Cook Inlet Sugpiaq Native communities of Port Graham and Nanwalek (Huntington et al., 2011; Salomon et al., 2007; Salomon et al., 2011). Nick Tanape, an Elder from Nanwalek, was a local research partner and major contributor to the project. The research team included Elders and other village residents from both communities. It started as a collaborative effort with the community to understand the cause of the decline of black leather chiton, referred to locally as the *bidarki* (Salomon et al., 2007, p. vii). It later expanded to investigate the serial decline of several marine invertebrates as a result of multiple ecological, human, and socioeconomic factors.

The review and evaluation of these case studies was based on the literature, newsletters, and interviews with several key players from each organization. Interviews turned out to be one of the better sources of information for community-researcher interactions since relatively little published information had evaluated these programs. A good review of the ABWC's effectiveness in working with beluga hunters and integrating traditional knowledge in research was provided through several published articles (e.g., Huntington et al., 2002; Huntington, Fernandez-Gimenez, & Frost, 2004; Fernandez-Gimenez and Huntington, 2006). Ultimately, information on the *Bidarki Project* was acquired through two published works (Salomon et al., 2007; Salomon et al., 2011) and conversations with the lead author (Anne Salomon) and the people of Port Graham and Nanwalek.

Common Themes of Successful Collaborations

A number of common themes emerged from review of the three case studies and corresponding literature. My findings from the evaluation are summarized below.

Intersection of Interests

It is insufficient to just agree there is a “problem,” because different stakeholders often have different perspectives on what problems exist and how to address them. All participants must share something in common or find an *intersection of interests* to bring them to the table. The WACH WG caribou

population was at a low in the early 1970s (Trent, 2011), which was also a time of intense controversy between managers and users, as well as among the different resource user groups. However, all user groups could agree on the importance of protecting caribou and caribou habitat from potentially non-compatible uses and maintaining caribou abundance in sufficient numbers for all users. All users could also agree on the importance of working together and integration of local and traditional knowledge along with scientific knowledge in resource management. It is through this common intersection of interests that managers and users were able to come together.

With respect to the ABWC, subsistence beluga hunters and agency scientists could all agree on the importance of conserving beluga whale populations, maintaining subsistence harvests and hunting practices, and being proactive to avoid the crisis that occurred with species like bowhead whales and caribou (Adams et al., 1991; Fernandez-Gimenez & Huntington, 2006; Frost, 2011). The ABWC group sponsors and stakeholders worked from a common interest of supporting research and increasing community involvement within the research process.

On the Bidarki Project, research participants – researchers, Elders, and other villagers – worked from a common interest to understand what changes caused the decrease in abundance of bidarki and other marine invertebrates important for subsistence (Huntington et al., 2011; Salomon et al., 2011). Village Elders and other residents were interviewed to learn about the marine environment and how social and economic changes over time had influenced the abundance of marine invertebrates. During this collaborative research, it became clear that Western science alone could not answer the questions, and that traditional knowledge of Elders on the ecological, socioeconomic, and other cultural conditions was required.

Right Timing

A critical consideration was timing among stakeholders. In 1976, the WACH suffered a dramatic decline in the caribou herd to an estimated population low of 75,000 animals (Western Arctic Caribou Herd Working Group, 2010). This caused a great deal of tension and distrust among subsistence users, other stakeholder groups, and ADF&G in the early 1970s, when caribou populations were very low (Trent, 2010). It would have been very difficult, if not impossible, in that contentious environment to overcome distrust to form a group (Trent, 2011). By 1993, the population had increased to over 450,000 animals, harvest limits had been relaxed for all user groups, and tensions eased somewhat. While a residual level of distrust still existed between the agencies and other resource users, the ability to establish and execute a collaborative approach to management was much better when the population was high and there were plenty of caribou for all users. Sufficient resources met the needs of all stakeholders when the

population was high, and could therefore focus on building relationships and addressing issues of common concern (e.g., habitat protection).

Timing was also important in the development of the ABWC. Alaskan and Canadian beluga hunters and the agencies wanted to be proactive and avoid the problems that arose with the International Whaling Commission's (IWC's) involvement in the bowhead whale crisis (Adams et al., 1991; Fernandez-Gimenez & Huntington, 2006; Huntington, 1992). It was also a consideration in the Bidarki Project, as articulated by Nanwalek Second Chief, James Kvasnikoff, in the forward to "*Imam Cimiucia: Our Changing Seas*" (Salomon et al., 2011, p. iv):

The research described in this book has helped us to recognize that bidarki are in high demand among our people. They are a delicacy here, and yet we are depleting them. When I went out with my son we could not find any decent sized bidarkis. It was less of a problem when our village was smaller. As our population has grown, the demand has grown. Even as we become intertwined with the Western world, some of our traditions are still being passed down to the younger generations.

This project has changed our community. It made us open our eyes and see how overharvesting can cause problems in the whole ecosystem. It made us think about our subsistence resources and it prompted local leadership to ask: How do we manage this? How do we regulate harvest so that the ecosystem can sustain itself and people can be fed at the same time?

The communities of Nanwalek and Port Graham saw many changes, and were looking to better understand the problem and look for solutions.

Strong Leadership, Teamwork, and Persistence

Every effort to establish effective community research relationships requires one or more strong leaders. Leaders must be willing to stick through the process, have a likeable personality, strong communication skills, and ideally have a background or training in cross-cultural communication or willingness to learn (Fernandez-Gimenez & Huntington, 2006; Fienup-Riordan, 2005; Frost, 2011; Gearheard & Shirley, 2007; Huntington et al., 2006; Pearce, et al., 2009; Trent, 2011). While such initiatives must have strong leadership, it also cannot be done alone. A broad base of support must be developed from agencies and other stakeholders – particularly resource users – to help in the process.

Each program had its obstacles to overcome. The effort to establish the WACH WG took almost three years to address the stakeholder issues related to tribal sovereignty, co-management, and group membership (Trent, 2011). Former ADF&G Regional Supervisor John Coady played a lead role in the development of the Working Group. In the 2005 *Caribou Trails* newsletter, a tribute to Coady's work, ADF&G wildlife research biologist Jim Dau shared the following statement (Dau, 2005):

By 1995 it became clear to John Coady that rural people were passionate about agencies and the public formally co-managing populations of wildlife together. As a result, he moved the concept of co-management from a topic of discussion to a reality with the formation of Working Group. Early meetings were challenging and sometimes tense. Despite their different challenges, John recognized that everyone who attended these meetings shared a common desire to conserve the WACH populations for the future. He made sure that the groups that may have felt threatened by co-management knew they were welcome to the table. He secured funding to support the process when there was no guarantee of success, and dedicated a large portion of John Trent's time to facilitate the process.

The ABWC was initiated by the North Slope Borough and other rural organizations with ADF&G support. The effort to establish the Committee had several strong leaders that stuck through the process and rallied support for the organization (Adams et al., 1991; Frost, 2011). Several committee members have been involved since the Committee was conceived.

Leadership in the Bidarki Project was provided through a combination of the efforts of both Anne Salomon and key contacts within the village to provide advice and support in working with the community [see acknowledgements in Salomon et al. (2011, pp. 95-98)]. Anne confronted challenges throughout her collaborative project, but remained patient and persistent in her efforts (Salomon, 2011). She placed a high priority on involving village Elders and other residents in all phases of the research process through interviews, personal conversations, employment in field research, traditional roundtable discussions, and other venues. Without her leadership, patience, persistence, and the good community-researcher relationships that resulted from this effort, the Bidarki Project would not have been nearly as successful.

In their work in the Canadian Arctic, Gearheard and Shirley (2007) note the importance of meaningful community involvement in project implementation and outreach. They note that “many of the challenges faced in community-researcher interactions ... could be alleviated by making local consultation, engagement, and communication integral parts of research design. As a prerequisite to project success, research members should be assigned the specific task of planning and coordinating local interaction and activities, and existing personal and resources should be deployed creatively for this purpose” (Gearheard & Shirley, 2007, p. 72). The authors also saw the value of involving locals in building capacity to improve the ability of local communities to participate in research, share their knowledge, and manage their resources.

Relationships and Trust

The development of good relationships and trust is often referred to as the single most important contributor to good community-researcher interactions (Berkes, 1999; Ellis, 2005; Fernandez-Gimenez & Huntington, 2006; Fienup-Riordan, 2005; Gearheard & Shirley, 2007; Huntington et al., 2006; Krupnik &

Jolly, 2002; Pearce, et al., 2009). As highlighted by Pearce et al. (2009, p.17), “community-research collaboration has been described as a relationship-building exercise, based on mutual trust and respect (Wiita 2006).”

Prior to the establishment of co-management groups and collaborative research/community efforts, relationships between the management agencies and the Alaska Native subsistence users were often strained. In the case of management of the WACH, ADF&G/Native Alaskan community relations during the late 1970s were at an all-time low (Trent, 2011). John Trent, an ADF&G management biologist who assisted John Coady in formation of the WACH WG, characterized relationship between the agency managers and researchers and the communities and resource users in the late 1970’s as an “us and them” relationship. Efforts to improve communication, collaboration, and co-management through the formation of the Working Group made great headway to improving relationships and trust among managers, researchers, communities, user groups, and other stakeholders. The success of this group can be attributed to the open and cooperative efforts of all Working Group participants and stakeholders.

The ABWC’s integration of Village representatives in the research process has been effective in improving the use of local of traditional knowledge and in building relationships between Alaska Native communities and researchers. Extensive community involvement has helped to promote mutual understanding and the development of long-term friendships (Fernandez-Gimenez & Huntington, 2006; Huntington, Fernandez-Gimenez, & Frost, 2004). Huntington et al. (2004) describes a project with several communities in the Bering and Chukchi Seas to document traditional knowledge of beluga whales. The authors note that the respective villages greatly appreciated that their knowledge was made available and used by scientists and others on the ABWC, and point to the importance of working together (Huntington et al., 2004, p. 6):

It is perhaps ironic that one conclusion of the present project is [that] one of the best ways to incorporate traditional knowledge is simply for hunters and researchers to interact with one another. The documentation project served in part to make all participants aware of the importance of traditional knowledge and what it has to offer. Documentation by itself, however, accomplishes little more than adding another report to the shelf. A setting in which it is taken seriously and put to use is essential.

Huntington et al. (2004, p. 6) noted further that committee membership “places everyone on an equal footing and allows information to be evaluated on its merits rather than according to its sources.” A broader committee membership helped build relationships and trust, and promote the effective exchange of traditional knowledge and scientific information.

The ABWC also represents an amazing success story and illustration of what local initiative and cooperation can accomplish. The ABWC has done an outstanding job in bridging the communication gap

between researchers and scientists. Everyone worked together as equals on ABWC sponsored projects, often leading to friendships among researchers and managers, beluga hunters, and other village residents. The unique membership structure that allowed non-Natives and researchers to fully participate on the committee, along with the continuity and sincere commitment of its membership, played a big role in its success.

The Bidarki Project was also very effective in building good relationships with Port Graham and Nanwalek. Salomon consulted with village leadership and other supportive individuals on how to most effectively work with the community (Salomon, 2011; Salomon et al., 2011). This project was developed in close collaboration with both Tribes throughout the process, including all steps of community research collaboration as defined by Pearce et al. (2009): early communication, community involvement in research design and development, opportunities for local employment, and dissemination of results. She not only developed good working relationships, but established many close friendships in the process.

Huntington et al. (2011, p. 439) provided a good example how the project help build a strong and trusting relationship:

Working together in the field allowed the research team to imagine and discuss what heavily and lightly harvested shores might have looked like in the past, both prior to contact with Europeans and in the post-contact period have the fur trade has extirpated the sea otter, a major consumer of nearshore shellfish. The field effort provided a common basis of experience in the local environment, a chance for A. Salomon and local researchers to develop common referents, so that discussions could begin with phrased like ‘As we saw the other day at ...’

Fienup-Riordan (1999) notes that friendships are a very important part of a successful research project, in that they help foster the acceptance and trust of communities. Fienup-Riordan further substantiates this claim in the following statement (p.20):

Over and over again, villagers’ statements reflect their view that how things are done in their area is as important as what is accomplished. Sharing management of research projects is as important as any specific research policy decided on or results obtained. Researchers and those who fund them need to ask if what they learned from projects planned outside of the community is worth the cost in terms of resentment and commitment on the local level. Conversely, research projects perceived as responsive to local concerns in all stages – planning, implementation, and review – stand a much greater chance of eliciting community cooperation and support.

Salomon et al. made sure that the community was involved in all steps of the process. Although her research was completed several years ago, I continue to hear many positive comments from people in Port Graham and Nanwalek of her research and about Anne as a dedicated and caring person even today.

Gearheard and Shirley (2007) note that researchers are unlikely to gain trust and respect from all community members; similar to the old adage “you can’t please everyone.” The authors noted that some

Nunavut residents harbored “deep feelings of suspicion and resentment” toward research that occurred a few decades ago. In the past six years, I have also heard some resentment from villagers from both Nanwalek and Port Graham about researchers that made promises they did not keep, or were using their research to “get rich and famous.” As Gearheard and Shirley (2007, p. 72) summarized, “researchers can only gain from employing project methods that work to build trust and rapport. Trust is crucial.”

Huntington et al. (2011, p. 443) identifies three factors for developing strong relationships. First, personalities and good social skills are very important, as well as the “ability to tolerate discomfort, to diffuse tension, and recover from hurt feelings...” Second, “the right local partners are essential.” And third, the authors stated that “collaborative field work may serve as an entry point and not only as an end in itself.”

Funding and Partnerships

As stated by John Trent, “there is never enough money” (Trent, 2011). Each of the WACH WG agency partners contributed ten thousand annually, for a total of forty thousand, to fund the WG’s annual meetings (Trent, 2011). The NSB and Bureau of Indian Affairs paid for the initial meetings of the ABWC (Frost, 2011). In both cases, the partner agencies and WACH WG and WACH members contributed a great deal of in-kind services and personal time for research, management, education, and outreach programs, an amount which collectively far exceeds the amount of money required to support their efforts. The success of research and management accomplishments of these groups has been built largely on the good faith efforts of member organizations. Both the WACH WG and the ABWC have been very successful in leveraging partnerships and collaborations to try to address the needs of their groups. Neither the WACH WG nor ABWC has their own dedicated full-time staff, and instead depend on the good faith efforts of committee members, local, state, and federal government staff to do the work.

The Bidarki Project was funded through a variety of sources including the Gulf Ecosystem Monitoring and Research Program, NOAA, and a Natural Sciences and Engineering Research Council of Canada post-graduate fellowship (Salomon et al., 2007, p. 1768). The development and publication of the “*Imam Cimiucia: Our Changing Seas*” was prepared in collaboration with Port Graham and Nanwalek (Salomon et al., 2011, pp. ix-x). Salomon sought support from a myriad of additional sources and partners for this publication (Salomon et al., 2011, pp. 97-98). This included the Rasmussen Foundation, Chugach Alaska Corporation, Alaska Sea Grant Program/University of Alaska Fairbanks, and the Pratt Museum. Staff support in the preparation of this publication was also in part by Simon Fraser University and the David H. Smith Conservation Research Fellowship. Anne’s drive and persistence in working with the Port Graham and Nanwalek communities and seeking the funding for this effort was truly

commendable, undoubtedly fueled in large part by her commitment to and close relationship with the Sugpiaq people, making her an indispensable asset to the project.

Use of Traditional Decision Processes

The WACH WG and ABWC incorporated some traditional decision processes. Talking circles³ are used during each of the WACH WG meetings, which provided committee members an opportunity to share local and traditional knowledge and any concerns with the rest of the WG and agencies (Dau, 2011). The annual ABWC meetings are held in a talking circle format and most decisions are made by consensus (Frost, 2011).

Talking circles were also used by Salomon et al. on the Bidarki Project. Anne also consulted with Village leaders as necessary for guidance on the most appropriate process to more fully engage Elders and other community members.

Summary of Relevance to the Port Graham Natural Resource Project

As summarized in Chapter 1, “Past Tribal Natural Resource Use and Management Efforts,” the Port Graham Tribe has a long history of engaging in tribal natural resource management and initiating research partnerships. Port Graham and Nanwalek have seen a substantial decline in many marine invertebrates of importance to the community. The Bidarki Project was a collaborative community project designed to help define the cause of the decline, identify possible projects to support natural resource management, and illustrate the benefits of community-researcher collaborations. Port Graham hosted several Wisdomkeeper Workshops between 2003 and 2007 to highlight natural resources issues important to the Tribes, to improve communications and exchange traditional ecological knowledge and Western knowledge between the communities, Western researchers and managers, and to promote the establishment of research collaborations to address important Tribal natural resource issues. Port Graham’s commitment to natural resource management is further illustrated through the goals and objectives the 2007 IRMP for Port Graham and Nanwalek to facilitate and promote individual and Village involvement resource management (ASCG, 2006, pp. 32-33).

³“Talking circles” are a traditional form of communication and healing in many Alaska Native Cultures. Napoleon describes talking circles as a process “where elders, parents and youth can come together to share themselves, and where truth can be spoken about all things communal, familial, and personal... The circle would not be a place for debate or argument, but a place to share oneself, and one’s experiences, feelings, and thoughts with the rest of the village... It is not only a place to get things off one’s chest, but a place to reestablish bonds between families and the rest of the community...” (Napoleon, 1996, p. 28)

Similarly, many Western researchers and educators located or working in the Kachemak Bay area have expressed an interest in working with the Port Graham and Nanwalek Tribes (see Appendix C). In 2011 as part of my Research Methods class, I sent out a survey to sixty-one researchers and educators that have, are currently, or may undertake research and environmental education projects in Kachemak Bay/Lower Cook Inlet area (representing over fifteen organizations) to learn of their experiences and interest in working with Native Alaskan Tribes. Of the thirty-eight respondents, only two individuals, or six percent of the respondents, indicated they were not interested in working with the communities. On a number of occasions, regional research and education staff tried to make connections or initiate collaborative projects with the Seldovia, Port Graham, and Nanwalek Tribes in Kachemak Bay, with mixed success. This survey identified some of the successes and challenges that the researchers and environmental educators have experienced in working with Tribes. The Port Graham Project built on the successes, and addressed some of the challenges.

This intersection of interests is also illustrated through one of the objectives of the Kachemak Bay Research Reserve (KBRR) to “contribute to increasing regional, statewide and national collaborations among agencies, communities, universities, and non-governmental organizations and tribal governments” (Kachemak Bay National Estuarine Research Reserve, 2012, p. 30). Managers of the KBRR (Thompson, 2011) and NOAA’s Kasitsna Bay Lab (Holderied, 2011) have expressed a strong commitment to both involve Port Graham and Nanwalek in research planning (e.g., participation in research committees) and in collaborating with the tribes on research and education projects. Through Pat Norman’s leadership, Port Graham has demonstrated the initiative to build partnerships with the KBRR, NOAA and other organizations. This is further illustrated through the 2003 Wisdomkeeper Workshop (Huntington, 2003), the 2004 Workshop follow-up, and the 2006-2007 natural resource project (Moonin, 2007). These collaborative efforts led to a number of projects, but there was still much work to be done. The Port Graham Project continues to build and expand on these relationships with the research community.

Follow-through from past Wisdomkeeper Workshops was largely contingent upon the agency or researcher taking the initiative to develop the projects and secure funding. Port Graham did not have the funding or staff to follow-up with researchers on these discussions. During initial discussions with the Tribe (Norman, 2011a; Norman, 2011b), Pat expressed an interest in evaluating accomplishments from these efforts and building partnerships to address remaining needs and invited me to assist in this effort. Pat has many responsibilities related to the operation of the Council and the Tribe, and recognized that he does not have time or expertise to take this on alone. His continued leadership, guidance, and support were essential to making this project and follow-up efforts a success.

Building relationships and trust are a large component of successful community research collaborations. Pat and I will work to build relationships between the Tribe, the researchers, and educators. Over the course of the project, the Tribe and researchers will communicate on multiple occasions and work together to develop a strategy to address priority natural resource information and management needs. These efforts will begin to build cross-cultural understanding, trust, and mutual respect among the Tribe, researchers, and educators.

The IRMP calls other Village groups, government agencies, and other stakeholders to work together to “create and develop open channels of input and information sharing from village residents, Elders and others who are interested in natural resource issues and local [and] traditional knowledge” (ASCG, 2006, p. 33). The timing is right to implement this part of the plan. The Port Graham Tribe understands that the community does not have all the money, time, expertise, and resources to do this alone, and would like to partner with the Western researchers and managers to address its natural resource information and management needs. Unlike the agency staff involved in WACH WG or ABWC, Port Graham does not have the luxury of full-time natural resource staff, as many state and federal agencies do. Similarly, in times of declining budgets, agencies and researchers in the Kachemak Bay area have the same challenge. To support their long-term involvement and follow-through, Port Graham understands it must obtain the resources and support to continue this effort, collaborate with researchers, and implement many of the projects.

The research team on the Bidarki Project illustrated the value and success of community-based participatory research both to researchers and the Tribes. This project made great strides in determining the roles of natural factors and local harvest activities in the decline of bidarkis and other marine invertebrates. This project required a multi-year commitment, but some researchers cannot commit this level of effort to a project. At a minimum, the Tribe should “be at the table” with Western researchers in the planning, development, implementation, and outreach of research in Kachemak Bay and lower Cook Inlet region. Through increased communication, the Tribe hopes more partnerships will be developed in the spirit and intent of the community-based research model.

CHAPTER 3: METHODOLOGY

The Port Graham Project represents an example of a community-based participatory research project where I am assisting a tribe in addressing their natural resource needs. Port Graham's main focus is to build upon past Wisdomkeeper Workshops to promote collaboration between the Tribe and researchers. The Tribe would like to identify and implement projects that address the decline of marine invertebrates in Port Graham Bay.

The Port Graham Project provided for early and ongoing communication with the Port Graham Tribe, and involvement of the Tribe in project design and development, implementation, and dissemination of results. This Project represents a two-way collaboration between the Tribe (the project lead) and Western researchers and educators, with coordination and facilitation assistance from me. The project developed and tested a systematic process to increase communication and collaboration to address the priority natural resource needs of the Tribe. In the following sections, I describe key project participants and the methods or processes applied.

Principal Project Participants

Port Graham Tribe – Project Lead

For the purpose of this project, the main point of contact in Port Graham is First Chief Pat Norman. Pat has been the First Chief for approximately 12 years. I look to Pat for guidance on all aspects of the Project. He has been involved in all aspects and has played a critical role in networking with the community and facilitating meetings with the Tribe. Pat has been a leader in addressing regional tribal natural resource issues, and has been the driving force behind the Wisdomkeeper Workshops and other efforts to promote collaboration with Western researchers and managers. Pat is one of the organizing members of the board for the Chugach Regional Resources Commission (CRRC, a regional natural resource Native non-profit, established in 1980), and has functioned as the board chairman since 1994. He has also served on a number of Alaska Native boards and commissions, including the Port Graham Village Corporation (15 years), the Alaska Sea Otter Commission (12 years), a Chugach Regional Representative Alaska Federation of Natives, and the Alaska Native Subsistence Halibut Workgroup.

Pat's multiple responsibilities to his Tribe, Corporation, and other cultural activities keep him very busy. He is active in the traditional Sugpiaq culture and subsistence way of life, as well as a good role model for youth and others in the community. Like Pat, many other Tribal staff and community members are very busy in work and other responsibilities within their culture and the community. The First Chief and Tribal staff are involved in many planned and unplanned administrative, community, and cultural

events. Activities could range from a break in the community water and sewer system, a power outage, or an illness or death in the community, to a variety of subsistence or cultural activities. It is important to understand these realities and be flexible when working with the Tribe. Collaborative processes with the Tribe must be efficient and respectful of their time.

Western Researchers and Educators

Kachemak Bay is a major center for coastal and marine research and environmental education in Southcentral Alaska. Three of the main research organizations and facilities that support or undertake marine research in the lower Cook Inlet area include the KBRR, the Homer Office of ADF&G (Commercial Fisheries and Sport Fish Divisions), and NOAA and UAF (which jointly manage the Kasitsna Bay Lab). A substantial amount of research has been undertaken in Kachemak Bay. Recently completed or ongoing research is summarized by the KBRR's annual publication "What's New in Kachemak Bay" (Murphy, 2011). The primary Homer-based education and outreach organizations in the Kachemak Bay region include the KBRR, Kasitsna Bay Lab, and Center for Alaska Coastal Studies.

My aforementioned spring 2011 survey of researchers and educators and their research experiences with Alaska Native tribes in the Kachemak Bay/Lower Cook Inlet area (see Appendix C) gave me the opportunity to gain a deeper understanding of the knowledge of the participants, some of whom I have worked with very closely. It also enabled me to assess their experiences in working with Port Graham, Nanwalek, or other indigenous communities, and help to identify challenges they may face in developing community-researcher collaborations. The survey showed that about two-thirds of the researchers and educators had already interacted with these tribes in some capacity. Most researchers did not significantly involve the tribes in the design, development, or outreach of their projects, but made presentations to the tribes after completion. Similarly, most of the environmental educators had delivered one or more environmental education events to youth in the community schools, but only a few had designed and developed programs to meet the specific needs of the tribes.

The survey also queried respondents with respect to their interest, ability, and potential obstacles in working with tribes. The vast majority of respondents indicated they had an interest in working with tribes. Two-thirds of respondents identified inadequate time, lack of funding, and more pressing work priorities as obstacles to collaborating with tribes. Another two-thirds of the respondents indicated that their lack of knowledge of the culture is or could be an obstacle to working with Port Graham and Nanwalek. Lastly, over half the respondents indicated that breakdowns in communication are or could be an obstacle in developing community research relationships. These findings help us understand the challenges that researchers and educators may face, and they help guide our efforts to build effective collaborative relationships between these individuals and organizations.

Graduate Student – Project Staff and Facilitator

My role on this project is to serve as staff, coordinator, and facilitator. I am responsible for research and analysis, under general guidance and direction from the Tribe. As coordinator/facilitator, my role was to help promote mutual understanding and build partnerships between the two main groups – Tribe and Western researchers and educators – to help meet the mutual needs of these groups.

My background includes a Bachelors of Science in Biology from the University of Alaska Fairbanks. Undergraduate work included research studying the life history, human use, and distribution of Arctic seals and whales with the ADF&G and NMFS. Spring and summer months were spent in Alaska Native coastal villages in the Northern Bering and Chukchi Seas collecting information and samples from the subsistence harvest of seals, walrus, beluga whales, and bowhead whales. From 1980 to the mid-1990s, I continued to work with ADF&G as their coordinator under the Alaska Coastal Management Program. Responsibilities included providing technical assistance to rural districts in developing and obtaining state and federal approval of their coastal management programs.

In 1995, I coordinated the State of Alaska's efforts to establish an Alaska unit of the National Estuarine Research Reserve System, a State-Federal partnership in environmental research, education, and outreach. I was appointed Reserve Manager after designation of the KBRR in 1999. Reserve programs were developed to address the research and environmental education needs of the greater Kachemak Bay community. This included initial work with the Seldovia, Port Graham, and Nanwalek Tribes to identify and address their specific natural resource needs.

After retiring from ADF&G in 2003, I worked as an Alaska Native Liaison for the NCCOS, which has a research lab in Kasitsna Bay on the south side of Kachemak Bay. NCCOS worked with CRRC and its member Tribes and UAF to develop a tribal natural resource training program, build research partnerships with the Chugach Tribes, and support statewide efforts to encourage Alaska Natives to pursue careers in the natural sciences. Because of their proximity to Homer and the NCCOS Kasitsna Bay Lab, we worked most extensively with the Lower Cook Inlet Tribes and schools, particularly in Port Graham and Nanwalek. Participation in the Wisdomkeeper Workshops, Port Graham natural resource projects, environmental education programs with the schools, and other community events afforded me the opportunity to learn more about Port Graham and Nanwalek, meet the people, and work with the Port Graham and Nanwalek Tribes.

My interest in learning more about Alaska Native ways of life and knowledge, and my desire to increase understanding, respect, and communication between Tribes and Western researchers led me into

the UAF Cross-Cultural Studies program. My commitment to the Kachemak Bay area tribes and interest in community-based research led me to the current Port Graham Project.

Community-Based Research Methodology: 6 Steps

Step 1: Define the Problem, Need, and Develop a Project Plan

The idea for this project arose from a brief conversation with Pat Norman in November 2010 at which he expressed a general interest in renewing natural resource research collaborations that started with the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop. The problem had already been identified at the Workshop – the decline of important marine invertebrates (i.e., clams, cockles, crabs, and bidarkis). The natural resource need was to develop and implement measures to restore marine invertebrates. For the Tribe to do this, the Tribe needed to gain a better understanding of the cause of the decline and the factors that affect the abundance of marine invertebrates. The 2003 Workshop recommended a number of potential projects to address these concerns.

Initially Pat suggested a collaborative project with Nanwalek. I discussed a general approach in January 2011 with both Pat Norman (Norman, 2011a) and Nanwalek Second Chief James Kvasnikoff (Kvasnikoff, 2011). We outlined a project to support a collaborative effort with both Tribes and researchers. We prepared a grant to partially fund this effort in January 2011. Although the proposal was not funded, the process of preparing the grant provided the impetus to develop the general goals, objectives, methodology, and outcomes for a project. The absence of funding necessitated that I narrow the project. The project was revised to focus on the priority natural resource needs of the Port Graham Tribe, and to focus on the decline of marine invertebrates in Port Graham Bay. Pat and I discussed a revised project focus at a meeting in Port Graham in May 2011. I then developed a more detailed outline which we discussed and revised at a follow-up meeting in Port Graham in September. The outline was further revised, reviewed and approved by Pat.

Step 2: Develop a Community Involvement/Outreach Process

Consistent with a community-based research approach, we wanted to encourage community input on the Project. Pat felt the best way to provide that input was to utilize the Port Graham Village Council and Environmental Committee. We held several joint meetings with these groups through the course of the project.

I also attended a few community functions as a way to meet more people and help promote the project. Most people recognized me from past visits to Port Graham, but it was not uncommon to get the friendly question, “What are you doing here?” This provided a good opportunity to meet more people

from the community, talk about the project and reflect that this is a community-based project to address the needs of the Tribe. Also, whenever I made trips to the Village to meet with Pat or to hold joint Village Council/Environmental Committee meetings, I tried to build in time to visit with the school, to visit friends, and to network with Council staff.

Step 3: Research Project and Community-Researcher Collaboration Update

The first step in assessing research needs was to identify and summarize the research projects that had been completed since that initial workshop. Huntington (2003, pp. 5-7) organized Workshop recommendations in a table sorted by general research topic, proposed research project, and potential collaborators. Using this table as a guide, I included the 2003 recommendations with an additional column to provide findings on project status and, where applicable, summarize findings and recommendations. The purpose of the table was to summarize recent research and provide a framework for the Tribe to work with researchers to identify gaps, develop priorities, and begin a strategy to address those gaps.

The process of completing the table was a joint effort between the Tribe and me. Between Pat Norman and Tribal environmental staff, the Tribe had a good sense of the projects that were initiated, particularly those related to environmental contamination studies. I was aware of most of the other studies through my previous work. I contacted and interviewed each of the principal investigators to obtain the information and reports necessary to populate this table.

There are a number of recent, ongoing, or future coastal and marine research projects in Kachemak Bay by state, federal, and other organizations that, while not a product of the Wisdomkeeper process, might be of interest to the Tribe. Such projects might address Tribal issues or provide a good foundation on which to build future projects. Pat and I thought an outline for other research projects in Kachemak Bay that would give Tribal and research participants a more comprehensive view of the nature and extent of research in the region. The best source of this information is the KBRR's "What's New in the Bay?" report (Murphy, 2011). With respect to researchers, it will also give the Tribe an opportunity to note any new or ongoing projects missing from the list.

A final step in this section was to evaluate the community-researcher collaborations on the projects in the Port Graham area since the 2003 Wisdomkeeper Workshop. I will define the nature of the community-research collaboration based on discussions with Pat Norman and the researchers. The community researcher collaborations as described by Pearce et al. (2009) and outlined in Figure 1; (Chapter 2, p. 19) will be used as a reference during the discussions.

Step 4: Review of Findings by the Tribe

The next step was to present the research update since the 2003 Wisdomkeeper Workshop to the Tribe. A joint Village Council/Environmental Committee meeting was scheduled in early November to present these findings. The intent of this meeting was to further introduce the project, provide an update on the findings, and get any feedback or direction on the research projects. I met with Pat prior to the meeting to both provide an overview of findings and discuss how he wanted to run the meeting.

Step 5: Post Wisdomkeeper Workshop Research and Collaboration Update

The fifth step in the process was to involve researchers in the development of research needs and priorities. In the absence of dedicated funding, we had to be creative and work cooperatively with the groups to achieve a desired level of communication and collaboration with researchers. The Tribe could not pursue the development of a broad-based workshop like the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop to bring a diversity of researchers together with the community. Such a large-scale workshop is a time consuming and expensive effort. Moreover, the Tribe indicated it would prefer to wait until more significant progress was made towards addressing their research needs before hosting a larger Workshop. Instead, the Tribe opted to employ more targeted collaborations with the research community. We developed a small ad hoc research advisory group (hereafter referred to as the “Research Advisory Committee” or RAC) that would be committed to working with the Tribe and willing to dedicate some of their time and resources to the cause. We wanted to include representation from the key regional research organizations (e.g., KBRR, NOAA/Kasitsna Bay Lab, and UAF) with the expertise or ability to gain access to the research expertise needed to address some of the natural resource issues (e.g., physical oceanography, marine biology, larval transport and recruitment, marine mammals).

A meeting was held in Port Graham for researchers to meet with Village Council and Environmental Committee members. The purpose of the meeting was two-fold. With respect to research, the Tribe and researchers were tasked to review the update and begin to identify research gaps, priorities, and potential partnerships to address Tribal natural resource needs. With respect to education, the Tribal and research participants were tasked to identify potential education and outreach projects with youth that could be connected to, in support of, or complement these research priorities. These education programs could be programs administered by the Tribe in collaboration with summer youth programs, collaborative programs with the Port Graham School, separate programs between regional environmental education organizations and Tribe, or any combination of these.

After the Tribal-researcher meeting, I prepared a summary to share with the Tribe, the RAC, and educators. I consulted with the RAC to seek their comment on the meeting outcome and

recommendations on how to proceed from here. I also met with Pat Norman to evaluate the results, consider RAC input, and develop a revised list of the Tribe's draft research priorities. The revised research priority list will be used in the development of the research strategy.

Step 6: Develop a Research Strategy

The sixth and final step in this project was to begin the development of a research strategy. The strategy was developed by the Tribe and researchers and focused on research planning and priority research projects over the next few years. The target outcome was to start several research and education projects and move forward with the initial steps toward meeting the Tribe's long-term objectives.

A final project meeting was held with key researchers, educators, and neighboring Nanwalek and Seldovia Tribes on March 9, 2012 to review the Tribe's list of draft research priorities. I worked with Pat and the RAC to develop a list of researchers that have expertise in these fields and interest in working with the Tribe. Pat also wanted to invite other Kachemak Bay area tribes – Nanwalek and Seldovia Village Tribes – as they share common interests and concerns and will be important partners in future research projects. The work session was held in Homer during the Kachemak Bay Science Conference to maximize participation by the science community. The overall purpose of the meeting was to identify research and education priorities of mutual interest, with an emphasis on what we can do in the next few years.

Meeting preparations included a series of meetings, calls, and emails with conference participants to lay as much groundwork for the meeting as possible. The intent was to get as much work done before the meeting to both help prepare participants and make the final project meeting as productive as possible. I met or called each of the invited researchers and educators to answer any questions and to start to identify potential collaborative projects. I also used this as an opportunity to help these participants learn more about the Port Graham community, culture, and natural resource issues and needs. Similarly, a few days before the meeting, I met with Pat in Port Graham to prepare for the meeting. I provided further information and background on project participants, and we discussed potential research projects and outcomes, revisited the project objectives and the Tribe's expectations for the meeting, and developed a strategy for the meeting.

CHAPTER 4: RESULTS

Project Planning and the Community Outreach/Involvement Process

The project planning and community outreach and involvement processes worked well. The May 2011 project planning meeting was very helpful in gaining a more complete understanding of the Port Graham community, their reliance – both culturally and for subsistence – on their natural resources, and the history of the decline of marine invertebrate in the Port Graham area. A draft project plan was developed after the May project planning meeting. This plan included a brief overview of past Wisdomkeeper Workshops, draft project goals and objectives, methodology, a list of products, and a schedule.

Pat and I met on September 8, 2011 in Port Graham to review the draft Project Plan. We worked through the plan in detail and made a number of changes to better reflect the Tribe's needs. What was also valuable to me were the many good "side discussions" at the September meeting about the community, traditional uses of marine invertebrates and other natural resources, and traditional and recent Tribal natural resource management efforts. These discussions added to my knowledge and respect for the Tribe and the community, provided a better understanding of the culture and the community's relationship to the natural resources, and a better understanding of how the Tribe has managed its natural resources traditionally, both in the past and in contemporary times. Moreover, these discussions and stories help to build my enthusiasm for the project.

Significant changes were made to the project plan as a result of the September meeting. The project plan was revised and returned to Pat on September 18th for another review (see Appendix D for the Project Plan). Pat approved the revised outline and distributed it to the Village Council and Environmental Committee.

The project plan called for a joint meeting of the Village Council and Environmental Committee to explain, discuss, and get feedback and comments on the project; however, that meeting was never scheduled. Pat felt the meeting was not needed, as the Council had been apprised of and was supportive of the project, and that any questions and comments could be addressed in subsequent meetings. We continued on with the project and held our first meeting of the project with the Village Council and Environmental Committee in early November to discuss the post-Wisdomkeeper research project summary (discussed in next section).

Several general goals and objectives were developed to reflect the target or focus for Port Graham Project and future efforts. These goals and objectives are provided below:

Goals:

1. To maintain a clean, healthy, and productive marine environment in Port Graham Bay.
2. To conserve, manage, and restore marine invertebrate populations that are important for subsistence to the Tribe.
3. To improve communication and develop research partnerships between the Tribe and Western researchers and managers.

Objectives:

1. To assess existing invertebrate populations, identify important habitats, and understand the natural processes that influence the distribution and abundance of important marine invertebrates.
2. To identify information needs and research projects to address the conservation and management of important marine invertebrates.
3. To identify opportunities for youth involvement in research and management to help youth acquire the knowledge, skills, and traditional Native values of resource stewardship and tribal natural resource management.
4. To engage the community, researchers, and educators in collaborative community-based projects.
5. To develop a strategy to address the research needs and develop the partnerships to effectively conserve, manage, and restore important marine invertebrates.

This project will be a start to address these goals and objectives. The Tribe is interested in securing the funding and developing the capacity for the Tribe to continue these efforts beyond this project. Wherever appropriate, the Tribe would like to be directly involved and a paid partner on future research projects.

Post-Wisdomkeeper Research Project Summary and Community Collaboration

Research Update

A summary of project status, results, and recommendations was compiled in tabular form. Two versions of the table were prepared (see Appendices E and F). Both tables include a description of general topic, current or proposed project, and who is or would be involved (columns 2 - 4) as originally described in Huntington (2003, pp. 5-7), as well as an initial assessment of the project status, results, and recommendations. The summary in Appendix E also includes endnotes and citations for each of the sources. The version in Appendix E was prepared with the idea that it would be more appropriate for use by the researchers and managers who are more accustomed and often expect to have the sources identified. The summary in Appendix F was prepared with the Tribal participants in mind. This

summary omits the sources and includes an additional column with discussion points. Both the literature (e.g., Feinup-Riordan, 2005; Kawagley, 2006) and my personal experiences in working with Port Graham and Nanwalek Tribes indicate that Alaskan Natives are more interested in results than who did the work or who should get the credit. I thought it would be helpful to include some discussion points also to help facilitate subsequent discussions with Pat or at a joint Village Council and Environmental Committee meeting.

The research community's response to the 2003 Workshop recommendations contained a great deal of variability. To the best of my understanding, the report recommendations were not distributed to meeting participants and no one person or organization was assigned the responsibility to follow-up on the recommendations. One of the Workshop recommendations was to develop a small, ad hoc 'Science Committee' to follow-up and prioritize the recommendations (Huntington, 2003); however, this recommendation was made in the final minutes of the meeting as researchers were leaving the Workshop, without any commitment to set up this committee or other means of follow-through identified (Seaman, 2003). For example, it was not decided who would be on the committee or who would take the lead. In essence, it was basically left up to individual organizations and researchers to take the initiative to pursue these recommendations and collaborate with the community. Some agencies and researchers at the meeting took this initiative, but most did not. A summary of these research project recommendations follows.

The first two general topics in the 2003 Wisdomkeeper Workshop report related to what conditions used to be like and how they have changed (Appendix E; Recommendation (R)-1, 2). The then current project – the “*Bidarki Project*” – was identified as the project to address these questions. The Bidarki Project was completed a few years later, and addressed these questions (Salomon et al., 2007; Salomon et al., 2011).

The recommendations identified several potential projects on the question of “what affects invertebrates today” (R-4a to 4f). The Bidarki Project also helped to partially address the question of what affects invertebrates today, through an exploration of the human factors (e.g., harvest) and natural factors (e.g., sea otter predation, water movement / larval transport, and habitat changes) that influence the abundance and productivity of bidarkis and other marine invertebrates. However, this project only extended in Port Graham Bay as far as Passage Island, and additional research would be needed for Port Graham Bay east of Passage Island.

Other recommendations under “what affects invertebrates today” relating to oceanography and larval transport studies (R-4a) as well as studies of littleneck clams on protected and reseeded beaches (R-4c and

d) were not addressed. Salomon et al. (2007) did undertake a literature review of sea otter diets and limited survey work in the outer beaches (R-4e), but did not specifically study sea otter abundance or feeding habitats in Port Graham Bay.

One of the most notable accomplishments was related to the study of existing contaminant burdens in invertebrates that could potentially affect invertebrates and the people who consume them (R-4f). NCCOS coordinated with the Port Graham Tribe, CRRC, and other organizations in Kachemak Bay region to develop and implement several contaminant studies. This included a study of bottom sediment quality (Hartwell et al., 2011), the use of Mussel Watch Program as a proxy for shellfish contamination (Apeti et al., 2010), and the study of contaminants in select fish and shellfish in Port Graham (Apeti et al., 2011). NCCOS also developed and implemented a project (R-8d) in collaboration with the Port Graham Tribe to map and describe benthic and intertidal habitats in Port Graham Bay (Burke J. S., 2010). This effort was complemented with an extension of the detailed, three-dimensional bottom habitat mapping under the Hydropalooza Project to include Port Graham Bay (Holderied, 2011; National Ocean Service, 2011).

Other recommendations were addressed under the topic of “how can tribal management help” (R-7). The Port Graham Village Council completed a one-year study to address this topic and further document traditional ecological knowledge of important marine invertebrates (Moonin, 2007). See Appendix E (R-7) for a summary of the results and recommendations from this study. It is an excellent resource on the role Tribal Management can play in helping to manage their natural resources.

The last recommended topic and project addressed were the establishment of Census of Marine Life sites in the Port Graham area (R-8b). Two sites were established, one at Point Pogishbi and a second on the northwest shore of Port Graham Bay.

Community-Researcher Collaborations

There were eight significant research projects that resulted, at least in part, from the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop and related collaborations with researchers: (1) the Bidarki Project (the University of Washington with Port Graham and Nanwalek Tribes), (2) benthic community analysis (with NCCOS), (3) mussel watch study (NCCOS with CRRC/Alutiiq Pride Shellfish Hatchery), (4) Port Graham fish and shellfish contaminant study (NCCOS with Port Graham Tribe), (5) Port Graham traditional management practices and traditional ecological knowledge study (Port Graham with Huntington Consulting), (6) addition of two local sites to the Census of Marine Life (University of Alaska Fairbanks), (7) benthic/intertidal habitat survey, and (8) the Hydropalooza Project (NOAA Integrated Ocean and Coastal Mapping Project and NCCOS Kasitsna Bay Lab).

The extent of community-researcher collaborations (see Figure 1, p. 19) was quite variable among these projects. Of these projects (excluding #5 which was led by the Port Graham Village Council), the Bidarki Project established the most extensive community-researcher collaboration, in that the researcher involved the Port Graham and Nanwalek Tribes throughout the project: early and ongoing communication, community involvement in research design and development, opportunities for local employment, and dissemination of results (see the Case Study discussion in Chapter 2).

In the NCCOS Benthic Community Analysis study led by Ian Hartwell (Appendix E, R-4f), Port Graham was not involved in overall project design. NCCOS later contacted the Port Graham Tribe as to their interest in expanding the project to Port Graham, and confirmation of interest enabled the funding to Port Graham Bay in the project (Hartwell, 2010). Through additional funding provided by NCCOS management, researchers were able to meet this request and expand the project to include Port Graham Bay⁴. NCCOS worked with Port Graham in selecting a site for sampling in the Bay and involved a village Elder, Herman Moonin, in the Port Graham Bay sampling. At the end of the project, NCCOS research staff made a trip to Port Graham to present the results to the Tribe.

The NCCOS mussel watch study was developed in collaboration with CRRC and their Alutiiq Pride Shellfish Hatchery in Seward, Alaska (R-4f). CRRC and Hatchery staff were involved in all aspects of the study, from problem and need identification to designing and implementing the study (including funding for Hatchery staff) (Apeti, 2011). NCCOS staff also went to Port Graham to share the results with the Tribe. NCCOS staff provided a similar level of coordination with the Tribe on the Port Graham fish and shellfish contaminant study (ibid). The community was involved in identifying the need for the project, providing project design input, and volunteering to collect and ship local samples. A meeting was held in Port Graham to share results of the fish histopathology studies. Results of the shellfish contaminant studies are pending.

On the NCCOS Benthic Habitat Mapping Survey led by Dr. John Burke (R-8d), NCCOS involved Port Graham in every aspect of the project (Burke, 2012). This project was developed in response to an expressed need at the 2003 Wisdomkeeper Workshop, and further discussed with the Tribe at the 2004 follow-up workshop in Port Graham. John worked with the Tribe in project design (identifying project goals, objectives, and outcomes). The Tribe was also actively involved in conducting the research.

⁴ The primary funding for this project was research award from the North Pacific Research Board. The original geographic focus of this study was central and northeastern Kachemak Bay.

NCCOS contracted with a local resident, Martin Norman, to assist in the ten-day survey. He provided both his time and the use of his boat to assist in the project. John Burke indicated that the “project would have been impossible to do without the local knowledge of Tribe” (ibid). NCCOS did provide Port Graham with several copies of the report, but due to the lack of travel funds, was not able go to Port Graham to present the study results to the Council. It is noteworthy to mention that the final report was prepared with the Port Graham community in mind; it was very well written, with many photos and graphics, and easily understood by diverse audiences.

The final project, the Hydropalooza Project, was a very detailed three-dimensional bottom survey of Kachemak Bay (R-8d). At Port Graham’s request, Kris Holderied was able to work with the managers of the Hydropalooza Project to extend the survey southward of Point Pogishbi to include Port Graham Bay and nearshore waters off Nanwalek. Kris provided a few copies of the high resolution, color-enhanced bottom habitat map from this survey to the Tribe, and even traveled to Port Graham to discuss the results and its utility for future habitat and oceanographic applications.

Port Graham Review of Past Workshops and the Research Update

A joint meeting with the Village Council and Environmental Committee was held on November 1, 2011. This date was set largely on the availability of Pat Norman and the Tribe’s long-time Environmental Program Coordinator. The meeting included seven participants from the Tribe: two from the Village Council, three Environmental Committee members, and two Environmental Program staff. The Tribe had hoped for more participation, but because of the illness of some members, conflicts with employment, other travel, and other conflicts, many members were unable to attend.

Pat Norman and I met before the meeting to preview the presentation, review the Wisdomkeeper update, and discuss an approach for the afternoon meeting. Both versions of the table were presented to Pat, who favored the simplified version with discussion points (Appendix F). My sense was that he thought the discussion points would help to define the questions facing the Tribe as it proceeds in natural resource planning.

The meeting started at noon, with snacks contributed by the Tribe and other meeting participants. The meeting lasted approximately two hours. Pat started with an introduction to the project and the purpose of the meeting. I followed with brief PowerPoint on past Wisdomkeeper Workshops in Port Graham and associated Tribal and science projects leading up to the current project. We then proceeded to work through the table as a group to look at the big picture and provide an overview of the full range of potential, current, and completed projects.

Participants listened intently and read or skimmed the results. Some group discussion took place on various projects, particularly the habitat mapping and environmental contaminant studies, where we had more substantive results from the NCCOS studies. Pat and other meeting participants also spoke briefly about the Tribe's continued interest in getting the youth involved in natural resource management. We closed the meeting with an overview of the subsequent steps in the project. All participants were invited to the November 17, 2011 meeting with researchers in Port Graham to continue the process of developing research and education priorities.

The goal of the meeting was to provide an overview of past Wisdomkeeper Workshops and associated natural resource projects, and to introduce and begin to engage the Village Council and Environmental Committee on the current project. Pat and I believe the meeting accomplished this goal. The table (provided in *Appendix F*) includes a lot of information, more than what can be reasonably grasped in one meeting. Participants appreciated the summary, and seemed to get a good feel of the work that has been done. Tribal participants were pleased to see the renewed effort to address issues related to the restoration of important marine invertebrates.

Collaborative Tribal-Researcher Workshop

The RAC was established to work with the Tribe in identifying research needs and developing partnerships to address those needs. This committee includes two researchers from the KBRR (Angela Doroff, Research Coordinator and Marine Mammal Biologist; Megan Murphy, Coastal Training Program Coordinator and Marine Biologist), NOAA Kasitsna Bay Lab (Kris Holderied, Director and Physical Oceanographer), UAF (Sarah Hardy, Marine Biologist and Biological Oceanographer), and Cook Inlet Regional Citizens Advisory Council (Susan Saupe, Science Director and Chemical Oceanographer). These organizations and individuals were selected for their background in the marine and ocean sciences, their connections to the marine science community, and their interest and commitment to working with Tribes.

The November 17th meeting had three objectives: (1) to provide an opportunity for researchers to meet and work with the Tribe within their community, (2) to promote a greater understanding of Port Graham's natural resource issues and needs, and (3) to begin the collaborative process to address Tribal natural resource management and research needs. In planning for this meeting, we tried to find a time that would work for the Tribe and all RAC participants, but it was impossible to find a time that would work for everyone. Weather was also an issue; the meeting was initially planned for November 16th, but a winter storm and poor flying conditions necessitated delaying the meeting for a day. One researcher –

Susan Saupe – could not travel to Port Graham on the 17th because of a prior obligation. Conflicting schedules and weather delays are a constant factor when working with remote Alaskan communities.

The joint Tribe-RAC meeting was very productive. Nine members from the Tribe participated in most of the meeting, plus three participants from a regional Alaska Native nonprofit – Chugachmuit – participated in the meeting. Researchers included Sarah Hardy and Kris Holderied⁵.

Pat Norman started the meeting with a welcome to visiting researchers and Tribal participants and a brief reference to past Wisdomkeeper Workshops and the current Port Graham natural resource project related to the revitalization of marine invertebrates in Port Graham Bay. Meeting participants were asked to help to identify research gaps and potential projects that could be pursued to address these concerns. In addition, since the participation of youth in science and natural resource management is a priority of the Tribe, meeting participants were asked to identify potential education and outreach projects. I then led the group through a review and discussion of the research update provided in Appendix E.

The result was a very informal, friendly, and lively discussion of potential research and education projects. The meeting summary is provided in Appendix G. The group identified a number of potential research projects and companion education and outreach projects, as well as potential partners in those efforts. While we reviewed the detailed table, more lively discussions were on those subjects or fields within the researcher's area of expertise. For instance, Kris Holderied, a physical oceanographer, inherently focused on projects related to oceanography. But because Kris, as Director of the Kasitsna Bay Lab and a major research partner with the KBRR, is well informed of other research in the bay, she was also able to share her knowledge and insights on other research topics and researchers in the bay. Sarah Hardy is a marine biologist with a research emphasis on larval ecology. Sarah participated in a number of discussions related to larval ecology and biological oceanography. She felt limited in her ability to contribute to other discussions because of her lack of expertise in many of the discussion areas. Both the Tribe and other participants greatly appreciated her involvement. Due to her connection with other marine and ocean researchers at UAF, Sarah also helped identify possible researcher partners at UAF to assist with other research projects, as well as possible education activities with youth, in respect to larval transport and settlement. All participants recognized the need to expand these efforts to include other expertise (see Appendix G, General Outcome #3).

⁵ Although Susan Saupe could not attend, she did participate in a pre-meeting worksession with RAC participants in Homer, Alaska on November 16th. Her comments and suggestions were shared with meeting participants in Port Graham.

The research discussions resulted in possible research projects that built upon recommendations from the 2003 Wisdomkeeper Workshop, as well as a number of new research projects. Researchers identified a number of new and ongoing marine and oceanographic research projects in the region that we were unaware of and that will help to address some of Port Graham's issues. I also shared a listing of related research projects from the KBRR's "What's New in the Bay" publication (Murphy, 2011) that, while not in Port Graham Bay, related to some of the research questions asked by Port Graham.

Many discussions and much excitement among researchers and community participants on possible education programs with youth also occurred as a result of the meeting. Potential projects included a drift card study, a study of sea otter feeding habits, plankton monitoring, harbor seal studies, larval recruitment studies, and resource assessment studies for clams and other marine invertebrates. These and other education projects could be done independently or in coordination with other work by scientists. In either case, the Port Graham Tribe would need to develop partnerships with research or education organizations and have the staff locally to support the development and implementation of such programs.

Overall, Pat Norman and other community participants were very happy with the meeting and the potential to implement some of these research and education projects within the Port Graham area. We felt the meeting objectives were met. It provided an opportunity for researchers to work with the Tribe and begin to establish relationships in the community; however, full RAC participation was not realistic. We were particularly disappointed that neither Angela Doroff nor Megan Murphy from the KBRR could attend. Nevertheless, it was an important start from which the Tribe could build. Kris and Sarah left with a much better understanding of Port Graham and its issues and needs. This meeting was also a very important step in a collaborative relationship with researchers to address their management and research needs.

Meeting Follow-up: Development of a Research Strategy

The November 17, 2011 collaborative Tribal-Researcher meeting was a good start in evaluating research accomplishments and identifying potential new research and education projects to address the needs of the Tribe. Meeting notes were prepared shortly after the meeting, and distributed to both the Tribe and RAC (Appendix G). The meeting resulted in a list of general outcomes and proposed research and education projects. The list of potential projects was long, and we did not attempt to prioritize those projects at the meeting. Workshop participants agreed that we needed to bring in additional researcher expertise before we could prioritize needs. For instance, the group raised questions on larval transport but needed additional expertise on larval transport before we could answer these questions.

I felt it was important to consult with both the Tribe and the RAC to explore options on how best to move closer to a list of priority projects and the development of partnerships to pursue these projects. From in the initial Project discussions in May 2012, Pat wanted focus in terms of the natural resource emphasis (i.e., marine invertebrates) and geographic focus (i.e., Port Graham Bay). Pat and I made plans to meet in Port Graham on November 22nd or 23rd to reflect on the meeting, discuss research priorities, and generally decide how to proceed. Unfortunately, this meeting was cancelled due weather and could not be rescheduled until December 5th.

A teleconference was set for November 30th to meet with the full RAC. The purpose of this meeting was to discuss November 17th meeting outcomes with the full committee and seek input on a process to develop priorities and start research projects. I indicated to the group that I would be traveling to Port Graham the following week to discuss research priorities and discuss how the Tribe wanted to proceed on the project. Based on previous discussions with the Tribe, I shared my initial thoughts on some of the likely priorities (e.g., compilation of geospatial data, assessment of current clam and crab populations, oceanography and larval transport studies, habitat mapping, and some youth education projects), and asked the group what they thought were the next steps. The idea was suggested that we hold a work session in Homer between the Tribe and researchers in conjunction with the 2012 Kachemak Bay Science Conference, March 9th to 11th. The group felt this would be a great opportunity to meet with researchers and environmental educators from the region who have been, are currently, or are interested in working in the Kachemak Bay/Lower Cook Inlet area. Friday morning, March 9th, was suggested since there are few conflicting events during that period and it would allow all participants to participate in the process. Another participant suggested that we target developing two to five research projects for 2012 that met the needs of the community and that we could start in the next few years. The group endorsed this idea.

Another topic that was discussed was the recommendation from the 2003 Wisdomkeeper Workshop to establish a Science Advisory Group to assist Port Graham and Nanwalek. The question was raised whether the establishment of such a group should be considered in the current effort. The group felt that the establishment of another science group was unnecessary. Researchers felt there were already so many science groups for various purposes, and that these groups included many of the same people. They felt that it would be more efficient and effective for Port Graham to participate in the existing groups. They hoped to get Port Graham (and Nanwalek) more engaged in the regional research discussions, and include Port Graham's needs as part of those discussions. Angie Doroff suggested that Port Graham consider participating in the KBRR's Research Committee. This committee meets on a quarterly basis, and includes researchers from a number of different research specialties. She noted that the group could revise the agenda to include issues of concern to Port Graham or Nanwalek, as well as invite other

expertise as needed. Kris Holderied mentioned the advisory group from the Kasitsna Bay Lab as another group that Port Graham could participate in. The Kasitsna Bay Lab group was recently established, and had met twice, both in association with the 2011 and 2012 Alaska Marine Science Conferences in Anchorage. Finally, the RAC suggested that Port Graham should also attend the KBRR Community Council meeting as way to learn about ongoing or proposed research and education activities.

I agreed to summarize the RAC meeting and share the group's recommendations for the committee and consideration by the Tribe.

I met with Pat Norman in Port Graham on December 5th. We first discussed several of the recommendations from the RAC. Pat thought the idea of holding a work session between the Tribe and researchers in Homer, in conjunction with the Kachemak Bay Science Conference, was a very good idea. The purpose of meeting was to develop a list of priorities and identify those projects we can move forward on in the next one to two years. The final Project workshop to develop a strategy was set for the morning of March 9, 2012, immediately preceding the start of the conference. Pat also supported the researchers' recommendation that the tribe participate in the KBRR and Kasitsna Bay Lab research committees as a way to complement Tribal-research coordination. Pat indicated he could use some of the Tribe's discretionary funds to attend these meetings. Finally, Pat and I reviewed the outcomes from the November 17th Tribal-Researcher meeting to develop a revised draft list of the Tribe's research priorities. Pat sent out a formal invitation to the March 9, 2012 to participants on February 14, 2012; this invitation included an introduction to the Port Graham Project and the revised draft list of research priorities (see *Appendix H*).

Research Strategy

Workshop Participants

Nineteen people participated in the March 9th workshop in the large conference room of the Alaska Islands and Ocean Visitors Center in Homer (see meeting summary in Appendix J). This Center is the headquarters of the KBRR and Alaska Maritime National Wildlife Refuge (U.S. Fish and Wildlife Service), and the venue for the 2012 Kachemak Bay Science Conference. This site was selected both for its convenience to researchers and to help Tribes become more familiar with the research Center.

Seven participants from Tribal organizations attended, including three from Nanwalek (a Tribal Council member, the Tribal Administrator, and the Chair of their Natural Resource Committee); two representatives from CRRC {a researcher (social scientist) and the Director of the Alutiiq Pride Hatchery (a fisheries biologist)}, a representative from the Seldovia Village Tribe (Environmental Program Director), and one from Port Graham (Pat Norman, First Chief). Twelve Western researcher and educator

participants included five members of the project's RAC (KBRR (marine mammal biologist), NOAA (physical oceanographer), UAF (biological oceanographer/marine biologist), Cook Inlet Regional Citizens Advisory Committee (chemical oceanographer), and Kasitsna Bay Lab (physical oceanographer)), a research scientist with the Kasitsna Bay Lab (marine biologist), the lead scientist from the Bidarki Project (marine ecologist), an ADF&G Homer Regional Office biologist (a fisheries biologist), a UAF research scientist with the International Arctic Research Center (scientist specializing in larval transport), a graduate student in anthropology, and two educators (the KBRR Education Coordinator and Kachemak Bay Campus Assistant Professor/Biology).

The Port Graham Tribe and I were very pleased with the number of participants, the depth of experience and expertise of participants. We were very fortunate to get such a large and diverse group of Tribal and Western researchers and educators in one place. Our success can be attributed to advanced preparation, assistance and commitment of the RAC members, from timing the meeting to coincide with the Kachemak Bay Science Conference, and the sincere commitment and interest of both the Tribe and researchers in working together.

Workshop Discussions and Outcome

The March 9th workshop represented an open and enthusiastic exchange of information and ideas by the Kachemak Bay area tribes, researchers, and educators on Port Graham's natural resource issues. While the focus was initially on Port Graham, early deliberations revealed that many Port Graham issues are similar to those in Seldovia and other areas of Kachemak Bay. The commonality of issues helped to reinforce participant interest in collaborating on research.

The March 9th workshop started with introductions. Pat Norman provided a history of the decline of marine invertebrates in the Port Graham area, and project goals and objectives. He briefly discussed traditional management techniques, and how the traditional management techniques – such as transplanting crabs, clams, or cockles from other areas of the state – would probably not be allowed under Western management systems. He then explained the Tribal Council's interest in collaborating with researchers to understand the causes of decline and the natural factors that influence their abundance. He asked for assistance in defining which research comes first, and how to move forward in developing, funding, and implementing these projects. He also emphasized the Tribe's desire to work with researchers and educators to inform and train the young people to be responsible for their natural resources as their Elders have taught. Lastly, he emphasized the Tribe's desire to collaborate with researchers in the development and implementation of these projects.

The group opened their deliberations with a discussion of the importance of setting clear policy and management objectives to guide decisions on research (Appendix J, p. 2; and policy and management studies, Row 14, p. 6). Several participants also reinforced the importance of factoring in local involvement and capacity in building project design and development (pp. 2-3). The group then turned their effort to identifying priority action or research projects to address Port Graham's natural resource management and information needs. A summary of these discussion outcomes is provided in tabular form in Appendix J (pp. 3-6). Each project/action is described by topic, the relative priority for completion, the project lead and potential partners, and a brief description of the need and the specific action or project.

All researchers agreed that the first action is to compile and synthesize what we know (Appendix J, Rows 1-3, p. 3-4). This includes defining the historical distribution of the key marine invertebrates and sharing that information with the research group. This information will help researchers develop studies to identify the historical sources and sinks of larvae, especially for clams and cockles which have relatively short planktonic life stages. The group also identified the need to consolidate available spatial data on the region – including local and traditional knowledge with Western knowledge – in a Geographic Information System (GIS) format such as ArcView so that that research partners and the Tribe will have a clear sense of what is known about the area. Lastly, several members of the group recommended that a database be developed for the GIS data.

The next priority (Appendix J, Row 4) was to secure the funding for Tribal staff or consultant to support the Tribe's continued involvement in these collaborative efforts and travel for research partners in this process. The group also supported the development of population assessments on key marine invertebrates, starting with an assessment of clam populations in Port Graham Bay (Row 5). With respect to oceanography studies, the group recommended the Tribe learn more about current studies in other areas of the Kachemak Bay and work with other tribes (e.g., Seldovia Village Tribe had implemented a drift card study), marine biologists, and oceanographers to develop a research plan future current studies in the bay (Row 6). Three modeling efforts were also discussed: the completion of a 3-D hydrographic model of the bay (Row 7, currently underway), the development of a conceptual model of larval transport and a lower trophic ecosystem model (Row 8), with the first two being the priority. Although modeling is an important part of the research, several participants cautioned that research not be limited to modeling, and that the plan include other research and monitoring efforts including larval settlement and survival studies (Row 10), genetic marker studies (Row 11), bottom sediment composition studies (Row 12), and potential research and monitoring studies on ocean acidification (Row 13). There were also a brief discussion of the need to continue these work sessions, either in the form of the smaller, more focused workshop (like

the March 9th workshop) or the larger, more broad ranging workshops (like the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop) (Row 16).

With respect to how to fund these actions and projects, the group recommended that participants work together to pursue a variety of funding sources from competitive grants, non-profits, and opportunistic funding. Overall, the researchers and educators were very pleased to see this research planning take place, as it gives them a sense of the community's research needs and priorities.

While this workshop was successful in identifying the research priorities, there was not enough time to flesh out the projects and develop a more detail research strategy. It is also important to keep in mind the main purpose of this effort to address the natural resource needs of the Tribe. The group did agree to try to meet again while it is "still fresh" to further develop a strategy. As captured in the meeting summary (Appendix J, p. 7):

Several participants suggested we not put our efforts on hold by several weeks, but instead start to scope out grant opportunities and other opportunistic funding to begin to address these issues. While it is still fresh – rather than forgetting about it until May – we should bring ideas for proposals to move this initiative forward. We developed some great ideas for projects and proposals, and should continue to think of what else we might need, and share our ideas with the group. We could talk about different calls for proposals, where the research activities could fit, what the deadlines are, and map a way for us to move forward. Moreover, people could think of potential opportunistic sources of funding, as well as possible short-term or long-term efforts targeted towards non-profit organizations like the Pew, Moore, or Sloan foundations....

The group recognized that due diligence of all participants will be needed to keep this effort going.

CHAPTER 5: DISCUSSION

Most research in the natural sciences in Alaska is undertaken by Western management or research institutions with little or no involvement from Alaska Native or other rural communities that may be affected by research. While more and more researchers are seeing the value of community involvement and the use of traditional knowledge in research (Huntington et al., 2011; Gearheard & Shirley, 2007; Pearce, et al., 2009), it appears that meaningful community-based research projects are still more of an exception, rather than the rule. While this appears to be true for research in the Kachemak Bay/Lower Cook Inlet region, we also discovered a sincere interest on the part of many researchers and environmental educators in collaborating more closely with regional tribes in the planning and implementation of research and education projects in Kachemak Bay.

The Port Graham Project represents a relatively rare instance where a tribe has taken the initiative to build relationships and collaborative partnerships with the Western researchers and educators to address their natural resource issues. The Port Graham Tribe has historically applied traditional management techniques to manage its natural resources, and is seeking to build upon local knowledge with Western science to address today's natural resource issues. The 2003 Port Graham-Nanwalek Wisdomkeeper Workshop was a substantial effort toward this goal with a focus on understanding the decline and restoring local populations of marine invertebrates. This project strives to assess past accomplishments, identify research needs and priorities, develop a living research strategy to help research management efforts, and generally improve long-term Tribal-researcher relationships. Substantial progress has been made, and all partners learned a lot in the process. My observations of the successes and challenges, and suggestions for improvement of the process, are described below.

Project Planning and Community Involvement

I have been fortunate to have established a good working relationship with the Port Graham Tribe. This project has allowed me to build upon past relationships, as well as better understand the culture and ways of life of the Sugpiaq people. It has allowed me to efficiently design and develop this project through two meetings. The May 2011 meeting was essentially an informal discussion of historical and recently natural resource practices, natural resource management needs, project goals, and community involvement. These discussions combined with past experiences laid a good foundation to draft a project work plan. We met again in September 2011 to review and finalize the plan. This process helped me to ensure the project was on track with the Tribe's needs and desires.

With respect to community involvement, Pat wanted to use the Council's existing Environmental Committee as the main vehicle for community involvement. After further discussion, Pat extended community involvement to include the Village Council to get additional feedback, Council buy-in, and further outreach for the project in the community. Two work sessions were held in November 2011 with the joint Council/Environmental Committee: the first on November 1st to introduce the project and present the post 2003 Wisdomkeeper research project update, and the second on November 17th with researchers to review the update and identify draft research and education priorities. Joint committee participation was limited at the November 1st meeting due in part to the short meeting notice, travel, work, and other personal conflicts of the attendees. Committee attendance at the November 17th meeting had more than doubled as result of more advanced notice and outreach before the meeting. Increased interest, as result of the first committee meeting, may have also contributed to increased attendance. The joint committee process functioned very well, bringing both a wealth of local knowledge and experiences to the table and engagement in lively discussions with researchers.

Post Wisdomkeeper Research and Community-Researcher Collaborations

This project includes a review and synthesis of research completed since the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop. We received positive feedback from both community and research participants on the background research and synthesis of findings in Appendices E and F. Participants liked the simpler format and its comparison to the 2003 Workshop recommendations. The committee was very interested in the work that has been done, and appreciated the research summary and format.

The 2003 Wisdomkeeper Workshop provided a forum to exchange information between Tribes and researchers, and set the stage for future collaborations. This project included a task to review and evaluate the follow-up process. Implementation of conference recommendations was left up to participants – both Tribes and researchers – to take the initiative to “continue to find ways to work together” (Huntington, 2003, p. 9). Some workshop participants suggested that a “Science Advisory Committee” be formed and a follow-up workshop be held in the spring of 2004. No science committee was ever formed, but a follow-up Wisdomkeeper Workshop was held in the fall of 2004. In my estimation, a science advisory committee was never formed because no one took the initiative to further explore the idea and form the group. The lack of time, funding for project follow-up, interest, or perhaps agreement that such a committee would be helpful, may have also contributed to why no one took initiative.

A number of researchers took the initiative to work with the Port Graham Tribe to implement workshop recommendations. One agency in particular – NCCOS – developed multiple projects to

address the needs of the community, particularly on workshop recommendations as related to environmental contaminants and habitat mapping in Port Graham Bay. NCCOS leadership encouraged agency research staff to work with the Kachemak Bay tribes to address their needs, and apply for research funding available through the Center's competitive research program and other programs. A number of NCCOS researchers attended the 2004 Wisdomkeeper Follow-up Workshop in Port Graham. Several other researchers also took the initiative of completing existing projects (e.g., the *Bidarki Project*) or extend existing projects to include Port Graham (e.g., the Census of Marine Life Project and Hydropalooza Project). The Port Graham Tribe also completed the recommendation to document traditional management practices and traditional knowledge.

The majority of researchers at the 2003 Wisdomkeeper meeting did not follow up. The reason for their lack of follow-up is uncertain, though likely a multitude of factors may have contributed. The lack of interest was probably not a significant issue. From my personal interactions, and other workshop sponsors' experience with researchers at that 2003 Wisdomkeeper Workshop, participant responses were very positive indicating that the Workshop was educational, engaging, and productive.

The lack of a deliberative, coordinated follow-through was probably a significant factor. The meeting report was not distributed to all meeting participants, nor did any individual, agency, or tribal organization take the initiative to coordinate or facilitate a response. It is not clear why the report was not distributed to meeting participants. My guess is that it basically "fell through the cracks" as staff from the CRRC (the initial grant recipient) was consumed by other work and life priorities. In the absence of follow-up, agency and other participants got back to their offices and were quickly consumed by their everyday activities. I also learned of a few instances of where researchers tried to initiate discussions with Port Graham and Nanwalek about possible research projects and, after repeated attempts, were not successful in making contact with the Tribe.

The results from the spring 2011 researcher-educator survey (several of the survey respondents participated in one or more of the Wisdomkeeper Workshops) indicated there is a lot of interest in collaborating with the Port Graham and Nanwalek Tribes. The most common potential obstacles in developing relationships with the Tribes include the lack of funding, inadequate time, and more pressing work priorities (Appendix C). A number of researchers and educators also indicated that an inadequate knowledge of the culture, lack of organizational support, and breakdown in communication could be obstacles in establishing community-researcher collaborations.

For those researchers who showed initiative, the 2003 Port Graham-Nanwalek Wisdomkeeper Workshop laid an excellent foundation for the development of community-based research projects. The

individuals and organizations, who expressed interest in working with Port Graham to address the workshop recommendations, made a conscientious effort to work closely with the Tribe through the development and implementation of their projects. As detailed in Chapter 2, the Bidarki Project was a model community-based participatory research project. Within the constraints of their budget and associated geographic constraints (i.e., most researchers were based at research centers in Maryland and North Carolina), the NCCOS also did well. The 2004 Wisdomkeeper Follow-up Workshop was an effective forum for NCCOS and other researchers to discuss possible research projects. Researchers were able to present possible research projects to address Workshop recommendations and get direct feedback from the community. Of the NCCOS research projects, the Burke (2010) benthic habitat survey most closely followed the community research collaboration model as defined in Pearce et al. (2009). This project included active involvement of the community in the research, including funding for both local boat use and the participants' time. Unfortunately, Burke did not have any funding for traveling to the community to discuss and disseminate project results; however, overall NCCOS is to be commended for stepping forward to work with the Port Graham and Nanwalek Tribes.

The primary recommendation I would give to the NCCOS and other researchers is to more fully involve the community in the project design phase for projects of interest to the Tribes. Where possible, researchers should try to meet with the Port Graham and Nanwalek Tribes or tribal representatives in person. This pre-project meeting would be an opportunity for all partners to fully engage in a project discussion and collaboratively define their respective roles in project design, development, and dissemination of results.

Improve Communications and Research Partnerships

A number of techniques were applied to improve communication and develop research partnerships between the Port Graham Tribe and Western researchers. We selected agency partners that wanted to work with the Tribe, so they shared a common goal. We strived to identify potential challenges to collaborations and identify ways to overcome them. The researcher-educator survey revealed many of the challenges. The survey revealed that those challenges differed from person to person, and from organization to organization. As project facilitator, I also devoted a lot of time talking to researchers, managers, and educators to further understand their challenges, discuss potential solutions, and how to apply them.

We learned that it takes a lot of advanced planning – from one to two or more years – to get support from these researchers. A closer look at the four principal research groups in Kachemak Bay starts to reveal their challenges. The KBRR receives roughly half its program funds from non-competitive sources

(e.g., operational funds from the National Estuarine Reserve System and ADF&G Sport Fish Funds) and half from competitive grants and proposals. The Reserve must constantly seek grants – often a year or two in advance – to maintain its staff and carry out its mission. Most of these funds are also tied to project-specific tasks, and the Reserve has little discretionary funds. Currently all staff are funded and committed to other functions, so even if a Tribe *wanted* to partner with the Reserve this year, they do not have the staff available to do so.

NOAA Kasitsna Bay Lab staff salaries are federally funded, but there is only two local research staff at the Kasitsna Bay Lab (the lab director and a researcher). The Lab Director's time is mostly consumed by administrative and research coordination responsibilities, and several research projects. The research assistant may direct his activities to any research or education activities subject to management approval. The Lab Director tries to encourage other NOAA staff (and their supervisors) to support research in the bay. Other NOAA staff must get supervisor approval to direct research to Kachemak Bay, and typically must get grants to cover research costs. The Director has enthusiastically supported the development of Tribal research collaborations, but has very little time to invest in these efforts. The research assistant has more flexibility in working with a Tribe on collaborative research and education projects.

Most ADF&G Homer Regional Office researchers in Commercial Fisheries and Sport Fish Divisions are state-funded, and their limited time is driven by priority issues as directed by ADF&G management or the Board of Fisheries. Given other state or regional priorities, it is often difficult for staff to devote their time to localized management issues. Individual ADF&G fisheries biologists may want to collaborate with the Tribes, but management may require them to work on other issues. Finally, university research staff salaries may be fully or partially state-funded, and in most cases must find grant funds to do the research through competitive grant sources. University researchers have the most flexibility of all of these organizations in what they research.

University and other researchers highlight the importance of advanced planning and a strategic approach to obtaining research support. Competitive research funding is difficult to obtain, and often requires several attempts to obtain research funding. All of these organizations have stressed the importance of advanced and strategic planning, and have welcomed this planning effort as an important first step in meeting Port Graham's research needs.

The development of the RAC was an important step in improving communication with regional researcher organizations and increasing awareness of Port Graham's natural resource issues and information needs. We selected individuals for this group based on their connection with research institutions, their interest in collaborating with local Tribes, their expertise and connections with other

researchers, and their willingness to commit some time to the planning effort. Due their busy and often conflicting schedules, it was very difficult to get the entire group together and schedule a meeting with the Tribe. RAC members nevertheless remained active and a valuable resource in evaluating past research, evaluating needs, and identifying information gaps and research priorities. In essence, the RAC members were a group of researchers in support of a common cause.

The RAC was established for the duration of the project. For future collaborations, the RAC suggested that the Tribe participate in existing research advisory committees: the KBRR Research Advisory Group, KBRR Community Council, and Kasitsna Bay Lab Advisory Group. Port Graham has expressed interest in participating in these groups, but this has not yet been implemented. More work will need to be done to determine the best avenues for future coordination and collaboration.

It is important to implement a two-way communication and learning process between the Tribes and Western researchers. From the very beginning, Pat Norman has emphasized his commitment to this goal. Whenever I talked to agencies, I looked for opportunities to share information about the history of the two villages, their way of life, and other social-cultural considerations. I similarly made an effort to share information on the agencies and individual researches and the challenges they face, with Pat and other community members. I shared and discussed the summary of the results from spring 2011 researcher-education survey with both the Tribe and researchers. The Tribe, researchers, and educators all seem eager to learn about each other, their work challenges, and their ways of life. Early in the project, I had considered preparing a presentation as an introduction to the history, culture, and way of life of the Sugpiaq people, and to do this with one or more people from those villages. I abandoned this idea when I learned how difficult it was to get the partners together. Had I pursued this, it would clearly have only reached part of the target audience. Given research and education staffs' limited time, it was more effective to share knowledge on a one-on-one basis. This also allowed us to address specific questions or issues as they arose.

Research Strategy and Future Efforts

The March 9, 2012 workshop was a good start in the development of a strategy to address Port Graham natural resource issues. This workshop represented an open and enthusiastic exchange of information and ideas by the Kachemak Bay Tribes, researchers, and educators around natural resource issues of concern to the Port Graham Tribe. Representation from the Tribes and research organizations was excellent, including seven Tribal participants, and twelve researchers and educators from two universities, four agencies, and one non-profit. As several participants characterized it, we pulled together an impressive group with diverse backgrounds and experience in collaborative research, and an

interest in promoting Tribal-researcher collaborations. The first third of the meeting was committed to group introductions and discussing issues and past research. This was the first time this group met in person, and was a good opportunity for participants to get to know each other and to begin to build relationships. Relationship-building is important to collaborative community-based projects as it begins to build a sense of familiarity, trust, and respect among all partners.

Subsequent research discussions have continued to be lively and free-flowing, resulting in the identification of priority needs and actions, potential funding sources, and general strategies to obtain funding. The meeting seemed to gain a life of its own at times as researchers enthusiastically shared their ideas and dominated the discussion, and I periodically redirected questions to Tribal participants to get their input. The energy was positive, and their intentions were good; however, this type of communication is quite different than in Native cultures, which is typically more quiet and reserved. In follow-up discussion with some Tribal participants, I learned that a few people were intimidated by this meeting format. Looking back at the meeting, I would have employed some different facilitation techniques to engage more Village participants in the meeting (e.g., a round-robin). As we regroup in the future, it will also be important to make sure that the research addresses the needs of the Tribes, and represents a sincere and meaningful collaborative effort.

The March 9th workshop was relatively short, two and half hours. While we achieved the main goal of the project, to begin to identify research priorities, participants were not able to commit to action. Several research participants recommended the group look for funding sources while the issues and discussions were fresh. The group agreed to meet in early May 2012 to take the strategy a step further, and identify more specific projects as well as possible funding sources to address these needs. The meeting was over at noon, with most participants continuing to socialize and informally discuss future actions over a catered lunch provided by the Port Graham Tribe. Pat Norman was pleased with the meeting process and also the outcomes. Nanwalek participants were not as active in the meeting, as they were new to the project, but still expressed their appreciation for being part of the process.

A large part of the meeting's success can be attributed to advanced preparation. The Tribe and I had worked with the researchers since the collaborative effort started back in May 2011. By the time researchers came to the meeting, they had a good sense of the issues and types of projects that might address the Tribe's needs. To help prepare Pat for the meeting, I provided further background on each of the meeting participants and some of their research ideas. Looking back at the meeting, it would have also been helpful to provide a similar briefing to the Seldovia Village Tribe and Nanwalek meeting participants. In the case of Nanwalek Tribe participants, other than Nick Tanape (who had been actively involved in the *Bidarki Project* and other research), we did not know if or who would be participating in

the meeting until they arrived at the meeting that day. Hopefully this project will be just the beginning of long-term community research collaborations in the Port Graham region, a process in which both the Nanwalek and Seldovia Tribes will become more active in the future.

Process Improvements and Recommendations

The collaborative process to develop a work plan went well. We were able to develop and finalize the work plan in two meetings, one before and one after the busy summer subsistence season. I believe that my previous working relationship with the Tribe, participation in past Wisdomkeeper Workshops, and basic grounding in their natural resource issues helped us expedite efforts to complete project planning so quickly. Moreover, this process was further expedited by the fact that Pat Norman and others in the Tribe had been so actively involved in addressing these natural resource issues with researchers for the past decade and had a good sense of the Tribe's overall natural resource goals, objectives, and priorities. I cannot think of anything I would have done differently other than to recommend that researchers new to the area invest more time in building relationships with the community.

To help build community-researcher relationships, it would have been good to have more interaction between the Tribe and Western researchers and educators. Wherever feasible, meetings should be face-to-face and held in the community. The November 17th work session in Port Graham between the Tribe and researchers was excellent, and a positive and engaging experience for all; however, researcher and educator participation was limited due to lack of travel funds, scheduling conflicts, and a relatively short timeframe in which this project was implemented. Both the agencies and the university have very limited discretionary travel funds. We overcame this challenge for the March 9th workshop by holding it in Homer in conjunction with the 2012 Kachemak Bay Science Conference. Most of the researchers were already there for the Kachemak Bay Science Conference, and UAF and Tribal participants were able to secure discretionary funding or combine the meeting with other travel. The Tribe, researchers, and educators recognize this problem and the need to fold more travel funds into future collaborative research, education projects, or planning efforts.

Pat Norman has expressed interest in more extensive collaboration with the Nanwalek Tribe. Port Graham invited Nanwalek to participate in the 2011 November 1st and 17th meetings in Port Graham, but because of weather and other factors they were unable to participate. The Nanwalek and Port Graham Tribes have a history of working together on natural resources, as evidenced by the 2006 IRMP for Nanwalek and Port Graham (ASCG, 2006). Goal 4, Objective J, calls for the "review of the IRMP at least every five years and coordinate with other natural resource agencies and update as needed." This project provides a good start for Port Graham in revising that plan. Nanwalek might consider undertaking

a similar natural resource planning effort in their community or addressing other objectives of the plan. Both the Nanwalek and Seldovia Village Tribes were invited and participated in the March 9th workshop in Homer. The communities have been talking about collaborating more often, and that meeting was a good start.

Few concerns relating to cultural and indigenous property rights questions were raised during the research planning process. At the November 17, 2011 meeting, researchers expressed the need for more information about the historical distribution of marine invertebrates to help them design oceanographic and larval transport studies. Other meeting participants suggested a project to compile existing geographic data into a consolidated GIS. A few Tribal participants raised an issue as to whether mapping historical marine invertebrate distribution and harvest areas in Port Graham should be made available to the public for fear that it would give away their favorite harvest areas. After further discussion, it was agreed that such information could be made available for research design purposes, and that the Tribe has ultimate discretion on additional use of that information. While there were few issues on cultural and indigenous property rights during the strategic planning process, it is likely to be a more common consideration in the future as the Tribe and researchers begin to design and implement more research projects. Future collaborative research efforts should be sensitive to the Tribes' cultural and indigenous property rights.

Limited time and funding required that we focus the Port Graham Project on research needs and developing a research strategy. The Port Graham Tribe also places a high priority on educating and involving youth in natural resource issues and management programs. The Tribe's goal is to develop projects that are relevant to regional natural resource issues. During the course of this Project, community members and researchers have identified a number of education projects for youth that could be associated with research projects. Wherever appropriate and possible, I would encourage the Tribe and researchers to factor such education, training, and local capacity building programs into the design, development, and implementation of research programs. Such programs may be developed as part of research projects, or as separate projects in collaboration with the Tribes and regional environmental educators.

Finally, I would like to commend the Port Graham Village Council on its commitment and initiative to manage its own natural resources that are so important to the Sugpiaq culture and way of life. Through the use of Wisdomkeeper Workshops and associated research by the Tribe and Western researchers, Port Graham has made substantial progress towards improving communications with the research community and in addressing a number of research and management questions surrounding the restoration of marine invertebrates in Port Graham Bay. This Project has allowed the Tribe and researchers to regroup, assess

the accomplishments and their challenges, and collaborate to chart a course moving forward.

Collaboration has reinforced the value of Tribal initiative without which, this Project would not have occurred. I encourage the Port Graham Tribe to continue their efforts to find the means and manpower to continue this initiative toward the goal of improving community-researcher collaborations and ultimately restoring and conserving its natural resources. Without continued Tribal leadership and initiative, I fear momentum, good will, and spirit of cooperation may be lost.

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Appendix A: Map of the Native Peoples of Southcentral Alaska

(Stanek, 1999, p. 7)



Appendix B: Map of the Lower Kenai Peninsula with Sugpiaq Place Names

(Salomon et al. 2011, p. xvii)



Historic Unegkurmiut Sites and Sugpiaq Place Names on the Southern Kenai Peninsula (Stanek, 2004, p. 19)

Settlement/Community	Pre-1880	1880	1890	1900	1910	1920	1929	1939	1950	1960	1970	1980	1990	
Kangiak (Day Harbor)	*	De Laguna notes there were villages in Day Harbor and a group called the Kanirmiut or "Bay People"												
Qutalleq (Resur. Bay)	*	A village mentioned by one of Birket-Smith's (1953) informants.												
Kani'lik (Two Bays)	*	De Laguna notes this may be Two Arm Bay. Birket-Smith (p.116) indicates Kangilik as near Seward.												
Aialik (Aialik Bay - several sites)	*	Archeological sites (Schaaf 1988); Oral tradition (McMullen 1997) describe occupation. Residents moved to Nanwalek and Koyuktolik Bay in mid 1800s.												
(Two Arm Bay)	*	Archeological site and found in oral history.												
(McArthur Pass)	*	Extensive archeological evidence, Schaaf and Johnson (1990), indicates resident population in last 1,000 years.												
Nuka Bay (Ualeq in De Laguna)	*	A number of village and camp sites on west side of Nuka Is. (Crowell 1993).												
Yaaliq (Yalik Bay)	NDA	32	Billings 1790 expedition met the Yalermiut. Moved to Nanwalek and other Cook Inlet communities in the 1880s.											
Kangiliq (Port Dick)	*	West arm of Port Dick (Leer et al.). Vancouver's expedition encountered a large number of Natives in kayaks. Same name of village near Seward.												
Tagaluq (Rocky Bay)	*	Oral history of Port Graham and Nanwalek residents and Leer et al. 1980.												
Kaniagaluk (Picnic Harbor)	*	Oral history of Port Graham and Nanwalek residents.												
Nunaluk (Windy Bay village)	*	Oral history of Port Graham and Nanwalek residents and Leer et al. 1980.												
Ashivak (Cape Douglas)	NDA	46	85	Aband.	---	---	---	---	---	---	---	---	---	
Tamarwik	*	A small village and travel stop at Anderson Beach on the mainland north of Perl Island. A sockeye stream and good harbor seal area.												
Arrulaa'ik	*	Clam Cove Village located at Port Chatham - inhabited at the time of Vancouver's expedition in 1794.												
To'qakvik (Chrome Village)	*	Based on De Laguna's informants, this was the village at the site of Portlock.												
Portlock (Port Chatham)	---	---	---	Established in 1915		47	NDA	---	---	---	---	---	---	
Qugyugtuliq (Dogfish Bay)	*	De Laguna and oral history of Port Graham and Nanwalek residents. Abandoned in the 1930s.												
Nanwalek (English Bay)	20	88	107	NDA	NDA	NDA	107	48	75	78	58	124	158	
To'qakvik or Coal Village	100	Established in the 1850s, moved to Nanwalek in the 1860s.						---	---	---	---	---	---	
Paluwik (Port Graham)	*	---	---	---	Established in 1912		NDA	93	92	139	107	161	166	
Seldovia (Ostrovski)	NDA	74	99	144	173	258	379	410	460	460	437	473	459	

sources: Rollins 1978; De Laguna 1956; Megensack 1982; Tanape 1983; Birket-Smith 1953; Schaaf 1988; Schaaf and Johnson 1990; Crowell 1993; Leer et al. 1980

* Permanent or seasonal settlements in pre-1880s. Documented by archeological and/or oral history information.

NDA Site was occupied but no population estimates available.

Settlements and Historic Population Estimates For The Lower Cook Inlet and Outer Kenai Peninsula Coast

Appendix C: Survey of Researchers and Educators in the Kachemak Bay Area

As part of a spring 2011 research methods class, I used a survey tool to interview researchers and environmental educators that have, are currently, or are proposing to conduct projects in the Kachemak Bay/Lower Cook Inlet area. The online tool, SurveyMonkey, was used to conduct this survey. I wanted to assess researchers' and educators' knowledge of Alaska Native way of life and the history of these communities, as well as their experience, interest, and potential obstacles or challenges in working with indigenous communities. Although I worked closely with many of the researchers and environmental educators in Kachemak Bay region for many years, I felt that a deeper understanding of their knowledge and experiences of working with Native communities would improve my ability to help build Tribal-Western collaborations in research.

Of the sixty one surveys that were distributed, responses were received from thirty-eight researchers and educators from fourteen organizations. Approximate two-thirds of the researchers and educators have either participated in science or outreach of projects with Alaska Native communities; of the twenty-three researchers that responded (question 8, page 7):

- ❖ thirty-nine percent (nine individuals) had not interacted with Port Graham and Nanwalek on any research projects;
- ❖ seventeen percent (four) indicated their results were shared with the community with little or no community involvement in research;
- ❖ twenty-two percent (five) indicated the community participated in project implementation but not in project design; and the remaining
- ❖ twenty-two percent (five) indicated that the tribes were involved in all aspects of the project.

The results show that a little more than half the respondents worked with Port Graham and Nanwalek tribes in some capacity, but that the interaction and involvement of the Tribe in design and implementation of the project – a level of participation promoted under the community-based research – was very limited. Only five individuals provided involvement in all aspects of the project, and most of these researchers were associated with one agency.

The responses from educators were comparable with respect to the level of community involvement; of the twenty-seven individuals that responded to the education and outreach question (see question 7, page 6):

- ❖ approximately twenty-six percent (seven) indicated they did not deliver any education and outreach programs in Port Graham and Nanwalek;
- ❖ fifty-two percent (fourteen) indicated they delivered existing programs;
- ❖ twenty-six percent (seven) indicated they delivered existing programs with modifications to address community needs; and
- ❖ four percent (one) indicated they developed and delivered new programs in response to a community request.

The majority of programs delivered to the tribes were existing education programs, with only a few including significant modifications to address community needs.

Under question nine (page 9), respondents were asked to describe their interest, ability, and potential obstacles in collaborating with the tribes on projects. The vast majority of respondents indicated they had an interest in working with the tribes:

- ❖ About two-thirds indicated that inadequate time, lack of funding, and more pressing work priorities can be an obstacles in working with the tribes.
- ❖ About a third indicated that their knowledge of the culture was a potential obstacle, while
- ❖ Another third responded that they “somewhat disagree,” suggesting that that their limited knowledge of local native culture could be an issue (note: approximately ninety percent of the respondents in question 10, page 9, indicated that their knowledge of culture and history of the villages was moderate or limited).
- ❖ Only eighteen percent of the respondents (seven) indicated that the lack of organizational support was a substantial obstacle.
- ❖ Lastly, approximately twenty-six percent (nine) respondents agree that the breakdowns in communication were an obstacle, while another third indicated that they “somewhat disagree.”

In summary, the survey showed that most researchers and educators are interested in collaborating with the Port Graham and Nanwalek Tribes. Like Tribal staff and community members, research and educator respondents are very busy, and face similar challenges with respect to lack of funding and other work priorities. Lack of organizational support and breakdown in communication were an issue with some respondents, and might be an issue with approximately a third of the other respondents.

While these results do reveal trends and challenges we need to consider, it is also important not to over-generalize. The responses are very individual-specific, and begin to shed light on the specific perspectives, realities, and challenges they face. In a sense, this survey does not represent “reality,” but

only the interviewee's perspective at the time of the interview. Individual responses provided a useful resource to help me begin to understand and address individual challenges to help build partnerships with the Tribe. It is important to note the survey does not substitute for one-on-one interaction with the Tribe, but that the Tribe and I continue to focus on building good relationships with researchers and educators.

SurveyMonkey: Kachemak Bay Results

KBay Cross-Cultural Collaborations



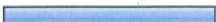
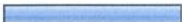



1. What organization are you most directly affiliated with (select one)?		
	Response Percent	Response Count
National Park Service	0.0%	0
ADF&G – Kachemak Bay Research Research	21.1%	8
ADF&G -- Homer Office	13.2%	5
NOAA/NCCOS	10.5%	4
Bureau of Indian Affairs	0.0%	0
U.S. Fish and Wildlife Service	2.6%	1
University of Alaska (Fairbanks)	23.7%	9
University of Alaska (Homer)	2.6%	1
Alaska Pacific University	0.0%	0
Cook Inlet Regional Citizens Advisory Council	2.6%	1
PWS Regional Citizens Advisory Council	2.6%	1
Center for Alaska Coastal Studies	7.9%	3
Homer Soil and Water Conservation District	2.6%	1
Alaska SeaLife Center	5.3%	2
Cook Inlet Keeper	5.3%	2
Alaska Ocean Observing System	0.0%	0
North Pacific Research Board	0.0%	0
Other (please specify)		2


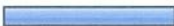
2. What is the focus of your position?

	Primary	Secondary	Not Applicable	Response Count
Program Management or Administration	45.5% (5)	54.5% (6)	0.0% (0)	11
Resource Management	37.5% (3)	37.5% (3)	25.0% (2)	8
Research	78.3% (18)	17.4% (4)	4.3% (1)	23
Environmental Education	41.7% (5)	58.3% (7)	0.0% (0)	12
Outreach	46.2% (6)	53.8% (7)	0.0% (0)	13
Environmental Advocacy	0.0% (0)	0.0% (0)	100.0% (1)	1
Other (please specify)				5
answered question				38
skipped question				0

3. Please describe your experience in working with rural Alaska Native or other Indigenous communities outside of Alaska. Please check all that apply.

	Response Percent	Response Count
I do not have any experience in working with Indigenous communities 	10.5%	4
I have participated in one or more meetings or workshops in Indigenous communities, but did not play an active role in the development of the meeting or workshop 	31.6%	12
I have delivered one or more environmental education and outreach projects in Indigenous communities 	47.4%	18
I have participated in outreach of existing research projects in Indigenous communities 	39.5%	15
I have worked directly with Indigenous communities to develop and implement research or education projects to address their needs 	31.6%	12
Other Comments		3
answered question		38
skipped question		0




4. Have you personally worked on collaborative research, environmental education, or outreach projects with the Port Graham or Nanwalek tribes or schools in the last ten years?

		Response Percent	Response Count
Yes (please go to question 5)		63.2%	24
No (please go to question 9)		36.8%	14
answered question			38
skipped question			0





5. Approximately how many research, education, or outreach projects with the Port Graham and Nanwalek tribes or schools have you personally been involved in over the past 10 years?

		Response Percent	Response Count
Research: 1 to 3 projects		52.0%	13
Research: 4 or more projects		0.0%	0
Education and Outreach: 1 to 3 projects		56.0%	14
Education and Outreach: 4 or more projects		12.0%	3
answered question			25
skipped question			13

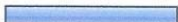



6. Please list up to three of the projects in Question 5 with the Port Graham and Nanwalek tribes or schools.

		Response Percent	Response Count
1		100.0%	25
2		68.0%	17
3		36.0%	9
answered question			25
skipped question			13

7. For education and outreach projects, please identify the extent of interactions with the Port Graham and Nanwalek tribes or schools. Please check all that apply.

	Response Percent	Response Count
I did not deliver any education and outreach programs in Port Graham or Nanwalek 	25.9%	7
I delivered existing education and outreach programs to the community 	51.9%	14
I delivered existing education and outreach programs, but with significant modifications to address community needs 	25.9%	7
I developed and delivered a new education and outreach program(s) in response to a community request, and worked with the community in program development 	3.7%	1
Other Comments		5
answered question		27
skipped question		11

8. For research projects, please describe the extent of interactions with the Port Graham and Nanwalek tribes or schools. Please check all that apply.

	Response Percent	Response Count
I did not interact with the Port Graham and Nanwalek tribes or schools on any research projects 	39.1%	9
Research project results were shared with the community, with little or no community involvement in project design or implementation 	17.4%	4
The community participated research project implementation and outreach, but not in project design 	21.7%	5
The community was involved in all aspects of the project, including project design, implementation, and dissemination of results. 	21.7%	5
Other Comments		3
answered question		23
skipped question		15

9. How would you describe your interest, your ability, or potential obstacles in collaborating with the communities of Port Graham and Nanwalek on research, education, or outreach projects of mutual interest. Please describe whether you agree or disagree the following factors.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Not Applicable	Response Count
Lack of Interest	0.0% (0)	5.4% (2)	18.9% (7)	62.2% (23)	13.5% (5)	37
Inadequate Time	22.9% (8)	48.6% (17)	11.4% (4)	5.7% (2)	11.4% (4)	35
Lack of Funding	27.3% (9)	48.5% (16)	9.1% (3)	3.0% (1)	12.1% (4)	33
More Pressing Work Priorities	25.0% (9)	44.4% (16)	11.1% (4)	2.8% (1)	16.7% (6)	36
Inability to Hire New Staff	11.4% (4)	22.9% (8)	5.7% (2)	8.6% (3)	51.4% (18)	35
Inadequate Knowledge of the Culture	0.0% (0)	36.1% (13)	38.9% (14)	13.9% (5)	11.1% (4)	36
Lack of Organizational Support	5.7% (2)	14.3% (5)	37.1% (13)	25.7% (9)	17.1% (6)	35
Breakdown in Community Communications	2.9% (1)	23.5% (8)	35.3% (12)	11.8% (4)	26.5% (9)	34
Other Factors?						10
answered question						38
skipped question						0

10. How would you characterize your understanding of the following aspects of the Alaska Native culture?

	Good	Moderate	Limited	Response Count
Indigenous compared to Western worldview and knowledge systems	10.5% (4)	73.7% (28)	15.8% (6)	38
History of the westernization of Cook Inlet (since the early 1800s)	5.4% (2)	37.8% (14)	56.8% (21)	37
Techniques for use of Local and Traditional Knowledge in research and management	7.9% (3)	42.1% (16)	50.0% (19)	38
Protocols for working with Indigenous communities	8.1% (3)	43.2% (16)	48.6% (18)	37
answered question				38
skipped question				0

Appendix D: Project Plan for the Port Graham Natural Resource Project

September 18, 2011

**Port Graham Natural Resource Project:
Wisdomkeeper Follow-up and Development of a Strategy to Address Natural Resource
Information Needs for Port Graham Bay**

INTRODUCTION

There were approximately five collaborative workshops between January 2003 and September 2007 to both share scientific and local and traditional knowledge and address some the concerns of the Port Graham community. These include:

1. **January 03, “What’s New in the Bay”:** This workshop was organized by the KBRR in collaboration with Port Graham. The meeting was held in Port Graham, and was designed to share available knowledge on Kachemak Bay. No meeting summary was available.
2. **2003 Wisdomkeeper Workshop:** This workshop was first and largest Wisdomkeeper, was initiated by Port Graham. This workshop was funded by *Exxon Valdez* Oil Spill (EVOS) restoration program. The community identified the following resources of concern: crabs (Dungeness, king, and tanner), bidarkis, clams (littleneck and butter clams), and cockles. Participants included state and federal agency researchers and managers, UAF/SFOS researchers, and Native Non-profits. Henry Huntington prepared a report from workshop (Huntington H. P., Report of the Port Graham-Nanwalek Wisdomkeeper Workshop, 2003).
3. **2004 Wisdomkeeper Follow-up Workshop:** This meeting appeared to be initiated collaboratively by Port Graham, Kachemak Bay Research Reserve (KBRR), and the National Oceanic and Atmospheric Administration (NOAA). The meeting attended by a number of Port Graham (a number of Elders and few community participants), NOAA (David Johnson, Terry McTigue, Gordon Thayer, John Burke, Kimani Kimbrough, and Glenn Seaman), KBRR [Judy Haner (Manager) and Scott Pegau (Research Coordinator)], and University of Alaska Fairbanks (UAF) (Katrin Iken). No meeting summary was available. However, this project did lead to several NOAA and other research projects.
4. **2007 May and September Wisdomkeeper Meetings:** These meetings resulted from the Port Graham Village Councils project, “Documenting Traditional Management Practices and Traditional Ecological Knowledge.” This project was funded through a grant from the Administration for Native Americans (ANA). Karen Moonin, a Port Graham Natural Resource Specialist, was the lead Council staff for the project. Henry Huntington was contracted to assist in documenting history of fish and wildlife management in Alaska, traditional knowledge and management practices, and assist in the Wisdomkeeper meetings. Karen and Henry prepared a report for the project (Moonin, 2007). Project results, project participants, workshop participants, and meeting minutes are summarized in the final report.

This proposed project will follow-up from the successful collaborations and the many projects that resulted from the above efforts. It will not rehash the efforts, but instead build from it. The 2006-2007 ANA project laid out an excellent foundation upon which to continue to build the Port Graham Natural Resource Program and develop partnerships to address the resource issues and information needs of importance to the community. The draft project goals, objectives, and methodology of this project are identified below.

GOALS, OBJECTIVES, AND METHODOLOGY

The goals, objectives, and methodology of this project will focus on the conservation and management of the marine resources of Port Graham Bay, with particular emphasis on the revitalization of important marine invertebrates. Although the community has keen interest in the terrestrial environment and other marine resources in important traditional uses areas, it has decided to focus initial efforts on a project to more fully understand and effectively manage the natural resources of Port Graham Bay.

Goals:

1. To maintain a clean, healthy, and productive marine environment in Port Graham Bay.
2. To conserve, manage, and restore marine invertebrate populations that are important for subsistence to the Tribe.
3. To improve communication and develop research partnerships between the Tribe and Western researchers and managers.

Objectives:

1. To assess existing invertebrate populations, identify important habitats, and understand the natural processes that influence the distribution and abundance of important marine invertebrates.
2. To identify information needs and research projects to address the conservation and management of important marine invertebrates.
3. To identify opportunities for youth involvement in research and management to help youth acquire the knowledge, skills, and traditional Native values of resource stewardship and tribal natural resource management.
4. To engage the community, researchers, and educators in collaborative community-based projects.
5. To develop a strategy to address the research needs and develop the partnerships to effectively conserve, manage, and restore important marine invertebrates.

Methodology:

- A. **Project Direction and Focus** – Work with the first Chief, Pat Norman, to develop a working project focus and description. Defer the Pat for guidance on how to most effectively engage the community and IRA Council. Present to the IRA Council and the Environmental/Natural Resource Committee for review and comments. Provide additional updates and opportunity for review and comment to IRA Council and Environmental/Natural Resource Committee as needed to meet project goals and objectives.
- B. **Workshop Summary** – Summarize past workshops to highlight past accomplishments and recommendations.
- C. **Workshop-Related Projects and Outcomes** – Identify and summarize research and monitoring projects that resulted (at least in part) from the Wisdomkeeper workshops.
- D. **Community-Based Research Approach** – Describe the process used in these research projects to collaborate with the community, and the extent to which past or ongoing community-based research and education project applied this approach (see Appendix A).
- E. **Identify Other Related Projects** – Although not a direct outcome of Wisdomkeeper process, there are number of recent, current, and future coastal and marine research projects undertaken by state,

federal, and other organizations that might help to answer questions related to Port Graham marine invertebrate conservation and management issues. Such projects could be modified to address community information needs or provide a good foundation on which to build future projects. The KBRR's "What's New in the Bay: Research Reviews, March 2011" would be good place to start this search. We have also learned of other projects by the UAF, KBRR, North Pacific Research Board (NPRB), and EVOS of potential relevance and interest to Port Graham natural resource issues.

- F. **Identify Potential Information Gaps and Research Needs** – In collaboration with the Tribe, develop a list of potential information gaps and needs.
- G. **Meeting with Key Research Entities in Kbay Area** – Schedule a meeting/work session in Port Graham with a small group from the community (to be selected by Pat and the Council) and four to six key research and educator from the Kbay area and UAF to review and help us refine the strategy. This will include defining research project needs and help us outline future steps future workshops. This might include the KBRR (e.g., manager and research coordinator), NOAA/Kasitsna Bay Lab (the lab director), UAF (a marine invertebrate person and oceanographer), and an educator from the KBRR.
- H. **Identify/Summarize Past Youth Environmental Education Programs** – Identify a sample of the youth/environment education programs that have been provided to Port Graham (and Nanwalek?) through the school system over the last several years. Identify how these programs were developed, and to what extent they worked with the school or tribe in developing these programs.
- I. **Identify Youth Regionally-Specific Environmental Education Programs** – Identify *examples* of school and summer education and research or monitoring programs that might address tribal priorities relate to Port Graham marine invertebrate and other marine conservation priorities of the tribe. The primary focus of the strategy is to define research needs, although we would like to begin identify natural resource education and training programs for youth.
- J. **Conduct a Survey Kbay Area Researchers and Environmental Educator Experiences in Cross-Cultural Collaborations --** In preparation for this project, I conducted a survey of researchers and educators that have, are currently, or may potentially work in Kachemak Bay and Port Graham and Nanwalek communities for their experiences in cross-cultural communications, their knowledge of the Alaska Native Culture, and their interest and potential challenges in collaborating with native communities. The survey has been completed, but the analysis is still in draft. An increased understanding of researcher and education experiences and knowledge of indigenous cultures will help us in developing future collaborations.
- K. **Develop Strategy** – Based on the work above, we will develop a strategy to help the community meet its research and management information needs and develop and maintain partnerships with the research and education community. This will focus on the current project goals related to marine invertebrates and marine conservation and management. The strategy will be developed in close collaboration with the community and be subject to the Council's review and approval.
- L. **Identify Potential Funding Sources and Partners** – We will also begin to identify potential funding sources and partners to address the tribe's natural resource information and management priorities. This may include the North Pacific Research Board, Alaska Ocean Observing System, ANA, Fish and Wildlife Tribal Grant Program, BIA grants programs, and other potential funding sources. We will begin to establish connections and relationships with prospective funding sources. As appropriate and time permits, the Council may develop and submit proposals to fund future Wisdomkeeper Workshops or implement other recommendations of the strategy.

PRODUCTS

- ☐ Summary of past Wisdomkeeper meetings, recommendations, and proposed actions.
- ☐ Summary of projects that resulted from the past Wisdomkeeper meetings
- ☐ Summary of other relevant projects in the Kachemak Bay/Lower Cook Inlet area
- ☐ Strategy to meet community marine research needs and develop and maintain long-term partnerships

SCHEDULE AND PROCESS

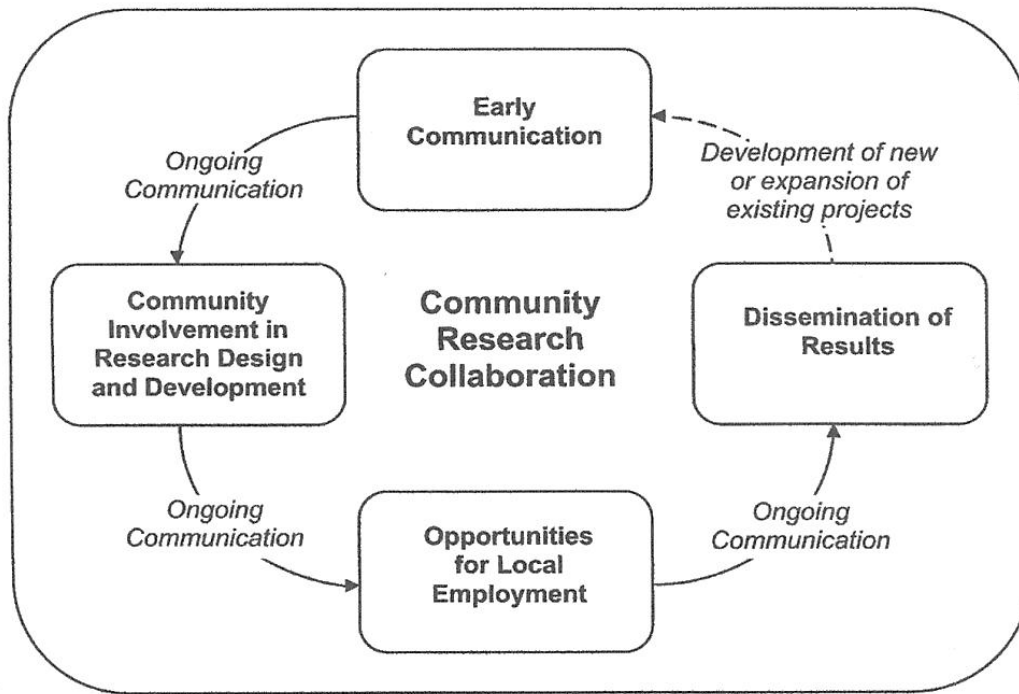
This project will be undertaken in very close coordination with the IRA Council. The following schedule was developed in collaboration Pat Norman. It was designed to complete the analysis and meetings needed to develop a draft strategy before the Christmas holiday and to allow the completion of the project by spring. This will also allow the Council and future partners to apply to potential funding sources to begin implementing the strategy and related Tribal natural resource program needs.

1. **Project Design, September 9th** – Meet with Pat to review project goals
2. **Project Research/Summary, September 15th to October 20th** – Summarize research and monitoring project resulting from Wisdomkeeper Workshops and related community efforts, and develop draft list of information needs. Develop a partial list of Environmental Education projects with schools from the survey (Methodology J)
3. **Council/Committee Review, October 31st** – Meeting with IRA Council and Environmental/Natural Resource Committee to review product in #3 above.
4. **Draft Strategy, November 1st to 7th** – Develop draft summary and rough strategy for researcher meeting. Meet with Pat Norman as necessary to develop and review draft document. Send document to meeting participants in #6 below.
5. **Researcher Meeting in Port Graham, Week of November 14th** -- Work session with select researchers (Methodology G). Work with Pat and tribal staff to prepare for meeting.
6. **Meeting Summary, November 30th** – Prepare meeting summary and outline of tasks to complete the strategy. Distribute to researchers and IRA Council and Environmental/Natural Resource Committee.
7. **Council/Committee Review, Early December** – Update and review of the committee report and strategy revisions by Port Graham.
8. **Strategy Final Draft, December and January** – Continue strategy development based on comments and direction from the Tribe.
9. **Council/Committee Review of Final Draft Strategy, February** – Work with Pat Norman to develop products and meeting with IRA Council and Environmental/Natural Resource Committee.
10. **Final Documents for Review and Project Defense by UAF Graduate Committee, February to April** – Prepare final documents to meet UAF graduate requirements and defend project.

I hope to defend my project in April, and graduate in May 2012. As appropriate from September 2011 through April 2012, I will also be working on preparing the various write-ups for my MA Research Project to meet UAF requirements. Pat Norman has agreed to review relevant chapters and if time permits, I will also work with the Council to develop a proposal to hold a full Wisdomkeeper Workshop or address other priorities in the strategy. Throughout the project, we will work to make connections with possible funding sources.

Community-Based Research Approach

(Pearce, et al., 2009)



Level of Community Interaction

(Cannon et al., 2004)

8 Community Control	Projects are locally derived, administered and managed, full responsibility for project management is delegated to or assumed by the community and regional organization
7 Partnerships	Partnerships of equals between State and Federal agencies and local users; joint decision making institutionalized
6 Collaboration	Community and regional organizations are involved in policy and decision making about project objectives
5 Cooperation	Use of local knowledge and local research assistants; some research/assessment activities are contracted to local groups and regional organizations
4 Developing Partnerships	Partnerships in project development may start; common objectives sought
3 Communication	Two-way communication begins; research plans begin to include and reflect local concerns
2 Consultation	Communities and regional organizations are consulted on projects; feedback from research findings go to the community
1 Informing	Communities and regional organizations are informed about projects; communication is one way

Appendix E: 2003 Port Graham-Nanwalek Wisdomkeeper Workshop Recommendation Update

A summary of efforts to address the research recommendations from the 2003 Wisdomkeeper Workshop is provided below. Columns 2 through 4 include the recommendations as written in the project report (Huntington, 2003), including a general description of the research topic, the proposed research project, and who is or might be involved in the project. The last column provides a summary of relevant research projects that are completed are underway. When available, we included a summary of project results and recommendations.

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
1	What did conditions used to be like?	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	<u>Status and Results:</u> Completed (the Bidarki Project ²). <u>Results:</u> Most people are familiar with the book “Imam Cimiucia: Our Changing Sea”
2	What has changed and how?	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	Same as #1 above
3	How did people used to manage their resources?	Tribal Natural Resources Programs (C)	Tribal Councils, Jennifer Ruesink & Anne Salomon	<u>Status:</u> Initial projects completed (Bidarki Project and 2006-2007 Port Graham project “Documenting Traditional Management Practices and Traditional Ecological Knowledge” ³) <u>Results and Recommendations:</u> See Row 7 of this table (pp. 4-5) for summary of results and report recommendations from Port Graham Traditional Management/Traditional Ecological Knowledge Project.
4a	What affects invertebrates today?	Oceanography and currents work to determine how larvae are dispersed in the area and whether this is a factor in recovery or repopulation (C, P)	Carl Schoch, Scott Pegau, and others; KBRR	<u>Status:</u> There have been no new studies of oceanography and currents in Port Graham associated with marine invertebrate recovery have been done. A study by Schoch and Chenelot looked at larval transport associated with bull kelp only (and included a site at Passage Island), but did not look at marine invertebrate larval transport.
4b	(What affects invertebrates today?)	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	<u>Status:</u> Completed. <u>Results:</u> The project details both human factors (e.g., harvest patterns) and natural factors (e.g., sea otter predation, oceanographic, and habitat considerations) that influence abundance and productivity of bidarki and other marine invertebrates. The study notes that by addressing multiple factors and integrating Western science and traditional knowledge, we are better equipped to collaboratively develop conservation plans.
4c	(What affects invertebrates today?)	Study of littleneck clams that were seeded to determine reproductive status and success (P)	Local residents in collaboration with shellfish researchers	<u>Status:</u> No additional clam study has been pursued since the initial EVO 1995-2000 CRRC/Tribal restoration project. <u>Results from Previous Restoration Project:</u> The initial project tested seeding and clam bed protection techniques. Due to slow growth, heavy predation, and other potential habitat factors, the project found that natural recruitment to legal sized clams on all beaches was deemed insufficient to sustain a long-term subsistence

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
				harvest pressure. Survival of protected clams was successful. Predation from sea stars, snails, and sea otters was a significant concern.
4d	(What affects invertebrates today?)	Predator exclusion study to compare survival of adult invertebrates in protected and unprotected zones (P)	Tribal Natural Resources Programs in cooperation with intertidal researchers	<u>Status</u> : No predator exclusion studies have been initiated in Port Graham.
4e	(What affects invertebrates today?)	Study of sea otter diet in this area	Alaska Sea Otter Commission, USGS, local residents	<u>Status</u> : There have been no specific studies on sea otter diet in this area. <u>Results from Previous Studies</u> : The Bidarki Project relied on literature on sea otter diet. There have been two recent and ongoing studies of sea otters in central Kachemak Bay that related to diet and feeding habitats of sea otters that may be of interest to the community ⁴ – “Why do sea otters use certain underwater habitats and not others” and “Monitoring Sea Otter Diets in Kachemak Bay, Alaska
4f	(What affects invertebrates today?)	Measurement of contaminant burdens in invertebrates and assessment of how might these levels may affect the invertebrates and those who eat them (P)	Tribal Council, Port Graham Hatchery, National Institute of Standards and Technology, Alaska Maritime Nat’l Wildlife Refuge, Alaska Community Action on Toxics	<u>Status</u> : NOAA responded with three regional contaminant studies: <i>Benthic Community Analysis</i> : The first study was an assessment of bottom sediment quality study in inner Kachemak Bay ⁵ , expanded to include three sites in Port Graham. Overall, selected metal concentrations were elevated in Port Graham Bay, which was suggested may be due to local geology. Organic contaminants were elevated at the site in Duncan Slough. The Duncan Slough had high levels of contaminants related to fuel and combustion by-products, contaminants related to sewage, and mercury. The authors note that none of the levels at any location indicate the “potential for immediate concern” ⁶ . <i>Use of Mussel Watch Program As a Proxy for Contamination in Shellfish</i> ⁷ : This study assessed whether the NOAA “Mussel Watch Program” could be used as a whether blue mussels could be used as a surrogate (i.e., a representative species) for measuring metals and organics in cockles and softshell clams. The study showed that blue mussels are a good surrogate, which suggests its potential for monitoring contaminants in subsistence foods. <i>Contaminant in Fish and Shellfish</i> ⁸ : Contaminant results for fish and shellfish should be available by the end year. The preliminary results for fish work confirmed the presence of parasites fish tissue, that all infections in fish were minor and nonpathogenic, and that the conditions did not exhibit a threat to the

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
				<p>health of the fish or subsistence consumers. <i>Ongoing Port Graham Environmental Program Initiatives:</i> Defer to Violate Yeaton.</p> <p><u>Project Recommendations:</u></p> <ul style="list-style-type: none"> i. <i>Benthic Community Analysis:</i> <ul style="list-style-type: none"> a. Source Identification and Analysis: Since Port Graham sediment distributions are higher than other Kachemak Bay and some of these metals bioaccumulate, Port Graham might consider a study to identify the sources of these harmful chemicals. b. For the harmful metals that bioaccumulate, a study to assess bioavailability and bioaccumulation may be warranted ii. <i>Mussel Watch as a Proxy:</i> No recommendations offered yet. iii. <i>Contaminant Body Burdens:</i> Results are still pending. No recommendations at this time. iv. <i>Port Graham Environmental Program:</i> Defer to Violet Yeaton.
5	What are the most vulnerable points in the life cycle of invertebrates in the area?	Larval survival/recruitment studies (C, P)	Local residents in collaboration with shellfish researchers, KBRR	<u>Status:</u> No known new studies on this general topic.
6	What can be done to improve conditions at those vulnerable points?	Assessment of current management practices (P)	Local residents and agency managers	<u>Status:</u> No known new studies on this general topic.
7	How can tribal management help?	Documentation of tribal management practices and assessment of their biological implications (P)	Tribal Councils, shellfish researchers, others	<p><u>Status:</u> The Port Graham “Documenting Traditional Management Practices and Traditional Ecological Knowledge” study⁹ was undertaken in direct response to this request.</p> <p><u>Results:</u> The report documents historical observations from an Elder Advisory Council, describes an effort by the youth to interview Elders to document traditional knowledge on species of interest (document on species data sheets, maintained by the Village Council), and summarizes the results of two</p>

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
				<p>Wisdomkeeper meetings with the community and the researchers and managers. The report notes that the project is "... only a step in documenting traditional management and ecological knowledge. There is so much more to learn from Elders, youth and others that utilize natural resources"¹⁰. Elders John Moonin and Simeon Kvasnikoff spoke of values of tribal management and involving youth: "[we] need to let the clams, crabs, and other animals reproduce and recover so that they will be plentiful (or remain so) in the future. They said it was essential for Elders to pass knowledge, values, and skills to younger generations [so] that they, too, will be able to look after the environment of which they are a part"¹¹. Finally, the report calls for the Council to apply and document use of its Tribal self-governance authorities. The Council continues to apply and documents its authority on regular basis¹².</p> <p><u>Report Recommendations</u>: Several report recommendations are included below¹³.</p> <ul style="list-style-type: none"> a. <i>Need to Educate of Younger Generations (Conclusion 1)</i>: "The future of tribal natural resource management depends on younger generations acquiring the knowledge, skills, wisdom, and values that are the foundation for traditional Native stewardship. Simply stating the rules and enforcing them does not create the understanding that leads to proper behavior. Education of this kind will not happen by chance, but will require planning, effort, and partnerships with various organizations." b. <i>Participate in State Advisory Committee Processes</i>: The report recommended the Village Council "pursue participation in the advisory committed process as well as attendance at the Board of Fisheries and Board of Game meetings." c. <i>Continue to Develop Partnerships in Research and Management</i>: This is an ongoing process. The strategy under the current project will help to implement that recommendation. d. <i>Community Actions</i>: Recommended actions include continued development and promotion of Elder-youth collaboration in form of conversations, projects, activities, and culture camps and the promotion of partnerships and cooperation with the school to more extensively involve Elders in the school programs and let the school know of the full range of community resources that are available to the school. e. <i>Wisdomkeeper Workshops</i>: The 2007 report and Pat Norman¹⁴ discussed

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
				<p>the community interest in hosting another Wisdomkeeper workshop. The last Wisdomkeeper meeting was held in 2007, and there has been interest in community to host to hold another Wisdomkeeper workshop to both address priority Port Graham Bay issues and learn more about the research that has been completed in the lower Cook Inlet and Gulf of Alaska.</p> <p>f. <i>Nanwalek Collaboration</i>: The building of “stronger relationships with neighboring communities regarding tribal natural resource management” was a recommendation at May 2007 Wisdomkeeper meeting¹⁵.</p>
8a	What should be monitored and how to promote recovery and sustainability of invertebrates?	Beach Walk program conducted by CACS (C)	CACS, local residents	<u>Status</u> : No specific program was developed under the Center for Alaska Coastal Studies Coast Walk program to address this topic.
8b		Extension of Census of Marine Life protocols to monitor new areas and habitats (P)	Katrin Iken, local residents, CACS	<u>Status</u> : One Census of Marine Life sites were established in Port Graham Bay and another at Point Pogibshi. This project determined the number, abundance and biomass of species in coastal habitat compared to other places in Alaska and the world. Kachemak Bay rocky intertidal beaches exhibited relatively high species diversity compared to other places in the world ¹⁶ .
8c		Photography to monitor changes in plant cover throughout the year and over time at selected sites (P)	Jeff Short, local residents	<u>Status</u> : No additional new photography in the Port Graham area that we are aware of.

#	<i>Recommendations from 2003 Wisdomkeeper¹</i>			<i>Status, Results, and Recommendations Updated October 2011</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>	
8d		Habitat mapping (C)	Scott Pegau, KBRR	<p><u>Status:</u> Two mapping projects in the Port Graham by NOAA, which are described below.</p> <p><u>Results:</u> <i>Benthic (Bottom) Habitat Survey:</i> This work was undertaken in the summer of 2005 in collaboration with the community of Port Graham by John Burke¹⁷. GPS, underwater cameras, and NOAA bathymetric data were used to conduct a detailed bottom habitat map of the Port Graham Bay and categorized the habitat into landscape zones. This Geographic Information System (GIS) product provides a baseline from which Port Graham and other managers and researchers can use to manage the natural resources and design other research projects. <i>Hydropalooza: Detailed Seafloor and Shoreline Mapping of Kachemak Bay:</i> The NOAA National Ocean Service (NOS) collected detailed “multi-bean sonar bathymetry data” in Kachemak Bay and Port Graham¹⁸. This project develops high resolution mapping of sea floor bathymetry. This product is currently being used to update Cook Inlet ocean circulation and tidal assessments, map bottom habitats</p> <p><u>Report Recommendations:</u> Burke (2010) included several recommendations:</p> <ol style="list-style-type: none"> This assessment may be used as a starting point for more targeted assessment of marine species to assess their distribution, map important habitats, determine abundance, and many other applications in resource management¹⁹. This survey has many applications and uses for future habitat work in Port Graham. Port Graham might consider building on this benthic GIS database. This study provides a benchmark upon which Port Graham and partners could monitor change over time. The database could be enhanced by adding new and historic or traditional knowledge of the bay²⁰. Hydropalooza data has many applications for management, including resource mapping and oceanography. Kris Holderied with the Kasitsna Bay Lab is very interested in working with the community to define their interests and information needs, and developing collaborative projects to address these needs.

Endnotes/References

- ¹ (Huntington, 2003, p. 5)
- ² (Salomon, Huntington, & Tanape, Imam Cimiucia: Our Changing Sea, 2011)
- ³ (Moonin, 2007)
- ⁴ (Murphy, 2011)
- ⁵ (Hartwell, Apeti, Claflin, Johnson, & Kimbrough, 2011)
- ⁶ (Apeti, Sims, Lauenstein, Hetrick, & Davenport, Assessment of contaminants in subsistence shellfish: Resurrection Bay, Alaska, 2010, p. 24)
- ⁷ (Apeti, Sims, Lauenstein, Hetrick, & Davenport, Assessment of contaminants in subsistence shellfish: Resurrection Bay, Alaska, 2010; Apeti, 2011)
- ⁸ (Apeti, Hartwell, Myers, & Hetrick, 2011)
- ⁹ (Salomon, Tanape, & Huntington, 2007; Salomon, Huntington, & Tanape, 2011)
- ¹⁰ (Moonin, 2007)
- ¹¹ (Moonin, 2007, p. 14)
- ¹² (Moonin, 2007, p. 24)
- ¹³ (Norman, 2011b)
- ¹⁴ (Moonin, 2007, pp. 24-26)
- ¹⁵ (Norman, 2011a; Norman, 2011b)
- ¹⁶ (Moonin, 2007, p. 25)
- ¹⁷ (Murphy, 2011)
- ¹⁸ (Burke J. S., 2010)
- ¹⁹ (Holderied, 2011)
- ²⁰ (Burke J. S., 2010, p. 24)

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**Appendix F: Research Project Update with Discussion Points
for Initial Meeting with the Tribe**

Row	<i>Recommendations from 2003 Wisdomkeeper</i>			<i>Status, Results, and Recommendations (Updated October 2011)</i>	<i>Discussion Points</i>
	<i>General Topic</i>	<i>Project (C = current; P = potential)</i>	<i>Who is or would be involved</i>		
1	What did conditions used to be like?	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	<u>Status and Results:</u> Completed (the Bidarki Project) <u>Results:</u> The results from this collaborative project are discussed in the book “Imam Cimiucia: Our Changing Sea.”	1. Are there other historical conditions related to marine invertebrates or other species of community interest? 2. This project emphasized a regional look at the changes over time. Does the community have more specific questions for Port Graham Bay?
2	What has changed and how?	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	Same as #1 above	Same as #1 above
3	How did people used to manage their resources?	Tribal Natural Resources Programs (C)	Tribal Councils, Jennifer Ruesink & Anne Salomon	<u>Status:</u> Initial projects completed: the Bidarki Project and the 2006-2007 Port Graham project “Documenting Traditional Management Practices and Traditional Ecological Knowledge” <u>Results and Recommendations:</u> See Row 7 of this table (pp. 4-5) for summary of results and report recommendations from Port Graham Traditional Management/Traditional Ecological Knowledge Project.	1. What additional work is needed (if any) to further document traditional natural resource management techniques?
4a	What affects invertebrates today?	Oceanography and currents work to determine how larvae are dispersed in the area and whether this is a factor in recovery or repopulation (C, P)	Carl Schoch, Scott Pegau, and others; KBRR	<u>Status:</u> No new current or other oceanographic studies have been initiated for Port Graham.	1. Should Port Graham pursue a partnership with the Research Reserve, University of Alaska Fairbanks, and/or another entity to begin a study? 2. What research issues and questions should the current studies address?

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
4b	(What affects invertebrates today?)	Bidarki Project (C)	Jennifer Ruesink & Anne Salomon; researchers and elders from Port Graham and Nanwalek	<u>Status:</u> Completed. <u>Results:</u> The project details both human factors (e.g., harvest patterns) and natural factors (e.g., sea otter predation, oceanographic, and habitat considerations) that influence abundance and productivity of bidarkis and other marine invertebrates. The study notes that by addressing multiple factors and integrating Western science and traditional knowledge, we are better equipped to collaboratively develop conservation plans.	
4c	(What affects invertebrates today?)	Study of littleneck clams that were seeded to determine reproductive status and success (P)	Local residents in collaboration with shellfish researchers	<u>Status:</u> No additional clam study has been pursued since the initial EVOS 1995-2000 CRRC/Tribal clam restoration project. <u>Results from Previous Restoration Project:</u> The initial project tested seeding and clam bed protection techniques. Due to slow growth, heavy predation, and other potential habitat factors, the project found that natural recruitment to legal sized clams on all beaches was deemed insufficient to sustain long-term subsistence harvest pressure. Survival of protected clams (either through plastic net covering or protective bags) was successful. Predation from sea stars, snails, and sea otters was a significant concern.	<ol style="list-style-type: none"> 1. Should Port Graham pursue a partnership with Fish and Game, the University, or other entity to address this topic? 2. Does the community have the capacity [e.g., available manpower (staff, contractors, or volunteers) and expertise] to partner with researchers and complete follow-up monitoring?
4d	(What affects invertebrates today?)	Predator exclusion study to compare survival of adult invertebrates in protected and unprotected zones (P)	Tribal Natural Resources Programs in cooperation with intertidal researchers	<u>Status:</u> No predator exclusion studies have been initiated in Port Graham.	<ol style="list-style-type: none"> 1. Should Port Graham pursue this study, and for what species? 2. Has this been done elsewhere in Alaska? 3. What would be the potential concerns of the management agencies, and how could they be addressed?
4e	(What affects invertebrates)	Study of sea otter diet in this area	Alaska Sea Otter	<u>Status:</u> There have been no specific studies on sea otter diet in this area.	<ol style="list-style-type: none"> 1. Should Port Graham pursue a collaborative research project

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
	today?)		Commission, USGS, local residents	<u>Results from Previous Studies:</u> The Bidarki Project relied primarily on literature on sea otter diet (note: this project did complete a regional sea otter abundance survey). There have been two recent and ongoing studies of sea otters in central Kachemak Bay that related to diet and feeding habitats of sea otters that may be of interest to the community -- "Why do sea otters use certain underwater habitats and not others" and "Monitoring Sea Otter Diets in Kachemak Bay, Alaska."	with local residents and organizations such as the Sea Otter Commission, U.S. Fish and Wildlife Service or Geological Survey, or the Research Reserve to study sea otter diet in the area?
4f	(What affects invertebrates today?)	Measurement of contaminant burdens in invertebrates and assessment of how might these levels may affect the invertebrates and those who eat them (P)	Tribal Council, Port Graham Hatchery, National Institute of Standards and Technology, Alaska Maritime Nat'l Wildlife Refuge, Alaska Community Action on Toxics	<p><u>Status:</u> NOAA responded with three regional contaminant studies:</p> <p><u>Benthic Community Analysis:</u> The first study was an assessment of bottom sediment quality study in inner Kachemak Bay, expanded to include three sites in Port Graham. Overall, selected metal concentrations were elevated in Port Graham Bay, which was suggested may be due to local geology. Organic contaminants were elevated at the site in Duncan Slough. The Duncan Slough had high levels of contaminants related to fuel and combustion by-products and mercury. The authors note that none of the levels at any location indicate the "potential for immediate concern".</p> <p><u>Use of Mussel Watch Program As a Proxy for Contamination in Shellfish:</u> This study assessed whether the NOAA "Mussel Watch Program" could be used as a whether blue mussels could be used as a surrogate (i.e., a representative species) for measuring metals and organics in cockles and softshell clams. The study showed that blue mussels are a good surrogate, which suggests its potential for monitoring contaminants in subsistence foods.</p> <p><u>Contaminant in Fish and Shellfish:</u> Contaminant results for fish and shellfish should be available by the end year. The preliminary results for fish work confirmed the presence of parasites fish tissue, that all infections in fish were minor</p>	<ol style="list-style-type: none"> 1. Should Port Graham pursue a partnership with NOAA or other entities to pursue funding for the potential projects suggested by Hartwell et al.? 2. Would Port Graham be interested in collaborating with NOAA to expand the mussel watch program as a surrogate for measuring contaminants in important subsistence species (and assisting NOAA in making connections with other native communities)? 3. Depending on the outcome of the contaminant body burdens in marine invertebrates in the NOAA study, Port Graham may wish to pursue other studies to address any new concerns. 4. How might the benthic community studies and

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	General Topic	Project (C = current; P = potential)	Who is or would be involved		
				<p>and nonpathogenic, and that the conditions did not exhibit a threat to the health of the fish or subsistence consumers.</p> <p><i>Environmental Protection Agency Contaminant Study:</i> EPA funded a study about ten or more years ago. Violet Yeaton may be able to discuss results.</p> <p><u>Project Recommendations:</u></p> <ul style="list-style-type: none"> v. <i>Benthic Community Analysis:</i> <ul style="list-style-type: none"> a. Source Identification and Analysis: Since Port Graham sediment distributions are higher than other Kachemak Bay and some of these metals bioaccumulate, Port Graham might consider a study to identify the sources of these harmful chemicals. b. For the harmful metals that bioaccumulate, a study to assess bioavailability and bioaccumulation may be warranted vi. <i>Mussel Watch as a Proxy:</i> No recommendations offered yet. vii. <i>Contaminant Body Burdens:</i> Results are still pending. No recommendations at this time. 	contaminant body burden studies (results pending) assist Port Graham ongoing efforts to further understand and mitigate the impacts of sewage effluent?
5	What are the most vulnerable points in the life cycle of invertebrates in the area?	Larval survival/recruitment studies (C, P)	Local residents in collaboration with shellfish researchers, KBRR	<u>Status:</u> No new regional studies on this general topic.	<ol style="list-style-type: none"> 1. Should Port Graham pursue a collaborative study with the University of Alaska, Research Reserve, or other researchers to address these research questions? 2. How might this project be linked with other research in the lower Cook Inlet, Gulf of Alaska, or other regional research on this topic? 3. Might the work by Salomon and others help us make a link to regional or statewide
6	What can be done to improve conditions at those vulnerable	Assessment of current management practices (P)	Local residents and agency managers	<u>Status:</u> No new regional studies on this general topic.	

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
	points?				<p>initiatives?</p> <p>4. Would another Wisdomkeeper help to recruit research partners on this topic?</p>
7	How can tribal management help?	Documentation of tribal management practices and assessment of their biological implications (P)	Tribal Councils, shellfish researchers, others	<p><u>Status:</u> The Port Graham “Documenting Traditional Management Practices and Traditional Ecological Knowledge” study was undertaken to address this topic.</p> <p><u>Results:</u> The report documents historical observations from an Elder Advisory Council, describes an effort by the youth to interview Elders to document traditional knowledge on species of interest (document on species data sheets, maintained by the Village Council), and summarizes the results of two Wisdomkeeper meetings with the community and the researchers and managers. The report notes that the project is “... only a step in documenting traditional management and ecological knowledge. There is so much more to learn from Elders, youth and others that utilize natural resources”. Elders John Moonin and Simeon Kvasnikoff spoke of values of tribal management and involving youth: “[we] need to let the clams, crabs, and other animals reproduce and recover so that they will be plentiful (or remain so) in the future. They said it was essential for Elders to pass knowledge, values, and skills to younger generations [so] that they, too, will be able to look after the environment of which they are a part”. Finally, the report calls for the Council to apply and document use of its Tribal self-governance authorities. The Council continues to apply and documents its authority on regular basis.</p> <p><u>Report Recommendations:</u> Several report recommendations are included below.</p> <p>g. <i>Need to Educate Younger Generations (Conclusion 1):</i> “The future of tribal natural resource management</p>	<p>1. What additional work is needed (if any) to further document traditional natural resource management techniques?</p> <p>2. Should Port Graham continue these efforts in collaboration with Nanwalek?</p> <p>3. Should Port Graham pursue funding for and host another Wisdomkeeper Workshop in the community?</p> <p>a. What the guidelines for participant selection from the research and management community?</p> <p>b. Should participant selection be driven just by the questions surrounding the marine invertebrates?</p> <p>c. Does the community wish to seek a complete understanding of related research in lower Cook Inlet and Gulf of Alaska (as in the 2003 Wisdomkeeper</p>

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
				<p>depends on younger generations acquiring the knowledge, skills, wisdom, and values that are the foundation for traditional Native stewardship. Simply stating the rules and enforcing them does not create the understanding that leads to proper behavior. Education of this kind will not happen by chance, but will require planning, effort, and partnerships with various organizations.”</p> <p>h. <i>Participate in State Advisory Committee Processes:</i> The report recommended the Village Council “pursue participation in the advisory committee process as well as attendance at the Board of Fisheries and Board of Game meetings.”</p> <p>i. <i>Continue to Develop Partnerships in Research and Management:</i> This is an ongoing process. The strategy under the current project will help to implement that recommendation.</p> <p>j. <i>Community Actions:</i> Recommended actions include continued development and promotion of Elder-youth collaboration in form of conversations, projects, activities, and culture camps and the promotion of partnerships and cooperation with the school to more extensively involve Elders in the school programs and let the school know of the full range of community resources that are available to the school.</p> <p>k. <i>Wisdomkeeper Workshops:</i> The 2007 report and Pat Norman discussed the community interest in hosting another Wisdomkeeper workshop. The last Wisdomkeeper meeting was held in 2007, and there has been interest in community to host to hold another Wisdomkeeper workshop to both address priority Port Graham Bay issues and learn more about the research that has been completed in the lower Cook Inlet and Gulf of Alaska.</p> <p>l. <i>Nanwalek Collaboration:</i> The building of</p>	<p>Workshop)?</p> <p>d. What should be the target date for the workshop or workshops?</p> <p>e. Should Nanwalek be involved in the Wisdomkeeper Workshop(s), and if so, how?</p> <p>f. What are possible funding sources to fund this project?</p> <p>4. How should youth involvement weigh into planning for a Wisdomkeeper Workshop?</p>

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
				“stronger relationships with neighboring communities regarding tribal natural resource management” was a recommendation at the May 2007 Wisdomkeeper meeting.	
8a	What should be monitored and how to promote recovery and sustainability of invertebrates?	Beach Walk program conducted by CACS (C)	CACS, local residents	<u>Status:</u> No specific program was developed under the Center for Alaska Coastal Studies Coast Walk program to address this topic.	
8b		Extension of Census of Marine Life protocols to monitor new areas and habitats (P)	Katrin Iken, local residents, CACS	<u>Status:</u> One Census of Marine Life sites were established in Port Graham Bay and another at Point Pogibshi. This project determined the number, abundance and biomass of species in coastal habitat compared to other places in Alaska and the world. Kachemak Bay rocky intertidal beaches exhibited relatively high species diversity compared to other places in the world.	
8c		Photography to monitor changes in plant cover throughout the year and over time at selected sites (P)	Jeff Short, local residents	<u>Status:</u> No additional new photography in the Port Graham area that we are aware of.	1. What is the current community interest in monitoring changes in plant cover?
8d		Habitat mapping (C)	Scott Pegau, KBRR	<u>Status:</u> Two mapping projects in the Port Graham by NOAA, which are described below. <u>Results:</u> <i>Benthic (Bottom) Habitat Survey:</i> This work was undertaken in the summer of 2005 in collaboration with the community of Port Graham by John Burke. GPS, underwater cameras, and NOAA bathymetric data were	1. Does Port Graham Environmental Program or any other Tribal Programs have the software and capacity for use of GIS? If not, would they be interested in building this capacity?

Row	Recommendations from 2003 Wisdomkeeper			Status, Results, and Recommendations (Updated October 2011)	Discussion Points
	General Topic	Project (C = current; P = potential)	Who is or would be involved		
				<p>used to conduct a detailed bottom habitat map of the Port Graham Bay and categorized the habitat into landscape zones. This Geographic Information System (GIS) product provides a baseline from which Port Graham and other managers and researchers can use to manage the natural resources and design other research projects.</p> <p><i>Hydropalooza: Detailed Seafloor and Shoreline Mapping of Kachemak Bay:</i> The NOAA National Ocean Service (NOS) collected detailed “multi-bean sonar bathymetry data” in Kachemak Bay and Port Graham. This project develops high resolution mapping of sea floor bathymetry. This product is currently being used to update Cook Inlet ocean circulation and tidal assessments, and bottom habitat mapping.</p> <p><u>Report Recommendations:</u></p> <p>d. The benthic habitat assessment may be used as a starting point for more targeted assessment of marine species to assess their distribution, map important habitats, determine abundance, and many other applications in resource management. This survey has many applications and uses for future habitat work in Port Graham – both research and education.</p> <p>e. Port Graham might consider building on this benthic GIS database. This study provides a benchmark upon which Port Graham and partners could monitor change over time. The database could be enhanced by adding new and historic or traditional knowledge of the bay.</p> <p>f. Hydropalooza data has many applications for management, including resource mapping and oceanography. Kris Holderied with the Kasitsna Bay Lab is interested in working with the community to define their interests and information needs, and developing projects to address Tribal needs.</p>	<p>2. Would the Port Graham be interested in obtaining and building upon the benthic habitat mapping information from NOAA?</p> <p>3. Is Port Graham interested in additional habitat mapping and population assessment of marine invertebrates and other marine species of Port Graham Bay? If so, what are the priority species and projects?</p>

Appendix G: Summary of November 17th Community-Researcher Meeting in Port Graham

Port Graham Natural Resource Project

DRAFT November 17 Meeting Notes

Meeting Participants:

Port Graham:	Harrieta McGhan, EC Daryl Kruen, Council Staff/ANA Moriah Marquez, EC Staff Jennie Kamluck, EC Pat Norman, VC/1 st Chief	Lydia McMullen, EC Fran Norman, Tribal Administrator Violet Yeaton, EC Staff Stella Meganack, VC & EC
Chugachmuit:	Jim Henkelman Susan LaBelle	Helen Morris
Researchers:	Sarah Hardy, UAF/Fisheries Sue Saupe, Cook Inlet Regional Citizens Advisory Comm. (in Homer meeting only)	Kris Holderied, NOAA/Kasitsna Bay Lab

Facilitator (Student): Glenn Seaman

General Outcomes: Several themes emerged from our discussions at the meeting. The following list includes what I drew from the meeting. I would appreciate if other meeting participants would share their comments and recommended changes or additions to this list.

1. *Intersection of Environmental and Natural Resource Interests:* Pat Norman previously expressed a desire to utilize the existing Port Graham Environmental Health Committee, along with the Village Council, to provide a sounding board from tribal natural resource efforts. The need and benefits of merging environmental and natural resource efforts was reinforced at this meeting.
2. *Integrate Port Graham and Chugachmuit Language Programs and Elder Participation in Education Programs:* Chugachmuit and several Port Graham participants emphasized the importance building language components and Elder involvement into youth education program. The Port Graham's 2006/2007 natural resource project also emphasized the need to increased Elder involvement in natural resource youth education programs.
3. *Expand Partnerships/Access Additional Expertise:* The November 17 meetings included three additional scientists, a physical oceanographer (Kris Holderied), and marine biologist/biological oceanographer (Sarah Hardy), and a chemical oceanographer (Sue Saupe, who was unable to attend the Port Graham meeting). All participants openly shared their knowledge and experience, but also realized the need to both seek additional expertise and partnerships in efforts to develop a research strategy. There were a lot relevant projects underway or planned that the community was not aware of, which emphasized the need for increased communication between the tribes and Western scientists and managers.
4. *Wisdomkeeper Workshops:* The last Wisdomkeeper Workshop was held in Port Graham in September 2007. The Tribe expressed interest in hosting additional Port Graham/Nanwalek workshops to both bring in additional expertise (noted in #3 above) and learn more about relevant coastal and marine research in lower Cook Inlet and northern Gulf of Alaska. Violet Yeaton also

expressed an interest looking for ways for the Tribe's Environmental Program to assist in the effort. The Tribe will likely pursue funding and partnerships to support additional Wisdomkeeper meetings.

5. *Cultural and Indigenous Property Rights*: It is important that partners and funders respect cultural and indigenous property rights over their information related to traditional harvest areas, traditional knowledge, and other cultural property. Violet shared an example of this on the need to control access to and use of Tribal information traditional natural resource harvest areas.
6. *Collaboration with Nanwalek*: Although not specifically discussed at this meeting, Pat Norman has expressed the Council's interest in continuing to develop and expand collaboration with the neighboring community of Nanwalek. This goal is further reflected several goals and objectives of the 2007 "Integrated Resource Management Plan for Nanwalek and Port Graham."

Research Projects: A number of potential research projects and collaborations were identified at the meeting. The potential projects I noted from group discussions are listed below. I identified the potential collaborators or partners in this effort, most of which identified by group participants at the meeting. This not a conclusive list of projects, and several participants indicated we need to bring in other expertise. The initial ideas that would require follow-up with potential partners.

1. *Integrate Hydropalooza, Benthic Data, and Other Geographic Data into a Consolidated Port Graham GIS Database (NOAA, KBRR, or GIS Contractor)*: Group discussions highlighted how much geographic data is available for the area, ranging from the Hydropalooza project and benthic habitat mapping by NOAA to Port Graham data on traditional use areas. The idea of developing a consolidated GIS database with relevant GIS data for Port Graham area was discussed. The idea was that this information could be put together in a form that could be accessed by Tribe in an easy to use format (e.g. Arcview), and can shared as appropriate (understanding some information is sensitive). Researchers suggested that this would be a good database to help focus future efforts and update over time as new information becomes available. Kris initially thought that the NOAA Biogeography group in Silver Spring, Maryland, might be able to assist in this effort if we could find travel funds. Kris later noted (11/18 communication) that the Biogeography group was currently overcommitted. Port Graham might explore future collaborations with NOAA, Kachemak Bay area organizations, or others organizations..
2. *Documentation of Historical Conditions in Port Graham Bay (Port Graham Village Council, Environmental Committee, and Elders)*: Port Graham participants noted that the Bidarki Project did not document historical conditions in Port Graham Bay inside of (east) of Portage Island. The group suggested historical natural resource conditions and harvest areas in Port Graham Bay should be documented. This would be a valuable source of data for future research projects.
3. *Expanded Use of Hydropalooza Data (Kris Holderied)*: Before the meeting started, Kris discussed some of the possibilities with Pat Norman for further modeling and use of Hydropalooza data. I was not part of that discussion, and will follow-up with Kris on possible uses of that data and products within Port Graham.
4. *Develop Local Natural Resource Monitoring Program (KBRR, Seldovia and Nanwalek Village Tribes)*: The group introduced the idea of developing a local natural resource monitoring program that could be undertaken by the Tribe, the youth, and the community at large. No details were discussed. The Seldovia Village Tribe has done some water quality monitoring in Seldovia Bay.

5. *Sea Otter Feeding Studies (Sea Otter Commission, USGS or KBRR sea otter/marine mammal specialist)*: The Bidarki project identified the need for additional sea otter feeding studies. The group reinforced this need, indicating that sea otters may be adversely affecting the recovery clam, cockle, and crab populations. The group briefly discussed the work Angela Doroff and other KBRR staff in Kachemak Bay, and briefly discussed whether similar studies could be done in the Port Graham and Nanwalek area with community participation.
6. *Harbor Seal Studies*: Several possible studies with harbor seals (a very important subsistence resource) were introduced.
 - a. *Contaminant Studies (Harbor Seal Commission)*: Both Pat and Lydia identified that this is an important local concern. Pat had noted in a side conversation that the Harbor Seal Commission is seeking funding for such a study, which the Port Graham Village Council has supported.
 - b. *Seal Health Monitoring Studies (Harbor Seal Commission, NOAA Alaska Fisheries Science Center)*: Local residents have noted the blubber of seals is much thinner than usual this fall, and are concerned about the health of seals. The community is interested in learning if this has been reported elsewhere, and why this may be occurring.
 - c. *Local Seal Studies (Harbor Seal Commission, Village Council, Glenn Seaman)*: Helen noted that the youth were very interested in past biosampling studies with the Harbor Seal commission. The group discussed the possibility of a community-based research project on locally caught seals. This might include feeding habits, life history studies, and collection of samples for contaminant studies.
7. *Network with Kachemak Bay and other Regional Studies*: Several ongoing or future studies were identified by visiting researchers. Port Graham might contact these researchers for possible work in the Port Graham area.
 - a. *Intertidal Monitoring Studies (Terry Klinger and John Harper)*: A study was recently funded to study the use of videos to monitor intertidal habitats. Sue Saupe thought the study was focused on mussels, barnacles, and focus, but suggested that there may be a possibility to expand the study to include species of importance to the native communities. Little is known about the details of the study, or even if it would be an option to include a site in Port Graham.
 - b. *NMFS Habitat Studies (Jon Kurland/Alaska NMFS Habitat Conservation Division Director; Kris Holderied; Sue Saupe)*: There is a new emphasis within NMFS to do more marine habitat studies in Alaska, and has apparently chosen Cook Inlet as its initial focus. The community might contact NMFS with relevant research and management questions, and invite them to work in Port Graham. Sue and Kris might be able to help to facilitate communication with NMFS?
 - c. *UAF/KBRR Drifter Study (Mark Johnson/UAF and Megan Murphy/KBRR)*: Sue and Kris learned of a recently funded drifter study in lower Cook Inlet. We need to learn more about this project and if it might help answer some research questions of importance to the community.
 - d. *Other Studies*: Work with other researchers to learn of other relevant research in area.
8. *Port Graham Bay Resource Assessments*: Pat Norman noted that the community is interested in learning more about the abundance, important habitats of marine invertebrates and fish, and factors limiting their abundance. The groups did not discuss how this could be accomplished. The initial surveys may include marine invertebrates:
 - a. *Littleneck and Butter Clams, Cockles (ADF&G Homer Office or KBRR?)*: This is one of the long-standing priorities of the Council, initially identified in the 2003 Wisdomkeeper Workshop. If possible, the community would like to see some surveys this summer.

- b. Dungeness, Tanner, and King Crabs (ADF&G Homer Office? UAF?): The community has seen a few more crabs in the bay in recent summers, and would like to identify current abundance and important habitats.
9. *Oceanography Studies (Sue Saupe, Kris Holderied, Steve Okkonen, and others)*: Kris (and Sue Saupe at the morning meeting) provided an overview on a relatively new project to develop a circulation model for Cook Inlet. The National Ocean Service is leading the project in collaboration with the Alaska Energy Authority and other partners. This will be a three dimensional model (from the surface to bottom) for all of Cook Inlet that will allow the general prediction of currents. A higher resolution model will be available for portions Kachemak Bay and Port Graham were a Hydropalooza surveys were completed. This product will be a good management and education tool, but has its limitations. Additional work would be needed in Port Graham and surrounding area to more fully understand the water movements and currents. We did not get into additional studies in any detail, which would require additional discussion with physical oceanographers.
10. *Larval Ecology and Transport Studies (Sarah Hardy and Georgina Gibson, UAF)*: Sarah Hardy's specialty is marine biology, with one of her specialties being larval ecology. Sarah briefly mentioned her snow crab work in the arctic and similar work could be done in the Kachemak Bay area on Tanner crab (will get more info from Sara). We discuss larval transport issues briefly, but did not identify specific projects. Sara suggested that we might want to involve a larval specialist in these discussions. She suggested one her colleagues at UAF, Georgina Gibson, who has done extensive research on larval transport.

Natural Resource Education Programs: Port Graham places a high priority on educating and involving youth in natural resource issues and management programs. Both community members and researchers identified a number of examples of education projects for youth that could be associated with research project. Some may be developed as a stand-alone project, but would require some assistance from a scientist or environmental educator with experience in this respective area. The goal is to develop projects that are relevant to regional natural resource issues.

Port Graham noted that they have received funding for a tribal youth program. Felecia Yeaton described this program at the November 1 meeting. This program creates about 14-20 summer jobs for youth during the summer. Tribal Youth Program projects often include activities such as community beautification, assisting Elders with various tasks, and community and coastal cleanup. Youth activities could easily include some small natural resource projects of local relevance.

As expressed by Pat Norman and the findings from the 2007 ANA project, the community would also like to see the school include more regionally relevant science in the school programs. We did not discuss this at the November 17th meeting. This should be discussed between the Tribe and school before the end of the project.

The following projects were identified as examples of possible natural resource education projects with youth. Potential collaborators and research project (described previously) that in most closely related to the education project are noted in parenthesis.

1. *Drift Card Project (Seldovia, Port Graham and Nanwalek tribal youth programs, local oceanographers – Research #9 or 10)*: Youth could work on a project to design and implement a

- drift card project around certain research questions. Drift card studies have been done by both the KBRR and Seldovia Village Tribe, so there is considerable expertise available. This might be a viable project for the students to plan during the school year and then implement during the summer.
2. *Sea Otter Feeding Habits (KBRR or USGS – Research #5)*: This was identified as a possible project, although no specifics were discussed. It was suggested we contact Angie Doroff for suggestions.
 3. *Plankton Monitoring (KBRR – Research #10)*: The idea of plankton monitoring was proposed and could be related to some of the larval transport questions described in the 2003 Wisdomkeeper Workshop report with respect to marine invertebrates. The KBRR education staff has considerable experience in citizen based plankton monitoring, and would be a logical partner in this effort if they're interested.
 4. *Harbor Seal Studies (KBRR, NOAA, Harbor Seal Commission, Others – Research #6c)*: This would be good study to get youth involved in research. This might involve feeding studies (stomach content analysis), age studies (aging from teeth or claws), and/or life history studies (reproductive track analysis). Glenn noted he has done this work for four years on Arctic seals and whales.
 5. *Summer Clam (and Crab?) Abundance Surveys (ADF&G or KBRR – Research #8a)*: This would be a good summer project to get youth involved in research.
 6. *Larval Recruitment Studies (Sarah Hardy, KBRR – Research #10)*: Sarah noted that there are a number of relatively simple techniques to collect larvae and determine when larvae settle. A scientist and/or educator from UAF or the KBRR may be a good partner in a larval recruitment study.

**Appendix H: Port Graham's Invitation to the
March 9th Research Planning Meeting**

Native Village of Port Graham

PORT GRAHAM VILLAGE COUNCIL

63998 GRAHAM ROAD, UNIT 1
P.O. BOX 5510 • PORT GRAHAM • ALASKA 99603-5510
907-284-2227 FAX 907-284-2222

Tribes, Researchers, and Educators:

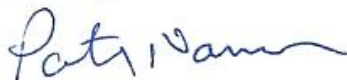
February 14, 2012

In September 2003 the Port Graham Tribe hosted a Wisdomkeeper Workshop in Port Graham to collaborate with Kachemak Bay area Tribes, tribal organizations, researchers, managers, and environmental educators on natural resource and environmental issues of importance to the Tribes, particularly related to decline of clams, cockles, crabs, and bidarkis. The purpose of the 2003 and follow-up workshops was to provide a forum for Tribes and other participants to share traditional knowledge and scientific knowledge our natural resources and traditional use areas, to educate Western researchers and managers of natural resource and environmental issues of importance to the Tribes, and to promote the development of Tribal-researcher partnerships to address these issues. A number of important projects resulted from this effort. The Port Graham Tribal Council recently started a project to evaluate the research that has been done since the 2003 Wisdomkeeper, identify gaps and research needs, and develop partnerships with researchers and educators to address these needs. Additional information on the current project is attached.

In collaboration with area researchers, we have developed a draft outline of research priorities (see attachment, pages 3-6). The Tribe is hosting a work session with other Tribes and regional researchers and educators on March 9th in association with the upcoming Kachemak Bay Science Conference. On behalf of the Port Graham Village Council, I would like to invite you to join us. The meeting is tentatively planned to be held at the Alaska Islands and Ocean Visitors Center – the site of the Science Conference – on March 9th, from 9:30 – noon, followed by a complementary lunch of pizza and salad from noon to 12:45 pm. The purpose of the meeting is to identify research and education projects of mutual interest, and to chart a course to implement these projects. Our emphasis will be on what we can do in the next few years.

We look forward to seeing you in Homer! We also encourage you to participate in the Kachemak Bay Science Conference (see <http://kbayscience.org/>), which starts at 1 pm following our meeting. If you have any questions on the March 9th work session, please contact Glenn at 907-299-1748, or glennseaman@pci.net.

Sincerely,



Patrick Norman
Port Graham Village Council

Attachment

Distribution:

John Kvasnikoff, Nanwalek IRA Council
Nick Tenape, Nanwalek

James Kvasnikoff, Nanwalek IRA Council
Michael Opheim, Seldovia Village Tribe

Angela Doroff, KBRR
Kris Holderied, NOAA
Sarah Hardy, UAF/SFOS
Debbie Tobin, UAA/Kachemak Bay Campus
Anne Salomon, Simon Fraser University
Ken Goldman, ADF&G
Sue Saupe, CIRCAC

Megan Murphy, KBRR
Dominic Hondolero, NOAA
Georgina Gibson, UAF/IARC
Jessica Ryan, KBRR
Henry Huntington, Pew Foundation
Jeff Hetrick, Alutiiq Pride Hatchery

Port Graham Natural Resource Project: Draft Research Priorities
Background for March 9, 2012 Homer Workshop

Project Background: Port Graham hosted the first Port Graham/Nanwalek Wisdomkeeper Workshop in September 2003. This workshop represented a collaborative effort with the Port Graham and Nanwalek Tribes, researchers, educators, and managers to address priority natural resource issues and exchange local, traditional, and scientific knowledge. Workshop discussions focused around the Tribes' interest in revitalizing depressed marine invertebrate populations – clams, cockle, crabs, and bidarkis (black leather chiton) – and various environmental contaminant issues. Workshop outcomes identified a number of research topics, projects, and possible partners to continue effort. Port Graham sponsored several follow-up workshops (November 2004, and May and September 2007). A number of research projects and Tribal natural resource projects resulted from this effort. Port Graham and Nanwalek also collaborated in the development of an “Integrated Resource Management Plan” to further detail the Tribes overall natural resource goals and objectives (Attachment 1).

Port Graham would like to reinvigorate these efforts. Specifically, the Tribe would like to (1) identify and evaluate the work that has been accomplished since the 2003 workshop, (2) identifying gaps and additional research needs, and (3) strengthening relationships and build partnerships with the researchers and educators to address these needs. Port Graham entered into a collaborative project in September with Glenn Seaman, a graduate student under the UAF Cross-Cultural Studies program, to start this process (see goals and objectives in Attachment 2). Multiple meetings were held this fall and winter with the Tribe and researchers. An ad hoc research advisory committee was established to assist us in this effort. We summarized natural resource and environmental projects since the 2003 Wisdomkeeper Workshop, and identified information gaps, developed draft research priorities, and identified possible education and outreach projects (see table, pages 3-6). The Tribe and researchers agreed that we should hold a final workshop with key researchers during the Kachemak Bay Science Conference to identify and begin to move forward on projects that will address Tribal needs. This final workshop is scheduled to be held in Homer, on Friday morning, March 9th.

Project Support and Research Priorities: The key to meeting the natural resource research and management issues in the bay will be to develop partnerships between the Tribe and the research and management community. Given the current economic climate, a collaborative approach is best way for the Tribe to accomplish its goals and objectives. Moreover, while the Tribe has much to offer with in the form of local and traditional knowledge, it does not have all the expertise or manpower to address these issues alone: working together will vastly increase our success.

The Tribe's goal is to be at the table with Western researchers and environmental educators. Initial efforts to build these relationships have been successful, but this is only a start. For these efforts to reach their full potential, the Tribe must have the natural resource staff and resources to continue these efforts. These needs include, but are not limited to:

- Natural Resource Staff Support – This should be accomplished through a combination of contractual and Tribal staff. Additional staff support is needed to follow-up and build on current efforts, conduct additional research education projects, and help develop and support collaborative projects.

- Travel Support – Travel support is needed for contractors, researchers, and educators to meet and work with the Tribe. Academic and agency researchers are faced with declining budgets, and we need funding for invitational travel to build partnerships and support integration of these projects with the Tribe.
- Project Funds – We need funding to support projects by the Tribe and to help support efforts with our research partners. Some projects might be undertaken by the Tribe (or contractors) with training and support from research partners. Other projects are best accomplished in partnership with researchers and the Tribe.
- Education Support – Involving youth and other community members in research or related education projects is a priority of Tribe where appropriate and practical. There is a huge potential to involve youth in both summer program and the schools. The Tribe would build the staff and resource support to help make this happen. Education programs should be rooted in its natural resources and resource issues.
- Tribal Collaboration – Port Graham and Nanwalek often work together on projects of mutual benefit. Nanwalek has not been directly involved in the current project over the last few months, but have tried to keep them informed and provided an opportunity to be involved, and will continue to do so. While our interests do overlap, Nanwalek also has unique natural resource interests and needs. We also would like to coordinate with the Seldovia Village Tribe in this effort, and learn more about their natural resources and environmental program.

A draft list of research priorities was developed by the Tribe based on discussions with researchers, which is outlined in the table below. This should be considered a start, as we will continue to refine this list with input from researchers, educators, and others.

There are five parts to this table:

- ☐ General Topic – This includes a draft description or title of the general topic.
- ☐ Potential Partners – This column includes the potential partners for this project. At present, it is listed by organization, but as we continue to develop these partnerships we will identify specific people.
- ☐ Priority and Year – This includes the relative priority, and also represents the year (from present) that would like to get these efforts started.
- ☐ Project Description – This includes a general project description and background for the research project. These should be considered draft, as we hope this will initiate discussion and welcome feedback from researchers. We also identified possible companion education (E) and community involvement (CI) component.
- ☐ *Partners, Support, and Actions: As a goal of the March 9 workshop, we would like to identify specific partners, support, and actions that would be pursued to support these efforts. We hope to fill out this section, set priorities, and move forward on a number of these projects.*

Draft Port Graham Research Recommendations				Partners, Support, and Actions – March 9 Workshop		
General Topic	Potential Partners	Priority & Year	Draft Project Description	Partners	Potential Support or Funding	Actions
Ocean Circulation Studies	Tribe, UAF, NOAA, KBRR	1 and 2+	<p>Research: To understand the physical factors that influence the distribution and abundance of marine invertebrates, we need to have a better understanding of the current and oceanography of Port Graham Bay and how it is affected by oceanography of lower Cook Inlet. Physical oceanography research is expensive and will take both time and money. NOAA and its partners are in the process of developing a three dimensional model of ocean currents in Cook Inlet, and UAF/KBRR are leading a drifter study that will include Port Graham Bay. The Tribe would like engage in discussions how these projects might help address Tribal needs.</p> <p>E&CI: The Tribe and researchers discussed a few projects as examples to both educate and facilitate community involvement in current studies. One example might include a drift card study. The Tribe would like to get one or more of these studies going this summer to get youth involved in studies of bay.</p>			
Larval Ecology and Transport Studies	Tribe, UAF, KBRR	1 and 2+	<p>Research: A number of questions have been raised with respect to larval transport and source of larvae for clams, cockles, and bidarki. Researchers have identified a number of questions regarding larval transport and ecology with respect to recovery of marine invertebrates that should be explored. It is difficult to find funding for such studies; the Tribe should continue to work with UAF, KBRR, and others to find creative ways to fund this research.</p> <p>E&CI: As with the circulation studies, a number of possible projects and other activities to involve youth were discussed. This included plankton monitoring and larval settlement studies.</p>			
Regional Bidarki	UAF, NOAA	1-2+	Research: A number of the research projects that the Tribe is seeking will help address some key questions on			

Draft Port Graham Research Recommendations			Partners, Support, and Actions – March 9 Workshop		
Potential Partners	Priority & Year	Draft Project Description	Partners	Potential Support or Funding	Actions
		larval transport and recruitment raised by Anne Salomon and others in the Bidarki Study. Some of the oceanographic and larval recruitment studies may also begin to answer some of the questions about the recruitment of bidarkis in the region.			
NOAA	ongoing	Research: The Hydropalooza project collected detailed multi-beam sonar bathymetry data for the Kachemak Bay and Port Graham area. This will have great utility in bottom habitat mapping and other modeling efforts in the region. Kris Holderied, Director of NOAA Kasitsna Bay Lab identified a number products including 3-D benthic mapping, and mapping hard/soft bottom sediments. E&CI: A number of products will have great utility for use in education and outreach efforts.			
Tribe, KBRR, Alutiiq Pride Hatchery, ADF&G	1	Research: Conduct survey of clam abundance on the Port Graham Bay beaches surveyed in the EVOS 1995-2000 clam restoration project. Establish the extent to which beaches have recovered and assess natural predation factors. Complete preliminary survey during the summer 2012 if possible. E&CI: Involve Tribe and youth in the process. Coordinate with Tribe's summer Tribal Youth Program and explore programs with the schools.			
Tribe, Alutiiq Pride Hatchery, ADF&G	1+2	Research: Conduct survey of Dungeness, king, and/or tanner crab abundance in Port Graham Bay to assess abundance and distribution in Port Graham Bay. Start in 2012 if possible. E&CI: same above.			
Tribes, KBRR, NOAA, CIRCAC, Contract or	1	Research: There is a considerable amount of spatial data available data available for the Port Graham area. This includes, but is not limited to, local and traditional harvest areas, NOAA's marine habitat mapping information, shoreline survey data, Hydropalooza data, subsistence data, aerial photos, etc. Both the Tribe and researchers alike identified the value of compiling this information in			

Draft Port Graham Research Recommendations				Partners, Support, and Actions – March 9 Workshop		
General Topic	Potential Partners	Priority & Year	Draft Project Description	Partners	Potential Support or Funding	Actions
			a single GIS source and make it available for viewing and use through Arc View. The Tribe could look for partners and securing grants to contract out this task. E&CI: Data will be available to Tribal staff, researchers, and schools for education use. Some information is sensitive (etc., subsistence harvest areas), and the Tribe may limit access to such data.			
Sea Otter Feeding Studies – Doc. LTK	Tribes	1	Research: Collect LTK on sea otter feeding habits over the course of the year. Information would be compiled and shared with researchers. E&CI: The Tribe and youth could get involved in collecting this data.			
Sea Otter Feeding Studies w/ Researchers	Tribe, Sea Otter Com., KBRR, USGS, other	2	Research: Through both local observations and scientific studies, sea otters have been known to feed on crabs, clams, and cockles and a variety of other marine invertebrates that are used by local residents. Efforts to restore the impact of sea otters on marine invertebrate must take sea otter predation into consideration. The Tribe could work with researchers to design and seek funding for a sea otter feeding study. E&CI: Wherever possible, researchers should involve the Tribe in the research (e.g., observers, boat use) and consider options for companion youth involvement or education components.			
Network with other Regional Studies	Tribe, KBRR, NOAA, UAF, CIRCAC, Others	ongoing	Research: Researchers identified a number of ongoing or future studies in the lower Cook Inlet that might help Port Graham address some of its information needs. Examples including an intertidal monitoring study, habitat assessment surveys by NMFS, and some drifter studies by UAF and KBRR. The Tribe needs to work with research partners to identify and, as appropriate, collaborate with researchers on the projects.			
Local Natural Resource Monitoring	Tribes	2+3	Research: Tribal and research participants discussed the possibility of developing local natural resource monitoring programs. There was a lot of interest in this, but the Tribe			

Draft Port Graham Research Recommendations				Partners, Support, and Actions – March 9 Workshop		
General Topic	Potential Partners	Priority & Year	Draft Project Description	Partners	Potential Support or Funding	Actions
			felt that the efforts to get several research projects going was a higher priority.			
Targeted WK Workshops	KBRR, NOAA, UAF, and others	ongoing	Research: The Tribes priority is promote small, targeted Wisdomkeeper Workshops to build partnerships and address their immediate/priority research needs such as resource assessments, oceanography, and larval transport/ecology work.			
Broader WK Workshops		2+, every 2-3 years	Research and E&CI: The community is very interested in promoting additional Workshops such as 2003 Wisdomkeeper Workshops. These workshops help to build partnerships, educate the community about the research in Cook Inlet and Gulf of Alaska, and provide a forum for Tribes and researchers to share their knowledge and expertise. However, they would like focus efforts in the first year to get some key research projects underway. The Tribe is currently considering having another Workshop in 2013.			
Historical Marine Invert. Distribution	Tribes	ongoing	Research: Researchers suggested that the Tribe document historical distribution of marine invertebrates and local harvest areas. Such data would have a variety of uses, including in the design/development of research projects, and evaluating changes over time. E&CI: The collection of this LTK would necessarily involve the Tribe. Youth may also be able to get involved in collecting the data.			

ATTACHMENT 1:

RELEVANT GOALS AND OBJECTIVES FROM THE INTEGRATED RESOURCE
MANAGEMENT PLAN FOR NANWALEK AND PORT GRAHAM

Goal 1: *To maintain and protect the biodiversity of our natural resources.*

Objective A: Analyze and summarize all available local natural resource data.

Goal 3: *To preserve our traditional relationship with air, sea and land.*

Objective A: Develop a comprehensive record of traditional ecological knowledge regarding each species and resource of interest including each contributor's comments on historic populations and characteristics over time.

Objective B: Provide education for local children and others about our traditional ways and nature of dependence on our natural resources.

Objective C: Utilize local traditional ecological knowledge and cultural traditions to help develop a natural resource program that is meaningful and effective for our traditional lifestyle.

Goal 4: *To facilitate and promote individual and village involvement in natural resource issues and management.*

Objective B: Work with the school to provide quarterly classroom presentations and projects.

Objective C: Conduct community meetings and presentations to provide program updates and information as well as solicit and document input from all participants.

Objective D: Provide education, public information and community outreach to local citizens on natural resource issues and information.

Objective E: Record community input on flip charts at meetings or on community natural resource survey forms, summarize and enter into tribal natural resources data base.

Objective F: Contribute information to the village newsletter about the natural resources and the salmon hatchery program.

Objective G: Coordinate the implementation of the IRMP with other village groups, government agencies and other stakeholders.

Objective J: Review the IRMP at least every five years and coordinate with other natural resource agencies and update as needed.

Objective K: Create and develop open channels of input and information sharing from village residents, elders and others who are interested in natural resource issues or local traditional ecological knowledge.

ATTACHMENT 2:
Port Graham Natural Resource Goals and Objectives

Initial Port Graham goals and objectives were established to help focus on the conservation and management of the marine resources of Port Graham Bay, with particular emphasis on the revitalization of important marine invertebrates. The Tribe has a keen interest in the terrestrial environment and other marine resources in important traditional uses areas, but wanted to focus initial efforts on understanding and effectively managing the natural resources of Port Graham Bay.

Goals:

1. To improve communications and develop research partnerships between the Tribe and Western researchers and managers.
2. To conserve, manage, and revitalize marine invertebrate populations that are important for subsistence to the Tribe.
3. To maintain a clean, healthy, and productive marine environment in Port Graham Bay.

Objectives:

1. To assess existing invertebrate populations, identify important habitats, and understand the natural processes that influence the distribution and abundance of important marine invertebrates.
2. To identify information needs and research projects to address the conservation and management of important marine invertebrates.
3. To identify opportunities for youth involvement in research and management to help youth acquire the knowledge, skills, and traditional Native values of resource stewardship and tribal natural resource management
4. To engage the community, researchers, educators in collaborative community-based projects.
5. To develop a strategy to address the research needs and develop the partnerships to effectively conserve, manage, and revitalize important marine invertebrates.

Appendix I: March 9th Workshop Summary

**Port Graham Natural Resource Project:
March 9, 2012 Research Strategy Workshop**

March 18 Draft – by Glenn Seaman

Workshop Participants

Tribal Organizations:

Pat Norman, 1st Chief, Port Graham Village Council
Michael Opheim, Director, Environmental Program Coordinator, Seldovia Village Tribe
Nick Tanape, Natural Resource Committee, Nanwalek
Jerry Demas, Acting Tribal Administrator, Nanwalek Village Council
Alexandra Hetrick, Nanwalek Village Council
Hanna Eklund, Researcher/Iqsak Curriculum Project, Chugach Regional Resources Commission
Jeff Hetrick, Director/Alutiiq Pride Hatchery, Chugach Regional Resources Commission

Other Researchers and Educators:

Sue Saupe, Science Director, Cook Inlet Regional Citizens Advisory Committee
Anne Salomon, Assistant Professor, Simon Fraser University
Dominic (Dom) Hondolero, Researcher, NOAA/Kasitsna Bay Lab
Kris Holderied, Director, NOAA/Kasitsna Bay Lab
Debbie Tobin, Assistant Professor, UAA/Kachemak Bay Campus
Ken Goldman, Fisheries Biologist, Alaska Department of Fish and Game (Homer)
Georgina Gibson, Research Assistant Professor, UAF/International Arctic Research Center
Sarah Hardy, Assistant Professor, UAF/School of Fisheries and Ocean Sciences
Jessica Ryan, Education Coordinator, Kachemak Bay Research Reserve
Angie Doroff, Research Coordinator, Kachemak Bay Research Reserve
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Student/Meeting Facilitator:

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Workshop Summary

The March 9th meeting was an open and enthusiastic exchange of information and ideas by the Kachemak Bay tribes, researchers, and educators around the natural resource issues and research and management needs of the Port Graham Tribe. Although the focus was on Port Graham, it became clear in the meeting that many of these issues and needs were shared by or of interest to other tribes, researchers, and natural resource managers. Moreover, these issues were more widespread than Port Graham, and many apply equally in Kachemak Bay and its sub-bays. As a result, there was strong interest by all participants to collaborate and work together to address their collective research and management needs.

In this summary, I will attempt to capture the main thrust or outcomes of the meeting. This is intended to be a start of an ongoing collaborative process to develop and implement a strategy to address the Port

Graham Tribe's and the overlapping interests and needs of the group. This summary is offered as draft, and I welcome and encourage recommendations from the group.

Port Graham Goals

A summary of the Port Graham goals and objectives of the natural resource project and the focus of the March 9th meeting was handed out at the beginning of the meeting (see Appendix to this summary). After participant introductions, Pat Norman provided a brief historical overview of priority natural issues and focus of this project. He noted the primary focus of this effort was to understand the cause of the decline of and how we can restore local populations of historically important marine invertebrates – cockles, clams, crabs, and bidarkis – in Port Graham Bay. As an example, Pat noted that village Elders noted that cockles and clams – and important subsistence food sources – used to be very abundant in Port Graham Bay from 30 to 35 years ago when they crashed and never recovered. He noted that through traditional management practices they would capture depleted resources from other areas and transplant them into to Port Graham Bay to restock depleted resources. Such a process is not allowed in today's Western management systems, or at best would require an extensive review and permitting process.

Pat noted how the Tribe would like to collaborate with researchers to develop and implement a plan (or plans) to answer these questions. The Tribes goal is to try to bring these resources back to harvestable levels. One of the key questions is what research projects come first, and how do we move forward to develop, fund, and implement these projects? Moreover, as we move forward in this effort, he wanted to make sure that we educate and train our younger people in how we can continue to be responsible for natural resources as our Elders have taught us. Where possible, he would like youth to be part of the research process.

Policy or Management Focus

There was a lot of discussion throughout the meeting on the importance of having clear management policies or objectives which research projects will be designed to inform. For the Port Graham project, one the main goals is to restore marine invertebrate populations (i.e. clams, crabs, cockles and bidarkis) that are important for subsistence to the Tribe. Some researchers noted that there is a significant difference between these marine invertebrates (e.g., different larval characteristics for each species – some have larval stages that last days, others months), and it is important to be clear which resources you project will address. At several points in the meeting it was emphasized that “what drives the decline of marine invertebrates is not necessarily the same as the recovery”, and it is important to look broadly at the possible causes and effects, not just focus on the causes of the decline. Also, different recovery and management strategies would need to be developed for different species.

Participants indicated the importance of focusing on the management entity you are trying to influence. In some cases, it may be appropriate to focus on Board of Fisheries and in other cases on the Tribe through Traditional Tribal Natural Resource Management. The group should identify the policy and decision-making processes it wants to influence, and then develop the research projects – both social and natural science research projects – to address those needs.

Local Involvement/Capacity Building/Youth Education

Several Tribal and research participants emphasized the importance on involving the community in research and monitoring projects to engage communities, promote exchange of traditional knowledge and scientific knowledge and to build community capacity. Pat Norman emphasized this in the project introduction and at various points in the meeting. Nick Tanape noted that scientists should “do research with the people first, before doing your research.” This is the approach Anne Salomon used in the development of the Bidarki Project. The two tribes and the researcher were equal partners and involved in all aspects of the Bidarki Project. The project also included funding to pay local research partners for their time and logistical support. Where possible, researchers should work with tribes in defining the problem, involve the tribes in research design and development, provide opportunities for local employment, and work with the Tribe in dissemination of the results and defining new research questions.

Several ideas were identified in the meetings. One idea was to develop marine invertebrate and ocean monitoring programs to include the development of local capacity. Another idea was to collaborate with Port Graham’s summer Tribal Youth Program to engage students in research and monitoring programs (e.g., clam studies or larval recruitment studies). A third idea is to develop a curriculum in school to get youth involved in research and monitoring during the school year. These are only a few of the ideas, and researchers and educators should work with tribes to identify possibilities on involving the community in research both in the summer and during the school year.

Research Projects

The bulk of the group discussions focused on research projects, including both social and natural system research. This was a very spirited and engaging discussion focused towards addressing the Port Graham Tribes goal of restoring marine invertebrate populations in Port Graham Bay. The three main questions from the Port Graham Tribe were: (1) what research is needed to understand the factors that influence marine invertebrate abundance and to help us develop a management system to restore and maintain these populations; (2) what research should come first; and (3) how to plan for and pursue these projects? I will attempt to summarize what I think came out of the meeting, and what seemed to emerge as the tasks to undertake in the first two years. Meeting participants should consider this draft for your review and comment, which we can continue to revise and update.

R#	Topic	Priority Complete	Lead (L) & Partners(P)	Need and Action
1	Pre-decline invertebrate distribution and habitats	ASAP Fall 2012?	L-PG Tribe P-NW Tribe	<i>Need:</i> Researchers need to understand the historical distribution of clams, crabs, cockles, and bidarki (e.g., sources and sinks of larvae). Known habitat conditions would also be helpful. Include relevant information on years of decline and other relevant historical information. Pat indicated much of this is available. <i>Action:</i> Prepare maps of historical distribution of key marine invertebrates in Port Graham Bay. Mine existing information and maps, and expand as needed. May require additional interviews with Elders and other residents.
2	Develop GIS with what we know	Year 1 Fall 2013?	L-PG Tribe P-CIRCAC, NOAA, KBRR, others?	<i>Need:</i> Researchers stress the importance of consolidating existing spatial data for the Port Graham Bay in one place, and in an easy-to-use format (ArcView?) and made available to the research planning group. Data would be consolidated from a variety of Tribal, agency, and other sources. <i>Action:</i> Seek funding to collect and consolidate existing special data. This will require additional Tribal support staff/contractor, as well as a qualified GIS contractor to design and construct the system. This will include such things as high resolution shoreline photos, Hydropalooza data, benthic habitat mapping information, EVOS clam restoration studies, etc. As funding permits (secondary goal), this might include a system to the Tribes to enter local spatial information and observations as it becomes available.
3	Develop GIS Database	Year 2?	L-PG Tribe?	<i>Need:</i> Researchers identified this as important, but suggested that this might be “different project” (something that could be follow-up project?). <i>Project:</i> Let’s discuss ... need more info from researchers and GIS specialists.
4	Local Support/ Capacity	ASAP Summer 2012, Ongoing	L-PG Tribe P-	<i>Need:</i> Port Graham needs to obtain funding for staff/contractor to continue facilitation, support Tribe collaborations with researchers, educators, and other tribes, and assist with travel support for researchers and educators, and collaborate with other tribes ([see “Background for March 9, 2012 Homer Workshop” in Pat’s meeting invitation, pp.1-2) <i>Action:</i> Seek grants to support the Tribe’s participation and work with researchers and educators to support collaborative projects.
5	Population Assessment (start with clams)	ASAP Summer 2012	L-Alutiiq Pride Hatchery (Jeff Hetrick), P-PG Tribe, Youth	<i>Need:</i> Assess present populations of littleneck and butter clams in Port Graham Bay undertaken as part of EVOS clam restoration project. Work with Port Graham’s summer Tribal Youth Program. Collect information to help guide future research planning. Expand population assessments to other marine invertebrates as funding permits. <i>Action:</i> Repeat surveys in Duncan Slough and Passage Island undertaken in late 90’s under EVOS restoration project to determine status of clam populations in these sites. (Jeff H. indicated this could be completed in a few days)

R#	Topic	Priority Complete	Lead (L) & Partners(P)	Need and Action
6	Oceanography of PG Bay	ASAP Year 1, Ongoing	L-PG Tribe P-NOAA, KBRR, UAF, SVT	<i>Need:</i> To understand the oceanography of Port Graham Bay and feed oceanographic and larval transport models. Collaborate with Megan Murphy and UAF on drifter study ⁶ . Coordinate with organizations do oceanographic studies. <i>Action:</i> (1) consult with SVT to learn more about their drift card study, what they learned, and how their experiences may be applied or modified to answer Port Graham questions; (2) collaborate with researchers to develop a research plan for understanding Port Graham Bay currents, including potential drift card studies (with youth) and collaboration with other ongoing or proposed studies (consider planning meeting with the tribes in the fall 2012); and (3) coordinate efforts with larval transport and settlement studies (see rows 7 to 9).
7	Physical : Oceanographic Model	ASAP Underway	L: NOAA/ NOS P: CIRCAC, UAF, Tribes, others...	<i>Need:</i> Detailed 3-D hydrographic modeling is needed to better understand the physical oceanographic processes in Cook Inlet, Kachemak Bay, and the sub-bay waters (like Port Graham and Seldovia bays). Moreover, this physical model is needed for larval transport and trophic ecosystem models. The resolution of map will be higher in Kachemak Bay (including Port Graham and Nanwalek) due to the detailed bottom mapping from the Hydropalooza study. <i>Action:</i> Complete the modeling effort now underway. [Kris indicated that this model – or parts thereof – will be completed in a little over a year]
8	Larval Transport – Conceptual Model	ASAP Year 1	L: UAF (Georgina Gibson) P: NOAA, Tribes, KBRR	<i>Need:</i> An “Individual Based Model” (IBM) is needed to model larval transport Lower Cook Inlet, Kachemak Bay, and its’ sub-bays. With the physical model expected to be completed in a little over a year, this is perfect time to seek funding for this study. <i>Action:</i> Develop a proposal(s) to various funding sources to develop an IBM for lower Cook Inlet and Kachemak Bay (or whatever is the appropriate scale). Coordinate with other oceanographic studies to improve the resolution and reliability of the model, and its applicability to the sub-bays of Kachemak Bay. Consider collaborative efforts with tribes to provide input to and test the model.
9	Lower Trophic Ecosystem Model	Year 2+	L: UAF (who?) P: KBRR, NOAA, Tribes	<i>Need:</i> A lower trophic ecosystem model is needed to better understand the sources and relationships of nutrients, phytoplankton, and zooplankton to support larvae. <i>Action:</i> Identify the partners, design a study, and seek funding for this modeling effort. Consider collaborative efforts with the tribes to provide input to and test the model.

⁶ UAF (Mark Johnson) and KBRR (Megan Murphy) are collaborating in a study to improve circulation modeling efforts with satellite-tracked drifters (see project description on p. 15, KBRR’s “What’s New in the Bay”). Megan Murphy was unable to attend our meeting, and we did not discuss this study at the March 9th meeting. One of the goals of that study is to “To improve understanding of how the sub-bay waters exchange with the larger bay waters.” In 2012, the KBRR will release drifters off Seldovia, east of Cohen Island, and near Bear Cove.

R#	Topic	Priority Complete	Lead (L) & Partners(P)	Need and Action
10	Larval Settlement and Survival Studies	Year 2	L: UAF (Sarah H.) P: KBRR, NOAA, Tribes	<i>Need:</i> As one researcher noted, a “model” is caricature of nature, and does not fully represent nature itself. Research should not be limited to models. Several researchers noted that we should develop studies to measure larval recruitment and survival. These studies should include local knowledge and involve the tribes, and potentially include education components with youth. <i>Action:</i> Work with the tribe(s) to identify priority marine invertebrates and develop a study to evaluate larval recruitment rates. Begin looking for funding so work may begin within the next year or two.
11	Crab Genetic Marker Studies	Year 1, Ongoing	L: UAF (Sarah H.) P: KBRR	<i>Need:</i> Genetic marking is an important tool to help solve the mystery of relatedness of stocks of marine invertebrates and fishes and the potential sources of larvae. This particularly helpful in species like crab where the larvae may be in a planktonic stage (subject to ocean currents) for up to several months. We should support efforts to fund these studies in the Gulf of Alaska and lower Cook Inlet region. <i>Action:</i> Sarah has developed proposals to do this work in Cook Inlet and Prince William Sound, and should continue to pursue this research. Work should be designed to consider the management questions in Port Graham Bay.
12	Hydropalooza Study and Benthic Habitat Mapping	Year 2	L: NOAA (J. Burke) or others? P: PG and NW tribes	<i>Need:</i> Kris Holderied has identified a number of uses of the multi-beam sonar bathymetry data from the Hydropalooza Study for research and management. One potential project to help Port Graham is to use the benthic habitat data from John Burke’s study in Port Graham Bay with the Hydropalooza data to develop detailed bottom sediment maps for Port Graham Bay. <i>Project:</i> Develop a biologist-engineer collaboration to design and develop this study. Coordinate with other researchers to determine how this work can complement and support other research in research and modeling efforts. Collaborate with the tribes in the development and implementation of this study. Submit proposals for funding.
13	Ocean Acidification	Year 2+	L: ? R: ??	<i>Need:</i> Ocean acidification was identified by a few participants as one environmental factor the will affect the productivity of marine invertebrates and other fish in future. No details were discussed. This should be considered by the group in future discussions. <i>Project:</i> ??

R#	Topic	Priority Complete	Lead (L) & Partners(P)	Need and Action
14	Policy and Management	Year 1, Ongoing	L: PG Tribe P: NW Tribe	<p><i>Need:</i> As Nanwalek's James Kvasnikoff noted in the Bidarki Project publication "Imam Cimiucia: Our Changing Seas" (pp. iv and v): "This project has changed our community. It made us open our eyes and seeing that overharvesting can cause problems in the whole ecosystem. It made us think about our subsistence resources and it prompted local leadership to ask: How do we manage this? How do we regulate the harvest so that our ecosystem can sustain itself and people can be fed at the same time?" This observation highlights the importance of management and policy decisions, the role that tribes can play in process.</p> <p><i>Project:</i> Port Graham and Nanwalek should continue to develop projects and find the resources to address natural resources management issues. Organizations that fund the science will want to see that the tribes are committed to developing management strategies to address their natural resource issues. These issues may be addressed through a combination of state and tribal management authorities.</p>
15	Targeted and Broader Wisdomkeeper Workshops	Ongoing	L: PG Tribe P: this group and others as appropriate	<p><i>Need:</i> The Port Graham Tribe's current priority is to promote small, targeted workshops to build partnerships and address their immediate/priority research needs such as resource assessments, oceanography, and larval transport/ecology work. The Tribe may seek to have larger workshop in Port Graham or Nanwalek in the next few years.</p> <p><i>Project:</i> Organize and support additional workshops as needed.</p>
16	NPRB Research Planning	Year 1+	L: PG Tribe and resource agencies	<p><i>Need:</i> The NPRB annually solicits comments on research topics of interest in preparing their annual request for proposals. Several meeting participants suggested we submit our needs and requests to NPRB. This needs to be done by June to weigh into the NPRB planning process.</p> <p><i>Action:</i> The group agreed to teleconference in early May. At that time, the group can decide how and what it wants to submit to the NPRB.</p>

Funding and Support

The group agreed that we need to pursue a diversity of potential funding sources to support these research and related education projects. These should include targeted grant funding sources for the more focused research or "hard science" (e.g., NPRB, National Science Foundation general oceanography or biodiversity program, non-profits (e.g., Pew, Moore, and Sloan foundations), and opportunistic funding (often small pots of money derived through interagency or other group collaborations, but which cumulatively can make an important contribution). In addition, the group supported the current effort to identify Port Graham management and research needs and projects, and felt that this should be used as guide to help direct future research efforts.

Next Steps

We made a lot of progress in this two and half hour meeting, and the meeting appeared generate a renewed interest and excitement in this collaborative effort. It was suggested at the end of meeting that

we teleconference the first week of May, and I agreed to send out a meeting request to the group for a meeting in the May 1-4 timeframe.

Several participants suggested we not put our efforts on hold by several weeks, but instead start to scope out grant opportunities and other opportunistic funding to begin to address these issues. While it is still fresh – rather than forgetting about it until May – we should bring ideas for proposals to move this initiative forward. We developed some great ideas for projects and proposals, and should continue to think of what else we might need, and share our ideas with the group. We could talk about different calls for proposals, where the research activities could fit, what the deadlines are, and map a way for us to move forward. Moreover, people could think of potential opportunistic sources of funding, as well as possible short-term or long-term efforts targeted towards non-profit organizations like the Pew, Moore, or Sloan foundations. We can discuss these in May.

The group should also consider when researchers might regroup in the fall or sometime soon thereafter. In the course of this project, it was also suggested the Port Graham Tribe might want to participate in the KBRR Science Advisory Group, the KBRR Community Council, or the Kasitsna Bay Lab Advisory Group. Pat was interested in these ideas, and such opportunities should be considered to support future collaborations.

Discussions thus far have intentionally focused on defining research needs and projects. Interested participants might want to have a separate meeting the Port Graham Tribe to discuss possible youth education programs with the Tribal Youth Program this summer. As Pat mentioned at the meeting, the Tribe would like to start a few small natural resource projects with youth this summer. This meeting might follow May research project discussions.

Appendix J: Port Graham Project Goals and Objectives

Goals:

1. To maintain a clean, healthy, and productive marine environment in Port Graham Bay.
2. To conserve, manage, and revitalize marine invertebrate populations that are important for subsistence to the Tribe.
3. To improve communication and develop research partnerships between the Tribe and Western researchers and managers.

Objectives:

1. To assess existing invertebrate populations, identify important habitats, and understand the natural processes that influence the distribution and abundance of important marine invertebrates.
2. To identify information needs and research projects to address the conservation and management of important marine invertebrates.
3. To identify opportunities for youth involvement in research and management to help youth acquire the knowledge, skills, and traditional Native values of resource stewardship and tribal natural resource management.
4. To engage the community, researchers, and educators in collaborative community-based projects.
5. To develop a strategy to address the research needs and develop the partnerships to effectively conserve, manage, and revitalize important marine invertebrates.

March 9th Research Work Session

Invitation: “The purpose of the meeting is to identify research and education projects of mutual interest, and chart a course to implement these projects. Our emphasis will be on what we can do in the next few years.”

Process to Date:

1. Evaluate research accomplishments since the 2003 Wisdomkeeper Meeting
2. Port Graham workshops with the Tribe, and follow-up collaborative meeting with Tribe and Researchers.
3. Summary review by the ad hoc research advisory group.
4. Tribe developed a draft research priority list.

Questions: We will work through the draft list of priorities, and ask participants to consider the following

1. Are these the right questions and priorities to address the management questions?
2. What are the research projects to address these needs?
3. How can this research connect to other research in Kachemak Bay?
4. What should happen first?
5. What are potential companion projects and programs to educate and engage youth natural resource research and management?
6. What can the Tribes do to help?
7. As identified in the Table ... what can we all do to move forward from here? Who are partners, specific actions, and how can we move these forward?
8. What are the big challenges, and how can we work together and collaborate to overcome them?
9. Others?