FINAL REPORT OF THE EXXON CULTURAL RESOURCE PROGRAM

by

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and
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Report submitted by Exxon Shipping Company and Exxon Company, USA [A Division of Exxon Corporation] in fulfillment of State of Alaska Archaeology Permit 91-4, Forest Service Special Use Permit 4118.01 (Amendments 2 and 3), National Park Service ARPA Permit 89-KATMAI-ARO-003, National Park Service ARPA Permit 90-KENAI FJORDS-ARO-001.
Published by Exxon Shipping Company and Exxon Company, USA (a Division of Exxon Corporation).
Library of Congress no. 92-075393.
EXECUTIVE SUMMARY

Exxon Company, USA developed and implemented a cultural resource program in 1989 with the assistance of state and federal agencies and Native organizations to address a myriad of cultural resource issues related to the Exxon Valdez oil spill cleanup. The program’s primary goal was to protect cultural resources during the cleanup by identifying archaeological sites, determining the potential effects of treatment on them, and mitigating impacts through avoidance and site monitoring. The site protection program ensured that Exxon’s oil spill cleanup program of 1989-1992 complied with state and federal historic preservation laws and regulations. In the process, the Cultural Resource Program collected a sizable amount of new information regarding the history of the Alutiiq region (Prince William Sound and the Gulf of Alaska).

Archaeologists surveyed over 5,000 km (3,100 mi) of Prince William Sound and Gulf of Alaska shoreline during four field seasons. In 1990, 265 km (164 mi) of shoreline were intensively surveyed. Two limited archaeological surveys were conducted in 1991, but no new sites were recorded in either 1991 or 1992. In 1989, 264 new sites were discovered and added to the Alaska Heritage Resource Survey (AHRS), and another 62 new sites were found in 1990. Archaeologists also inspected and monitored hundreds of treatment areas throughout the program. Project activities in 1991 and 1992 focused primarily on training cleanup personnel and monitoring cleanup operations.

A number of governmental agency and Native organization cultural resource representatives were directly involved in deciding how to protect sites through the Interagency Shoreline Cleanup Committee (ISCC) in 1989 and the Cultural Technical Advisory Group (CTAG) in 1990 and 1991. Members of these groups reviewed Exxon’s shoreline treatment plans and the actions (constraints) Exxon proposed for site protection. The formation of a cultural resource advisory group (CTAG), and the use of simple, standardized archaeological constraints are two of the program’s notable contributions to emergency site protection.

The 326 new sites which the Exxon Cultural Resource Program discovered and added to the AHRS represent 54% of the 609 archaeological sites known from the spill area. Hundreds of previously known sites also were visited and documented (updated) during the project. In all, 526 (86%) of the 609 sites in the project area were visited by program staff. Artifacts generally were collected only from areas where treatment was planned. Only 333 items were collected, along with 23 carbon, tephra, and material sam-
ples. All site data were transmitted to the State of Alaska Office of History and Archaeology (OHA) for inclusion in the AHRS and in OHA files which are used for resource management and research.

The Cultural Resource Program developed and maintained a comprehensive site database for sites in the project area. The data were vital both in planning and administering the site protection program, and in synthesizing the information gathered during the program and presented in the final reports.

The three previous Cultural Resource Program reports (Mobley et al. 1990; Haggarty et al. 1991b; Betts et al. 1991) integrated administrative objectives, problems, and solutions with the scientific results obtained by the project. The 1989 and 1990 data pertaining to sites within the jurisdiction of the region’s four major governmental agencies were summarized in the 1990 report (Haggarty et al. 1991b), along with an analysis of the maritime cultural ecology of the Alutiiq area which encompasses the territory of the Chugach and Koniag people. We analyzed and interpreted these data from a cultural ecological perspective, and described seasonal and demographic aspects of the settlement patterns in existence prior to Euroamerican contact. Dramatic changes in Native settlement and subsistence patterns occurred in the Alutiiq region over time, and our analysis addressed the causes and effects of these changes. The reports fulfilled the permit stipulations under which the work was conducted, and copies have been distributed to libraries, cultural resource managers, Native organizations, industry representatives, and interested members of the public.

The Cultural Resource Program made a unique contribution to the archaeology of the Alutiiq region by identifying large villages, site remnants, and intertidal sites containing organic artifacts and subtidal deposits. These sites contain information which will further our knowledge of Alutiiq cultural developments and the geological processes which affect sites. Radiocarbon dates for two archaeological sites in Prince William Sound dated by the program extend the known age of human habitation in the area to earlier than 4000 B.P. (before present). We dated selected tephra layers from sites on the little-known outer Kenai Peninsula coast, and the results provide initial chronological data for the area. Project staff also documented numerous post-contact sites containing information about the Russian fur trade, fox-farming, mineral prospecting and mining, and World War II-era military defense. This report analyzes these sites and puts them in a socio-economic context.

The Cultural Resource Program benefited greatly from the direct input of agency and Native organization representatives. This involvement enabled project archaeologists to simultaneously protect sites and survey large stretches of previously unexamined remote shoreline. In addition to fulfilling the obligations required by the state and federal archaeology permits, Exxon went beyond compliance and contributed a wealth of data pertinent to the history of the region. Research and cultural resource management opportunities in Prince William Sound and the Gulf of Alaska have been enhanced by the program, and a better understanding of the Native and Euroamerican history of the Alutiiq region has been acquired because of the efforts of all involved.
ACKNOWLEDGEMENTS

It is our privilege to thank the many people who supported this project with their ideas and expertise. Among the most encouraging have been Otto Harrison, currently President of Exxon Shipping Company, and Michael Smith, Exxon Company, USA Alaska Area Manager. The foresight and wisdom of their supportive decisions throughout the program translated directly into site preservation and a better understanding of the region's history.

We are grateful to all of the archaeologists who participated in the extensive fieldwork programs in 1989 and 1990, especially Charles Mobley who directed the program in 1989. Archaeologists Robert Betts and Jon Erlandson helped conduct the 1991 and 1992 programs, and we appreciate their contributions. Aron Crowell and Rick Reanier also contributed to the program during the past two years. We gratefully acknowledge the professionalism and dedication of our colleagues who were involved in the project.

The Exxon operations staff and supervisors who assisted us throughout the past two years deserve our thanks, particularly Scott Naumann, Frank Box, Chris Katsimpalis, John Czarnecki, and Al Snook. Their cooperative attitude ensured our program's success.

Many Exxon managers, staff, and contractors were also very helpful and a pleasure to work with: Tom Krueger, Chipper Loggie, Mike Barker, Andy Teal, Tom Kelley, Chris Dash, John Phillips, Julie Arin, Diane Nore, John Garrison, Ed Owens, Tim Doyle, Chera Thomison, Blake Reikana, Tim O'Connor, Judy Meidinger, Buzz Rohlfing, Ron Riehs, Ole Olson, and Greg Grant. Dorothy Fletcher of Anchorage has provided expert administrative support by editing our reports and keeping us organized.

We are indebted to the archaeologists and other representatives from state and federal agencies and Native organizations who contributed their professional expertise to the program: Joan Dale, Chuck Holmes, Judy Bittner, Tim Smith, Michele Jesperson, Dave McMahan, and Doug Reger of the Alaska Office of History and Archaeology; John Johnson of Chugach Alaska Corporation; John Mattson and Leo Keeler of the Forest Service; Ted Birkedal, Paul Gleeson, Susan Morton, and Jeanne Schaaf of the National Park Service; Chuck Diter and Debbie Corbett of the Fish and Wildlife Service; Ron Kent of the Bureau of Indian Affairs; Bob Travis of the Coast Guard; Rick Knecht of Kodiak Area Native Association (KANA), and all the agency personnel who marshalled the permit applications through the system. Special thanks to Bob Shaw, deputy SHPO (State Historic Preservation Officer), for patience and perseverance with the artifact curation agreement which took longer than necessary due to forces beyond our control.

We appreciate the helpful report review comments provided by John Johnson of Chugach Alaska Corporation, Joan Dale and Jo Antonsen of the Alaska Office of History and Archaeology, Ted Birkedal of the National Park Service. We are also grateful to the following Alaskans who helped us
research this report: Bruce Merrell and Dan Flemming of the Z.J. Loussac Public Library in Anchorage who helped with numerous research and bibliographic issues; Diane Brenner and Walter Van Horn who provided access to the archives and collections of the Anchorage Museum of History and Art; Marge Heath of the University of Alaska Fairbanks Alaska and Polar Regions Department who helped with historic photo requests; Michael Burwell, Minerals Management Service shipwreck expert who helped with shipwreck issues; and Georgie Reynolds and Theresa Rick of the US Army Corps of Engineers at Elmendorf Air Force Base for assistance with the Aircraft Warning Service material. Thanks to the American Museum of Natural History Library Archives for permission to cite the A.J. Stone material; the Special Collections, University of Washington Libraries for reproducing the Port Hobron photos; the San Francisco Maritime National Historic Park for the A.J. Fuller photo; Martin Longo of Mission Critical Systems, Anchorage for digitizing the figures; Ruth Ann Carnahan of C-Graphics for typesetting advice; and the staff of Color Art Printing of Anchorage.

Lastly, we dedicate this report to all who work to preserve cultural resources in Alaska and throughout North America:

*The past - the infinite greatness of the past - For what is the present after all but a growth out of the past?*  
   
   -Walt Whitman
**List of Acronyms and Abbreviations**

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<tr>
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<td>ACHP</td>
<td>Advisory Council on Historic Preservation</td>
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<td>ACC</td>
<td>Alaska Commercial Company</td>
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<td>ADEC</td>
<td>Alaska Department of Environmental Conservation</td>
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<td>AHRS</td>
<td>Alaska Heritage Resource Survey</td>
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<td>CTAG</td>
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<td>Department of Natural Resources</td>
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<td>Final Shoreline Assessment Program</td>
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<td>Federal On-Scene Coordinator</td>
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<td>Geographic Information System</td>
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<td>Gulf of Alaska</td>
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<td>HAZWOPER</td>
<td>Hazardous Waste Operations and Emergency Response</td>
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<td>Interagency Shoreline Cleanup Committee</td>
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<td>Knight's Island Alaska Consolidated Copper Company</td>
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<td>Russian American Company</td>
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CHAPTER 1

INTRODUCTION

Cultural resource management in Alaska involves numerous cultural areas, site types, regulatory issues, public parties, and private citizens (Workman 1985). Exxon responded to the Exxon Valdez oil spill of March 1989 by implementing an extensive shoreline assessment and cleanup (treatment) program in Prince William Sound and the Gulf of Alaska (Figure 1). At the same time, the Cultural Resource Program (CRP) was initiated to protect the area’s archaeological sites from potential impacts during shoreline assessment and treatment, and to address numerous cultural resource management concerns generated by the massive cleanup effort.

During the cleanup, Exxon took into account new and existing information about the location and nature of sites in the area, and conducted the cleanup in compliance with state and federal cultural resource management regulations. A host of government and Native organization personnel worked with CRP archaeologists to provide recommendations and assistance throughout the cleanup which was completed in June, 1992. This report describes the 1991/92 site protection program and summarizes program contributions to cultural resource management and to Alaskan archaeology. This final report should be read in conjunction with prior reports to understand how the program was developed and implemented.

The Cultural Resource Program generated a great deal of new archaeological and historical information (Mobley et al. 1990; Haggarty et al. 1991b; Betts et al. 1991; Erlandson et al. 1992; Wooley et al. 1992; this volume). Reconnaissance shoreline surveys during the 1989 emergency response defined the type and location of cultural resources in the spill area (Mobley et al. 1990:147-190). Detailed site descriptions and subsequent cultural ecological analysis of sites documented in 1989 and 1990 refined the general understanding of environmental influences on pre-1741 Native settlement, subsistence, and demographics in the Alutiiq culture area (Haggarty et al. 1991b:205-247). Throughout the project, staff gathered archaeological and archival information pertaining to many post-1741 sites. The sites and their role in understanding recent changes in Alutiiq culture and land use are discussed in Chapter 3.

The program went beyond merely fulfilling the numerous identification and protection tasks required under permit during cleanup. Exxon archaeologists conducted an extensive archaeological site update program and produced thousands of pages of confidential site information and maps.
for use by agency and Native organization archaeologists; published and distributed project results in a series of public reports; presented project results at local and national meetings; helped fund and organize Alaska Archaeology Week events; and researched the environmental context and historical connections of sites in the area. The Exxon Cultural Resource Program went beyond historic preservation law compliance and made an enduring contribution to Alaskan archaeology while protecting the area’s sites.

The Cultural Resources of the Alutiiq Region

The region associated with the spill extends roughly 750 km (466 mi) east to west by 500 km (310 mi) north to south, encompassing Prince William Sound (PWS), the outer coast of the Kenai Peninsula and the Barren Islands, the Kodiak Archipelago, and the Pacific coast of the Alaska Peninsula from Cape Douglas to Stepovak Bay (Figure 1). Less than 15% of the 14,500 km (9,000 mi) of shoreline in the region was actually touched by oil (Owens 1991). The spill area—shorelines where oil was either present or suspected—includes approximately 900 miles of shoreline within this region.

The tectonic history of the area is complex, with profound implications for the study of the history of the region’s maritime people. The area is a tectonically active “collision coast” where two of the earth’s major crustal plates converge causing earthquakes and continual modification of the region’s shorelines. Buried peat deposits in the adjacent Cook Inlet region indicate six to eight major subsidence events occurred in that area over the past 4,700 years (Combellick 1991:22). Much of PWS and small portions of the Kenai Peninsula and Kodiak Archipelago were uplifted by the 1964 earthquake (Plafker 1965, 1967). Most of the Kodiak Archipelago and the Kenai Peninsula subsided during the quake, while the Alaska Peninsula remained largely unaffected by the event. Numerous drowned trees and intertidal peat deposits marking former landforms inundated by salt water as a result of subsidence were noted during CRP surveys (Mobley et al. 1990:Fig. 9). Birket-Smith (1953:179) and de Laguna (1956:3) attributed an apparent lack of early village sites in PWS to site destruction caused by shoreline submergence and erosion.

Prince William Sound and the Kenai Peninsula are the ancestral homeland of the Chugach Alutiiq while the Kodiak Archipelago and the Alaska Peninsula are home to the Koniag Alutiiq. The term Alutiiq refers to the language, culture, and historic territory of these people (Pullar and Knecht 1990:9). The Alutiiq region roughly coincides with the area affected by the Exxon Valdez spill. The region’s archaeological record spans 10,000 years, encompassing a wide range of prehistoric and historic sites that record occupation and use by people of Native, Russian, and American ancestry.

Range of Cultural Resource Sites

Most sites in the project area are located near the coast due to past human reliance on ocean resources. Some sites (or portions thereof) have eroded or subsided and now are located in the intertidal zone whereas others are still located in the adjacent upland areas. Many sites are difficult to recognize even to the trained eye. Some sites consist of a single stone tool lying on the beach. Other sites, such as villages occupied by hundreds of people a few generations ago, may now be noticeable only as a cluster of depressions in the earth where semi-subterranean houses once stood.

Various site types are present in the project area. Middens are sites where human occupation refuse has been deposited. Thickness may range from a few centimeters to several meters with the remains of shellfish often forming the dominant cultural material, though bone or fire-cracked rock middens occur. These sites are not always visible on the surface, but can be detected in cut banks, steep erosional slopes (Figure 2), caves, rockshelters, and rocky promontories. Middens generally are located in the uplands, although some are being
Figure 1  Cultural Resource Program Project Area.
eroded by wave action, resulting in disturbed archeological material accumulating in the intertidal zone. At a few places, past subsidence preserved intact midden material beneath beach cobbles.

Wet midden sites often contain preserved wood and plant fiber artifacts including masks, basketry, and other organic items. Such sites are rare and are usually found when wave or stream action erodes a portion of the site exposing well-preserved materials, although they also may be located entirely in the subtidal zone as a result of tectonic subsidence. Wet sites have the potential to clarify aspects of prehistory not possible under normal preservation conditions (Jordan and Knecht 1988; Haggarty et al. 1991b:182-183; Anchorage Daily News 1992).

Caves and rockshelters (rock overhangs, the walls and ceilings of which provide natural shelter) may contain artifacts, faunal debris, burials, rock art, or other evidence of human occupation or use. Although generally located in the uplands, some examples are close to sea level. Rock art sites, including pictographs (rock paintings) and petroglyphs (rock carvings), are relatively rare in the Alutiiq region. Petroglyphs, when found, are usually in or near the intertidal zone, while pictographs are generally in the uplands. Most petroglyphs known in the project area are in the Kodiak region, whereas most pictographs are located in PWS.

Fish traps are a type of prehistoric structure used by Alutiiq people to capture salmon and other fish. These structures generally consist of rock walls or wood stake fences located in streams, tidal channels, or intertidal flats adjacent to streams.

Post-contact (1741-present) Native, Russian, and Euroamerican sites occur sometimes as isolates (individual objects), but more often in association with other features. These include cabins, fox farms and fox traps, docks, roads, World War II bunkers, and mining and logging camps. Historic structures and artifact scatters (multiple objects) are most common in the uplands, although some are present in the intertidal zone.

At eroded prehistoric and historic sites, fragile organic midden elements (shell, bone, charcoal, etc.) are destroyed by wave or stream action leaving only scattered deposits of large artifacts in the intertidal zone or in stream channels. Eroded sites were classified as artifact scatters or isolates. Most intertidal artifacts, such as prehistoric adzes, projectile points, stone lamps, or historic mining equipment, are erosional remnants of upland villages, camps, or industrial sites.

Along the coast, many different environmental forces affect site integrity, which is a critical factor in determining the scientific value of an archeological site. Site integrity is better preserved in upland or subtidal sites because they usually are less exposed to the wind and wave action that rapidly alters sites. When upland sites are exposed to wave and tidal action, either through subsidence

\[ \text{Figure 2} \quad \text{Eroding midden, Kodiak area.} \]
or erosion, the remaining intertidal portion of these sites loses the contextual integrity of an intact upland site.

Sources of Potential Site Impact

Both natural and human impacts can have a devastating effect on cultural resources, including damage to or destruction of entire archaeological sites. The natural and human sources of potential impacts to cultural resources are discussed in Mobley et al. (1990:101-114) and Haggarty et al. (1991b:132-133). The more common natural threats include glaciation, subsidence, landslides, tidal waves, erosion, and earthquakes. Human activities that threaten cultural sites include logging, mining, commercial development, recreation, vandalism, and major construction projects such as buildings, dams, pipelines, and highways. Little can be done to protect cultural resources from natural impacts (which are often sudden and catastrophic), but this is not the case with human impacts. Steps can be taken prior to the potential impact to protect the integrity of the information contained in archaeological sites and to recover site data. Cleanup, direct oiling, and vandalism were the sources of potential impact which the CRP took steps to mitigate.

Cleanup

The risk of potential impact depended on site location, site composition, the degree of oiling, and the intensity of cleanup. The risk to upland sites from direct oiling and direct cleanup impact was negligible. However, cleanup crews working near sensitive upland sites introduced the possibility of site disturbance from pedestrian traffic and vandalism. Conversely, intertidal sites, including intact subsurface middens, fish traps, rock art sites, and artifact scatters, were at risk from direct oiling and from cleanup. Sites and artifacts could potentially be coated with oil, disturbed, or removed.

Intertidal cultural resources potentially affected by cleanup included stone and wood fish weirs, rock art, shipwrecks, remains of historic structures such as wooden piers, and prehistoric and historic artifact scatters and features. Many intertidal sites once located in the uplands have subsided into the intertidal zone as a result of tectonic events and erosion. Scattered stone tools re-deposited by erosion are the most common intertidal sites in the spill area, and although less valuable scientifically than intact deposits, they may contain diagnostic artifacts, or may indicate the location of buried deposits.

Preservation of intact site deposits in the intertidal or subtidal zone is rare. Program staff were aware of the potential and looked for these sites during surveys, and monitored areas where such material was likely to be encountered during cleanup. Upland cultural resource sites such as prehistoric villages, camps, caves and rockshelters containing habitation deposits and/or burials, historic structures, artifact scatters, and isolated artifacts also required protection from disturbance and were monitored.

The 1990, 1991, and 1992 cleanup methods (Exxon 1990; Haggarty et al. 1991b:133-135) were generally less intense and less intrusive than the 1989 techniques (Mobley et al. 1990:101-114). The potential for adverse impacts declined as crews decreased in size and number, and as information developed within the program was applied to increase the efficiency of the site protection process. Manual treatment (primarily debris and asphalt/tarmat pickup), limited mechanical treatment, and bioremediation were conducted in 1991. Only manual treatment occurred in 1992. As discussed in Chapter 2, the CRP mitigated impacts to cultural resources associated with Exxon's 1991 and 1992 cleanup programs.

Oiling

The primary physical impact of stranded oil on shorelines in 1989 was to temporarily obscure some intertidal artifacts. Stone artifacts cannot be
radiocarbon (\(^{14}\)C) dated, so oiling of intertidal stone artifacts was not damaging. Oiled artifacts collected in 1989 and 1990 were successfully cleaned, and subsequent natural cleansing of uncollected specimens greatly reduced this minor impact. Indirect oiling of sites in the uplands through cleanup material stored in the uplands was a related source of concern. Exxon's strict "no uplands access" policy, a major component of the site protection program, was strictly enforced throughout the program, minimizing the potential impact of unrestricted access to the uplands.

Chemical impact to cultural resources is possible if organic materials (wooden artifacts, fish weir stakes, faunal remains, etc.) are contaminated with oil. The presence of preserved intertidal archaeological site deposits in the region raised the possibility of impact to such sites by \textit{Exxon Valdez} oil, although such sites would have already been exposed to hydrocarbon contamination associated with natural seeps, commercial fishing and mining operations, minor oil spills, and oily sheens from fishing vessels, float planes, and other motorized traffic. In dating material from the LaBrea tar pits and elsewhere, scientists appear to have successfully removed hydrocarbon contaminants prior to dating (Ho \textit{et al.} 1969; Miller 1969; Berger \textit{et al.} 1971), so such impacts can be mitigated. The results of state and federal government damage assessment studies which investigated site contamination are discussed in Chapter 4.

**Vandalism**

Vandalism is a human impact that has been affecting the Alaska's cultural resources for years. Casual collection of artifacts by recreational campers, kayakers, fishermen, and others is not uncommon in the region because site erosion continually exposes artifacts. A more serious and destructive problem in the Alutiq region, and in Alaska in general, is intentional "looting," non-scientific digging into sites by persons intent on collecting artifacts, often for sale or barter. Both casual collection of and intentional digging for artifacts are illegal on public land.

The Cultural Resource Program worked to prevent site vandalism through training, spill cleanup monitoring, and support of anti-vandalism programs. In 1989, two incidents of vandalism were directly related to the spill cleanup, and one resulted in prosecution. No vandalism incidents related to the cleanup were reported in 1990, 1991, or 1992. In 1989 and 1990, CRP archaeologists documented many previously unrecorded sites that had been vandalized by looters in the past, as well as many known sites which had been vandalized repeatedly over a period of many years. The most basic step in addressing site vandalism on public land is compliance with federal statutes requiring agencies to document the location, nature, size, and condition of archaeological sites. Basic site inventory data were lacking for over half of the sites in the spill area prior to the spill. Because sites are remote, vandalism is difficult to monitor and curb, but gathering archaeological site inventory data is the crucial first step in any process aimed at protecting Alaska's heritage sites.

**Regulatory Background**

At the time of the spill there were existing state and federal laws that protected cultural resource sites on public land, including the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Alaska Historic Preservation Act (AHPA). The aim of historic preservation legislation is to preserve the information integrity of cultural resources which may be adversely affected by undertakings such as construction or other development projects.

The Advisory Council on Historic Preservation (ACHP) is a federal agency that administers Section 106 of NHPA through procedures defined in the implementing regulations (36 CFR 800). Federal involvement in undertakings with the potential to affect cultural resources (such as the cleanup)
triggers a Section 106 consultation process among government agencies and interested parties. Under normal conditions, this process involves identification of the cultural properties which may be affected, determination of the potential impacts to these properties, and mitigation to minimize or avoid any adverse effect. The process is routinely handled by the State Historic Preservation Officer (SHPO), with oversight by the ACHP, often through a Memorandum of Agreement that identifies steps and considerations specific to the undertaking.

Archaeological permits are required by law when conducting activities which may affect sites on public land. Each permit stipulates how individual archaeological investigations should be conducted and reported. The State of Alaska issues field archaeology permits covering archaeological investigations on state tidelands and uplands. Archaeological investigations on federal lands typically involve an ARPA permit and a special use permit. Exxon's Cultural Resource Program obtained 24 ARPA and Special Use permits to conduct archaeological investigations on state and federal lands over the four field seasons: eight in 1989, 10 in 1990, four in 1991, and two in 1992. State and federal historic preservation laws and permit procedures which apply to the project are summarized in Mobley et al. (1990) and Haggarty et al. (1991b). The 1991 and 1992 permits are discussed in Chapter 2.

**Cultural Resource Program Overview**

The primary objective of the CRP was to protect cultural resources during cleanup without slowing or hindering cleanup by:

- locating and assessing archaeological sites;
- determining the potential effects of treatment on them;
- mitigating potential impacts through avoidance, site inspection, site monitoring, and education; and,
- maintaining confidential site information.

No model existed for conducting a cultural resource site protection program under an emergency situation for a very large and virtually unsurveyed area with the potential for undocumented coastal sites. With input from the ACHP, the SHPO, the Forest Service, other government agency and Native organizations, and Exxon, a Memorandum of Agreement was developed which spelled out responsibilities specific to the undertaking and provided a framework for the CRP.

The general design of the CRP included:

- extensive shoreline surveys conducted by CRP archaeologists to identify and document cultural sites;
- synthesis of new survey data with existing site data to document sensitivities for consideration during cleanup plan development;
- development of archaeological protection strategies (constraints) based on specific site sensitivities to ensure sites would not be impacted by cleanup operations. These constraints were an integral part of the cleanup plan for each shoreline unit;
- training response workers to ensure awareness of laws and procedures related to cultural resources;
- responding to special "incidents" such as reported artifact finds to ensure that all sites were protected.

Consistent with provisions of the Memorandum of Agreement and the permits, procedures
were set up to document findings in interim and final reports and to provide for curation of all artifacts and samples collected during the program, as well as the project’s administrative documents, field notebooks, photographs, and videotapes.

The 1989 Program

In 1989, Exxon engaged 24 archaeologists to conduct the site protection program. As of March 1989, only 283 sites in the spill area (shorelines where oil was present or suspected) were recorded on the Alaska Heritage Resource Survey (AHRS). Many more were suspected because, according to oral tradition, the area had been inhabited prior to European contact by a large population of Alutiiq people. Exxon’s archaeologists, in cooperation with state and federal agency and Native corporation archaeologists, gathered the site data needed to assess the archaeological sensitivities of treatment areas.

In 1989, archaeologists joined geologists and biologists on three-member Shoreline Cleanup Assessment Teams (SCAT) that evaluated oiling conditions and formulated environmental and cultural constraints for cleanup plans. Archaeologists conducted reconnaissance surveys prior to cleanup, collecting site information for site protection constraints. Although vast areas were covered, the intensity of reconnaissance surveys varied in many cases, depending on the degree of oiling and the likelihood of impacts associated with cleanup. In areas where cleanup was planned, archaeologists determined its potential effect on any sites located within cleanup segments, and recommended avoidance, inspection, monitoring, artifact collection, and educational instruction as means to mitigate potential site impacts. Two hundred and sixty four new sites were found during 1989, 43% of all known sites in the project area (Figure 3). In addition, Exxon archaeologists revisited and updated the condition of 178 (63%) of the 283 previously known sites in the spill area.

State and federal agencies with major land holdings in the spill area issued three Archaeological Resources Protection Act (ARPA) permits and five Special Use permits to the Cultural Resource Program in 1989, and the program met all permit stipulations. An interim report was required by the government agencies, and was written after the field season (Mobley and Haggarty 1989a). The permitting agencies and Native organizations reviewed the interim report as well as a draft of the 1989 final report, and the authors incorporated the review comments into a published report (Mobley et al. 1990). The program sent 1,000 copies of the report to libraries, museums, universities, Native organizations, industry response organizations, and interested parties around the world.

The 1990 Program

The framework for Exxon’s 1990 treatment activities was developed during the winter of 1989-90. Fourteen archaeologists conducted the fieldwork and managed the site protection program.
Fieldwork initially focused on collecting further cultural resource data from specific shorelines (subdivisions) so that the Cultural Technical Advisory Group (CTAG) could evaluate Exxon’s proposed archaeological constraints.

CTAG was developed as a management process in 1990 to facilitate agency and Native organization review of Exxon’s site protection measures as required under Section 106 of the NHPA. The group was comprised of archaeologists from Exxon, from state and federal agencies, and from Native organizations, as well as a Coast Guard and an Exxon management representative. CTAG reviewed and discussed Exxon’s treatment plans and the archaeological constraints proposed by the CRP. Through CTAG, affected and interested parties examined and approved constraints required to protect cultural resource sites in each subdivision during treatment, a process described in Haggarty et al. (1991b:33).

After constraints were approved, program archaeologists inspected and monitored sensitive subdivisions and worked with Exxon supervisors and treatment personnel to ensure site protection as cleanup progressed. Archaeologists also educated treatment crews, systematically updated AHRS site records, and investigated site incidents. In 1990, archaeologists identified 62 new cultural resource sites (Figure 3), and documented in detail 157 known sites. By the end of 1990, project archaeologists had identified 326 (54%) of the 609 sites known in the project area at that time.

During the winter, archaeologists prepared reports required by the 10 permits issued to the 1990 program. An interim report (Haggarty and Wooley 1990a) and a final report (Haggarty et al. 1991b) described the program, its results, and the regional implications of the new archaeological data from a cultural ecological perspective. A second report (Betts et al. 1991) incorporated data from a joint Park Service/Chugach Alaska Corporation report (Schaaf and Johnson 1990) and described the discovery, management issues, treatment events, and archaeological monitoring at SEL-188, an archaeological site on the outer Kenai Peninsula coast. Governmental agencies and Native organizations reviewed drafts of all reports, and their comments were included in the published versions. Exxon Company, USA published the final 1990 report and the SEL-188 report, and 1,000 copies of each were also distributed to cultural resource managers, libraries, and industry response organizations.

The 1991 and 1992 Programs

The 1991 and 1992 Exxon Cultural Resource Programs were much smaller than the 1989 and 1990 programs, but the area’s cultural resource sites were carefully safeguarded. Sites were protected through consultations with treatment supervisors, site inspections prior to treatment, site monitoring during treatment, site incident investigations, AHRS site record updates, and an education program. Exxon approached the issue of site protection in a manner that went beyond compliance by accumulating additional data that improves our knowledge and understanding of the culture history of the region.

Program Results

Design and implementation of a program to protect cultural resources in the spill area was a challenge given the size and remoteness of the area and the paucity of information on the resources to be protected. Although laws and regulations intended to protect cultural resources were in place well before the spill, there were no precedents for implementing a program of the size and nature of the CRP. The normal sequence of identifying, assessing, and mitigating potential site impacts was compressed into a short period of time because of the emergency cleanup and the short summer cleanup season. The CRP conducted what amounted to many years’ worth of archaeological shoreline survey in the space of a few months in order to assess the potential impact of the cleanup on sites.
All shorelines which were potentially affected by oil, whether actually touched by oil or not, were surveyed at least at a reconnaissance level. Archaeologists visited and described 526 cultural resource sites during the four-year program. Of these, 326 were new sites which the CRP located, documented, and reported (Figure 3). Surveys conducted by the CRP more than doubled the total number of known sites in the area, from 283 to 609. Only 83 (14%) of the 609 sites in the spill area were not inspected by CRP archaeologists, and none of these were near shorelines involving cleanup.

The CRP protected sites from adverse impacts. Two cases of vandalism were directly linked to the cleanup activity which involved thousands of people working on over 1000 miles of shoreline during four cleanup seasons. State of Alaska (Reger et al. 1992) and US Government (Dekin 1993) damage assessment studies (discussed in Chapter 4) did not find significant impacts to cultural resources caused by the oil or the cleanup. In fact, considerable new information on the history and pre-history of the area was gained over the course of the program through the unprecedented level of shoreline surveys and site descriptions.

In 1989 and 1990, in addition to documenting hundreds of new sites, archaeologists discovered and described important well-preserved wet sites and defensive sites that contain information about Alutiiq culture. Initial surveys of portions of the outer Kenai Peninsula and Barren Islands provide basic archaeological data for an area which had never been systematically investigated. In 1991, examination of accumulated project data including natural resource concentrations and pre-contact Alutiiq site distributions allowed project archaeologists to analyze the human ecology of this maritime region (Haggarty et al. 1991b:205-247; Erlandson et al. 1992). The reports explored environmental factors which affected the nature and location of human settlements and discussed changes in Alutiiq settlement, subsistence, and demographics over time.

More than 100 post-contact sites including fox farms, mining camps, canneries, and shipwrecks were found during the program. These sites indicate intense land and resource use in the Alutiiq region during the recent past, and contain valuable information about post-contact settlement patterns, commercial resource development, and socio-economic adjustments. Chapter 3 discusses these post-contact sites, documents the origin and use of some sites, and examines how they contribute to an understanding of late 19th and early 20th century life and culture change in south-central Alaska.

Report Structure

This report satisfies the reporting stipulations in the 1991 and 1992 permits, a procedure accepted by the agencies for the 1989 report and followed in subsequent years. Similarly, the organization and content of the reports prepared by the program were developed in consultation with the government agencies and Native organizations as part of the Section 106 process. Comments on all report outlines and drafts were solicited from the permitting agencies and organizations and were incorporated in the final published reports.

This report describes the 1991 and 1992 programs and is a cumulative summary of the Exxon Cultural Resource Program. Chapter 2 describes the program's administration and presents the results of the 1991 and 1992 site protection programs. Chapter 3 focuses on the post-contact sites found during the project, and discusses recent changes in land and resource use indicated by the sites. The final chapter reviews four years of site protection and study, summarizes damage assessment studies, and explores cultural resource protection strategies for future emergency responses.
ADMINISTRATION, CLEANUP, AND SITE PROTECTION

Shoreline conditions were assessed and documented during multi-agency surveys in 1991 (MAYSAP) and 1992 (FIN-SAP), and shoreline cleanup was completed at appropriate locations each year. Archaeological constraints approved by CTAG for subdivisions which had been treated in 1990 generally were reapplied in 1991 and 1992, and CRP archaeologists ensured that sensitive sites were inspected or monitored during cleanup. This chapter describes the MAYSAP and FIN-SAP surveys, shoreline cleanup, permitting, and the site protection program.

The May Shoreline Assessment Program (MAYSAP) was a survey of the condition of specific shorelines in Prince William Sound and the Gulf of Alaska conducted by Exxon, the appropriate government agencies, and land managers. The surveys provided site-specific documentation of shoreline status for review and use by the Technical Advisory Group (TAG) and the Federal On-Scene Coordinator (FOSC). The 1992 Final Shoreline Assessment Program (FIN-SAP) surveyed all beaches requested by the FOSC and the State On-Scene Coordinator (SOSC) and completed shoreline cleanup at locations where the survey team agreed treatment would be environmentally beneficial. At the five locations where consensus could not be reached, the FOSC and SOSC directed work on three of the subdivisions. The FIN-SAP program took place between May 15 and June 10, 1992. On June 5, 1992, the FOSC determined that the Exxon Valdez cleanup operations were successfully concluded (Ciancaglini 1992).

Of the 118 MAYSAP subdivisions recommended for cleanup by TAG in 1991, 104 were located in Prince William Sound. Nine subdivisions on the Kenai Peninsula, four on Kodiak Island, and one on the Alaska Peninsula were also treated in 1991. Of the 81 FIN-SAP subdivisions surveyed during 1992, 75 were located in Prince William Sound and six were on the Kenai Peninsula.

The 1991 and 1992 approach to site protection was nearly identical to the strategy employed during 1989 and 1990 (Haggarty et al. 1991:161-204). In 1991, cleanup began on May 30 in Prince William Sound, and all mechanical treatment and most manual cleanup in Prince William Sound and the Gulf of Alaska were complete by July 15. During this time, archaeologists monitored and inspected sites and ensured that appropriate cultural
resource constraints were followed. One vessel-based cleanup crew continued bioremediation and minor cleanup at selected subdivisions in Prince William Sound through August 30, 1991, but limited archaeological field work was required during the final and relatively unobtrusive phase of treatment.

The purpose of the Cultural Resource Program was to ensure proper training of all cleanup and survey personnel and to maintain cultural resource site protection during operations. The 1991 field program had four components: consultation and inspection of 27 subdivisions, monitoring 10 sites, (seven subdivisions, one study site, and two remediation locations), updating eight AHRS sites, and investigating five site incidents. The 1992 field program involved consultation and inspection of eight sites; monitoring and updating one site; and investigating one site incident. Unlike the 1989 and 1990 programs, no extensive archaeological surveys were conducted and no artifacts were collected in either 1991 or 1992.

Land Management

All major land-management agencies and Native organizations in the spill area were involved in 1991 and 1992 site protection consultations. The 1991 cultural resource investigations were conducted on lands managed by the State of Alaska, the USDA Forest Service (Chugach National Forest), the National Park Service (Kenai Fjords National Park, and Katmai National Park and Preserve), and the Fish and Wildlife Service (Becharof National Wildlife Refuge). FINSAP work and 1992 cultural resource review was limited to lands managed by the USDA Forest Service, Chugach Alaska Corporation, Chenega Village Corporation, Port Graham Corporation, and the State of Alaska. The 1991 MAYSAP and 1992 FINSAP surveys and TAG review enabled all major land managers to participate in decisions regarding treatment on or adjacent to their lands. The roles of the government agencies and Native organizations with cultural resource management responsibilities in the spill area are discussed in detail in prior reports (Mobley et al. 1990; Haggarty et al. 1991b).

Governmental agency and Native organization representatives participated in the 1991 shoreline assessment program (MAYSAP) and in CTAG. Most shoreline subdivisions requiring cleanup in 1991 were located in Prince William Sound. As a result, the State of Alaska (which claims ownership of the region's tidelands), and the Forest Service (the major upland land manager in Prince William Sound) were most involved in 1991 consultations. Shoreline assessments in the Kenai Peninsula, Kodiak Island, and Alaska Peninsula areas involved shorelines adjacent to upland parcels managed by the Park Service and Fish and Wildlife Service, but few subdivisions in these areas required cleanup.

The 1992 FINSAP crews surveyed 75 subdivisions in Prince William Sound, and six subdivisions on the Kenai Peninsula. The 1992 FINSAP participants included TAG members, and a more streamlined FINSAP structure enabled TAG to make treatment decisions on-site during the survey. A formal CTAG group was not needed in 1992 due to the limited nature of anticipated cleanup.

The FINSAP survey and cleanup plans included only manual treatment options such as tarmat removal and raking. Since the intensity of cleanup was to be determined during the survey, all 81 subdivisions were considered to be treatment subdivisions for the purpose of applying cultural resource constraints. The 1991 constraints were reapplied in 1992 with some modifications, and the land managers and the SHPO approved the constraints prior to FINSAP survey and the concurrent limited cleanup.

Permits

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<tr>
<th>Table 1</th>
<th>Cultural Resource Program Archaeology Permits 1989-1992</th>
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<tr>
<td><strong>STATE OF ALASKA</strong></td>
<td></td>
</tr>
<tr>
<td>Special Use Permit</td>
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<tr>
<td><strong>USDA FOREST SERVICE</strong></td>
<td></td>
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<tr>
<td>Special Use Permit</td>
<td>⚫</td>
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<tr>
<td><strong>NATIONAL PARK SERVICE</strong></td>
<td></td>
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<tr>
<td>Katmai Park ARPA Permit</td>
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<tr>
<td>Kenai Fjords ARPA Permit (Park)</td>
<td>⚫</td>
</tr>
<tr>
<td>Kenai Fjords ARPA Permit (SEL-188)</td>
<td></td>
</tr>
<tr>
<td>Katmai Special Use Permit</td>
<td>⚫</td>
</tr>
<tr>
<td>Kenai Fjords Special Use Permit</td>
<td>⚫</td>
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<tr>
<td><strong>US FISH AND WILDLIFE SERVICE</strong></td>
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<tr>
<td>ARPA Permit</td>
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<tr>
<td>Special Use Permit</td>
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<tr>
<td>Kodiak NWR Special Use Permit</td>
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</tr>
<tr>
<td>AK Maritime NWR Special Use Permit</td>
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</table>

and regulations, Exxon Company, USA, through the CRP, acquired two ARPA and two Special Use permits to conduct the 1991 and 1992 programs (Table 1). Amendments to the Forest Service Special Use permit (4118.01), and the State of Alaska Field Archaeology permit (1991-4) extended the previous permits through 1992. The 1991 and 1992 Cultural Resource Program Work Plans were submitted with each permit application (Appendices A and B).

Exxon Company, USA had acquired separate Alaska Department of Natural Resources (DNR) Land Use permits in 1991 (SCV 91-004) and 1992 (SCV 92-001). These enabled Exxon to conduct its cleanup operations on state-owned tidelands and included cultural resource provisions. Exxon also obtained Chenega Corporation and Port Graham Corporation land use licenses in 1991 and 1992 which noted site protection considerations addressed by the CRP. No subdivisions on Fish and Wildlife Service land requiring archaeological attention were treated in 1991 or 1992. Minor remediation occurred at one site in the Becharof Refuge on the Alaska Peninsula, but no archaeology permit was required.
DNR Land Use Permits

The DNR Land Use Permit (SCV 89-004), issued to Exxon Company, USA on April 4, 1989, covered shoreline cleanup operations on state-owned land, including tide and submerged land. Two of the 17 stipulations appended as Attachment A to the original permit refer directly to the Cultural Resource Program:

9. All site specific shoreline cleanup work plans shall incorporate the timely recommendations of the State Historic Preservation Officer.

10. If, in connection with any of the operations authorized under this permit, EXXON, its officers, agents, employees, contractors, subcontractors or their personnel encounter any previously undiscovered paleontological, archaeological or historical sites or artifacts, field operations shall be suspended on that portion of the project area, and the Director of EXXON’s Cultural Resource Program shall be immediately notified and the State Historic Preservation Officer notified within 24 hours.

These two stipulations and stipulation seven which required Exxon to comply with all applicable federal, state, and local laws and regulations affecting shoreline cleanup operations linked this permit to the four 1991 archaeological permits and the two 1992 permits.

DNR Field Archaeology Permit

The DNR, through the Office of History and Archaeology (OHA), issued the 1991 Field Archaeology Permit (permit 91-4), and extended it to cover the limited 1992 activities. The purpose of the work covered by the permit was:

... to preserve information integrity of cultural resources potentially impacted by shoreline cleanup activities. Field work primarily will involve site inspection and on-site monitoring associated with treatment activities.

Stipulations requiring project personnel to meet the Secretary of the Interior’s Standards and Guidelines, prepare a final report, and transmit project data to the University of Alaska Fairbanks at the end of the project also applied in 1991 and 1992. An agreement with the University of Alaska Fairbanks Archives (Rasmuson Library) for storage of original program documentation was signed in 1990. A separate agreement for curation of the artifacts at the University of Alaska Museum in Fairbanks was signed in 1992, followed shortly thereafter by transfer of the artifacts and supporting documentation. As with previous years, project supervisors and field personnel met the Secretary of the Interior’s standards, and this report fulfills the reporting requirements of the 1991 permits and 1992 permit extensions.

USDA Forest Service Permit

The original Special Use Permit (4118.01), issued by the Forest Service on June 12, 1989, was extended on April 4, 1990 (Amendment 1), on June 12, 1991 (Amendment 2), and on May 19, 1992 (Amendment 3) to cover archaeological work associated with the 1990, 1991, and 1992 cleanup on Chugach National Forest land in Prince William Sound. All three amendments contain basically the same stipulations included in the original permit (see Haggarty et al. 1991b:31).

National Park Service Permits

The Park Service Alaska Regional Office issued two ARPA permits for archaeological investigations on park lands in 1991, both pertaining to monitoring. One was issued for treatment of a subdivision in Kenai Fjords National Park, and the second related to remediation of Exxon’s former helicopter fuel cache in Katmai National Park and Preserve on the Alaska Peninsula. NPS permits were not required in 1992 since no work was conducted on Park Service land.

The Park Service originally issued ARPA permit 90-KENAI FJORDS-ARO-001 for monitoring SEL-188 in 1990. The Park Service renewed the permit on June 11, 1991 to cover 1991 treatment at SEL-188. A Special Use permit was not issued because no upland investigation was anticipated. The 1991 ARPA permit extension was identical to the 1990 permit except for modifications which addressed the lack of upland investigations and the need to amend the SEL-188 final report. Monitor-
ing conducted in 1991 under this permit was reported in Betts et al. (1991).

The Park Service Alaska Regional Office originally issued ARPA Permit 89-KATMAI-ARO-003 in 1989 for work in Katmai National Park and Preserve. The permit was re-issued in 1990, and was extended to September 30, 1991 to cover inspection and, if necessary, monitoring of remediation at Exxon’s Kukak Bay fuel cache. A Park Service archeologist had inspected the fuel cache area in 1989, but the Park Service required that an Exxon archeologist examine subsurface deposits at the fuel cache prior to 1991 remediation due to the lack of subsurface data available, and due to the anticipated amount of sediment removal. CRP archeologists monitored the remediation which was conducted between July 30 and August 24, 1991.

CTAG

The Cultural Technical Advisory Group (CTAG) convened in 1990 to provide government agencies and Native organizations an opportunity to review each cleanup plan and Exxon’s proposed archeological constraint. CTAG reviewed 587 of the 1,035 subdivisions assessed by the Spring Shoreline Assessment Teams (SSAT) in 1990. (The 448 subdivisions not scheduled for treatment were not reviewed). In 1991, CTAG concluded that the constraints established for individual subdivisions in 1990 also would apply in 1991, provided the treatment area remained unchanged and that the intensity of treatment was equal to or less than in 1990. Re-applying the 1990 constraints in 1991 simplified the process and greatly reduced the number and length of 1991 CTAG meetings. The 1991 CTAG meetings provided agency and Native organization representatives an opportunity to resolve concerns pertaining to the 1991 program. CTAG meetings were not necessary in 1992.

Formulating Constraints

CTAG met several times in 1991 to review the Cultural Resource Program’s progress and to discuss the cleanup program. Procedures for determining 1991 archeological constraints (Table 2) were established in consultation with CTAG representatives and were included in the work plan (Appendix A). Constraints were applied based on the results of the review process (Figure 4). The CRP tracked subdivision constraints with a database developed in 1990 containing information on subdivision length, upland land manager, cleanup history, archeological constraints, FOSC and SHPO approval dates, and monitoring status. The Cultural Resource Program periodically provided summary data reports to CTAG representatives.

CTAG did not review the constraints recommended by Exxon in 1991 when they were iden-

<table>
<thead>
<tr>
<th>Table 2</th>
<th>1991 Cultural Resource Program Archaeological Constraints</th>
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<tbody>
<tr>
<td>Deferred</td>
<td>If treatment is planned, a cultural resource evaluation is required prior to shoreline treatment.</td>
</tr>
<tr>
<td>Holding</td>
<td>Cultural resource survey in progress. Shoreline treatment cannot proceed until field data have been assessed and a formal archaeological constraint entered on the shoreline evaluation form.</td>
</tr>
<tr>
<td>Standard</td>
<td>If cultural resources are uncovered during treatment, stop work in the vicinity, mark the location of the find, and contact Exxon’s Cultural Resource Program immediately.</td>
</tr>
<tr>
<td>Inspection</td>
<td>Consultation and inspection with an Exxon archaeologist is required prior to treatment. Specific on-site monitoring requirements will be determined at that time.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>An Exxon archaeological monitor is required on-site during shoreline treatment.</td>
</tr>
</tbody>
</table>
tical to the 1990 constraints. CTAG did review all Exxon-recommended changes to the 1990 constraints, and the SHPO reviewed and signed all 1991 constraints. Following these guidelines, an archaeological constraint was applied to each 1991 MAYSAP Evaluation Form and was signed by the SHPO.

In 1991, CTAG reviewed three subdivisions which had not been surveyed by an archaeologist in 1989, but where cleanup was planned. CTAG requested that two subdivisions, DE-001 and TB-007, be surveyed. The surveys did not identify any cultural resources, and standard constraints were applied. CTAG also reviewed and applied standard constraints to three cleanup subdivisions which had been surveyed by an archaeologist in 1989 but had not been cleaned in 1989 or 1990. Twelve subdivisions which were scheduled to be treated mechanically in 1991 were given inspection constraints.

The use of standardized constraints developed by the Cultural Resource Program in 1990, the Exxon supervisors' familiarity with these constraints and with cultural resource sensitivities, and the small size of the 1991 and 1992 programs ensured the protection of cultural resources during Exxon's 1991 and 1992 operations. Each culturally sensitive subdivision had been inspected prior to
treatment in 1990. As field archaeologists became familiar with the nature and exact location of cultural resources, the treatment methods, and the role of Exxon supervisors, phone consultations rather than on-site inspections were sufficient to protect cultural resources late in the 1990 season. Similar procedures were employed in 1991 and 1992 since the treatment programs were essentially scaled-down versions of the 1990 program.

Training and Education

Exxon's training program informed Exxon supervisors, agency monitors, and cleanup personnel of state and federal historic preservation laws and regulations, and to teach personnel how to follow approved site protection procedures. A public education effort endeavored to heighten awareness of the need to protect and preserve heritage resources, and to help government agencies combat site vandalism throughout Alaska.

MAYSAP participants took part in a three-day training session in Anchorage before fieldwork began. The session included an overview of program objectives, team member roles, and documentation procedures; presentations on environmental, biological, and archaeological sensitivities; and a mandatory eight-hour HAZWOPER (Hazardous Waste Operations and Emergency Response) training session. A joint presentation by the SHPO and the Director of Exxon's Cultural Resource Program included an overview of state and federal historic preservation legislation, a video describing the region's cultural resources and site protection, a summary of the 1990 program, and procedures to follow if cultural resources were encountered during survey or treatment. A copy of Exxon's strict policy of dismissal for any project personnel who disturbed cultural resources was included in the MAYSAP Manual (Exxon Company, USA 1991). All of the 1991 Exxon crew supervisors, and most crew members and agency representatives, worked on the 1990 program and were familiar with the education program, so the MAYSAP session was an important refresher course.

The 1992 FINSAP orientation and manual also included cultural resource training. Since most of the participants had seen the training video at least once and had been through prior training sessions, they reviewed project policies and guidelines, and viewed slides of sites which had been documented and protected during the program.

In 1991, the education program expanded to consider education goals at the state level. Exxon continued to provide funds and staff support to help promote the second annual Alaska Archaeology Week - a cooperative effort by the National Park Service, Minerals Management Service, and the Anchorage Museum of History and Art. Funding and staff support also were used to develop an archaeology curriculum for an organization involved in educating school children about historic site protection in Alaska. A change in attitudes about protection of heritage sites can be achieved if government agencies, Native organizations, and private corporations continue to combine expertise and funding of such programs.

The 1991 Program

Three archaeologists, with the assistance of Exxon's support staff and the cooperation of government agency and Native organization archaeologists, conducted the 1991 site protection program. Staff archaeologists consulted with Exxon cleanup supervisors; conducted site inspections, site monitoring, and AHRS site record updating; investigated site incident reports; and trained cleanup personnel in cultural resource site protection procedures. Fieldwork was conducted as needed between June and August, 1991. Implementing CTAG-approved archaeological constraints minimized potential impacts to cultural resources. Archaeological site inspection and monitoring protected cultural resource sites located in or near areas of planned treatment.
Shoreline Conditions and Cleanup Methods

Cleanup methods changed as shorelines began to recover. Many techniques were utilized in 1989 (Exxon 1990), but large-scale mechanical washing was not necessary after 1989. Mechanical treatment was conducted in a few subdivisions in 1990 as part of the storm berm relocation program devised to release subsurface oil trapped in winter storm berms and facilitate recovery. The effects of 1989 and 1990 cleanup were enhanced by natural cleaning of oil by winter storms which scoured Prince William Sound and the Gulf of Alaska. After bulk oil was removed in 1989, cleanup decisions were made by evaluating the "net environmental benefit" of removing weathered oil from beaches being colonized by intertidal plants and animals. In 1991, cleanup methods were limited to manual treatment with the exception of 12 subdivisions which were cleaned mechanically. All mechanically cleaned subdivisions were inspected by an archaeologist.

Manual removal of tarmats, asphalt and mousse patties, and oiled sediment by shovel, rake, sorbent pad, and trowels (Exxon 1990:55) was the most common cleanup method employed in 1990, 1991, and 1992. Over the span of three cleanup seasons and three winters, oil weathered considerably through exposure to sun, wind, and wave action. Weathered oil in the form of asphalt (also referred to as "tarmat") was the most common type encountered during the 1991 and 1992 programs. Asphalt areas were treated manually by breaking up and removing patches of consolidated oil and beach sediment, and picking up isolated tarballs and the occasional beach litter and oiled debris. Manual treatment, sometimes combined with bioremediation, comprised over 90% of the treatment effort in 1991 and 100% of the 1992 effort.

Initially in 1991, all treatment crews conducted manual treatment, including the Chenega Bay crew. Each team consisted of an Exxon supervisor, a Coast Guard monitor, a state monitor, a skiff driver, and eight Oil Spill Response Technicians (OSRT). Treatment was scheduled to coincide with the lower half of the tidal cycle so access to most of the intertidal zone was possible during a single event. Part way through the cleanup schedule, one of the crews was shifted to bioremediation, and an oil geomorphologist was added to the crew.

May Shoreline Assessment Program (MAYSAP)

Exxon Company, USA implemented the 1991 MAYSAP Program to assess selected Prince William Sound and Gulf of Alaska shorelines. MAYSAP personnel included six survey teams, five operating from vessels and one from a helicopter. In addition to the survey teams, one vessel-based team of Chenega Bay residents performed minor debris pickup during MAYSAP (discussed below). There were 11 members on each team, including representatives from the Coast Guard, National Oceanic and Atmospheric Administration (NOAA), Alaska Department of Environmental Conservation (ADEC), Exxon, the local community, and the land manager, as well as an oil geomorphologist, a marine biologist, two treatment crew workers, and a skiff driver. MAYSAP's stated purpose was:

> to jointly survey, assess, and document the current conditions of certain shorelines in Prince William Sound (PWS) and the Gulf of Alaska (GOA) and perform debris pickup as appropriate (Exxon Company, USA 1991:1)

The two debris pickup workers were to retrieve recoverable oil residue, spill debris, and minor concentrations of tarballs, tar patties, and patches of asphalt encountered during the survey. Debris pickup, as defined in the MAYSAP Survey manual, was removal of:

- oil spill related trash or oily debris
- surface oiling conditions easily accessed and removed without intrusive actions, (i.e. that which can be plucked from the surface without disturbance of the subsurface or adjacent sediments). These types
of oiling conditions will usually be in the form of tarballs, tar patties or small patches of asphalt.

Debris pickup did not include:

- digging to remove subsurface lenses of oil
- moving boulders, berms, etc. to access oil
- tilling, excavation or any techniques that could be classified as intrusive
- washing of any kind

The work was conducted under the direction of the team’s Exxon supervisor while the multi-agency team was assessing shoreline conditions.

The six teams surveyed, assessed, and documented 581 subdivisions: 430 in FWS and 151 from the outer Kenai Peninsula, Kodiak, and Alaska Peninsula areas. TAG reviewed the survey documentation from the subdivisions, along with previous documentation from other subdivisions that could not be surveyed in 1991 due to ecological constraints or inaccessibility at the time of the survey. After TAG review, the reports were forwarded to the Cultural Resource Program for the appropriate archaeological constraint and for review and signature by the SHPO prior to being sent to the FOSC for final approval.

The review process was routine since constraint guidelines had been approved by agency and Native organization representatives on CTAG. If changes were made by the FOSC, the report was returned to Exxon’s technical group and the Cultural Resource Program for further review. If necessary, a new archaeological constraint was applied and resubmitted to the SHPO for review and signature. This situation arose when the FOSC changed TAG’s "no treatment required" recommendation to "treatment required." This type of modification required a change in the archaeological constraint from a Deferred Constraint (which was applied to all subdivisions with a "no treatment required" recommendation), to one of three working constraints (Standard, Consultation and Inspection, or Monitoring). The FOSC rarely changed TAG’s treatment recommendations.

CTAG’s role in the 1991 program was greatly reduced by the reduced potential for site impacts and by the decision to reapply archaeological constraints approved in 1990. Of the 584 subdivisions assessed by MAYSAP and reviewed by TAG and the FOSC, only 118 required treatment. The Cultural Resource Program reapplied the 1990 archaeological constraints to most of the 1991 treatment subdivisions. CTAG met occasionally to discuss issues unique to the 1991 cleanup, and representatives were kept informed of CRP status and cleanup progress.

The Chenega Bay Crew

An agreement between Exxon and the Chenega Village Corporation specified that a Chenega Bay crew would assess subdivisions and pick up oiled debris near the village of Chenega Bay as part of the MAYSAP program. Since the Chenega Bay crew was composed primarily of treatment personnel, it differed from other MAYSAP survey teams. Because their treatment was expected to be more intensive than other MAYSAP teams, SHPO approval was required before the crew could proceed.

Prince William Sound was divided into five sectors for the MAYSAP survey. Sectors four and five included shorelines close to the village which the villagers considered important. One hundred and twenty-five subdivisions were located in the two sectors designated for debris pickup by the Chenega Bay team. Exxon Cultural Resource Program staff reviewed earlier constraints for these and determined that 81 of the 125 subdivisions had standard constraints in 1990, eight had inspection constraints, three had monitoring constraints, and 33 had deferred constraints. Exxon recommended to the SHPO that the Chenega Bay crew assess and conduct debris pickup in the 81 standard constraint
subdivisions. Exxon also recommended that cleanup be postponed in the 11 subdivisions with monitoring or inspection constraints, and in the 33 subdivisions with 1990 deferred constraints until after TAG, CTAG, and the FOSC reviewed the MAYSAP survey results.

The SHPO reviewed the proposed archaeological constraints, and, after minor revisions, approved standard constraints in the 81 subdivisions. The SHPO recommended that cleanup be postponed in the remaining 44 subdivisions until after TAG and, if necessary, CTAG reviewed the MAYSAP results.

**Shoreline Cleanup**

Shoreline cleanup began May 30, 1991 in Prince William Sound with two vessel-based squads, one helicopter-based squad, and a Chenega Bay crew operating out of fishing vessels in areas near the village (Figure 5). Two more vessel-based crews were added later in the program. Cleanup expanded to the Kenai Peninsula Kodiak Island, and the Alaska Peninsula later in the field season. Most treatment ended July 15, 1991, although one vessel-based crew operated during July and August to conduct bioremediation of selected shoreline segments.

**State Evaluation Clause Subdivisions**

During the FOSC-approved treatment program, Exxon assessed and performed minor debris pickup on subdivisions that the state had indicated they were going to reassess and treat, if required. TAG had already reviewed the 66 "State Evaluation Clause" subdivisions and determined that there was no net environmental benefit to be gained from cleanup at these sites. The FOSC had approved and signed "no treatment" recommendations for the 66 subdivisions, and the SHPO had signed a deferred constraint for them. Exxon, under the FOSC's direction, re-evaluated these subdivisions and made plans for treating them during the re-evaluation process, if treatment was required.

Prior to MAYSAP, agreement had been reached with the SHPO and CTAG that only minor and non-intrusive debris pickup could be performed as part of MAYSAP. The 66 "state clause subdivisions" were to be re-evaluated (and possibly treated) by one of six regular treatment crews. As a result, the Exxon Cultural Resource Program decided that these subdivisions should be assessed in the same manner as all FOSC-approved subdivisions to ensure that cultural resources were not impacted by any intrusive treatment performed during re-evaluation. All 66 subdivisions were added to the Cultural Resource Program database and were regarded as normal subdivisions approved for treatment by TAG and the FOSC.
Site Consultation and Inspection

In 1991, Exxon supervisors were required to contact an archaeologist before cleaning any of the 27 subdivisions with a consultation and inspection constraint. In 1992, the Exxon archaeologist consulted with the supervisors prior to the field season and discussed site avoidance criteria for each sensitive subdivision. CTAG relied upon the field archaeologists to make the final decision regarding the need to visit the site during treatment.

During 1990 CTAG review, the consultation constraint had been used to trigger a field inspection of the subdivision and the archaeologist determined whether treatment could proceed without the presence of an archaeologist. If the archaeologist determined the site would not be impacted by planned treatment, no further action was required. The constraint was upgraded to monitoring if the archaeologist concluded that an archaeologist needed to be present to protect the site from any potential cleanup impacts. Subdivisions with monitoring constraints were monitored regardless of the type and intensity of planned treatment. Since most subdivisions were treated at least twice, a consultation was sufficient to protect cultural resources in most subdivisions with this constraint. A consultation or an on-site visit occurred prior to any crew visiting a subdivision with this constraint.

Consultation with the Exxon supervisor involved discussing the specific sensitivity, the reason for the constraint, and the procedures to follow to ensure that the site was protected during treatment. Often, consultation with the Exxon supervisor was all that was required prior to bioremediation since this treatment method was short-term and non-intrusive. Twenty-seven (23%) of the 118 subdivisions treated during Exxon’s 1991 operations required consultation and inspection by an Exxon archaeologist.

Exxon Operations produced a weekly treatment forecast which allowed CRP archaeologists time to consult with Exxon supervisors regarding treatment plans, and to arrange for inspection or monitoring. Exxon’s 1991 supervisors had supervised crews in 1990 and were familiar with the archaeological constraints and how they applied in the field.

One subdivision on Elrington Island in Prince William Sound was treated without consulting an Exxon archaeologist in 1991. The subdivision had been signed by SHPO, TAG, and the FOSC as a subdivision not requiring treatment in 1991. It was one of 66 subdivisions which ADEC asked to be reassessed. An Exxon crew reassessing these subdivisions treated this subdivision prior to the decision on how these 66 "state reassessments" were going to be handled. The FOSC formally changed the treatment status of the subdivision to "treatment required" shortly afterwards, and the Exxon crew performed limited manual treatment in the subdivision. No sites were located in the subdivision; therefore no site impact occurred. This procedural error caused some concern, so the program tracked the remaining 65 "state reassessments" and managed them as if they were recommended for treatment. The constraints determined by CTAG in 1990 were used for these subdivisions in 1991.

The only subdivision in the Alaska Peninsula area which required consultation and inspection in 1991 was atypical of most project assignments. Near the end of the MAYSAP survey, it became apparent that a single subdivision in Katmai National Park and Preserve required inspection. The Cultural Resource Program asked the Park Service whether or not NPS needed to issue ARPA and Special Use permits to cover the lone site inspection required in the park. Director Jim Haggarty and the Park Service Regional Archaeologist Ted Birkedal discussed the nature of the planned treatment and the location of the two nearby sites. They decided that the sites could be protected during treatment if the Exxon supervisor and the National Park Service Resource Manager on the treatment crew were given clear instructions on how to proceed. Haggarty and Birkedal pre-
pared explicit instructions for the Exxon supervisor and the Resource Manager, and contacted both individuals by phone to ensure that the procedures were understood. As a result, no ARPA permit from the Park Service Regional Office or Special Use permit from the park was issued to cover inspection of the work, and treatment occurred without impacting cultural resources.

Two situations not directly associated with treatment but involving the Cultural Resource Program developed later in the summer. Both involved remediation of contaminated fuel caches on the Alaska Peninsula - one in Kukak Bay, Katmai National Park and Preserve, and the other at Island Bay, Becharof National Wildlife Refuge. Due to the degree of subsurface disturbance anticipated at Kukak Bay, the Park Service requested that an Exxon archaeologist inspect the location and, if necessary, monitor remediation. The Park Service extended the Cultural Resource Program's 1990 ARPA permit for Katmai National Park and Preserve to cover the remediation. The Regional Archaeologist for the Fish and Wildlife Service determined that an ARPA permit was not required for remediation of the Island Bay location, but requested that the location should be inspected and monitored, if necessary. Both sites were inspected prior to remediation and monitored during two separate events. No evidence of human occupation or use was observed at either location.

Site Monitoring

The monitoring constraint required that an Exxon archaeologist be present during all treatment events in the subdivision. This constraint applied primarily to subdivisions with cultural resources in the intertidal zone or those with burial sites in the adjacent uplands. Archaeological sites in the intertidal zone required a monitor to ensure that crews did not inadvertently disturb or remove artifacts. A monitor also was required in subdivisions with upland burial sites to ensure that Exxon's "no uplands access" policy was strictly enforced due to the extremely sensitive nature of these sites. The monitor's primary role was to ensure that cultural resource sites in the intertidal zone and sensitive sites in the uplands were protected during all treatment events.

Cultural Resource Program staff tracked subdivisions requiring monitoring on the daily treatment schedule and called the Exxon supervisor to confirm the treatment date and to make arrangements to join the crew. Weather was always a consideration in traveling by helicopter from Anchorage to the field.

Eight (7%) of the 118 subdivisions treated in 1991, and one (1%) of the 81 subdivisions treated in 1992 required monitoring by an Exxon archaeologist, and these subdivisions were monitored each time they were treated. Six of the eight subdivisions monitored in 1991 were in Prince William Sound and two were on the Kenai Peninsula. The subdivision monitored in 1992 was located in Prince William Sound. Monitoring also occurred in 1991 in a subdivision where intertidal PVC pipes were removed from a test-well study site near the end of the summer due to the presence of a nearby site.

Detailed cultural resource data collected during 1989 and 1990 fieldwork allowed the 1991 and 1992 cultural resource staff to be cognizant of specific cultural resource issues in each subdivision requiring monitoring. Protection of intertidal sites required solutions ranging from total avoidance of artifact areas to treatment by field archaeologists rather than crew members. Sensitive upland sites such as caves and rockshelters were less complicated to protect during treatment because the major task was preventing access to the uplands. Site updating was done either prior to or after the monitoring event, not during treatment when crews and monitors were present in the subdivision.

1991 Monitoring at SEL-188

In 1991, CTAG addressed the issue of additional treatment near SEL-188, an archaeological site on the outer Kenai Peninsula and the subject of
a project report (Betts et al. 1991). TAG initially recommended that the minor amount of treatment which could be done at this remote subdivision would not be cost-effective in terms of the resulting net environmental benefit, and the FOSC concurred. However, the National Park Service objected to the TAG recommendation, and the FOSC referred the matter to CTAG.

Several CTAG representatives stated at the outset of the meeting that treatment decisions were outside of their jurisdiction. Some CTAG members reminded the FOSC representative that CTAG's function was not to make treatment decisions, but rather to respond to a treatment decision by ensuring that the appropriate archaeological constraints were in place. If TAG and the FOSC made a "no treatment" decision, CTAG did not review the subdivision since there was no potential threat to cultural resources. The FOSC decided that Exxon should treat the SEL-188 subdivision, and CTAG required that the set of procedures established for prior treatment at the location be followed to minimize disturbance to cultural resources in the intertidal zone. When the FOSC changed the status of the subdivision from "treatment not required" to "treatment required," the Park Service gave Exxon an ARPA permit extension to cover site monitoring. The superintendent of Kenai Fjords National Park concluded that a Special Use permit was not required for the 1991 treatment event because all cleanup was restricted to the state-owned intertidal zone.

Monitoring at SEL-188 involved implementation of a work plan developed in 1990 to protect the artifact scatter located in the intertidal zone during treatment (Betts et al. 1991). The work plan and archaeological monitoring effectively identified and protected cultural material, including a tiny slate bead (less than 1 cm wide) which was found during 1990 beach cleanup (Figure 6). The cleanup at SEL-188 in 1991 was accomplished in one tide cycle, and the results were included in the site protection report (Betts et al. 1991:77-78). No treatment was conducted at this site in 1992.

AHRS Site Updates

Updating AHRS sites was not a priority of the 1991 program because of the small size of the program, and because 335 sites had been updated in 1989 and 1990. The eight AHRS sites that were updated during the 1991 program were completed as part of the monitoring requirements. All eight sites were photographed, videotaped, and documented in field notebooks. Site documentation primarily involved observations on the condition of the site since its last update. One very important site (SEW-071) was a reported village whose location had never been verified. According to Chugach oral tradition, the settlement was the home of people who eventually moved to old

Figure 6  Slate bead (49SEL-188-062) collected from beach sediments during site monitoring in 1990.

Chenega village on Chenega Island. CRP archaeologists revisited the reported site location and found and recorded a buried deposit of shell midden. Only one site was updated in 1992.
Site Incidents

Five site incidents were recorded in 1991: three were reports of possible cultural resource material, and two were reports of a new site or of potential site disturbance. Site incident forms were completed when incidents were reported. All incidents were investigated and the Cultural Resource Program documented information received about the incident, the response, and the results of any field investigation.

Two artifact finds and one human skeletal find were reported and investigated in 1991. All were found to be authentic. One of the artifacts, a section of a wooden water pipeline probably eroded from the ruins of a nearby abandoned mining town, was found mixed with storm-tossed debris on top of a winter storm berm (Figure 7). It is presumed the item was deposited there during the previous winter. The second artifact was a small stone lamp located in the intertidal zone. The lamp was found in a previously documented fire-cracked-rock scatter [SEW-444] and was mapped and photographed (Figure 8). Both artifacts were left in place in accordance with project collection policies since they were in no danger of being affected by cleanup.

A human cranial fragment was found on Park Service lands by a MAYSAP survey team member. The fragment was reported to the Exxon supervisor of the team who followed Cultural Resource Program policy by leaving the item in place and reporting the find to the project director. However, later the same day, the Chief Park Ranger, a Resource Protection Officer accompanying the MAYSAP survey team, noted that the skull fragment rested on recent vegetation and exhibited a color and texture consistent with recent origin. The ranger collected the item and turned it over to the Park Service Regional Archaeologist in Anchorage who sent it to the Alaska State Troopers for analysis. As it turned out, the skull fragment was forensic evidence, not an archaeological find.

The two 1991 incidents involving archaeological sites concerned possible disturbance to two known sites by a Fish and Wildlife Service study team camp near the sites, and investigation of a potential new site reported by members of a MAYSAP survey team. In the first case, Fish and
Wildlife Service field personnel were contacted regarding the proximity of their field camp to two recorded cultural sites, advised of the sensitive nature of the sites, and asked to avoid these areas to prevent any disturbance. The potential new site observed by members of a 1991 MAYSAP team was investigated, but no evidence of human occupation or use was observed.

**The 1992 FINSAP Program**

A final shoreline assessment survey (FINSAP) of 81 shoreline subdivisions was conducted in May 1992 to identify residual oil, and, if appropriate, treat the shorelines. This program differed from previous surveys in that treatment was anticipated during the survey, and cultural resource constraints were formulated accordingly. In 1992, only limited manual treatment occurred. As before, all personnel participated in a training session which included cultural resource management instruction.

**Shoreline Conditions and Cleanup Methods**

Highly weathered asphalt and surface oil residue were the most common conditions encountered in 1992. Much of the 1992 cleanup involved either raking to disperse sediments containing surface oil residue, or manually removing small amounts of remaining weathered surface asphalt patches. Spill-related debris was picked up whenever it was encountered. Some isolated pockets of accessible subsurface oil were manually tilled or picked up, depending on the survey team consensus. Extended cleanup only occurred in three subdivisions in 1992, none of which had any known cultural resources present.

The definition of manual treatment was addressed during FINSAP cultural resource planning. In previous years, TAG determined the exact nature and location of treatment prior to CTAG deciding the appropriate constraint. In 1992, with the TAG process being conducted in the field, cultural resource constraints essentially were pre-approved. Pre-approval dictated a specific plan for manual treatment. The nature of survey treatment was addressed in an April 24 memo from ADEC to Exxon:

Treatment in place such as tilling, breakup, or exposure will be the preferred method over bagging and removal of oiled sediments for light amounts of oiling. Gross oil concentrations will probably require excavation and bagging. The 1991 treatment and subsequent natural weathering processes are expected to reduce the gross contamination levels to lesser concentrations. As a result, the state expects that further contamination can be adequately contained and treated in place rather than removed from the shoreline.

**FINSAP Constraints and Results**

Representatives of Exxon, state and federal agencies, and private land managers conducted the Final Shoreline Assessment Program (FINSAP) in 1992 by jointly surveying and documenting shoreline conditions and performing appropriate spill-related cleanup. This survey differed from prior assessment surveys in that TAG review was shifted
to the field. Two crews of eleven in two separate vessels conducted the survey/treatment program in May and June, 1992. Cultural resource constraints were approved prior to the FINSAP program through consultation with land managers and the SHPO. Constraints for segments which had been inspected in 1990 and 1991 on the basis of intrusive mechanical treatment were downgraded to standard constraints since no mechanical equipment was to be used in 1992, and since no cultural resources had previously been found in those subdivisions.

Sixty-four of the 81 FINSAP subdivisions received some sort of treatment, with all but three being treated by the survey team during the course of the survey. One site was monitored by an archaeologist during cleanup, and seven others were treated under the consultation and inspection constraint. These constraints ensured that no site access and no intentional or inadvertent removal of archaeological material occurred.

Portions of 81 subdivisions were surveyed during FINSAP. Cultural resource constraints on the 81 subdivisions included eight consultation and inspection constraints, and one monitoring constraint. The extent and degree of remaining surface and subsurface oil documented during FINSAP continued to decline, and biologists noted continued recovery of impacted areas (Exxon Company, USA 1992:1). No treatment was required in 17 of the subdivisions, minor treatment was conducted during survey in 61 subdivisions, and 3 FOSC-directed subdivisions were treated. Cultural resources were protected during the FINSAP program and no adverse site impacts or site incidents occurred. Admiral Ciancaglini of the USCG-FOSC and Commissioner Sandor of ADEC confirmed in June, 1992 that Exxon Valdez cleanup operations were successfully concluded.

Site Incidents

One site incident was reported in 1992, involving possible site disturbance reported during the FINSAP survey. An Exxon supervisor reported a trench had been excavated in the intertidal zone adjacent to a known site and near an area where artifacts had been collected in 1989. The CRP checked to ensure that cleanup crews had not been in the area in 1992, and reported the disturbance to the SHPO and to the Forest Service, the upland land manager. The program later ascertained that the disturbance had been caused by a State of Alaska Department of Environmental Conservation crew which had been conducting its own cleanup program apart from the FINSAP survey. A site visit indicated that no archaeological material had been disturbed.

Summary

The 1991 Cultural Resource Program was conducted by three archaeologists and its size was approximately 10% of the 1990 program. The 1991 program was able to use or revise most of the procedures which had been developed in 1990 with the assistance of government and Native organization archaeologists. The smaller 1992 program did the same. The reduced treatment effort and the decision by CTAG to adopt the 1990 standardized constraints reduced the need for direct involvement of state and federal agencies and Native organizations in 1991 and 1992. While CTAG met infrequently, it continued to play an important oversight role in the site protection program.

This report was required under the four permits issued to the CRP for the 1991 and 1992 programs, and fulfills the reporting requirements of all permits issued to the Cultural Resource Program in 1991 and 1992. An agreement was finalized in 1990 with the University of Alaska Fairbanks Rasmuson Library for curation of all of the project’s administrative documents, field notebooks, photographs, and videotapes, and an agreement was finalized in 1992 with the University of Alaska Museum in Fairbanks for curation of all artifacts, objects, and samples collected during the Cultural Resource Program.
Previously, Haggarty et al. (1991b:205-252) discussed the social, demographic, and ecological implications of pre-contact archaeological sites and natural resource distributions in the Alutiiq region. During 1991, the project explored the cultural environment of the more modern archaeological sites documented during the project to continue the analysis of human adaptations in the Alutiiq region. Prior to 1989, scant archaeological research had been done in the area, and basic information on the origin, use, and abandonment of many of the newly discovered fox farms, canneries, salteries, military sites, shipwrecks, and other historic sites was not available. This chapter identifies past occupancy and use of some of the sites, discusses selected socio-economic attributes, and examines how the sites reflect changes in the post-contact cultural conditions in the Alutiiq region, particularly Prince William Sound. It is not possible to examine thoroughly the post-contact history of the Alutiiq region in this chapter. Rather, this report seeks to outline historical themes indicated by the abundance of certain post-contact site types documented during the program, and connect archival and anecdotal data to specific sites.

There are 228 known sites with post-contact components in the project area, of which 123 (54%) were recorded by Exxon Cultural Resource Program archaeologists. Seventy-three (31%) are located in Prince William Sound (Haggarty et al. 1991b:305-318). Although a complete post-contact history of the region has not been written, local historical data are available. Rakestraw (1981) includes an historical sketch of the Chugach National Forest; the Lethcoes (1985, 1990) profile important individuals and events in Prince William Sound; Chaffin (1983) and Harvey (1991) compile aspects of Kodiak area history; Klein (1981) documents the history of Kachemak Bay; and Pedersen (1983) does the same for the Kenai Peninsula. These studies, and the type and abundance of post-contact sites documented during the past four years, indicate intense 19th and early 20th century land use in the Alutiiq region.

The following discussion focuses on late 19th and early 20th century sites documented by the Exxon Cultural Resource Program, particularly sites in Prince William Sound. Many post-contact sites discovered during the program are described in Chugach National Forest Ranger Notes and Diaries (Chugach National Forest Rangers n.d.; Mur-
Ray n.d.; Pratt n.d.), an archival collection which links certain sites with specific people, events, and prevailing issues of the early 20th century. Data from other archival sources connect additional names, faces, and anecdotes with sites, and historic photographs of people and sites provide supplemental documentation and a visual frame of reference. This investigation describes aspects of changing land and resource use patterns which have evolved in the project area since initial foreign contact. The nature and context of the region’s post-contact sites indicate extraordinary culture change and major shifts in land and resource use during the past century.

Post-Contact Alutiiq Life

Previous project reports discussed culture change resulting from Euroamerican contact with Alutiiq people in the 18th and 19th centuries (Mobley et al. 1990:51-54; Betts et al. 1991:15-29; Haggarty et al. 1991b:90-112). To briefly summarize, Vitus Bering’s voyage in 1741 initiated the contact era, and piqued Russian interest in the land and furs to the east of Russia. Captain Cook’s voyage reached Prince William Sound in 1778, and his accounts sparked Euroamerican interest in the trade of local sea otter skins to Asia. Spaniards also explored and claimed portions of the land in the Gulf of Alaska region between 1775 and 1791.

The data regarding Native lifeways which these early explorers and traders collected must be used cautiously in interpreting the past because early observers were culturally biased and because Native culture change was continuous before and after European contact (Haggarty et al. 1991b: 75, 209-213). We are just beginning to be able to evaluate critically ethnohistoric and ethnographic data with the benefit of through systematic archaeological data.

Foreign influences during the late 1700s caused changes in Native political organization and in settlement patterns. Epidemics, internal and external warfare, conscription, and relocation caused drastic declines in population. New systems of food production and distribution altered diet, health, and subsistence in the region. These major changes were not unique to the Alutiiq region:

Changes in Alaska Native Societies due to contact with expanding non-Native populations have followed roughly the same sequence in all areas. The time periods of major changes vary, reflecting historic circumstance, but everywhere the effects of contact were felt by 1850. Changes in traditional technology were followed by changes in economy and settlement patterns, encouraged primarily by the commercial exploitation of resources, such as the fur trade, commercial whaling and fishing, by compulsory western education, and by major population reductions (Case 1984:362).

This is not to say that Alutiiq culture was destroyed or eliminated – it adapted to new and different circumstances. Crowell (1992) discusses aspects of Koniag art and ceremonialism which persisted into the 19th century. Some Alutiiq values related to food sharing and extended family relations persist, and others related to plant and animal lore have merged with non-Native customs and beliefs. A recent movement by Alutiiq people seeking to learn their history, define themselves, and reclaim pride in their heritage attempts to revitalize the culture (Pullar 1992). Nevertheless, the loss of self-governing local groups, the reorganization of land and resource use, and the restructuring of subsistence and economic pursuits were major and irreversible changes in the Alutiiq way of life. The Alutiiq culture of the mid-1700s was transformed by Russian and Euroamerican influences, and it continued to be altered profoundly during the 19th and 20th centuries by Western socio-economic forces.

Post-Contact Socio-Economic Change

The distribution, abundance, and availability of subsistence resources were crucial factors in Alutiiq settlement and demography prior to foreign contact. With an influx of EuroAmericans after the initial exploration period (1741-1783), Euroamerican government and business ventures
increasingly influenced where and how Alutiiq people lived. The policies of the Russian American Company so thoroughly influenced the Koniag of Kodiak Island, for instance, that Holmberg (1985:51) stated in a public paper delivered in 1854:

The introduction of Christianity and, consequently, a beginning of civilization, as well as the labor forced upon them by the Russian company, compelled them to abandon many of the habits of their fathers. All this resulted in the new generation knowing nothing of their beliefs and only little of the customs and habits of their fathers.

Disease epidemics during the 19th and early 20th centuries afflicted entire Alutiiq communities. These communities were already undergoing great social changes brought on by foreign contact. It is entirely likely, based on the large size and number of late pre-contact villages, that unrecorded epidemics had occurred prior to direct contact in the 18th century, and had already impaired customary subsistence and settlement. Pre-contact epidemics and their devastating effects on aboriginal people have been noted elsewhere (Ramenofsky 1987; Campbell 1989; Guilmet et al. 1991). Such epidemics would have made Alutiiq society sus-

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(Adapted from Levin 1991:212)
Figure 9  Native Children Attending Seldovia School, January 1910. (Alutiiq and Dena’ina children lived in the area.

dectible to the social breakdown which occurred under Russian rule during the early and mid-1800s.

According to Fortuine (1989:201-208,233,262), recorded disease outbreaks in the Alutiiq region during the post-contact period include respiratory disease epidemics in 1819, 1827, and 1881; smallpox in 1837; a measles epidemic in 1874; typhoid in 1881 and 1900; and tuberculosis throughout the period. Fortuine (1989:236) characterizes the terrible smallpox epidemic of the mid-1830s as one of the most significant events in the history of Native Alaska:

The surviving Natives of southern and western Alaska found their world in ruins ... Starvation was a grave threat to many families, since the loss of hunters precluded storage of food for the winter ... Families were broken up everywhere ... The Koniag, who suffered heavy losses in the epidemic, probably experienced the greatest change of all ... [and were] consolidated [from] sixty five Koniag settlements on Kodiak Island into a mere seven ... Village sites and hunting grounds which had been occupied for centuries had to be summarily abandoned for unfamiliar ones.

Difficult living conditions and increased availability and use of alcohol under American rule during the late 1800s intensified the health crisis. The head of the Alaska Commercial Company post at Nutchek noted in 1889 (ACC n.d.b.:3): "I never saw so many persons crippled, both old and young, blind, paralyzed - or suffering from contraction of the muscles in arms & legs owing to old cancerous sores." Many miners returning to Prince William Sound from the interior gold fields also were in poor health and were responsible for the spread of disease. Alutiiq and non-Native interactions were a source of culture change and illness; some resulted in mixed offspring (ACC n.d.b.:4): "Yesterday PM one of the native ladies was safely deliv’d of a bouncing boy. Reported father a miner, named Jim ..." Lethcoe (1985:46) notes that in the late 1800s non-Native hunters were ineligible to hunt sea otters, but some circumvented this by marrying Native women. The wide population fluctuations of Alutiiq villages between 1880 and 1980 is evident in Figure 8, and episodes of population loss appear to correlate with Fortuine’s dates for major disease epidemics.

The expanding presence of federal and territorial government agencies, private corporations, land speculators, orphanages, public schools, and Christian missionaries in the late 19th and early 20th centuries stimulated further social and economic changes among the surviving Alutiiq. The Alutiiq and the Creoles (mixed Alutiiq/Russian) continued their affiliation with the Russian Orthodox Church; however, new economic and education opportunities influenced life in the region (Figure 9). A mixed economy of cash employment augmented by harvesting wild resources developed during this era.

Commercial enterprises drew Alutiiq people (at least seasonally) away from the mid-1800s villages and toward mines, canneries, and towns such as Kodiak, Seldovia, Seward, Cordova, and Chignik (Davis 1984:202) (Figures 9 and 10).

The expanding cash economy also attracted Alutiiq people into adjacent regions such as Bristol Bay and Cook Inlet. Dena’ina elder Peter Kalifornsky (1991:3) discusses Native participation in com-
mmercial clam digging on the west side of lower Cook Inlet in the early 1920s:

They set up a factory at Snug Harbor to can clams. Different people came to Polly Creek. Some came from Iliamna, others from Seldovia, Kodiak, Ninilchik, Tyonek, or Kenai.

Commercial fishing, trapping, and sport hunting affected the availability of some subsistence foods, and participation in the cash economy meant that certain subsistence activities had to be either rescheduled or abandoned. By the mid-1920s, many Alutiq villages which had been the focus of the Russian and American fur trade were abandoned or only inhabited seasonally by small numbers of people (Pratt n.d.):

[May 11, 1924] Lutz, Jacobsen and myself went ashore and inspected Nuchek Indian village . . . There is only one habitable cabin here. The other buildings including the church, being in ruins. No natives were at the village, and there were no signs of recent occupation other than some half-starved dogs.

[June 9, 1926] . . . started for Port Etches to lay out a sample [forestry] plot . . . Lutz and I went ashore and called on Chief Chimawiski at Nuchek Indian village. Only two families here now - the chief, his wife and 15 year old son, and a Mrs. Rice - native - and her 5 boys ranging in age from 6 months to about 10 years . . . The chief has seaweed and devilfish [octopus] drying in the sun, both of which he declared were "plenty good to eat" in the winter. The seaweed is perfectly black when dried, and very tough - almost rubbery . . . During the winter they cook it about like spinach.

The eruption of the Katmai/Novarupta volcano on June 6, 1912 was a major natural disaster which forced permanent abandonment of Katmai, Douglas, Pauwik, and Savonoski -- Alaska Peninsula villages with Alutiq residents. The lives of these villagers had already been changed by commercial fishing when the volcano spewed about six cubic miles of ash across the region. Dumond (1979:383) cites one survivor's account that the majority of the population from the coastal villages of Katmai and Douglas had gathered at Kafka Bay to catch and smoke fish to sell to a Kodiak entreprenear when the eruption occurred in 1912. Dumond (1979:384) also recounts evidence that people from the interior village of Savonoski had assembled near the mouth of the Naknek River on the Bristol Bay side of the peninsula in search of seasonal commercial fishing employment when the eruption occurred. Tragically, an influenza outbreak in 1919, part of a worldwide pandemic, killed many of the Alaska Peninsula Natives who had endured village abandonments caused by the eruption (Dumond 1979:384).

Socio-economic and demographic conditions in the Alutiq region changed so rapidly during the late 19th and early 20th centuries that within a generation Native people became a minority in their traditional territory. Danish anthropologist Kaj Birket-Smith studied Chugach culture in the early 1930s and described the disparity between the generations (1953:3):

The old man [Makari] belonged to a period when, in spite of foreign rule, the natives were still to some extent masters of their own country. The daughter [Matrona], however, represented the

Figure 10 Native People at Chignik (circa 1910). (Note Native, Russian, and American influences).
present day when they definitely constitute a lower class.

Alutiiq gender and social relationships also changed during the post-contact era due to new living arrangements and subsistence strategies resulting from policies established by Russian and American institutions. Alice Lipke, a store owner married to a wireless operator at Seldovia, describes Native acculturation and the sale of artifacts during the early 20th century (1938:180):

There was a time, but a few years ago, that one could buy all kinds of curios in Seldovia such as charms and tokens, idols and ivories, fur garments and skin garments, baskets, eagle claws, eagle feathers, spear heads, stone lanterns. Today, you can find nothing. No more does the old native woman come to the dock-side with her handicraft to sell you. In her stead, comes the trim native girl, decked out in silk, high heels, and trim "cloche" hats. She has a swagger and a tilt of the head that would do any "grande dame" credit.

The USDA Forest Service started regulating Native and non-Native land use and subsistence in the newly formed Chugach National Forest during the early 1900s. Alutiiq timber crews harvested timber for local mines and canneries. Deer were transplanted from Sitka to Prince William Sound between 1917 and 1924 (Lethcoe 1985:63) and were protected from hunting while they became established. Some Natives apparently acquired venison from southeast Alaska where deer were hunted intensively for their skins (Pratt n.d.):

[November 23, 1928] [in Cordova] Spent 2 hours with Supervisor McDonald, Dr. Chase and Marshall Closes investigating a report that Indians had killed a deer. We found a deer head outside an Indian shack. It later developed that the head came from a carcass shipped up from Southeastern Alaska.

Commercial fishing, mining, and fox farming supplanted the fur trade during this era. Alutiiq subsistence in the 18th century was focused on abundant seasonal resources, and had emphasized sea mammal hunting. This pattern had already been severely altered during the Russian era, and was further disrupted by summer employment opportunities which pulled people away from subsistence activities (Stanek 1985:45).

The discovery of gold on the Kenai Peninsula and in the interior, and the discovery of copper and gold in Prince William Sound were major reasons for the change in the ethnic composition of the region. Valdez was one of the jumping-off points for hordes of miners from "Outside" streaming inland, and many who were daunted by difficulties in reaching the interior explored mining possibilities in Prince William Sound (Figure 11). These mining ventures provided some packing, logging, and construction work for local Native people, while large canneries on Kodiak Island and in Prince William Sound, Cook Inlet, and Bristol Bay provided Native people with construction and other employment opportunities. Alutiiq people made major cultural adjustments to a social landscape which had been altered by Native population loss and fundamental changes in settlement and subsistence. A thorough assessment of the socio-economic impacts of each phase of development is not within the scope of this report. However, it is clear that new commercial enterprises continued to change an already-modified Alutiiq culture, and left ruins and artifacts which constitute the post-contact archaeological record of the area.

The American Fur Trade

Russia’s sale of Alaska to the United States in 1867 followed the decline of the Russian American Company’s fortunes. With the transfer of Alaska, the Hutchinson, Kohl & Co. bought most of the buildings, equipment, and supplies of the Russian American Company and, in 1868, formed the Alaska Commercial Company (ACC) which ran trading posts in Prince William Sound, on Kodiak Island, and on the Kenai and Alaska peninsulas (Oswalt 1967:iv). The socio-economic impact of the commercial fur trade was most pronounced just before the fur market collapsed in 1897, prior to the protection of sea otters in 1911 under the Fur Seal Treaty Act (Stanek 1985:44):
... competition for the fur trade was allowed by the new American government, extremely high prices were paid for fur, and the market became inflated. The extended credit policy was carried to an extreme in order for trading companies to secure Native business. A period of wealth prevailed among the Natives, large debts were accumulated, and cash entered the local economy as a result of stiff competition among traders.

The ACC obtained land mammal and sea mammal furs from Alutiiq hunters who hunted and trapped during excursions to outlying areas, including offshore islands which had been abandoned in the late 1700s: "Ab't noon two bidarkas arrived from Knight's Isl'd, belonging to party" (ACC n.d.b.:5). "Arrival of 2 Bydarks from Barren Islands. Their catch 1 sea otter" (ACC n.d.a.). According to a ledger of furs purchased during the winter of 1894-95 at English Bay, 105 mink, 48 land otter, 30 marten, 19 bear, 6 wolverine, and 2 sea otter were taken by Alutiiq hunters who ranged over a wide area in search of furbers (Figure 12).

Some stores had a difficult time keeping the hunters outfitted, as this passage from a company journal from Nuchek in 1889 indicates (ACC n.d.b.:9):
When we first came here [Nuka Island] we found all sorts of old contraptions set up in the trails and close to dens, their purpose having been to catch land otters. On the trails of the mainland and nearby islands were decayed death-falls by the hundreds. We found little box-like houses built with sticks, in which to set steel traps for minks; all manner of spring poles; plenty of other evidence of the ingenuity of man in his effort to outwit every living thing that walked on legs.

Further examination of ACC records, Russian Orthodox Church archives, and Alutiiq oral traditions could yield more data on socio-economic aspects of Alutiiq hunting and trapping during the mid-to-late 1800s. Investigations of sites such as AFG-005, SEL-178, and XBS-014 which the Cultural Resource Program documented as having both pre- and post-contact deposits may also produce archaeological information pertinent to these issues.

Mining

The Klondike gold rush of 1898-99 brought thousands of prospectors through Prince William Sound to Valdez. Copper, gold, and chromite discoveries and subsequent mining in Prince William Sound and the outer Kenai Peninsula attracted many non-Native "Outsiders" to the region in the early 20th century. Naturalist John Burroughs, a member of the Harriman Alaska expedition in 1899, described prospectors waiting for the steamer at a cannery near the present town of Cordova (Burroughs 1910:65,66):

Over 3,000 men had gone into the Copper River region a year or more before [1898] on the wildest, vaguest rumor of gold . . . Now they were coming out destitute and without one cent's worth of gold. Alaska is full of such adventurers ransacking the land; we heard of them in several other points; men looking for new Klondikes, exploring remote corners, going eagerly and quietly into the wilderness, crossing glaciers, rivers and mountains, hoping to be the first in new and rich fields.

By 1907, Prince William Sound had experienced its own mineral boom as a result of development of large copper mines at Ellemar, Latouche, Port Fidalgo, and Knight Island (Figures 13, 14).
Over 200 million pounds of copper from Prince William Sound were produced by fifteen companies between 1900 and 1930 (Lethcoe 1990:179). Mining’s effect on Alutiiq culture is not well documented, but Saleeby’s (1992) study of Athapaskan culture change during the gold rush era (1886-1920) concludes:

There is no doubt that all Athapaskan groups experienced change . . . as a result of culture contact during the gold rush era. However, the impact in the territory of groups . . . where gold and/or copper mining was early, very productive, and sustained a resident white population was much greater than for groups where mining activities were ephemeral or of marginal economic importance.

The influx of non-Native Outsiders affected the Alutiiq economy, especially in Prince William Sound. Wage employment, tourism, and Outside customs brought new socio-economic influences to the region. The growth of mining towns such as Latouche brought culture change to the Alutiiq region.

The remains of Latouche [SEW-026] were documented in detail by Cultural Resource Program archaeologists in 1989 (Mobley et al. 1990:180-190). Latouche was the focal point of early 20th century culture change in southwest Prince William Sound. This company town of over 500 people essentially transplanted early 20th century American culture into an area which already had been transformed by the Russians, the maritime fur trade, and the commercial fur trade. O’Neel (1965:23), a former resident, recalls the amenities of life at Latouche:

The general store operated by the company supplied provisions for the families and there was also a butcher shop with a butcher on duty eight hours a day. The company maintained a fine hospital with a medical doctor and two and sometimes three graduate nurses and complete surgery, x-ray equipment and so forth. A dentist also made his headquarters there . . . Latouche also boasted a modern laundry and cleaning plant, a wireless station . . . a barber shop and a post office. The company maintained first class recreation facilities, too, including a large recreation hall and tennis courts. The recreation hall had pool tables, a reading room and a two-lane bowling alley . . . Dances in the hall were a regular feature of Saturday nights in Latouche the year around . . . Sometimes a steamer was in port, loading ore, or crews came from fish processing plants near Latouche . . . There were two good-sized lakes which furnished trout fishing in summer and skating in winter. Skiing, snowshoeing and tobogganig were also popular winter sports, and in summer there was boating on protected waters and saltwater fishing for salmon and halibut, crabbing and clam digging. In the fall we hunted ducks and geese, and ptarmigans and grouse were plentiful on the island.

Helen Green Van Campen, the wife of Frank Rumsey Van Campen, manager of the Beatson Copper Mine at Latouche, wrote fiction for the Saturday Evening Post during the 1910s. The following narrative (Van Campen 1913:364-365) provides a glimpse into Euroamerican life at the town during its heyday:

I live on the island of La Touche, in Prince William

(P.S. Hunt Photographer. Anchorage Museum of History and Art (B62.1.945))

Figure 13 Reynolds-Alaska Development Company Excursionists at A.K. Beatson's Copper Mine, Latouche Island 1907.
Sound, Alaska . . . While I write a vaudeville story, set on Broadway, I look out of a front window and see a freight boat loading ore at the dock, and at the islands across the channel . . . Every ten days or nights a main steamer from outside - the States - moos mournfully down the channel, and the waves come stronger against my house, which is built on piles over the water, and the captain begins to yell, and the folks on our dock yell, and the headline just misses somebody, and we swing lanterns and stamp our rubber-booted feet to keep warm. Then she's near enough so we can find out who's on this trip, - if the Seward dentist travels to Valdez, it's the right of all the coast Alaskans to know whose teeth Doc is going to fix, and when a man goes out to get married, his friends know more about it than he does. In winter, when it is mostly dark day and night, the ships manage to get there about 2 A.M. with a Norther blowing so your hands will freeze to a rope. But then there's summer . . . I do my housework, make nearly everything I wear, from gowns to slicker suits and hats, crochet caps, wash the family flannels because the Aleut woman boils them, split the kindling and wash windows, carpenter a little . . . hunt ptarmigan on the mountains and keep the broken glass of the beach out of the feet of Murphy the dog. Think of people sweating and complaining on Broadway, when I'm out in a heavy sweater . . . fishing for 100-pound halibut out in the dory. We eat mince pie all summer on La Touche, and when we want ice-cream we tow in a little, right sized iceberg that's come down from Chenega glacier - no place like the North!

The Cultural Resource Program documented the remains of towns, mines, exploration camps, sawmills, and isolated mining artifacts related to this era such as SEL-017, SEW-267/391, SEW-446, SEW-449, SEW-450/480, SEW-454, SEW-483, SEW-496, and SEW-514. Some sites are documented in photos and narratives (Figure 15), and others may have unique oral history potential if descendants of individuals who lived and worked at the sites can be identified and interviewed.

A booklet for the Knight's Island Alaska Copper Company promoting a copper mine in Drier Bay [SEW-391] includes the following de-
cription of mining strategies and support facilities (Everts and Deacon 1907:16-20):

The easiest and most economical method of mining is to get under the ore body and blast it down from the roof; to accomplish this a tunnel is being driven into the side of the mountain, which will tap the ore body about three hundred feet below its apex. The length of this tunnel will be about two hundred and thirty-five feet (of which sixty has been completed), and it is going forward at the rate of a foot and a half a day . . . We propose to erect an aerial cable tramway from a point near the mouth of the tunnel to that rocky projection in [the] Bay; there we shall construct ore bunkers to receive the ore conveyed to them in buckets, each of which will carry fifteen hundred pounds and make the trip along the wire cable, a distance of less than a mile, in a few minutes. No power will be required in operating the cable, as the momentum gained by the buckets filled with ore will bring the empty ones back to the tunnel mouth after they have unloaded automatically into the ore bunkers. These will be constructed upon a rocky shelf, some fifty feet above low tide and from them the ore will travel down a chute, leading directly into the vessel’s hold.

Figure 16 illustrates site SEW-391 after the tramway and wharf were constructed. Figure 17 depicts an adjacent mining camp in Drier Bay (KIACCO being the acronym for Knight’s Island Alaska Consolidated Copper Company).

The William A. Dickey Papers (Dickey n.d.) document corporate and operational aspects of copper mining at the Rua Cove mine on Knight Island [SEW-483]. A Princeton graduate, Dickey is credited with having re-named Denali Mt. McKinley in 1897. He apparently located large mineral claims near Dawson in 1898, and developed the Landlock Bay mine near Valdez prior to helping associates obtain and later develop the Rua Cove property. In an August 26, 1916 letter to his associate Fred B. Snyder of Minneapolis, Dickey proposed that Snyder buy fox farmer Fred Liljegren’s 1/8th portion of the Rua mine, and Mrs. Bertha Rua’s majority interest: "... this would be $28,000 cash for the property, and would be by far the best buy in my opinion ever made in this part of
Alaska.” Liljegren needed cash to buy his partner’s interest in a fox farm.

Dickey noted interactions with Alutiq people; for instance, he traveled by "bidarky" between Landlock Bay and Ellamar in 1912. Also in 1912, he hired a Native crew to build two log houses for $300. According to Chugach Alaska Corporation Cultural Resource Manager John Johnson (personal communication, 1992), Mr. Joseph Harrison and his Chugach wife, Lena, raised their family at the Rua Cove site. In an October 21, 1915 letter to Mr. George Waldren of Valdez, Dickey wrote:

I have been unable to see any of the natives relative to a contract for logs since you were here. Just now they have been getting piles [pilings] for various parties and have plenty of money so it would be a bad time to contract with them.

The amount of copper ore actually sent from the mine to be smelted is unclear, but Dickey’s correspondence, business records, and survey notes indicate the speculative and cyclical nature of mining and development in Prince William Sound during the first half of the 20th century:

[Dickey n.d., August 27, 1912 letter from Wm. Dickey to Mr. C.E. Bogardus, Seattle] We do not need an assayer here… The woods in this vicinity are crowded with assayers and mining experts, mostly graduates of technical schools. In Valdez the other day I was asking my friend if he knew where I could get a couple of good miners. He replied, ”I do not know where you can get any good miners, but I can get you a dozen experts in ten minutes.”

[Dickey n.d., June 23, 1917 letter from Wm. Dickey to Mr. F. Snyder, Minneapolis] It is very hard this year to get good steady men. Work is so plentiful that everyone is quite independent and our men quit on the slightest pretext.

[Dickey n.d., October 25, 1932 letter from Wm. Dickey to Mr. M.F. Butler, Kansas City] Latouche is practically deserted, all the machinery has been sold and is gradually being removed. In fact, the whole of Prince William Sound is going to seed rapidly, even the fishing business this summer being very quiet.
[Dickey n.d., April 14, 1934 letter from Wm. Dickey to Mr. H. McWilliams, New York] Quite a gold boom is now in progress in Prince William Sound and I would certainly advise taking advantage of this opportunity.

Other correspondence includes letters between Dickey and Judge Anthony Dimond of Valdez, the Latouche Copper Mining Company, the Consolidated Mining and Smelting Company of Canada, Goodyear Tire and Rubber Company, and the Mitsubishi Company.

Mining played a significant role in the post-contact history of Prince William Sound and the outer Kenai Peninsula by drawing numerous Outsiders with their new customs to the region, expanding the region's infrastructure, and providing wage employment for local people. CRP archaeologists documented numerous mining sites in Prince William Sound, the outer Kenai Peninsula, and on Shuyak Island in the Kodiak area. Project archaeologists also documented a pre-1912 historic

(San Francisco Maritime NHP; Owens Collection [G11.19,396])

Figure 18 Ship \textit{AJ Fuller} at Northwest Fisheries Co. Cannery, Uyak, Kodiak Island (early 1920s?).

(Anchorage Museum of History and Art [390.13.6])

Figure 19 Ship \textit{Indiana} Leaving Karluk, 1900. (Canneries such as the facilities at Karluk were a major source of culture and resource change in the Alutiiq region. Note Alutiiq barabaras and skin boat frames in foreground and Western frame houses in background).
artifact scatter including pick axes [AFG-171] on the Alaska Peninsula, possibly related to prospecting. Mining was a principal vehicle of change in land use and ownership, socio-economic structures, and ethnic composition of the Alutiiq region.

Commercial Fishing

Commercial fishing in the Alutiiq region began in the 1880s prior to the gold rush and subsequent influx of miners. The fishing industry grew during the 1890s and early 20th century from small canneries and salteries supplied by fishermen with beach seines into large facilities supplied by fishtraps. In the Alutiiq region, the expansion of the commercial fishing industry and the mining boom occurred simultaneously. While mining was concentrated in Prince William Sound and the outer Kenai Peninsula coast, the commercial fishing industry prospered throughout the region. The industry’s social, economic, and resource impacts are chronicled by Bean (1891), Moser (1899), Hassen (1978), and Roppel (1986). Commercial whal-
ing, sea-lion hunting, shrimping, and clamming also thrived at certain locations for short intervals during the 20th century.

CRP archaeologists documented numerous abandoned commercial facilities from this era, including AFG-109, AFG-136, AFG-140, AFG-147, KOD-393, SEW-498, and XMK-060. Some of the cabin ruins and historic artifact scatters documented by the project also may relate to other small fishing enterprises from the late 1800s and early 1900s. Many canneries and villages were abandoned after the destruction caused by the 1964 earthquake and subsequent tidal waves - a natural disaster with far-reaching social effects in the region (see Davis 1971).

Karluk Lagoon, on the west side of Kodiak Island, was the site of one of the world’s richest commercial salmon fisheries, with over 3.5 million fish processed there in 1891 (Moser 1899) (Figure 19). As fish stocks at the Karluk River were depleted, other canneries sprang up, such as the Northwest Fisheries Company Cannery at Uyak, Kodiak Island (Figure 18). The commercial fishing industry’s impact on Alutiiq material culture was enormous (Haggarty et al. 1991b:99). By the 1930s, Alutiiq people were dependent on purchased clothing, boats and equipment, tools, and food as a result of the growth of the commercial fishing industry in the region (Figure 20).

Davis (1984:202) considered commercial fishing’s effect on Alutiiq settlement patterns:

The changing settlement patterns of the Pacific Eskimo, as reflected in the census, include the abandonment of many villages, the growth of others, and the development of several new villages. These changes may well prove to be in direct response to the rise and fall of canneries in key locations.

The use of commercial fish traps (Figures 21, 22) during this era promoted the depletion of anadromous fish stocks and led to subsequent reductions of fish harvests until the traps were outlawed at statehood in 1959 (stream barricades had been prohibited since 1890).
and Knight islands. Lethcoe (1985:65) reports that between World War I and World War II, four salmon canneries and six herring reduction plants operated in the Latouche Island, Knight Island, and Evans Island area. Pratt (n.d.) wrote in his work diary on August 1, 1922: "There are eight herring salteries operating near Latouche and from all reports they are having an exceedingly prosperous season." Many women who staffed herring facili-

ties (Figure 23) married local miners (Lethcoe 1985:66).

Commercial fish traps were used frequently in the Alutiiq region to harvest salmon. Archaeologists noted trap ruins during Cultural Resource Program surveys in Prince William Sound, and plats in the Alaska Packers Association Records (Alaska Division of State Libraries and Museums 1982) indicate fish trap locations
throughout southcentral and southeast Alaska. Chugach National Forest Ranger Notes and Diaries record lumber appraisals related to fish trap and cannery construction, such as this entry for March 19, 1927:

Left the cannery at 9:30 am. Pulled into Barnes Cove ... Scaled two floating traps for Barney Lee. Colin Leonard is building some traps here, but did not scale them. (Murray n.d.)

The next day, Murray called at the Gorman Packing Co. and Cannery in Drier Bay, Knight Island:

Got them lined up on a timber sale. This layout has been a saltery until this year, the Gorman people are turning it into a two line modern cannery, all machines will have individual motor control. They expect to be ready in plenty of time for the fishing season ... (Murray n.d.)

A plat of the Alaska Pacific Salmon Corporation's Drier Bay cannery from 1931 (Figure 24) illustrates a cannery site plan. The plat shows segregated housing for Chinese and Filipino workers who labored at many canneries and who brought foreign customs and illnesses with them.

Herring was (and still is) one of the major species harvested in Prince William Sound. During the peak year of 1936, the herring reduction facility at Port Ashton across from Latouche (Figure 23) processed over 56,000 tons of herring (Lethcoe 1985:66). The Ranger Notes and Diaries include reports of Prince William Sound herring fisheries (Pratt n.d.):

[September 9, 1921 at Everett Pacific Saltery, Thumb Bay, Knight Island]. Interviewed Supt. Johnson re: amount of timber cut last season and this ... This outfit has put up 3700 barrels of herring so far this season and expects to get a pack of 7000 barrels by the last of October when they will close for the season. They have a total crew of 32, of which about 8 or 10 are girls and women. They complain that the run of herring is smaller than for several years and Johnson accounts for this by the fact that a whaling steamer operated in this vicinity this spring and thinned out the whales. His theory being that the whales drive the herring into the bays, and consequently a scarcity of whales means a scarcity of herring in the bays.

[September 11, 1921]. Put into Sawmill Bay and called at Franklin Packing Co. Saltery plant. Met Supt. Bushman and Mr. and Mrs. Mitchell ... They complain of a light herring run this season, but expect to get a pack of 20,000 to 30,000 barrels. In connection with the saltery they run a fertilizer plant ... Ran up to San Juan Cannery [8,000 barrels put up, expect 12,000]. They have a total crew of 102, 20 of which are women and girls.

Commercial resource development figured prominently in the post-contact history of the Alutiiq region, and fishing has been a dominant industry. Resource development influenced the post-contact evolution of Alutiiq society just as the development of aboriginal sea mammal hunting and fishing enterprises structured pre-contact Alutiiq culture. The archaeological record clearly indicates that Native societies in the Alutiiq region were constantly changing in response to shifting social, economic, environmental, and political conditions. For some, the post-contact cannery and saltery sites documented during the Cultural Resource Program may lack the fascination and appeal of the ancient pre-contact sites, but they manifest the profound cultural, economic, and ma-

(Special Collections Division, University of Washington Libraries (UW-14112))

Figure 25 Port Hobron Whaling Station, Sitkalidak Island (circa 1930). (The station was situated adjacent to the path of migrating whales).
terial changes which commercial fishing brought to the Alutiiq region in the 20th century.

Commercial Sea Mammal Hunting

Commercial whaling in Prince William Sound is not well documented. Lawrence (1966) records pre-Civil War commercial whaling by sailing ships in the Gulf of Alaska between Prince William Sound and Kodiak Island. The September 9, 1921 passage from Pratt's journal (above) clearly indicates whaling in the sound, and Tornfelt and Burwell (1992:40) note the 1920 wreck of a whaling boat reportedly used to secure whale meat for fox farmers.

Better documentation exists for whaling by the American Pacific Sea Products Company at Port Hobron [KOD-202], on Sitkalidak Island off the eastern shoreline of Kodiak Island (Figures 25, 26, 27). Whale products such as whale oil, fertilizer, and bone meal from whales killed in the Gulf of Alaska were processed at the Port Hobron station. According to the William S. Lagen Collection at the University of Washington Library (n.d.), American Pacific built the Port Hobron station in 1927 after they closed their station in Bay City, Washington. American Pacific also ran a very successful station at Akutan, on the Aleutian Islands, using their seven killer boats: the Moran, Patterson, Aberdeen, Westport, Unimak, Kodiak, and Tanginak. Project archaeologists documented the remains of the vessel Northern on the beach at the Port Hobron site in 1989. The demise of the whaling station came during World War II (University of Washington Library n.d.): Dwindling catches, rising labor costs and poor prices paid by their primary customer, Proctor and Gamble, contributed to the decline of the companies, but World War II was the final blow. During the war the American boats were leased to the U.S. Coast Guard . . . After the war, American Pacific attempted to recover its losses from the Navy.

Figure 26 Whaling Industry, Port Hobron, Alaska (circa 1930). (Photos depict processsing of a blue whale, rarely seen in the Gulf of Alaska).
The ruin of Pacific whale stocks during the early 1900s had obvious short-term human impacts in addition to the more obscure long-term biological repercussions (Newell 1966:201):

A sad commentary on the whaling methods of 1912 was the fact that drifting whale carcasses were listed as a menace to navigation in Northwest waters. Capt. Louis Knaflitch of the power schooner Bender Bros. reported in October that there were nearly 200 carcasses in Akutan harbor and 100 adrift in the Bering Sea, it being the practice in many cases to extract only the easily procurable oil and abandon the remainder of the carcass at sea. Since the giant bodies averaged 100 tons in weight they constituted a real hazard to the small schooners and steamers of the northern fishery.

The potential of commercial sea lion hunting was explored in the Alutiiq region after World War II. According to Calkins et al. (1975:4):

Commercial interest in sea lions brought about harvests of pups for their pelts and some experimental harvest of adults for meat. A total of 45,808
Figure 28  
Alaska Fox Farm Scene. (In 1921, fox pelts were worth over $200 apiece).

Sea lion pups were recorded harvested from Alaskan rookeries from 1959 through 1972. A total of 31,070 of these came from Marmot and Sugarloaf Islands [Barren Islands].

It is no coincidence that areas which were the focus of early 20th century commercial harvesting of anadromous fish, whales, and sea lions are adjacent to some of the large pre-contact Alutiiq villages. The resource abundance which enabled areas such as Karluk, southeast Kodiak, and the Barren Islands to support large numbers of Alutiiq people prior to contact also appealed to the capitalists and commercial resource developers of the early 20th century. Although Alutiiq and Euroamerican groups adapted to the same environment and harvested the same species, archaeological remains from both groups are distributed differently because of cultural differences.

**Fox Farming**

Fox farms, fox traps, and fox pens were the most numerous post-contact sites documented during Cultural Resource Program surveys (AFG-100, SEL-183, SEL-222, SEL-224, SEL-225, SEW-438, SEW-452, SEW-453, SEW-459, SEW-460, SEW-464, SEW-465, SEW-466, SEW-468, SEW-482, SEW-503, SEW-524, SEW-539, XBS-016). Many other cabin sites and structural ruins recorded during the project likely relate to fox farming.

Bailey (1992:98) states unequivocally: "The advent of island fox farming, which peaked in the 1930s, was the worst ecological catastrophe experienced in Alaska" because of the foxes' extensive predation on defenseless seabird colonies. Janson (1985) and Klein (1986) describe individual fox farms and discuss regional variations. A US Government publication printed at the height of the fox-raising period describes the necessary equipment, permits, and techniques (Ashbrook and Walker 1925). The following discussion identifies

Figure 29  
Green Island Fox Farm, Prince William Sound (circa 1912). (A Japanese man and his Chugach wife raised their family at this fox farm).
people who raised foxes at sites documented during the Cultural Resource Program, and integrates other fox farming data.

Janson (1985 Ch:8:1) noted that nearly sixty fox farms once existed in Prince William Sound (Figure 28). Forest Service Special Use permits indicate over 100 permitted sites within the Chugach National Forest (Haggarty et al. 1991b:287-290). Many of the original fox farms in Prince William Sound were occupied between about 1894 and 1905, but were later abandoned because of low fur prices. Janson (1985 Ch:8:2-4) describes the rise in fox fur fashion and price. By 1921, a single fur was worth $250, and the following year, $100,000 worth of blue fox skins was shipped from Prince William Sound.

Fred Liljergren, a Swede married to a Native woman, is credited with introducing the first blue foxes (from Greenland) into the sound on Seal Island and, later, on Storey Island. Many Native people owned fox farms and raised their families at these sites. According to John Johnson (personal communication, 1992), a Japanese man named Charlie Mike Ujoka and his Chugach wife Julia Chernoff worked and raised their family on a farm on Green Island [Figure 29]. Fox farms are significant sites which enable a clearer understanding of the social and economic changes which affected Chugach and other Native and non-Native people in the region during the 20th century.

The late Enola Olds of Valdez grew up on a very large fox farm on Eleanor Island - the Shumaker Fur Farm [SEW-438] (Figure 32) documented during the Cultural Resource Program. Janson (1985 Ch:8:7) quoted Ms. Olds "...there were so many people living around the sound that it was not really lonesome out there." Enola's father, Mr. Shumaker, kept supplies aboard his boat that he sold to other fox farmers and neighbors in Latouche, Tatitlek, and Ellamar. Pratt (n.d.) established the date of the Shumaker farm:

[September 13, 1921] "...after supper went ashore and met Mr. and Mrs. Shoemaker [sic] and their partner Mr. Lund. They moved onto this island from Lone Island in the fall of 1919 with 19 foxes - nine females and 10 males.

Forest rangers traveled around Prince William Sound to ensure that special use permit sites were being used for their intended purpose. They recorded a great deal of fox farming data in the process (Pratt n.d.):

[October 15, 1925] [on a boat trip to western PWS] ...we ran as far as Peak Island where we anchored for the night... spent the evening at the fox ranch. Clock had gone to Icy Bay to tow a whale in for fox feed.

[June 22, 1927] Chas. F. Minor, owner of Crafton Island fox ranch called at office. He reports to be receiving an average of $73.00 per skin on the London market.

[September 23, 1927] Proceeded to Lone Island, where Grover Gordon, who operates a fox farm there, showed McDonald and Holbrook over the place. This island has never made any money and there is some talk of them abandoning it this winter... Proceeded to Storey Island... they have a good garden here and several bearing apple trees well laden with ripening fruit of inferior quality and size. Ira McLean and his wife were here from (Odale Collection, Anchorage Museum of History and Art [B91.9.86])

![Figure 30](image) More Than 5,000 Snowshoe Hares Drying for Fox Food (circa 1925). (An enormous amount of food was necessary to run a large fox farm).
Bald Head Chris Island. They now have a cow... They state that Van and Wallace on Axel Lind Island have a couple of milk goats.

Poaching was common and difficult to control because of the remoteness of the islands and the lack of law enforcement. Pratt (n.d.) noted how the Kulper and Baker ranchers on Elrington Island dealt with the problem:

[September 11, 1921] Owing to the size of the island - 7 miles long - they plan on establishing 4 permanent camps on different parts of the island which will enable them to protect themselves fairly well against poachers.

This problem, and its temporary solution, may explain the presence of small cabins (such as XBS-016, XBS-017) on remote parts of islands with large fox farms. Janson (1985 Ch.8:4) describes a subsequent approach to the problem: "The need for protective legislation and other laws led to the organization of a number of fur farmers' organizations." The Prince William Sound Blue Fox Association was formed in 1922.

A tremendous amount of food was required to feed the foxes. Janson (1985 Ch7:6) notes that fish heads from the cannery at Port Graham were used for fox feed. The food was cooked in a fifty-gallon drum cut in half. A photo from a fox farm on the Kasilof River, on the Kenai Peninsula north of Homer, shows five thousand snowshoe hares drying for fox feed (Figure 30). Mrs. Sather (1946c:18) (Figure 31) described the endless feeding tasks:

> The main fox feed on Nuka Island, as on most fox islands, is fish - humpback salmon, for the most part. We purse-seine them, either with the power boat or with a large rowboat that has a roller on the stern... With good luck we've caught as many as three to five thousand humpies at one haul; but many a time we've put out our seine and caught only a hundred or two... Our larger [salting] tank holds eleven thousand salmon... the smaller... holds nine thousand... Some years ago, we decided that a steady diet of fish is not conducive to the degree of productivity required for a successful fox-ranching industry, so we started feeding seal and sea-lion meat, too. There was at that time a Territorial bounty of two dollars a seal, and in the winter, when work was scarce, some men would go seal hunting for the bounty. The bounty has since been raised to three dollars... Pete made a neat working arrangement with a group of them [hunters]. He would take them and their camping outfits to some glacier on salt water; let them use one of our skiffs; and carry their mail and supplies to them. In return, they would give us the seals after they had been scalped. We often obtained as many as two hundred seals in a season...[19] On his frequent trips to Seward in the spring, Pete often brings home a sea lion.

Sea birds were used as fox feed during the early 20th century, but a prohibition on killing the birds reportedly hurt fox farmers. Janson (1985 Ch4:8) remarks that Peter Petrovsky of Uyak Bay on Kodiak Island:"... reported great difficulty. Foxes need feathers and bones for good digestion, and since he raised some of them in pens, it was a problem." Alutiiq people participated in fox farming directly by leasing islands and breeding foxes,
and indirectly by supplying fox farmers with wild food for feed (Janson 1985 Ch7:6):

Near Port Graham and English Bay there were a number of small islands that were farmed for blue foxes, notably Passage Island. Passage Island was owned by John A. Hebert, who had other fox islands... Hebert had plenty of help he could hire, and wages were low. "That was lower hard times, very low times," said Mickey Moonin of Port Graham, who was a child at the time. He and his brother Larry used to hunt porcupines and rabbits to sell to the fox farm. They got 25 cents for a rabbit and 50 cents for a porcupine. "Sometimes we'd get ten rabbits and twenty porcupines and sell them to the fox farm," he said.

References to moonshine production at fox farms in the region are common. Janson (1985 Ch8:6) reports: "Another source of extra income for
fox farmers in the 1920's was bootlegging. Goose Island, near Ellamar, had a liquor still in conjunction with its fox farm." Lethcoe (1985:68), with tongue in cheek, states: "During prohibition, several fox farmers experimented with feeding their foxes grain, claiming they did very well on large [grain] shipments." Pratt (n.d.) implies the use of fox farms as fronts for making illegal alcohol:

[June 5, 1929] Messrs. Church and Chidister of the Bureau of Prohibition called to see what areas Cunningham had under permit. They visited Wooded Island and found evidence that it was being used as a "distillery." They report no improvements of value on the Island and no sign of foxes.

This account by Mrs. Sather of Nuka Island indicates the existence of these sites, and of the potentially large quantity of moonshine produced (Sather 1946d:39):

One Sunday we were out in the skiff with no other purpose in mind than cruising around and exploring... We turned into this stream and were meandering along with time on our hands when suddenly we spied an enormous pile of brush heaped high not more than a stone’s throw from the bank. Tom [her first husband] and I looked at each other, too greatly surprised to say a word. Just a few steps farther, and there around the brush pile we saw a building about twenty feet square. The door was open, so Tom walked over and looked in... We looked around the place. Standing on benches three feet high all around the walls were fifty-gallon mash barrels. We could hear the yeast working. In one corner stood a thirty gallon still, going full blast. The "mountain dew" was running in a crystal-clear stream the thickness of a good-sized sewing needle. Jack was using oil for fuel, which was why we had seen no smoke.

In 1918, painter Rockwell Kent and his 8-year-old son spent six months on Fox Island (near Seward in Resurrection Bay) with a 70 year-old fox farmer named Olson. Kent’s published journal includes fox farm sketches and anecdotes (Kent 1920).

Fox farm ruins on the Barren Islands [AFG-099, AFG-100] were documented during the project. The structures appear to have been built by New York socialite Kay Barker (Barker 1939). She noted that she had been to the island around 1930, had stocked the island with foxes, and had built a cabin. She returned seven years later to collect some mating pairs to stock a fur ranch in upstate New York. In her absence, the island had been poached, and the poachers had ruined her cabin [AFG-039]. She built a new cabin [unrecorded] and fox feed houses and pens [possibly AFG-099], and removed a number of foxes from the island. At one time, Kay Barker was married to Jack McCord (Long 1975: 120), and his name is associated with the earlier site [AFG-039].

The Cultural Resource Program documented vestiges of the fox farm era currently disintegrating in the harsh coastal elements. Fox farming flourished for a short time in the Alutiiq region during the early 1900s. Many of the islands which had been inhabited by Alutiiq hunter/gatherers centuries ago were re-occupied by Swedes, Norwegians, other Euroamericans, and Alutiiq people who built and maintained fox farms on the islands. During its peak in the mid-1920s, fox farming provided a significant source of revenue for many hard-working people in coastal Alaska, and brought lasting culture change to the Alutiiq region.

Logging

The long history of forest products use in the Alutiiq region is apparent in the pre-contact woodworking tools and wooden artifacts found in archaeological sites throughout the region. An Alutiiq ethnobotany (Russell 1991) indicates broad use of trees, shrubs, and plants as food, shelter, tools, containers, medicine, adornment, charms, and masks. Cultural Resource Program archaeologists documented evidence of both ancient and modern tree use in the region. In addition to numerous pre-contact woodworking tools and some preserved wooden artifacts, numerous culturally modified trees (scarred trees, bark-stripped trees, axe-notched trees, tree stumps, etc.) were documented, along with various wooden structures.
The CRP has not established the ages of scars left on the many culturally modified trees documented by the Cultural Resource Program (Mobley and Eldridge 1992), but many scarred trees undoubtedly relate to the intense use of forest products during the post-contact era. Spruce "pitch," obtained by scarring trees, was used by Alutiiq people as gum and medicine, and it was mixed with oil to caulk wooden boats (Russell 1991:10). Post-contact spruce scars in the region may relate to boat repair by Natives, explorers, traders, fishermen, miners, and fox farmers. Other tree scars may have marked traplines or travel routes. Soberg (1990:29) describes his partner blazed trees when their group was stranded on Montague Island in 1925.

References to Native timber harvesting during the early 1900s are fairly common in the Forest Service ranger notes. Local timber was in great demand for building mines, docks, fish traps, and canneries, while higher grades of housing lumber were imported from Puget Sound. The construction superintendent at Rua Cove mine on Knight Island noted (Dickey n.d.):

[February 5, 1917 letter from T. Blakeney to W.A. Dickey] The powerhouse is finished except chinking and the shingles. Covered the roof with 1" x 12" boards and that will give protection enough until we get Natives to make the shingles.

[February 10 letter from T. Blakeney to W.A. Dickey] Some Natives came from Chenega and cut wood for us which helped out a lot. They intend on coming back to make shingles.

The Forest Service regulated timber harvested within the boundaries of the Chugach National Forest although Lethcoe (1985:56) states that unreported logging was common early on. By the mid 1920s, the rangers were actively patrolling and enforcing the regulations (Pratt n.d.):

[August 15, 1925] I met Tech. Ass't. Lutz at Evans Bay; He is very much disgusted with operations of
handloggers on this side of the sound. He thinks their operations should be very strictly limited. He stated that Gillis and Graves were planning to begin operations in Bays where they should not be allowed to go.

[October 20, 1925] . . . we ran to tie mill in Thumb Bay. The storm played havoc here. The sleeping tents, drying shed, and part of the mill were wrecked. A boom of logs broke . . . In several places patches of timber several acres in extent were laid flat by the wind.

[September 8, 1926] With supervisor McDonald and Charles J. Goodall of Cordova Mill and Lumber Co. Stopped for a few minutes at Tatitlek Indian village where Mr. Goodall arranged for some logging by the natives. Had a short visit with Father Tikon Laurisej, school teacher, very interesting character . . . Proceeded to Ellamar [where] Mr. McDonald explained to Meyers the timber sale procedures as regards native logging.

[April 2, 1929] Nick Makaka and another native called and showed us on the chart where they had logged about 30 m. hemlock for Cordova mill.

[Murray n.d.] [March 16, 1927] Examined the cutting area of some Native hand loggers here [near Sheep Bay] found it in fairly good condition. They have about 12,000 feet of hemlock saw logs in the water.

[May 2, 1927] Ran to Thumb Bay. Outfit cutting here for the San Juan Fishing and Packing Co. Have cut about 500 pilings.


[September 30, 1927] [In Bay of Isles, Knight Island] Cruised a small tract of piling at the head of the right arm on the right side. Most of this area is a re-cut of an old logged-off area.

(Seward Album, Alaska and Polar Regions Department, UAF/91-038-02n)

Figure 34    Sportsmen at Seward, Alaska (circa 1925).
Murray's last entry is quite revealing as he indicates that cutting second-growth timber on Knight Island was already occurring in 1927.

Logging sites recorded by the Cultural Resource Program include the ruins of a sawmill site in Thumb Bay [SEW-497] on the southwest coast of Knight Island. The Alaska Railroad produced railroad ties at a sawmill on Knight Island (Figure 33), and SEW-497 may be the ruins of that mill. Abundant cut stumps, some with springboard notches from handlogging, were noted along the shores of Prince William Sound and the outer Kenai Peninsula.

**Trophy, Market, and Bounty Hunting**

Commercial over-fishing around the turn of the 20th century reduced the availability of subsistence fish in the Alutiiq region, and resulted in the formation of the Afognak Island Forest and Fish Culture Reserve (Rakestraw 1981:10). Sherwood discussed the early 20th century health of Alaska game stocks and the evolution of Alaska game laws and noted (1981:31):

Despite the continuation of hunting for the local markets and what Madison Grant of Boone and Crockett, a mammalogist, called the "havoc worked on game" by transient miners in many locations, Grant could write in 1907 that destruction of game had not yet gone far enough to permanently injure the fauna of the region, but that scientific protection of wildlife should be undertaken immediately.

The steep rise in imported meat prices during World War I made wild meat that much more attractive (Sherwood 1981:34). By the early 1920s, game clubs frequented by gentlemen hunters and sportsmen were formed in Cordova and Seward
Contact artifacts found at these sites originated during such enterprises (Figure 36).

Guiding was also a source of cash for some Natives at the turn of the century (Stone 1901:3):

A great many hunters are now visiting the country annually, and taking out large numbers of heads. Some of these people pay big prices for help, which makes it rather hard to secure help for such work as mine at reasonable wages, especially as the carrying of whole skins, and leg bones of these animals makes my work much harder. One sportsman paid his men ten dollars per day for one hundred days, hunting a country about forty miles from me. This fall, worse than the sportsmen, is a considerable number of men who live in the country and hunt game animals for their heads, disposing of them in large quantities at good prices to a San Francisco trading company that sends its schooner up there every year to pick them up.

Stone (n.d.) notes that he paid his two Native assistants, Alex and Nicoli, about $145 apiece for 99 days' work - considerably less than his (unnamed) competitor.

Later in the century, bounty hunting provided cash income for both Native and non-Native Alaskans. A bounty was put on seals, and the Territorial Department of Fisheries operated a predator control program against seals which included aerial bombing (Ohls 1983). Bounties also were put on other animals which fed on salmon (bald eagles) or salmon eggs (Dolly Varden char). Alutiiq participation in these programs is described in an account of a mailboat from Cordova which serviced Prince William Sound communities in the 1950s (Bilderback 1956:32-33):

Our last main stop before going home will be Chenega, a small Indian village of about eighty people... Many of the men bring aboard hides from unborn seals. During the spring when the men shoot the seals for a $3.00 bounty, the seals are sometimes having pups. Before the small seals are born, they are a beautiful ivory white in color with a pelt of a texture more like fur than hair... Needless to say, the unborn seal’s pelt is highly prized for making parkas, and other wearing apparel, as they are rare and hard to get...
Bald eagle talons brought a bounty in the early and mid 1900s. According to Stalmaster (1987:153), over 128,000 birds (or their talons) were turned in to territorial officials for bounty payment between 1917 and 1952. Fox farmers also waged war on bald eagles (Janson 1985 Ch6:6):

... [eagles are] the greatest enemy of fox pups ... Josephine [Sather], after discovering the remains of a blue fox pup at the base of an eagle's nest, became their enemy. Like most other fox farmers, she waged relentless warfare against them. Eagle claws brought a bounty of about $2 per pair of talons.

The impact of sport, trophy, and bounty hunting on Alutiiq life has not been investigated in detail, but it must have been a "double-edged sword." Impacts to subsistence species occurred, but bounty hunting and guiding also provided some Alutiiq people much-needed cash.

Livestock Grazing

At the turn of the 20th century, the US Department of Agriculture became interested in the stock-raising potential of Alaska. Alaska's population had increased after gold strikes, canneries were being built, there was a scarcity of beef in "the States," and the food supply of Native people was at a critical point (Long 1975:112). This prompted the shipment of cattle to the Alutiiq region for grazing (Long 1975:109):

The Russians had shipped hardy Siberian cattle to their Alaskan colony as early as 1794... By 1833 it was estimated that fewer than two hundred head of the breed still survived along the coast of Russian Alaska...  

The prairies of the middle-western frontier had been first utilized to fatten cattle for markets... West Coast cattlemen began to recognize that the islands of Alaska might provide a similar function. Several herds were shipped from San Francisco to fatten on Kodiak Island and several other islands in southwestern Alaska. The cattle did well and
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were slaughtered in October and shipped back to Seattle and San Francisco.

Sheep and other livestock were also imported to feed workers at canneries on Kodiak, but predation by bears and the devastating effects of the 1912 Katmai volcanic eruption inhibited the success of this practice.

Jack McCord was also interested in raising cattle in the region, particularly on Sitkalidak and Chirikof islands south of Kodiak, but no legislation existed which allowed such private use of public lands in Alaska (Pratt n.d.):

[July 4, 1928, in Kodiak] Mr. and Mrs. Jack McCord returned to the boat with us and remained for dinner . . . (McCord explained Sitkalidak Island stock raising venture to Flory).

McCord helped prepare The Alaska Fur Farming Act in 1926 which provided for leasing of public land for raising fur-bearing animals, and The Alaska Grazing Bill in 1927 which allowed the Secretary of Agriculture to establish grazing districts and leases on public lands outside of other established reserves or national forests (Long 1975:119). McCord also organized a cattlemen's association which presented a petition to the Alaska Game Commission asking for the right to kill bears any time they menaced livestock and property, to the dismay of stateside conservationists (Sherwood 1981:53).

McCord also had his hand in fox farming on islands off the south tip of the Kenai Peninsula, and had interests in mining and oil exploration in various parts of Alaska. During the World War II military build-up of Alaska, McCord supplied the US Navy and US Army with beef and mutton from herds he raised at his ranch at McCord Bay, Sitkalidak Island (Long 1975:143).

Livestock raising damaged archaeological sites in the area, especially on Chirikof and Sitkalidak islands where cattle overgrazing accelerated erosion. While on a trip to Kodiak, Forest Service Executive Assistant L.C. Pratt noted the effects of plowing on cultural resource sites at the experi-

mental farm on Kodiak Island [KOD-205] (Figure 37) (Pratt n.d.):

[July 5, 1928] Drove six miles to Abbert's ranch . . . Dr. Abberts has 160 acres all fenced . . . Abberts reports that the brown bears last year killed 200 head of his sheep and 17 head of cattle. He is naturally very bitter against any protection for brown bear. He showed us a number of ancient Indian stone implements plowed up in his fields.

Land use activism by entrepreneurs like McCord affected how Alaskans viewed themselves and eventually led to the statehood movement. As more Outsiders moved into the territory during the mid-20th century, they felt stifled by what they viewed as a lack of opportunity to establish business ventures because of the shortage of private land. The importation of thousands of military personnel to Alaska during World War II exacerbated this situation by creating thousands of new residents practically overnight. Some military personnel stayed on after the war, and many moved to Alaska during the cold war military build-up.

World War II Military Build-up

The Japanese bombing of Pearl Harbor in December 1941, and their invasion of the Aleutian Islands in June 1942 touched off a period of frantic military activity in Alaska. In addition to the thousands of troops sent to the Aleutians, thousands more were sent to the territory to construct bases and harbor defenses (Bush 1944), the Alaska Highway (Coates 1992), and oil lines (Gage 1990). Kodiak Island was the focus of considerable activity. Kodiak's hastily-organized defenses included a "Home Guard" comprised of local people, including Natives, which drilled in the streets (Hall 1945:38). Blackouts were common, and in 1942, women and children of servicemen stationed at Kodiak were evacuated from the island (Hall 1945:44).

During the next few months [of 1942] Kodiak would become the bastion of the North Pacific, an anchor that would hold the Pacific Coast . . . The earth moving equipment continued to slash hills, fill valleys, and change the course of rivers . . .
(Adapted from US Army Corps of Engineers file 18-15 N-103-1, prepared March 29, 1943)

Figure 38 Construction Plans, Aircraft Warning Service Site, Outer Kenai Peninsula [SEL-202/203], 1943.
Hourly we expected the Jap invasion (Hall 1945:49-52).

Cultural Resource Program staff recorded the ruins of harbor defenses constructed during the war near Seward, and on Kodiak and Spruce islands. Staff also documented the remains of a 1944 construction camp and pier [SEW-435], part of a lighthouse construction project in Prince William Sound which was never completed (Haggerty et al 1991b:183-184). According to a photo in Bush (1944:225), a road was built to Jeanie Point on Montague Island, Prince William Sound, and a mobile radar site was established there in 1942. The ruins of a road [SEL-203] and a flight of wooden stairs [SEL-202] on a steep, exposed island also were documented during SCAT survey of the outer Kenai Peninsula in 1989.

SEL-202/203 are ruins of an Aircraft Warning Service (AWS) detector site, associated with southcentral Alaska (Anchorage-Seward-Cordova) defense preparations during World War II. According to Bush (1944:217), "These stations were expected to give minimum warning of the approach of hostile aircraft ..." The sites were remote and were built where observers could monitor long stretches of coastline (1944:218):

Due to the isolation of most detector sites, complete housing and utilities for the operating personnel of about 50 men were provided. Diesel generator power plants, cold storage buildings and other housing were furnished by the [Corps of Engineers], while the steel detector building and antenna tower were supplied by the Signal Corps ... Civilian labor was used wholly or in part in the fixed detector stations at ... [SEL-202/203].

Access and construction were difficult. The sites were isolated, the seas were rough, and the high priority work at the large airfields precluded diverting adequate floating equipment to the AWS sites (Bush 1944:219). If the detector site was on an inaccessible peak, long tramways were necessary to haul equipment and supplies up the peak (Bush 1944:220). It appears that both roads and tramways were constructed at SEL-202/203. Beach landings were impossible because of rough seas, and when lightering docks and warehouses were built, storms would wipe them out. This was the case at SEW-202/203, as evidenced by a photo in Bush (1944:223) which shows wreckage of a dock and a vessel west of the site base camp.

Site construction plans (Figure 38) indicate a warehouse, tramway, power lines, sewer lines, quonset huts, cold storage, and barracks on top of this isolated islet on the outer Kenai Peninsula coast near Nuka Island. SEL-202/203 was probably the source of military personnel whom Mrs. Sather fed occasionally at her fox farm on Nuka Island, and who engaged in target practice at the nearby sea lion rookeries (Sather 1946c:24):

... during the war, the service men stationed in Alaska found that sea lions made excellent practice targets. All they had to do was bring the boat up close to a rookery, then make believe they were fighting Japs. Since the fellows had plenty of ammunition at their disposal, hundreds of sea lions became feed for the fishes. Hundreds of others drifted up onto the beaches, where they made feed for birds, coyotes, and bears.

The development of military bases and outposts in Alaska during World War II was a watershed in the modern use of land and resources in the Alutiq region. Construction opportunities provided cash wages for many residents, and the large influx of "Outsiders," many of whom were sportsmen, created additional pressure on fish and game species. World War II military activities in Alaska are gaining greater interest among historians, and the remains of remote military installations documented by the Cultural Resource Program contribute archaeological data to these investigations.

Shipwrecks

Ships and small boats have always been central to settlement, subsistence, commerce, and industry in the project area. The hazardous nature of navigation in the Gulf of Alaska and Prince William Sound resulted in many lost and/or wrecked ships. Tornfelt and Burwell (1992:4) list 353 ships wrecked in the Cook Inlet/Gulf of Alaska area, and 41 ships wrecked in the Kodiak area. They graphed the number of ships wrecked per
year (1992:Figure 3), and found that peaks in the shipwreck curve correspond to three major commercial eras of the late 1800s and early 1900s—whaling, gold rush activity, and commercial fishing.

Project staff documented the wreck of a Japanese steamer, the *Shinkoku Maru* [SEW-528], in 1990 (Haggarty et al. 1991a:151), and seven other shipwrecks were identified and described during the project. The *Shinkoku Maru* was lost on November 26, 1923, according to Tornfelt and Burwell (1992:45). The vessel was en route from Portland, Oregon to Yokohama, Japan when it broke a tailshaft and was taken under tow by another vessel. During a gale which struck while they were off Montague Island, the steamer was cut loose and it was swept onto the rocks. All but one of the crew escaped. This vessel was visited by local residents who salvaged material from it (J. Johnson, personal communication, 1991), and by Forest Service personnel who collected objects from the wreck (Pratt n.d.):

[May 10, 1924] Tied up alongside wrecked Jap steamer *Shinkoku Maru*, went aboard and secured some souvenirs . . .

[June 18, 1929] After spending an hour aboard the *Shinkoku Maru*, continued on to Cordova . . .

Other wrecks had more tragic consequences. According to Tornfelt and Burwell (1992:13), the worst boating disaster in Prince William Sound history occurred in 1799 when 200 men in 60 bidarkas hunting furs for the Russians encountered a sudden storm off Hinchenbrook Island and were lost. Tornfelt and Burwell (1992:40) also note the wreck of the *Gunner*, a gas screw whaling boat which was used to secure whale meat for fox farmers. The vessel was lost in Prince William Sound in 1920 when its whaling gun exploded.

Other shipwrecks documented by the Cultural Resource Program are AFG-152, SEL-187, SEW-448, SEW-455, SEW-486, SEW-487, and SEW-490. The inventory and description of shipwreck sites in the project area contribute to a better understandings of post-contact land and resource use in the region. Native and non-Native people literally risked their lives to fish, trap, hunt, and mine along these shores. These sites manifest the grave hazards faced by the post-contact residents and industries of the Alutiq region.

**Summary**

Alutiq culture underwent turbulent change during the Russian colonization in the late 1700s, and during the disease epidemics of the 1800s. Alutiq people experienced further dislocation, acculturation, and socio-economic change with the introduction of new land use patterns, institutions, and technologies during the late 1800s and early 1900s. Commercial harvesting of the Alutiq region's minerals, timber, fish, sea mammals, and other fur-bearing animals in the late 19th and early 20th centuries involved constructing new towns, canneries, mines, homesteads, fish traps, fox farms, and additional support facilities and structures. Substantial economic, demographic, technological, residential, linguistic, and ideological changes occurred as Outside investors developed the region's resources, and as local people participated in the growing cash economy by trapping, fishing, mining, logging, and fox farming. The ethnic composition of the region was transformed with the arrival of thousands of miners, fishermen, and others from what is now the Lower 48 and elsewhere. Fur trading, commercial fishing, whaling, fox farming, mining, military defense, and other post-contact developments presented Alutiq people and other area residents with a new set of variables to which they had to adapt. The cumulative effect of these post-contact changes further transformed Alutiq culture and laid the foundation for modern life in the region.

This discussion has emphasized the socio-economic background of the sites so they can be understood in an appropriate cultural and historical context. Many Alutiq region post-contact sites, particularly the American period sites, remain unrecorded or poorly documented. Sites in Alaska
and elsewhere generally must be 50 years or older to be considered eligible for historic preservation, and sites such as World War II remains are just becoming eligible for listing and management. The Cultural Resource Program produced systematic archaeological site survey data for over 100 post-contact sites in the Alutiiq region. These sites contain valuable information about human use of land and resources in the Alutiiq region during a period of intense commercial resource development and culture change.

Future analysis of post-contact sites will help document changes in settlement patterns and resource use in the Alutiiq region. The sites contain artifact and faunal assemblages that hold detailed information regarding the social, technological, and economic aspects of life in the Alutiiq region during the late 19th and early 20th centuries. Oral history data from individuals who recall early 20th century life in the region will provide an understanding of site ownership, use, and abandonment, and will supplement archaeological, historical, and archival information.

The history of the Alutiiq region is a 7,000 year chronicle of human adaptation to the environmental, cultural, and social forces which influenced human land and resource use in the region. Post-contact archaeological sites are the most recent evidence of human settlement in the Alutiiq region, a record which began when maritime hunter/gatherers colonized the area and left their stone and bone tools at ancient camp sites. Inventory, description, analysis, and protection of pre- and post-contact archaeological sites will enable greater understanding and appreciation of the history of human life in this rich and diverse environment.
PROJECT SUMMARY AND EMERGENCY RESPONSE RECOMMENDATIONS

The variety of sites in the Alutiiq region indicates a diverse pattern of land use by many cultures over the past 10,000 years. The 1989 and 1990 cultural resource surveys produced the management data needed to protect sites during cleanup while identifying many significant sites and creating future research opportunities and management benefits.

The Cultural Resource Program greatly increased the knowledge of Alutiiq region archaeology by identifying and documenting hundreds of significant sites, by identifying new intertidal sites with organic artifacts and subtidal deposits, by conducting the first systematic archaeological surveys of the outer Kenai Peninsula, and by dating several important new sites in Prince William Sound and the Gulf of Alaska. $^{14}$C dates for two sites extended the known age of human habitation in PWS to earlier than 4000 years ago (Haggarty et al. 1991:175). Tephra samples identified from sites on the outer Kenai Peninsula coast provide initial chronological data for this little-known area (Haggarty et al. 1991:176). The CRP also gathered important new data on large village sites, fort sites, and significant wet sites in the area. The project also recorded and analyzed numerous post-contact sites throughout the Alutiiq region containing valuable information on the Russian fur trade, fox-farming, mineral prospecting, mining, and World War II-era military defense.

The Exxon Valdez spill was the largest spill to date in the United States. Other larger spills such as the Torrey Canyon in 1967 in England (900,000 barrels), and the Amoco Cadiz in 1978 off the Brittany coast of France (1,700,000 barrels) involved cleanup programs which included the use of heavy equipment (Woodward Clyde 1991). While the Exxon Valdez cleanup had the benefit of applying techniques used and lessons learned during other spill cleanups, the sensitive cultural resource status of remote Alaskan shorelines was unprecedented in prior oil spill responses. Cultural resources in the Alutiiq region were considered vulnerable because of the maritime nature of the sites left by peoples inhabiting the area, the tectonic history of area shorelines, and because the region had never been systematically surveyed. The region’s archaeological sites are valuable because they are irreplaceable, non-renewable resources which document the process and evolution of cultural development in coastal Alaska. This situation compelled Exxon to establish a cultural resource
program to protect sites potentially at risk from the cleanup.

The Exxon Cultural Resource Program safeguarded cultural resources in the spill area during cleanup and ensured that the shoreline treatment program complied with state and federal historic preservation laws. Cultural Resource Program staff found and documented 326 new sites, 54% of the 609 sites now known in the project area. Five hundred and twenty-six (86%) of all sites in the project area were visited by program staff during 13 months of field work. This was one of the largest cultural resource management projects in the state’s history, and it has focused new interest on the history of human occupation in the Alutiiq region. This chapter summarizes the results of the project and of subsequent state and federal damage assessment studies, and recommends procedures for future emergency responses with the potential to affect cultural resource sites.

The Process and Results of Site Protection

The CRP was a massive undertaking developed and implemented under emergency conditions. Procedures to identify and protect cultural resources without impeding the effectiveness of the cleanup were rapidly and successfully implemented. Extensive shoreline surveys provided information on previously known and unknown sites which was synthesized and used to develop site protection constraints for all cleanup activities. Cultural resources experienced minimal disturbance during cleanup because of specific constraints such as avoidance, access restrictions, and working only with an archaeological monitor at sensitive locations. These constraints were integral to each cleanup plan and were taken into consideration during the approval and implementation of those plans (Wooley and Haggarty 1993).

Personnel involved in the cleanup were made aware through cultural resource education and training programs of the cultural sensitivities, the regulations protecting sites, and strict procedures to follow if cultural materials were encountered during cleanup. Documentation describing the precise location and nature of cultural sites was made available only to authorized personnel to ensure that site confidentiality was maintained as far as practical. The CRP was successful largely because of the cooperation and support of the federal and state agencies, Native organizations, and others involved in the cleanup.

General project strategies and methods were spelled out in Memoranda of Agreement (MOA) and Understanding (MOU) signed by governmental agencies and Native organizations. Detailed Cultural Resource Program work plans were prepared each year and submitted with permit applications for review and comment. As required under Section 106 of the National Historic Preservation Act, individual site protection issues were resolved in consultation with all state and federal agencies and Native organizations which manage cultural resources in the project area. Archaeological constraints recommended by Exxon for each segment or subdivision were reviewed prior to treatment, and each shoreline evaluation form was signed by a State Historic Preservation Officer (SHPO) representative.

The formation of the Cultural Technical Advisory Group and their review of cultural resource sensitivities on a beach-by-beach basis was an important project development. CTAG embodied Section 106 requirements for consultation with affected and interested parties, and brought numerous agency and Native organization personnel into a close working relationship focused on protecting cultural resources.

To protect cultural resource sites during the cleanup, project staff surveyed shorelines prior to cleanup to update known sites and to locate and document new sites, determined the effects of planned cleanup on the sites, and mitigated potential impacts through education, avoidance, site inspection, site monitoring, and artifact collection. They assessed the potential impact of cleanup, de-
terminated whether an archaeologist needed to inspect or monitor treatment, and mitigated potential impacts by ensuring that cleanup personnel understood and complied with approved constraints and with Exxon’s strict cultural resource protection policy. Updating the condition of previously known sites adjacent to treatment areas increased the management value and interpretive potential of project results.

The site update program led to the compilation of hundreds of detailed site descriptions and maps which have already been used extensively by agency cultural resource managers. Site updates provided the agencies and land managers with specific data regarding the nature and condition of remote sites, many of which had either never been assessed by professional archaeologists, or had not been evaluated since the 1930s. Site updates led to the identification of important preserved organic site components at AFG-005 and SEW-068, and to the expansion of numerous 14(h)(1) historic site claims by Chugach Alaska Corporation. Over 1,000 pages of site data gathered during the program were assembled in two confidential volumes and submitted to the four permitting agencies as part of the 1989 and 1990 final reports. The SHPO has overseen subsequent dissemination of these data to other qualified entities such as Native organizations and academic researchers.

As required in the MOA, copies of all field data were provided to the government and Native organizations, and project files and personnel have been accessible to all parties throughout the project. A curation agreement has been established with the Rasmuson Library, University of Alaska Fairbanks, to curate all original documentation. An agreement with the University of Alaska Museum in Fairbanks for curation of all artifacts, objects, and specimens collected by the program has also been signed, and the artifacts have been sent to the museum.

Project reports (Mobley and Haggarty 1989a; Haggarty and Wooley 1990a; Mobley et al. 1990; Haggarty et al. 1991b; Betts et al. 1991; this volume) describe the Cultural Resource Program’s regulatory and administrative framework and synthesize the considerable archaeological data collected during the project. The distribution of the reports to Native organizations, cultural resource managers, universities, libraries, national emergency response teams, and interested members of the public has communicated project results to a wide audience.

Exxon Company, USA, through its Cultural Resource Program, approached the issue of archaeological site identification and protection in a manner which went beyond compliance. Exxon management wholeheartedly supported the site identification, consultation, and protection effort required under Section 106 of the National Historic Preservation Act by committing helicopter and vessel charters; logistics and remote communication support; and staff offices, salaries, and equipment. In addition, Exxon supported staff archaeologists’ proposed site update program, and numerous other procedures focused on collecting additional data which increase our knowledge of the region’s history. Exxon went beyond strict compliance with cultural resource regulations by supporting recovery, analysis, and dissemination of cultural resource data beneficial to present and future cultural resource managers, researchers, and all who share an interest in the history of the Alutiiq region.

Exxon supported staff proposals to present papers at professional conferences (Haggarty 1989; Erlandson et al. 1991; Wooley et al. 1992) and to publish papers on the results of the program (Mobley 1989; Mobley and Haggarty 1989b; Haggarty and Wooley 1990b; Erlandson et al. 1992) so that knowledge gained as a result of the project would be widely shared. Exxon also provided staff time and funding for an exhibit developed in 1990 for Alaska Archaeology Week, a cooperative project with the National Park Service, Minerals Management Service, and the Anchorage Museum of History and Art. This ongoing annual event is intended to increase public awareness of heritage
resource preservation and the need to combat site vandalism.

Exxon managers supported staff proposals to go beyond the standard cultural resource management reporting format to analyze and present 1990 project data from a combined management and theoretical perspective. Exxon also supported the archival research required to document the background of the post-contact sites described in this report, as well as the publication and distribution of the four project reports.

**Indirect Benefits**

Indirect benefits resulted from the Cultural Resource Program's approach to site protection in addition to the direct benefit of a large amount of compiled and disseminated archaeological data. Bureau of Indian Affairs (BIA) archaeologists have reassessed some Chugach Alaska Corporation 14(h)(1) Alaska Native Claims Settlement Act (ANCSA) historic site selections in Prince William Sound to include new sites and new site components discovered by CRP archaeologists. In 1990 and 1991, BIA archaeologists resurveyed seven ANCSA 14(h)(1) sites and made boundary revisions and surface collections based on new site information collected in 1989 by project archaeologists. Other 14(h)(1) sites in the area are currently being reassessed based on project results and subsequent site visits.

In 1989, Exxon archaeologist Pete Phippen identified the remains of a nearly complete kayak frame (Mobley et al. 1990:50) on the shoreline at the edge of a 14(h)(1) site. A treatment crew was working in the general area, and Cultural Resource Program archaeologists spent much time and energy documenting the site and safeguarding it during treatment in 1989 and 1990. BIA archaeologists excavated and collected the kayak frame in 1991 and it is currently being preserved for future study. The kayak probably was constructed during a brief resurgence of kayak building in Prince William Sound in the 1930s (Ron Kent, personal communication, 1991). The identification, protection, and preservation of this item was one benefit of the cooperative site protection program.

Another rare artifact, a brass bell from a US Lighthouse Establishment (precursor of the US Coast Guard) buoy, was collected in 1989. Project archaeologists collected the artifact from the intertidal zone in Prince William Sound, and the bell is currently on loan to the Valdez (Alaska) Museum where it is part of a display on the navigational history of Prince William Sound.

Other archaeology in the region has been inspired partly or entirely by the Exxon Cultural Resource Program. A site on Afognak Island [AFG-005], monitored and documented in both 1989 and 1990 by project archaeologists, was recently test excavated by Rick Knecht, Kodiak Area Native Association archaeologist (Anchorage Daily News 1992). According to Knecht (personal communication, 1992), the excellent potential for organic artifact preservation noted at the site in 1989 during Exxon site monitoring was confirmed during testing. Basketry, game pieces, and other organic artifacts were preserved, and future excavations at the site may shed light on cultural transformations which ultimately manifested themselves in the elaborate Koniag traditions.

Mobley and Eldridge (1992) evaluated the use of forest products in the Prince William Sound area based in part on their participation in Cultural Resource Program surveys. Moss and Erlandson (1992) analyze the nature and age of defensive sites in the North Pacific, including forts from the Alutiiq region found during the Cultural Resource Program, and Moss (1992) discusses the regional implications of some of the new site data generated by the program. Linda Yarborough (personal communication, 1992) plans to excavate and analyze artifacts and fauna from one of the most widely-known sites in Prince William Sound [SEW-004], a site documented and monitored by the Cultural Resource Program. State of Alaska damage assessment studies located intact cultural deposits preserved in the subtidal zone at sites originally
identified by the Cultural Resource Program (Reger et al. 1992).

Another indirect result of the program includes increased attention being given to coastal cultural resources by area land-managing agencies. The USDA Forest Service is expanding training for law enforcement personnel in the Chugach National Forest to increase the protection of sites in the forest. The National Park Service is initiating an interdisciplinary study of the Kenai Fjords National Park coastline addressing questions about human adaptations and coastline morphology raised in CRP reports (Betts et al. 1991, Haggarty et al. 1991). These and future projects represent a renewed interest in Gulf of Alaska archaeology and should increase our knowledge of the past.

Many approaches developed in Alaska by Exxon's technical group and by the Cultural Resource Program are being adopted for use in other regions. For example, Canada has developed shoreline assessment manuals for British Columbia (Owens et al. 1991), the Great Lakes regions (Woodward-Clyde Consultants 1991), and the Atlantic Coast (Woodward-Clyde 1992), and plans are underway for an assessment manual for the Beaufort Sea area. The province of British Columbia has compiled shoreline data and published oil spill response atlases for high-risk areas on the west coast of Vancouver Island (Dickins et al. 1990), the southern Strait of Georgia region (Howes et al. 1992), and is currently compiling data for an atlas for the northern Strait of Georgia region. These and other publications (Haggarty et al. 1991a; Harper et al. 1991a; 1991b) are based on needs recognized and processes developed and implemented by Exxon as part of the Exxon Valdez response.

cultural ecological analysis of the site data within a regional context (Haggarty et al. 1991b; Erlandson et al. 1992) has facilitated a clearer understanding of Alutiiq maritime culture. The Cultural Resource Program validated the utility of systematic shoreline survey in discerning regional settlement and subsistence patterns. The program also demonstrated the value of Geographic Information System (GIS) site and resource zone mapping in analyzing site densities and distributions through space and time. The integration of new and existing site data into an interpretive regional framework strengthens our ability to investigate Alutiiq pre-contact history.

Project field procedures included systematic site surveys, non-intrusive collection of C\textsuperscript{14} and tephra samples, collection and analysis of diagnostic surface artifacts, and site mapping and videotaping. These methods are effective cultural resource management tools which open up productive research avenues. There are now twice as many sites known in the project area, and this expanded site database is a fundamental tool for managing and interpreting Alutiiq cultural resource sites. The publication of 10 new \textsuperscript{14}C dates (see Erlandson et al. 1992) contributes chronological information related to important sites in the region. These data represent an enduring contribution to future research in the Alutiiq region.

The discovery of upland and intertidal site remnants in Prince William Sound focused attention on the need to document complex tectonic processes which affected regional shorelines so that site densities and distributions may be more accurately assessed. The two intertidal wet sites which project archaeologists documented in Prince William Sound are significant discoveries which will ultimately improve the level of knowledge of Alutiiq pre-contact history. Further documentation of the age and location of relic Prince William Sound shorelines and associated site remnants will complement this program.

Easton's (1992) examination of subtidal cultural deposits in coastal British Columbia, and in-
tertidal investigations by Reger et al. (1992) demonstrate that some cultural deposits survive sea level changes. Detailed geomorphological and paleoseismic research would be required to understand adequately the context and function of intertidal and subtidal sites, particularly sites associated with intertidal peat deposits. Buried peats in the adjacent Cook Inlet region indicate six to eight subsidence events during the past 4,700 years (Combellick 1991:22). Similar documentation of complex local and regional paleoseismic events in the Alutiiq region would permit a better understanding of the effects of tectonic activity on cultural resource sites and on past human populations.

The documentation of previously unknown village sites in the Kodiak region by project archaeologists indicates the density of late pre-contact settlement in the area and the lack of adequate inventory. Rick Knecht (personal communication, 1992) recently recorded a very large (100+ houses) previously unidentified village on Kodiak Island. These discoveries point to the opportunity for anthropologists to reassess Alutiiq pre-contact population estimates, population densities, and the mechanisms of pre- and post-contact depopulation (see Ramenofsky 1987). Cultural resource site inventories are the next step in this process. The defensive sites identified during the project on the Alaska Peninsula, Kodiak Island, and outer Kenai Peninsula coasts present additional opportunities to investigate issues related to social conflict such as pre-contact invasions and competition for resources (see Moss and Erlandson 1992).

The project’s cultural resource surveys on the outer Kenai Peninsula coast were the first extensive systematic surveys done in the area. A number of important sites were identified, and although the human history of the area is poorly understood, there was moderate pre-contact settlement of the area. Investigations at SEL-188 (Betts et al. 1991) and the analysis of intertidal lithic artifacts and dating of the upland portion of the site indicate initial settlement of the site around 1300 B.P. (Betts et al. 1991:128), the first 14C dates for the area. The analysis of site and resource distributions on the outer Kenai Peninsula coast indicates a regional settlement pattern focused on marine resource concentrations (Betts et al. 1991:143-154). Program surveys and site distribution analysis on the outer Kenai Peninsula coast were an important first step in understanding the history of human settlement in this nearly unknown area.

The post-contact sites identified during the project (fox farms, canneries, salteries, mining camps and settlements, and military sites) indicate intensive post-contact land use and resource exploitation in the region, particularly during the early 20th century. Archival research of specific sites has added valuable information about people who lived and worked in the area, businesses which operated there, and the cultural adjustments to historical changes in land and resource use which occurred in the Alutiiq region. There is potential for collecting site-specific oral history information from people who lived in the region during the first half of the 20th century and who built and/or lived at these now-abandoned sites. Such data will permit a better understanding of post-contact land and resource use, and how changes in land and resource use affected Alutiiq culture and history.

Assessment of Archaeological Impacts

No significant spill-related injuries to cultural resources were documented by the CRP during the extensive four-year program. Although some injuries were documented, they were largely minor and far less significant than the observed injuries from chronic erosion and pre-spill vandalism. The primary goals of the program – to protect sites from cleanup impacts and to protect all sites in proximity to cleanup operations from vandalism – were achieved with a high degree of success through site protection constraints and education.
Government sponsored damage assessment studies confirmed the effectiveness of the CRP site identification and protection approach - an approach conducted with input from and with the approval of the SHPO, agency and Native organization representatives. Dekin (1993:6) surveyed 60 shoreline segments previously surveyed by the CRP and relocated all 17 sites that the CRP had identified. While his survey identified new sites in four of the 45 segments in which the CRP had reported no sites, the sites were "small and low in visibility." Dekin (1993:6) concluded that his damage assessment survey "...confirmed the efficacy of their [CRP survey] efforts" and that "the most widely observable injury was from coastal erosion ..." (1993:1).

Direct oiling

Most surface intertidal archaeological deposits in the spill area lacked integrity; and therefore, were relatively less important archaeologically than intact upland sites (see McMahan and Holmes 1987:22). Some oiled intertidal sites or artifacts suffered minor, short-term cosmetic injuries. Some artifacts were collected and cleaned, while others were left in place to be cleaned by tidal action. Careful inspection and monitoring of sites helped protect intertidal artifacts from damage or removal. The CRP documented two intertidal sites which contained intact subsurface cultural material, but neither site was oiled. Since it was recognized that there could be additional, nonvisible, subsurface sites, careful inspection and monitoring of cleanup areas where such deposits were possible ensured that they were protected from physical disturbance during cleanup.

An issue considered, but not directly addressed by CRP studies involved the potential interference of Exxon Valdez oil on $^{14}$C dating. CRP staff expected the impact of direct oiling on the overall archaeological framework of the area to be negligible because only sites in the intertidal could be directly touched by oil, and very few intertidal sites were expected to have either the integrity or surviving organic artifacts that would allow effecting dating. It also became apparent through the CRP that relatively few sites were initially touched by oil, and that the combination of the extensive cleanup effort and natural cleaning rapidly removed the oil that was initially stranded on the shorelines.

Government sponsored damage assessment studies have confirmed that significant impairment to $^{14}$C dating did not occur. Reger et al. (1992) investigated the presence of oil at 13 intertidal sites in the spill area. Four of these sites yielded collections and radiocarbon samples suitable for assessing the impacts of oiling. Although two of the sites contained sediments which tested positive for traces of oil, the study concluded that $^{14}$C dates from artifact-bearing levels at these sites were well within the range of dates established for artifact assemblages in the region.

A federal damage assessment study of the effect of oil on $^{14}$C dating of wood, peat, and charcoal samples (Mifflin & Associates 1991) concluded that $^{14}$C ages are severely affected (appear older) by the introduction of 14C-deficient crude oils. The study indicates that weathered crude oil penetrates organic material poorly - even in a highspeed centrifuge. This suggests that the potential for oil contamination of organic archaeological materials was slight outside of PWS where the crude was weathered and was emulsified. The study also concluded that oiled samples could be successfully decontaminated and radiocarbon dated, though the time and cost of dating would be substantially increased.

Dekin (1993:1) found no evidence for the Exxon Valdez had oiled any upland deposits, but he did find widespread low-level hydrocarbon contamination from other sources at these sites. He also identified intact intertidal deposits at seven sites (Dekin 1993:5), but found no evidence of damage to the sites by Exxon Valdez oil. From these investigations, Dekin (1993:4) concluded:
...small, but detectible, amounts of petroleum hydrocarbons may occur in most archaeological sites within the project area. However, we do not find evidence of extensive soil contamination from a single definable source (the crude oil spilled from the Exxon Valdez).

Both Reger et al. (1992) and Dekin (1993) conducted actual field investigations at more than 20 of the sites most likely to have sustained damage by direct oiling. Their studies indicate that direct oiling did not injure archaeological sites in the spill area.

Vandalism

During CRP surveys, archaeologists found many sites which had never been recorded by an archaeologist but that had been vandalized, indicating that pre-spill vandalism was a serious problem lacking baseline data. The CRP instituted an extensive education program to instruct cleanup personnel about site protection procedures and to combat potential site vandalism associated with the cleanup. During the four-year period, only two site vandalism incidents were found to be directly related to the spill cleanup, and one was prosecuted by federal authorities.

Dekin’s study was the only damage assessment study which dealt with vandalism. He concluded: "Vandalism was limited and could not be associated with the oil spill and cleanup activities" (Dekin 1993:1).

Other studies

Jesperson and Griffin (1992) and McAllister (1993) conducted other damage assessment studies which did not involve fieldwork. Jesperson and Griffin evaluated CRP and agency archaeological documentation for evidence of site injury and concluded that 19 (3%) of the 609 sites in the spill area showed "substantive" injury due to direct oiling or cleanup, and an additional 16 (2.5%) demonstrated "circumstantial" evidence of injury. Their classification of 'substantive' injuries is not supported by field surveys and documentation by the CRP. Likewise, Dekin (1993) and Reger et al. (1992) found no site impacts from either direct oiling or from the oil spill response at four sites which they inspected identified by Jesperson and Griffin as having sustained "substantive" injury.

Dekin (1993:6) and McAllister (1993) report that 1287 cultural resource sites exist in the spill area, and McAllister bases a gross estimate for damage restoration costs on this figure. They never define the "spill area", but Dekin (1993:2) reports that it includes "1,287 known sites from the Alaska Heritage Resource Survey files." This area of evaluation is different from the actula spill areas surveyed by the CRP since the AHRS (as of January 1991) included 609 sites in the actual spill area — that is, on or adjacent to shorelines where oil was either present or possible. The 609 sites include 249 sites located more than 200m away from oiled shorelines. It is illogical and unreasonable for sites remote from the actual area of the spill and subsequent cleanup to be included in studies assessing spill injuries.

The data from the CRP, and damage assessment studies by the State of Alaska (Reger et al. 1992) and the US Government (Dekin 1993, and Mifflin & Associates 1991) indicate that damage to cultural resource sites resulting from the Exxon Valdez oil spill and the cleanup was negligible.

Summary and Recommendations

The potential impacts of planned treatment on cultural resource sites were mitigated by consulting with government agencies and Native organizations on the level of constraint appropriate to planned treatment, and by successfully implementing the constraint in the field. This was accomplished through daily consultations with Exxon treatment supervisors and by conducting specified site inspections prior to treatment, monitoring designated sites during treatment, investigating site incidents, updating AHRS site records, collecting artifacts threatened by planned treat-
Summary and Recommendations

ment, and educating survey and treatment personnel. The education program consisted of briefing survey and treatment personnel on appropriate state and federal historic preservation laws, on the procedures to be followed to protect cultural resources encountered during shoreline surveys and treatment, and on the sensitive and fragile nature of cultural resource sites. The successful execution of these tasks during the four treatment seasons minimized disturbance to sites in the project area.

Projects of this scope and size invariably produce insights that have the potential for triggering changes in administrative processes; logistics and procedures; research designs; field methods; and data recovery, compilation, synthesis, and interpretation. Many of the lessons learned during the project were applied immediately, enhancing the overall effectiveness of the response effort on a daily, monthly, and yearly basis. The project’s compliance with state and federal historic preservation laws resulted in a number of recommendations pertaining to site protection issues. Some of these recommendations apply to natural disasters and to other human incidents, but most pertain to day-to-day cultural resource management issues.

The most emphatic recommendation is the need for land managers and landowners to conduct cultural resource inventories of their lands prior to an emergency. Systematic shoreline surveys are the most effective tool for identifying and managing coastal cultural resources. C14 dating of these deposits as part of the survey strategy will enable placement of the sites in time as well as in space. More active management of cultural resource sites may help to curb site vandalism and will facilitate the collection and preservation of site data which would otherwise be lost to erosion.

The next recommendation is for landmanagers and owners to compile and organize their cultural resource data into easily accessible and immediately usable electronic and hard-copy files. GIS systems enable this task to be conducted efficiently, and other resource and management data can be integrated when necessary. The success of any response effort hinges on having these data ready and available during the early stages of the response. Trying to collect, compile, and organize data in the midst of an emergency is difficult and time consuming and reduces the productivity of the initial response.

Each state and federal land-managing agency is mandated by law to manage cultural resources on its lands. Over half of the sites in the project area were unknown, indicating neglect of cultural resources by public agencies – ostensibly because of lack of funding. Many of the previously undocumented sites found during this project showed evidence of vandalism. Much is being done to educate the public on the need to protect sites from vandalism and illicit collecting, but more education is necessary. Thorough site identification and documentation must be conducted by public agencies with coastal landholdings containing sites at risk from erosion, vandalism, and other potential impacts.

This important lesson was learned as a result of the Exxon Valdez spill and is being addressed by the Province of British Columbia Ministry of Environment, Lands, and Parks through the production of oil spill response atlases for high-risk shorelines along the British Columbia coast (Dickens et al. 1991; Howes et al. 1992). These atlases include cultural resource site inventories and rankings, and indicate areas where inventory data are lacking. Land-managing agencies in Alaska and other coastal states may profitably adopt similar strategies to better identify and protect cultural resource sites along high-risk shorelines.

The SCAT process developed and implemented during the spill response was essential for initial shoreline assessment, evaluation, data documentation, and treatment decision-making. Archaeological data generated during SCAT determined the level of constraint required to protect cultural resources during initial treatment. More intensive field surveys may be required later in the response effort, depending on the thoroughness of the initial survey, the presence of resources,
and the type, intensity, and location of planned treatment. It is critical that the scope and intensity of the shoreline survey be identified and that the survey methods and procedures be standardized at the outset and employed for the duration of the project.

Systematic surveys, conducted within a regional framework, will result in better site management, and, ultimately, in a better understanding of the past. Recent archaeological inventories of the west coast of Vancouver Island (Haggarty and Inglis 1985), north coast of B.C. (Wooley and Haggarty 1989), southeast Alaska (Moss 1989), and southern Strait of Georgia (Grant Keddie, personal communication, 1992) document pre-contact sociopolitical units which differ from those reported ethnographically. Regionally organized inventory of previously unsurveyed lands in coastal south-central and southeast Alaska will help clarify regional cultural patterns and developments (McCartney 1992).

We also recommend that consultation regarding cultural resources with all affected and interested parties be implemented immediately after the incident so that the level of consultation required under Section 106 of the National Historic Preservation Act is inherent in the initial response. CTAG functioned very efficiently and constructively after it was formed during the second year of the response. This type of multi-agency group should remain the primary administrative vehicle for consultation with state and federal agencies and Native organizations. Government agencies and Native organizations should identify personnel who could participate in the review process as CTAG representatives, should future needs arise. Implementing a CTAG-style process at the time of the emergency would avoid unnecessary false starts and strengthen site protection during the initial stages of the response.

The standardization of archaeological constraints was also an important refinement which occurred during the review process and is a procedure which is strongly recommended for future responses. The system employed five constraints: one for subdivisions not scheduled for treatment (Deferred); one for subdivisions requiring additional field survey data (Holding); and three "working" constraints (Standard, Inspection, and Monitoring). The Holding constraint would change to one of the three "working" constraints after a beach survey was completed and the results were evaluated. This system simplified the site protection process at the functional level since the constraint on the Shoreline Evaluation form let the treatment supervisors know at a glance whether they could work a given subdivision, consult with an archaeologist prior to treatment, or have an archaeologist on site during treatment. The constraint was written for and applied to the entire subdivision rather than just a portion of it. As a result, this system protected the confidentiality of site location and was simple to understand and use in the field.

Figure 39 Smith Island, 1944.
Consultation with Native organizations and their direct involvement in all aspects of a site protection process are essential. In Alaska, Native corporations often are the largest private landholders in the region, and many of the sites potentially impacted in an emergency situation are either on lands owned or selected by regional or village corporations. In addition, some Native organizations maintain that all Native cultural resource sites are an integral part of their own history and tradition — including sites on public lands. Native involvement in site protection decisions will bring an important perspective to the site protection issues in addition to improving the effectiveness of the site protection process.

Direct involvement by government and Native organizations in the decision-making process, uniform access to all available information, review and discussion of proposed archaeological constraints, concurrence and approval of final constraints, flexibility of the inspection constraint, and the authority of field archaeologists to make field determinations regarding the necessary degree of site protection were instrumental in the success of the site protection program. These procedures contributed to the effective management and protection of cultural resources during the response effort and were a major factor in the overall effectiveness of the Cultural Resource Program.

In the eagerness to respond to an environmental emergency, we must ensure that damage is not done to cultural resources located in the area. When an atmosphere is established where all cultural resource management concerns can be aired and addressed in a cooperative manner, with the benefit of comprehensive site inventory data, the Valdez project experience confirms that cultural resource sites can be protected from potential negative impacts during an emergency response.
REFERENCES CITED

Alaska Commercial Company

Alaska Division of State Libraries and Museums

Anchorage Daily News

Ashbrook, Frank G., and Ernest P. Walker
1925 Blue-Fox Farming in Alaska. United States Department of Agriculture, Department Bulletin No. 1350. Washington, D.C.

Bailey, Edgar P.

Barker, Kay

Bean, T. H.

Berger, R., R. Protsch, R. Reynolds, C. Rozaire, and L.R. Sackett

Betts, R.C., C.B. Wooley, C.M. Mobley, J.C. Haggarty, and A. Crowell

Bilderback, Doreen

Birke-Dow, Kaj

Burroughs, John

Bush, James D.
Calkins, Donald G., K.W. Pitcher, and K. Schneider

Campbell, Sarah K.

Case, David S.

Chaffin, Yule

Chugach National Forest Rangers

Ciancaglini, Rear Admiral D.E.

Coates, Kenneth

Combellick, R.A.

Crowell, Aron

Davis, Nancy Y.


de Laguna, Frederica

Dekin, Albert A. Jr.

Dickey, William A.


Dumond, Don E.

Easton, N. Alexander
Erlandson, J.M., J.C. Haggarty, C.B. Wooley, and A. Crowell

Erlandson, J.M., A. Crowell, C.B. Wooley, J.C. Haggarty

Everts, Frank, and A.R. Deacon
1907 From St. Louis to Kiacco Cove, Alaska: Being the log of a voyage undertaken by Frank Everts and A.R. Deacon to inspect the properties of the Knight's Island Alaska Copper Co. August 1 - September 10, 1907 Prince William Sound. Rare Book Collection, Rasmuson Library, University of Alaska Fairbanks.

Exxon

Exxon Company, USA


Fortune, Robert

Gage, S.R.

Guilmet, George M., R.T. Boyd, D.L. Whited, and N. Thompson

Haggarty, James C.

Haggarty, James C., and Richard Inglis

Haggarty, James C., and Christopher Wooley


Haggarty, James C., Anne E. Faxton, and Kevin Neary

Haggarty, J.C., C.B. Wooley, J.M. Erlandson, and A. Crowell

Hall, George Lyman


Harvey, Lola

Hassen, H.

Ho, T.Y., L.F. Marcus, and R. Berger

Holmberg, H.J.


Janson, Lone

Jordan, R.H., and R.A. Knecht

Kalifornsky, Peter

Kent, Rockwell

Klein, Janet R.


Lawrence, Mary Chipman

Lee, Molly

Lethcoe, Jim
Lethcoe, Jim, and Nancy Lethcoe

Levin, Michael J.

Lipke, Alice Cushing
1938 *Under the Aurora.* Suttonhouse. Los Angeles.

Long, John Sherman

McCartney, Allen P.

Miffin & Associates, Inc.

Miller, G.J.

Mobley, Charles M.

Mobley, C. M., and Morley Eldridge

Mobley, C.M., and James C. Haggarty


Moser, Jefferson F.

Moss, Madonna


Moss, Madonna, and Jon Erlandson

Murray, T.E.
Newell, Gordon (editor)

O'Neel, C.M.

Ohls, Karl

Oswalt, Wendell

Owens, Edward H.

Owens, E.H., M.A. Cramer, M. Fawcett, and J.C. Haggarty

Pedersen, Walt and Elsa

Plafker, G.
1967 *Surface Faults on Montague Island Associated with the 1964 Alaska Earthquake*. USGS Professional Paper 543-G.

Pratt, L.C.

Pullar, Gordon L.

Rakestraw, Lawrence W.

Ramenofsky, Ann
1987 *Vectors of Death*. University of New Mexico Press.

Reger, D., J.D. McMahan, and C.E. Holmes

Richter, D.H.

Roppel, Patricia

Russell, Priscilla N.
Saleeb, Becky


Sather, Josephine

1946a The Island: The First of Four Chapters of "Fox Farm at Nuka Bay." *Alaska Sportsman.* July 1946.

1946b The Foxes: The Second of Four Chapters of "Fox Farm at Nuka Bay." *Alaska Sportsman.* August 1946.

1946c The Birds and the Bears: The Third of Four Chapters of "Fox Farm at Nuka Bay." *Alaska Sportsman.* September 1946.

1946d Our Glorious World: The Last of Four Chapters of "Fox Farm at Nuka Bay." *Alaska Sportsman.* October 1946.

Schaafsma, Jeanne, and Lora Johnson


Sherwood, Morgan


Soberg, Ralph

1990 *Survival on Montague Island.* Hardscratch Press.

Stalnaker, Mark V.


Stanek, R.T.


Stone, Andrew Jackson

1900 October 26, 1900 letter from Homer, Alaska, to J.A. Allen, Curator of Vertebrate Zoology, American Museum of Natural History. American Museum of Natural History Library Archives.


Tornfelt, Evert E., and Michael Burwell


University of Washington Library


Van Campen, Helen Green


Woodward-Clyde Consultants


Wooley, Christopher B., and James C. Haggarty

Wooley, C.B., J.C. Haggarty, and J.M. Erlandson


Wooley, C.B. and J.C. Haggarty


Workman, William B.