



Kenai Fjords National Park Coastal Campsite Monitoring Program 2007 – 2008

Final Report



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Acronyms:

NPS	National Park Service
KEFJ	Kenai Fjords National Park
GIS	Geographic Information System
GPS	Global Positioning System
EPMT	Exotic Plant Management Team
LNT	Leave No Trace



Above: Photograph of sea kayaks on a camping beach in Aialik Bay.

Cover: Photograph of a backcountry campsite in Northwestern Fjord.

Abstract

In 1988, Kenai Fjords National Park (KEFJ) initiated a coastal campsite impact monitoring program to better understand the distribution, location, and condition of backcountry campsites and associated resource impacts. There have been numerous challenges to the successful implementation of this program including changing and ambiguous protocols, subjective impact assessment parameters, inefficient field methods, lack of training for survey crews, data collection errors, archaic data management systems, inconsistent and opportunistic survey efforts, and the absence of clearly defined program goals. Recent reviews of the KEFJ coastal campsite monitoring program by the park and the NPS Inventory & Monitoring program recommended significant changes to the monitoring protocol including use of updated field techniques such as high-precision GPS, electronic data collection using hand-held personal computers, improved training of field staff, and efficient data analysis and reporting tools. This report summarizes field activities and other efforts associated with the ongoing development and refinement of the KEFJ coastal campsite monitoring program in 2007 and 2008.



Above: Photograph of a kayaker's camp surrounded by an electric fence to discourage curious bears in Northwestern Fjord.

Background

Impacts associated with coastal backcountry camping represent the most significant threat to coastal resources and the visitor experience that KEFJ manages directly (Tetreau 2004). The purpose of the KEFJ coastal campsite monitoring program has been to provide resource managers and protection staff with the critical information needed to make decisions regarding the stewardship of sensitive coastal resources and high-value recreational opportunities (Figure 1). Scientifically and technically sound resource information is essential for policy and management decisions including future backcountry management planning efforts (Marion 1998, Marion et al. 1993). The KEFJ coastal campsite monitoring program relates directly to Strategy 3 of the *Pacific Ocean Parks Strategic Plan*, “Demonstrate a commitment to ocean stewardship through adoption of sustainable tourism and recreational opportunities, operations, and practices at ocean parks.” The establishment of a valid, rigorous monitoring program for coastal backcountry areas of KEFJ will aid the park in addressing the following Action Items: 1) identify public infrastructure in the greatest need of maintenance, repair, or protection; 2) identify ocean and recreational conflicts; and 3) develop information on marine recreational visitor use patterns. Information gained from monitoring is used in outreach and education materials that encourage ocean stewardship among boaters, campers, and other recreational users. Improving management of coastal resources and visitor experiences also addresses NPS Alaska Region Strategic Plan Focus Areas 1 & 2.



Figure 1. Photograph of a backcountry visitor enjoying the scenery in Pederson Lagoon, Aialik Bay.

Introduction

KEFJ includes approximately 500 miles of remote coastline accessible only by boat or floatplane. The availability of suitable landing beaches and camping areas is limited by the rugged fjord topography which is characterized by steep, rocky headlands, cliffs, and boulder beaches that are virtually inaccessible to boaters and campers. As a result, opportunities for camping are limited to only about 60 sheltered sand and gravel beaches scattered along the length of the park from Nuka Bay to Bear Glacier (Figure 2). About half of these potential campsites are located in the more remote southern end of the park, the Outer Coast and Nuka Bay, and consequently receive very little overnight use. As a result, nearly all backcountry camping is concentrated at about 30 sites located in Aialik Bay and Northwestern Fjord. These same areas also contain sensitive cultural and natural resources, including salmon spawning streams, ground-nesting marine birds, coastal sedge meadows, bald eagle nests, and archaeological sites. Periodic surveys of selected sites beginning in 1988 revealed impacts to park resources and the visitor experience, including fire rings, charred wood, cut stumps, root exposure, vegetation trampling, trash, human waste, soil erosion, campsite proliferation, damage to ghost trees, wildlife-human interactions, and social trails (Tetreau 2004).

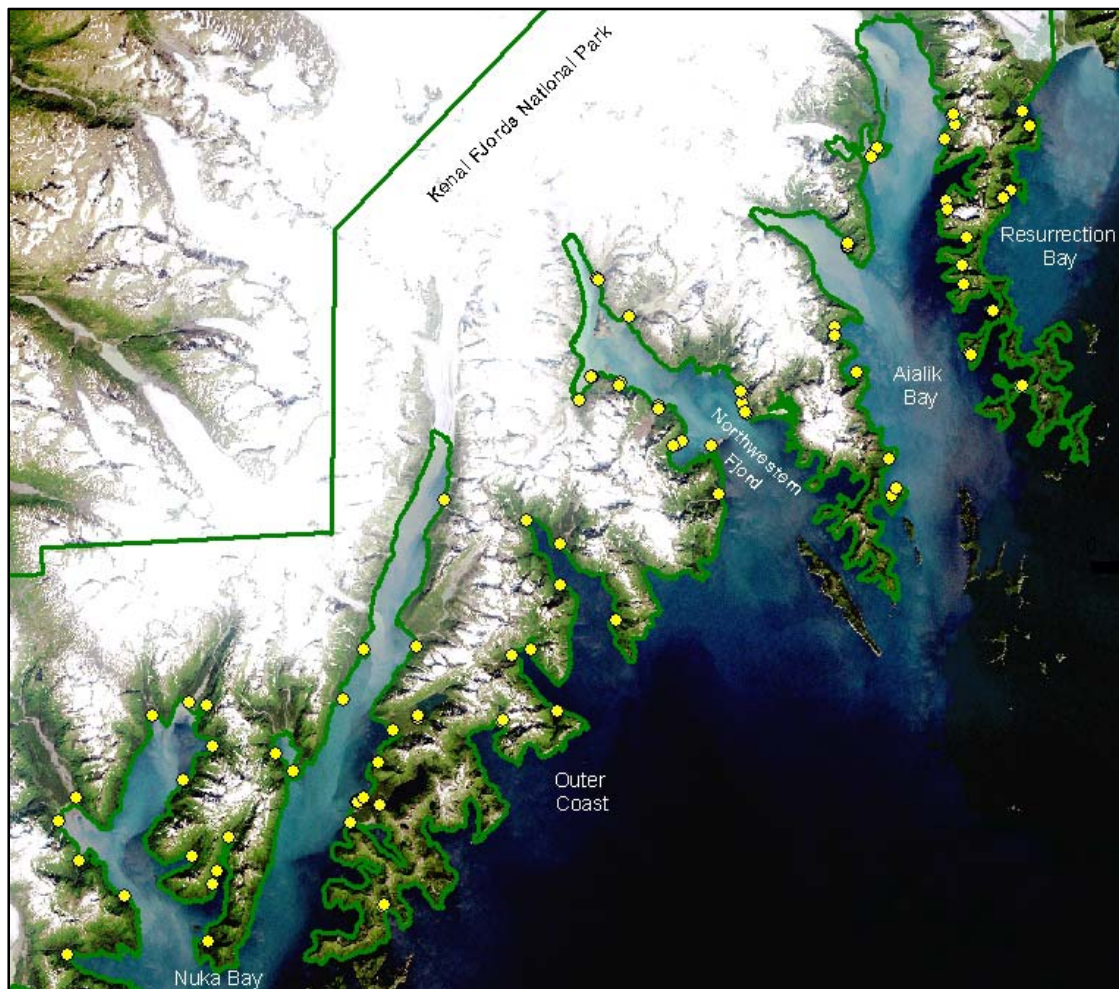


Figure 2. Distribution of known and potential campsites along the Kenai Fjords shoreline prior to 2007.

Managing dispersed backcountry camping in coastal areas of national parks in Alaska is an on-going challenge (Monz and Twardock 2004, Ingle et al. 2003). Recent increases in both motorized (motor boat and float plane) and non-motorized (sea kayak and sailboat) uses underscore the need for accurate and retrievable visitor site and use monitoring data. Over the past decade, recreational use of backcountry coastal habitats in KEFJ (primarily sea kayak camping) has increased (KEFJ, unpublished data), causing concern for sensitive natural and cultural resources and the backcountry visitor experience. Inventories and assessments of human impacts at coastal backcountry campsites in KEFJ were conducted by NPS backcountry rangers and biological technicians during the summers of 1988, 1993, 1997, 2001, and 2003 using methods that were similar to those developed for the NPS by Jeff Marion (Marion 1991). Only a subset of campsites was opportunistically surveyed each year due to limited staffing. A variety of protocols had been used over the years making it difficult to compare data between years and assess overall trends in backcountry camping and associated resource impacts. Past protocols were technically challenging and time-consuming for Ranger and Resource Management staff to implement in the field resulting in inconsistent collection and limited usefulness of the data. Additionally, established protocols were developed and designed for use in forested areas presenting challenges for use in coastal areas where most overnight camping occurs primarily on sand or gravel beaches with little soil or vegetation cover.

Perhaps the most significant problem plaguing these surveys was the imprecise location data (i.e. site sketches, GPS coordinates, photographs) associated with each site making accurate site relocation a major problem thus limiting the usefulness of the historic data for long-term monitoring (Tetreau 2004). Not until the late 1990s, were Global Positioning Systems (GPS) available for mapping campsites. Prior to 1997, all campsite locations were determined from USGS topographic maps. Beginning in 1997, the Rockwell Precision Lightweight GPS Receiver (PLGR) was used by field crews if available. While PLGRs were the most accurate GPS units available at the time, errors of up to 100 meters or more greatly limit the usefulness of these data (Tetreau 2004). Although later versions of the survey protocol called for use of permanent site markers and precise area measurements (i.e., radial transect method) these steps were rarely followed by field crews likely due to insufficient training (Tetreau 2004). As a result, a summary of all campsite monitoring data from 1988 to 2003 produced a qualitative description of trends in campsite condition class ratings but failed to provide a quantitative analysis of trends in total campsite area or campsite persistence over time (Tetreau 2004).

Despite these challenges, park managers and coastal field staff agreed that the campsite monitoring program is an essential tool for achieving the management goal of maintaining coastal habitats in their natural condition while providing high quality backcountry recreational opportunities. Reviews of the KEFJ coastal campsite monitoring program by the park and the NPS Inventory & Monitoring program recommended “significant changes” to the monitoring protocol including use of updated field methods such as sub-meter accuracy GPS, electronic data collection and storage techniques, and efficient data analysis and reporting tools (Tetreau 2004, Monz 2006).

2007 Rapid Coastal Campsite Assessment Survey

Introduction

In 2007, the KEFJ Ecologist, Meg Hahr, and Lead Coastal Ranger, Janette Chiron, began collaborating on how to revive the KEFJ coastal campsite monitoring program. With AKR GIS Project funding, we purchased a Trimble GeoXT handheld submeter GPS unit capable of delivering submeter accuracy both real-time and post-processed. Using differential correction, the Trimble GeoXT GPS receiver is capable of 1 – 3 meter accuracy, and is an ideal tool for conducting campsite inventories (Newman et al. 2006). We also continued our collaboration with Dr. Christopher Monz, a Utah State University Recreation Ecologist with extensive experience conducting campsite impact monitoring and research in coastal Alaska. Following a Rapid Campsite Assessment technique developed by Dr. Monz, we planned and implemented the first park-wide campsite inventory in KEFJ. The objectives of the inventory were to collect accurate site location information and assess the condition of all existing and potential campsites and exotic plant infestations along the KEFJ coastline.

Methods

From 30 July to 3 August 2007, a joint Resource Management and Ranger team conducted an inventory of campsite impacts and exotic plants at 56 known and potential camping beaches between Nuka and Aialik Bays. Using data from the park's backcountry campsite monitoring program and coastal ranger patrols, we determined which coastal areas were known or likely to receive use by overnight campers (Figure 2). Some of the land along the KEFJ coastline is owned by the Native village corporation of Port Graham. These lands were conveyed to Port Graham Corporation in 1996 under the Alaska Native Claims Settlement Act (ANCSA). A permit from Port Graham Corporation is required to access these private lands, however some areas are marked as public easements and can be used by overnight campers for up to 24 hours without a permit. In general, we did not conduct surveys on private lands unless a designated public camping easement was present.



Figure 3. Photographs of field staff documenting backcountry visitor use in Northwestern Fjord, Kenai Fjords National Park.

The survey was conducted aboard the NPS *M/V Serac*, a 53 foot fiberglass Class M/V Modutec. The team was divided into two field crews that worked independently each day by skiff (i.e., a Naiad 4.8 meter rigid-hull inflatable with 90 hp outboard motor, and a Zodiac Mark 3 inflatable with 30 hp outboard motor). Each team included a biological technician familiar with exotic plant identification and proficient in implementing the NPS AK Exotic Plant Management Team (AK-EPMT) data collection protocol. All known or potential camping beaches were surveyed by walking the length of the previously identified coastline segment while looking for campsites, other signs of visitor use, and exotic plants. All field data were collected with a Trimble GeoXT GPS receiver running TerraSync 3.00 and using the AK-EPMT and Rapid Campsite Assessment custom data dictionaries. Exotic plant survey methods were described by Wetherbee (2007). Sub-meter accuracy GPS locations were collected for all visitor use sites and limited site attribute data were also collected for each feature. All surveyed areas were also mapped even if no evidence of visitor use was found in order to document survey effort and the condition of the site. The Rapid Campsite Assessment data dictionary was developed by Dr. Monz and modified by KEFJ for the survey (Figure 4).

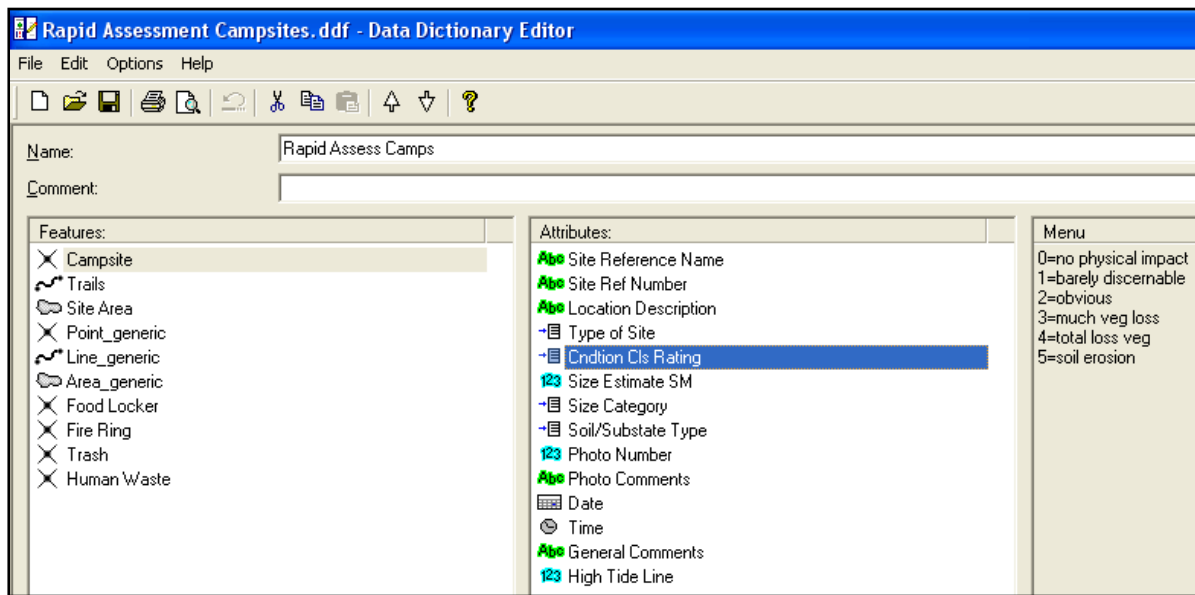


Figure 4. Rapid Campsite Assessment data dictionary used in the 2007 survey.

For this survey, a campsite was defined as any disturbed visitor use area likely used for overnight camping (may include tent sites or cooking sites). Each campsite encountered was mapped individually so that a single camping beach may contain numerous campsites. Selected site attribute data were collected for each campsite, and a condition class system was used to quickly and easily describe the level of impacts at a particular visitor use site. Condition class systems provide a simple qualitative description of site conditions and do not rely on intensive and sophisticated measurements of resource impacts (Marion 1991). Campsites were assigned a condition class rating using the criteria from the KEFJ Coastal Backcountry Campsite Monitoring Manual (KEFJ 1997):

CONDITION CLASS DEFINITIONS

Class 0: A campsite exists, but no physical impact can be found that would indicate the presence of the site. This applies to sites where people have camped but left no trace, or sites that have completely recovered since the previous survey and are no longer discernable.

Class 1: Campsite barely distinguishable; slight loss of vegetation cover and /or minimal disturbance of organic litter. This class includes lone fire pits with no other impact (which should be destroyed after the survey).

Class 2: Campsite obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.

Class 3: Vegetation cover lost and/or organic litter pulverized on much of the site, some bare soil exposed in primary use areas.

Class 4: Nearly complete or total loss of vegetation cover and organic litter, bare soil widespread.

Class 5: Soil erosion obvious, as indicated by exposed tree roots and rocks and/or gullying.

Results

From 30 July to 3 August 2007, we successfully completed rapid campsite assessments and exotic plant surveys at 56 known or potential camping beaches along the KEFJ shoreline between Nuka and Aialik Bays (Figure 5). This is the most geographically extensive campsite survey ever undertaken in the park (Appendix A). Likewise, it is the first time Nuka Bay beaches were surveyed in more than a decade, and the first time Outer Coast beaches were ever systematically surveyed for campsite impacts. Similarly, this is the most comprehensive exotic plant survey conducted on the KEFJ coast to date. Due to confusion over land ownership and jurisdiction, we did not survey the Delight Spit or Desire Beach camping easements. We were also unable to survey campsites in Resurrection Bay (Porcupine and Bulldog Coves) due to poor weather on our return to Seward. Consequently, four known camping beaches were not surveyed in 2007.

Of the 56 beaches surveyed, only 15 (26 percent) contained one or more established campsites (Table 1). Campsite impacts were substantially more prevalent in Northwestern Fjord and Aialik Bay (areas closer to Seward) where visitor use is highest than along the Outer Coast and Nuka Bay (Figure 5). No exotic plants were observed at any of the beaches we surveyed (Wetherbee 2007).

Table 1. Summary of conditions at 56 beaches surveyed in Kenai Fjords National Park in 2007.

<u>Condition Rating</u>	<u># of Beaches</u>
No Impacts Observed	41
Condition Class 1	9
Condition Class 2	1
Condition Class 3	5

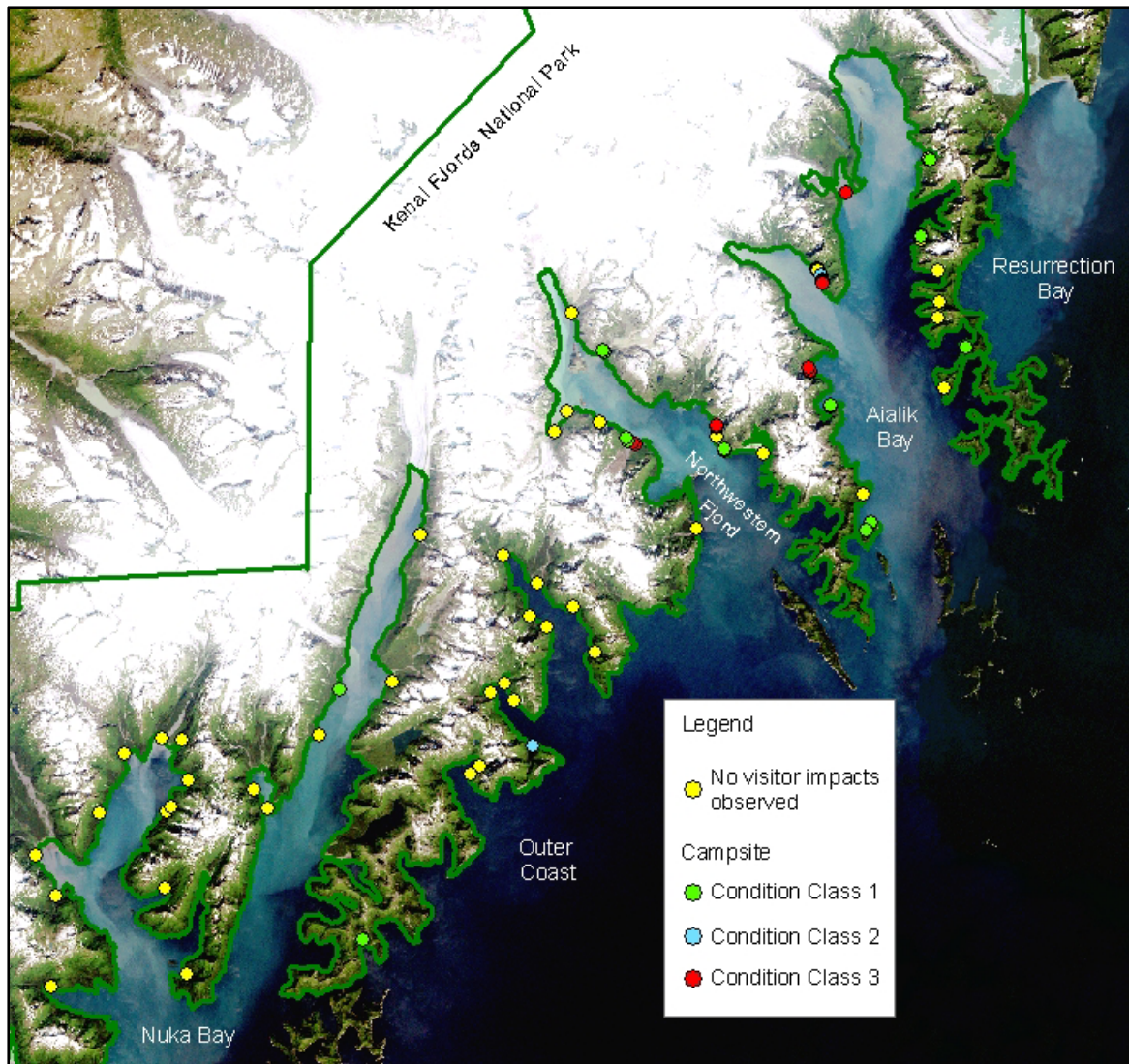


Figure 5. Distribution and condition of known and potential camping areas surveyed along the KEFJ shoreline in 2007 (n=56).

We mapped 39 individual campsites at the 15 beaches where biophysical evidence of overnight camping was observed, and found a median condition class of 1.76 (1-3). Sites were found mainly on sand (n=13), cobble (n=15), and gravel (n=4) substrates with only seven sites located on organic soil.

Other visitor impacts we documented were trash, social trails, and fire rings. Trash was observed at just four beaches (Sunlight Glacier, Verdant Cove, Thunder Bay, and Cloudy Cape) and only in very small amounts (less than a handful). Fire rings were observed at seven beaches (Chance Cove, Cloudy Cape, Thunder Bay, Paguna Arm, Northeastern Glacier, Verdant Cove, and McMullen Cove). Social trails were mapped at seven beaches (i.e., Sunlight Glacier, Northeastern Glacier, Drop-Off, Quicksand, Holgate, Pederson Lagoon, and Abra Cove). Improperly disposed of human waste was not observed at any of the 56 beaches surveyed.

Coastal Campsite Monitoring Protocol Refinement – 2008

In 2008, KEFJ was awarded \$8,967 in funding from the NPS Alaska Region Coastal Marine Grant Program to obtain the expertise of Utah State University Recreation Ecologist, Dr. Christopher Monz, for the purpose of improving the park's languishing coastal campsite monitoring program. The objectives of this project were to refine the park's campsite monitoring protocol, attempt to analyze 20 years of monitoring data to describe trends in resource condition, explore innovative techniques for campsite assessment, hold a campsite monitoring workshop, provide training for park field crews, and perform a detailed assessment of a subset of heavily used campsites in Aialik Bay to field test and refine the revised protocol. Our overall intent was to replicate as much as possible the previous protocols so that newly collected data would be comparable with the historic data.

On 25 August 2008, we hosted a one-day workshop in Seward on measuring and monitoring backcountry campsite impacts that was attended by 18 participants including staff from KEFJ Ranger and Resource Management teams, AK Regional Office Environmental Planning and GIS teams, Denali National Park, Chugach National Forest, and AK Department of Natural Resources (Figure 6). The workshop objectives were to:

- Provide a forum for field professionals, researchers and park managers to discuss and compare campsite monitoring methods and approaches.
- Understand the theory regarding resource changes associated with backcountry camping and the influence of environmental, use-related, and managerial factors.
- Become familiar with campsite monitoring protocols through field-based exercises.
- Learn how to quantify resource changes through the selection of indicators and the implementation of a campsite monitoring program.
- Obtain hands-on experience in the measurement of a variety of campsite condition attributes including area of disturbance, vegetation loss, soil exposure, tree damage and social trails, using Trimble hand-held GPS, permanent site markers, and digital photo points.



Figure 6. Campsite monitoring workshop participants in Exit Glacier.

Presentations included an overview of backcountry campsite impacts, monitoring protocols, and standard field methods by Dr. Monz. Park and regional office staff described campsite monitoring efforts at Lake Clark, Kenai Fjords, Denali, and Katmai National Parks, and discussed challenges including field work in remote areas, specialized training needs, consistency over time, and data management. Participants discussed the value of a standardized campsite monitoring protocol and data management strategy that can be used by parks throughout the region. The afternoon session was a hands-on introduction to the key components of campsite impact assessment including radial transect method, condition class, and site boundary definition (Figure 7). Jim Pfeiffenberger, the Ocean Alaska Science and Learning Center (OASLC) Education Specialist, produced a DVD of the workshop and copies were mailed to resource managers from WRST, GLBA, KATM, LACL, DENA, and GAAR who were unable to attend the one-day workshop.



Figure 7. Campsite monitoring workshop participants practice field assessment techniques using Trimble GPS units at the Exit Glacier campground.

Following the workshop, park Resource Management and Ranger staff and AKR GIS Specialist, Greg Daniels, spent four days on the coast with Dr. Monz field testing and continuing to refine the campsite monitoring protocol, practicing new field site assessment techniques, and resolving some of the issues related to site delineation that are unique to coastal environments (Figure 8). We based our work off of the *M/V Serac* and focused our efforts on high-use campsites in Aialik Bay at Holgate Beach, Pederson Lagoon, Quicksand Cove, McMullen Cove, Bear Cove, and the beach north of the Holgate Public Use Cabin (PUC). Under Dr. Monz's direction, we initiated use of non-intrusive, numbered site markers (buried 6" spikes) to permanently mark campsite center-points for ease of future relocation and long-term monitoring. Center-points were

established at all of the beaches we visited except McMullen Cove where campsites are all located on the cobble beach berm and subject to over-washing by winter storms.

We also extensively practiced the radial transect method which is used to obtain highly accurate and repeatable measures of the total campsite area. In the past, KEFJ field crews were frustrated by the difficult and time-consuming nature of this task and as a consequence used it infrequently. Instead, campsite area was estimated ocularly or by taking just two measurements (length x width) of sites which are usually convoluted polygons. As a consequence, past measurement of total impacted area are grossly imprecise and not valid for between year comparisons. New field equipment including the Sonin Combo Pro electronic measuring device and Suunto Sighting Compass has made the collection of the radial transect data much more efficient (replacing old fashioned measuring tapes). Additionally, the process was improved greatly by entering the radial transect data directly into Pocket Excel on the Trimble GeoXT as the measurements were obtained.



Figure 8. KEFJ, AKR, and USU staff take a lunch break while conducting campsite assessments at the Pederson Lagoon camping easement in Aialik Bay.

By the fourth day of our field effort in Aialik Bay, we had revised and field tested the monitoring protocol and data dictionary to the point where we were able to use it to successfully complete 12 detailed campsite assessments at Bear Cove and the beach north of Holgate PUC. These data were subsequently analyzed and additional revisions were made to both the protocol and data dictionary with the assistance of AKR GIS Specialist, Joel Cusick (Figure 9). We found several errors in the Pocket Excel files which we believe were due to the difficulty of seeing the screen and sensitivity of the stylus. Using base funding in FY09, we were able to purchase all the necessary field equipment for conducting detailed campsite impact assessments including a Schonstedt pin locator, monopods, Olympus Stylus 1030 waterproof digital cameras, Sonin Combo Pro electronic measuring devices, and Suunto sighting compasses.

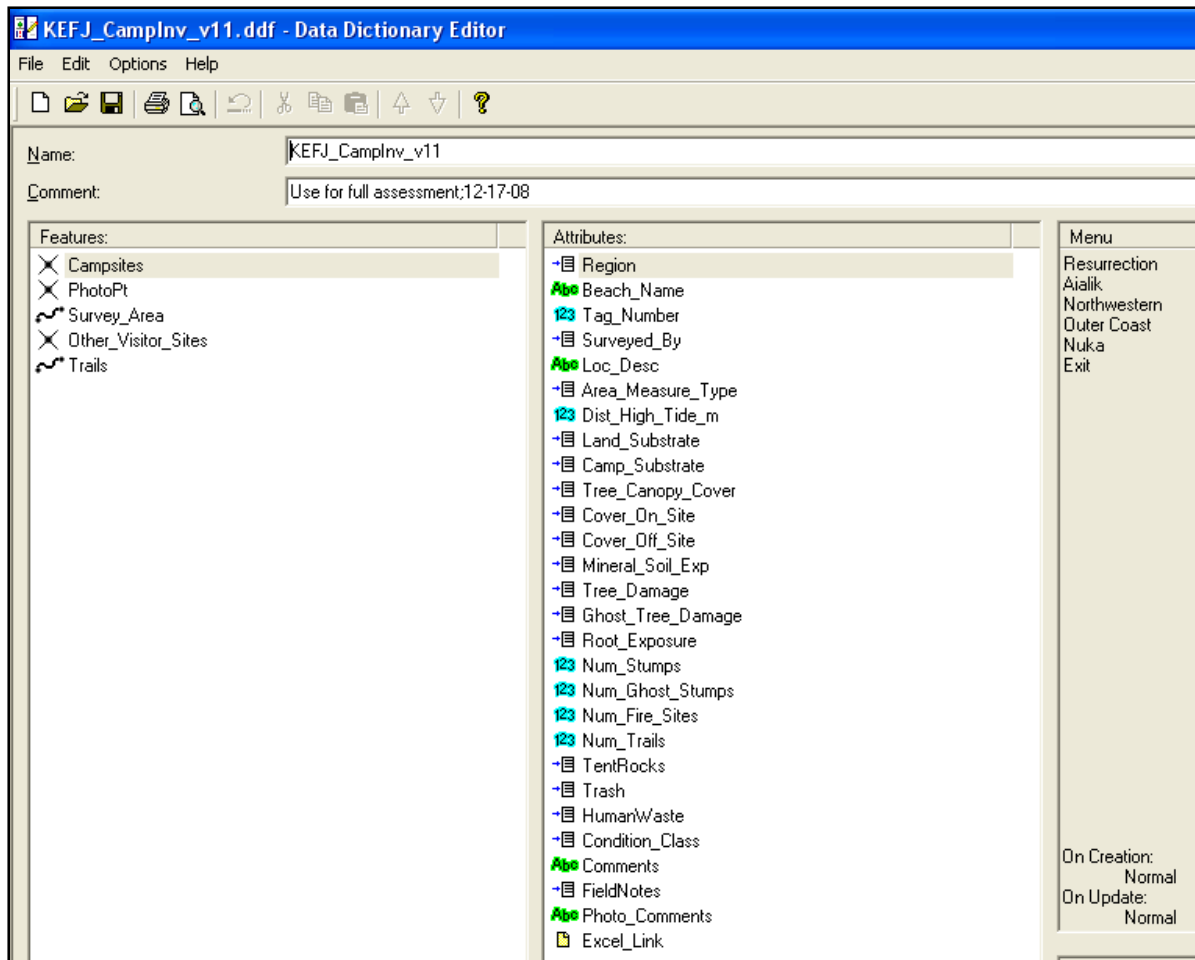


Figure 9. KEFJ Detailed Campsite Assessment data dictionary (version 11) showing feature classes and attributes (i.e., impact parameters) associated with the campsite feature.



Figure 10. Using a Trimble GeoXT GPS, Nate Millard from Utah State University collects campsite location and condition data in KEFJ.

Detailed Campsite Assessments – 2009

Park staff continue to work with AKRO GIS specialists and Dr. Monz to complete refinement of the monitoring protocol including development of a sampling strategy, field procedural manual, and Standard Operating Procedures for data management. Additionally, with support from AKRO GIS specialists we are working towards an electronic data management system which incorporates all survey data (including data from prior survey efforts) into an ESRI GeoDatabase for use in the park's GIS. The use of GPS PhotoLink software, will allow us to automatically create metadata for each photo and link it directly to spatial data in GIS. A HTML link will also allow us to view all site photos for multiple features and from multiple years on a single page thus eliminating the frustration of the "data in a milk crate" syndrome. The revised protocol will also contain detailed guidance for using both the Rapid Campsite Assessment and Detailed Campsite Assessment data dictionaries. In the future, all campsite impact assessment data will be collected electronically in the field using a hand-held Trimble GPS unit with a custom data dictionary. KEFJ is now on its way to an updated campsite monitoring protocol which incorporates recent advances in field data collection techniques, most notably high-precision GPS and hand-held personal computers. KEFJ Ecologist, Meg Hahr, will be sharing the results of this interdisciplinary effort at the upcoming George Wright Society conference in Portland, Oregon in March 2009.

In February 2009, we were awarded a grant from the NPS Alaska Region Coastal Marine Grant Program to continue our collaboration with Dr. Monz and Utah State University in FY09. Approximately \$3,600 in grant funding will match funding from Utah State University and KEFJ, and enable KEFJ staff to continue benefitting from Dr. Monz's expertise as we conduct detailed impact assessments of all established coastal backcountry campsites in Aialik Bay and Northwestern Fjord in 2009 using the revised monitoring protocol. Initial site assessments can be quite challenging due to the unique characteristics of each backcountry camping area. Dr. Monz's expertise and experience in site delineation will improve the efficiency and accuracy of these field assessments, thus ensuring the effectiveness of long-term monitoring efforts.

In August 2009, an interdisciplinary team of park Resource Management and Ranger field staff, AKRO GIS specialists, and Dr. Monz (led by KEFJ Resource Management Specialist, Fritz Klasner) will conduct coastal campsite impact assessments in Aialik Bay and Northwestern Fjord aboard the park vessel, the *M/V Serac*. We expect to complete this field work in 10 days weather permitting. Upon completion of this project, the majority of established coastal campsites in KEFJ will be permanently marked for reliable relocation and mapped with high-precision GPS. All information gathered during detailed impact assessments will be incorporated into the campsite monitoring ESRI GeoDatabase for use in the park's GIS, and a final report will be prepared summarizing field data collection efforts.

Coastal campsite monitoring data can then be integrated with other spatially-explicit data on the distribution of sensitive coastal resources such as bald eagle nests, seabird colonies, salmon streams, archaeological sites, black oystercatcher breeding territories,

rare plants, etc. to conduct a cumulative assessment of the overall extent of impacts to ecological and cultural resources and the visitor experience in the park's coastal backcountry. Such analyses have been used in other coastal parks including Glacier Bay and Gwaii Haanas, to conduct visitor-resource risk assessments and develop standards and indicators for natural and cultural resources and the backcountry visitor experience (Smith et al. 2007, Gajda et al. 2000).

Recommendations

The 2007 Rapid Campsite Assessment survey was a very efficient and successful effort that yielded a considerable amount of useful data on the status of KEFJ's coastal backcountry. It is a great tool for systematically tracking the existence and persistence of campsites throughout the park with relatively little cost and effort. We recommend conducting a complete census of all known and potential camping beaches in KEFJ using the Rapid Campsite Assessment protocol in conjunction with exotic plant surveys (following the AK-EPMT protocol) every 3-5 years. This could be accomplished in approximately seven days with the *M/V Serac* and two field crews of Ranger and Resource Management staff. In addition to the 56 beaches we surveyed in 2007, Delight Spit easement, Desire easement, Porcupine Cove, and Bulldog Cove are known camping areas that need to be resurveyed. Bear Glacier Lake should also be surveyed for campsite impacts as well as the camping beach at the head of Aialik Bay (NE corner). According to coastal rangers, both these areas have been experiencing increasing use in recent years.

With the exception of Pederson Lagoon and Delight Spit easements, other public camping easements on private lands (n=10) in the park are not signed and impossible to locate precisely in the field. Consequently, field crews must survey the entire beach for camping impacts which takes considerably more time. If the easements were marked, then crews could map the exact location which would greatly improve the efficiency of future surveys.

In addition to the Rapid Campsite Assessment, detailed campsite assessments and monitoring are needed at the most heavily used and impacted sites in Northwestern Fjord and Aialik Bay. These will need to occur more frequently and will require a higher level of expertise and training to coordinate and complete. Dr. Monz is a great resource and will be assisting the park in determining which sites require intensive, detailed assessments and at what interval reassessments should occur to assess trends in site conditions over time.

It is our recommendation that exotic plant surveys be conducted annually at all campsites with condition class ratings of 1 or above in Northwestern Fjord, Aialik Bay, and Resurrection Bay (n=14). These are the same camping areas that contain (in some cases extensive) networks of user-created trails (i.e., social trails). These areas are at the highest risk of exotic plant introductions due to the observed level of use and disturbance. It is quite remarkable that the park beaches we surveyed in 2007 were all found to be weed free. A similar inventory of camping beaches in Glacier Bay, found an invasive species of dandelion (*Taraxacum spp.*) in many parts of the bay (Lewis et al. 2007).

Overall, the current condition of coastal backcountry use areas in KEFJ appears to be very good with low levels of impacts observed at relatively few sites. We report an average condition class rating of 1.76 for coastal campsites in 2007, and Tetreau (2004) calculated an average rating of 1.2 for all campsites surveyed between 1988 and 2003. In contrast, a similar survey of campsite conditions in Prince William Sound found a mean condition class of 4 (0-5) (Monz and Twardock 2004).

The majority of coastal backcountry campsites in KEFJ are located on sand, gravel, and cobble beaches, typically on top of the beach berm where there is little soil and vegetation due to winter storms and wave action. By their nature, these are durable sites that are resistant to biophysical impacts such as vegetation loss and soil erosion. Educational efforts and management actions (such as placement of food lockers) should encourage backcountry visitors to camp on durable surfaces and avoid disturbance to the sensitive beach grass community and forest understory whenever possible. The results of our 2007 Rapid Campsite Assessment survey indicate that coastal rangers and Leave No Trace (LNT) educational efforts have been successful at minimizing many of the impacts associated with dispersed backcountry camping in coastal areas, as evidenced by absence of improperly disposed of human waste and the relatively few times we encountered fire rings or trash/litter. The absence of exotic plant infestations at backcountry campsites is another excellent indicator of the overall health of coastal ecosystems in KEFJ.

Use of annual KEFJ Voluntary Backcountry Registration (VBR) data on backcountry visitation levels and patterns in conjunction with campsite impact data can provide a more complete picture of coastal backcountry use. These data can then be used to prioritize areas for targeted resource studies and monitoring (e.g., exotic plants, ground-nesting birds, bear-human interactions, archeological sites) and management actions (e.g., trail/campsite rehabilitation, educational efforts, food locker placement).

Although the biophysical impacts of coastal backcountry camping currently appear to be low, there have been no baseline studies of the quality of the visitor experience. Many social science studies have found that the scenic appeal of an area and the opportunity for solitude can be diminished by the proliferation and high density of campsites, trails and associated impacts (Leung and Marion 2000). Because of the durable nature of most coastal camping areas, physical impacts alone may not be an accurate indicator of visitor use levels or campsite conditions in coastal areas of KEFJ. Perceived crowding and conflicts between user groups (independent travelers vs. guided groups) are potential social impacts that warrant investigation in order to further our understanding of backcountry visitor use and inform ongoing education, management, and mitigation efforts.

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Captain Fred Wells



Zach Babb



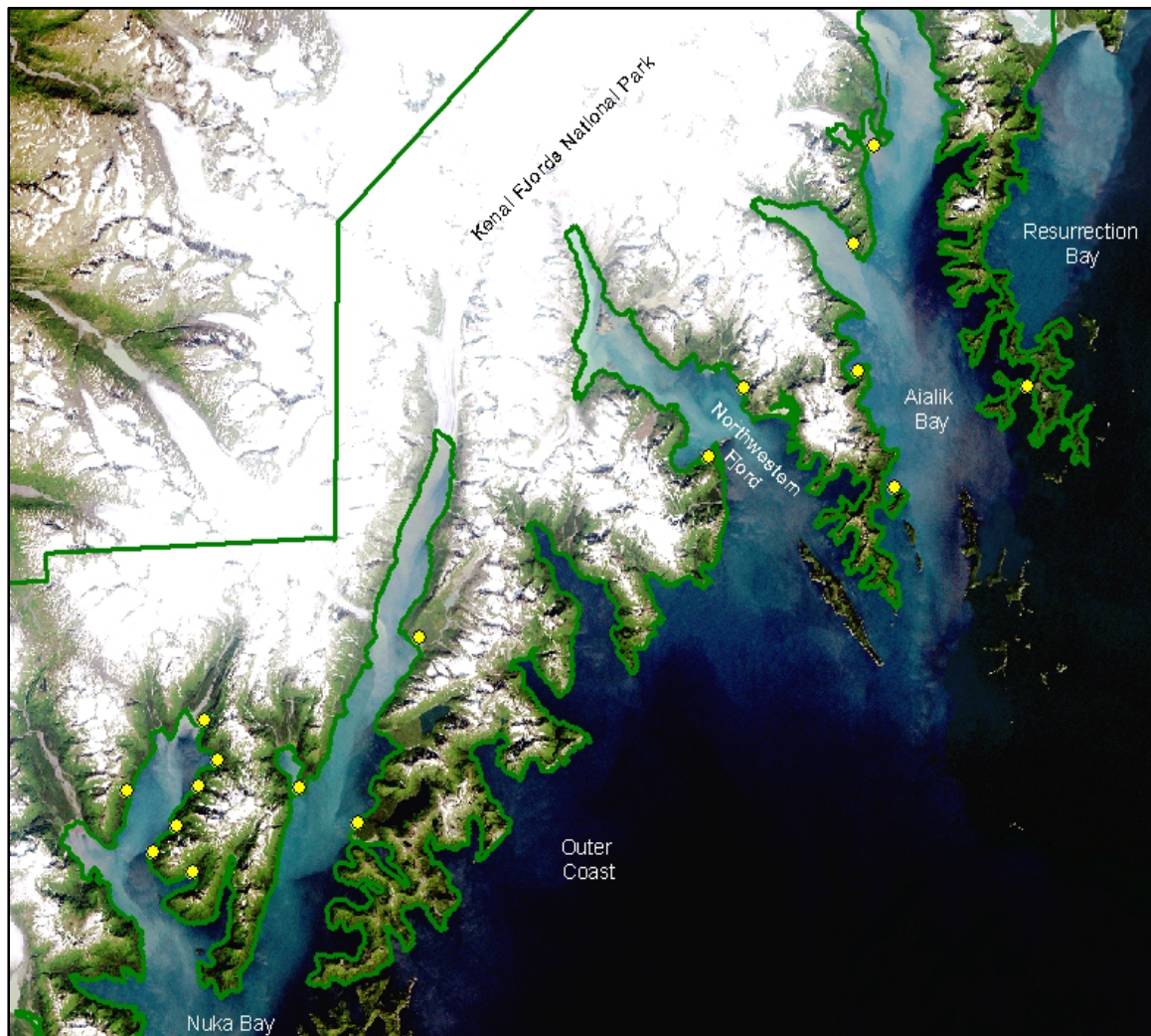
Captain Dennis Magnuson and Mick Sela

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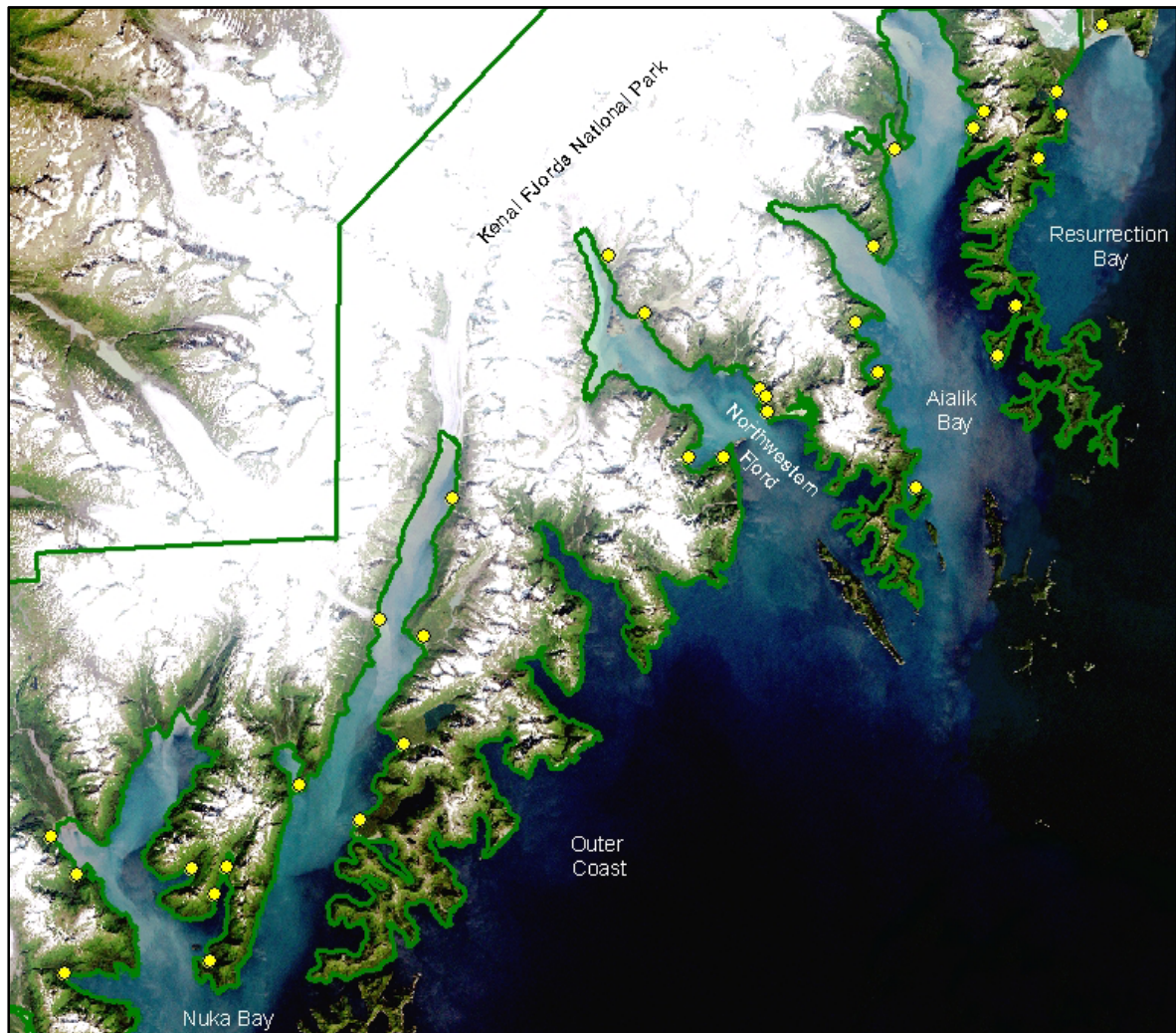
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Appendix A. Maps showing the geographic extent and distribution of previous campsite impact survey efforts in Kenai Fjords National Park.



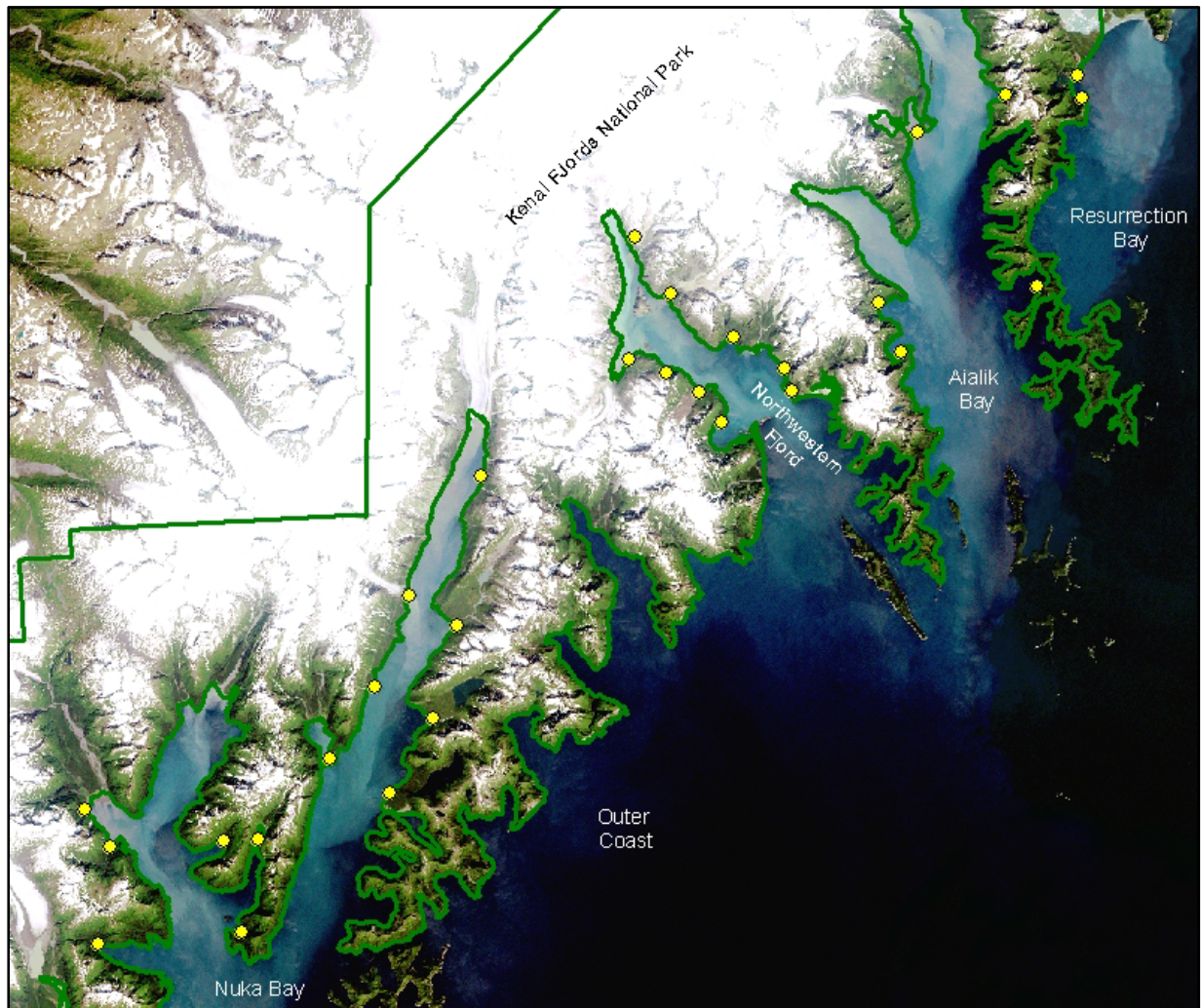
A. Beaches surveyed for campsite impacts in 1988 (n=17).

Appendix A. Continued.



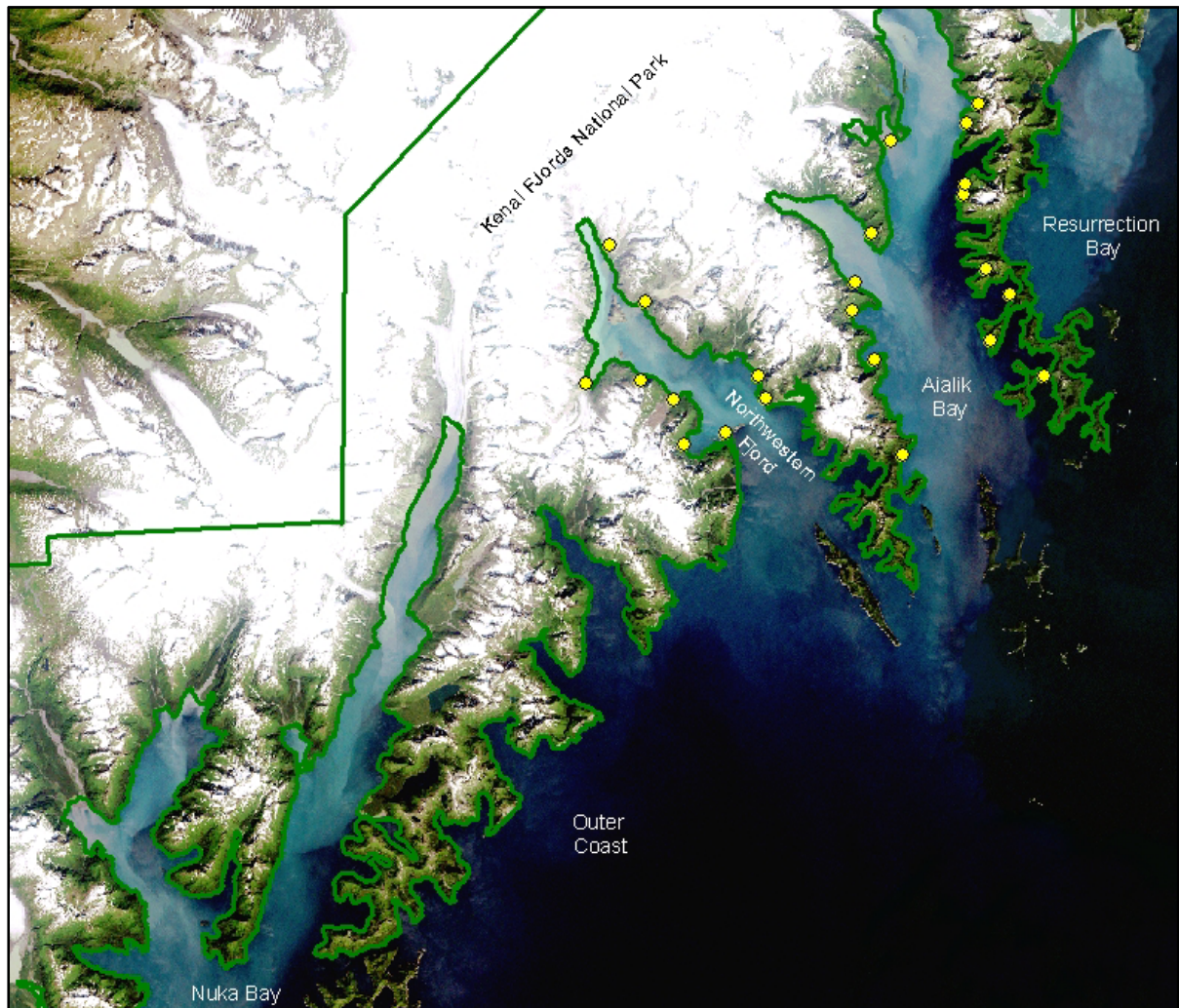
B. Beaches surveyed for campsite impacts in 1993 (n=33).

Appendix A. Continued.



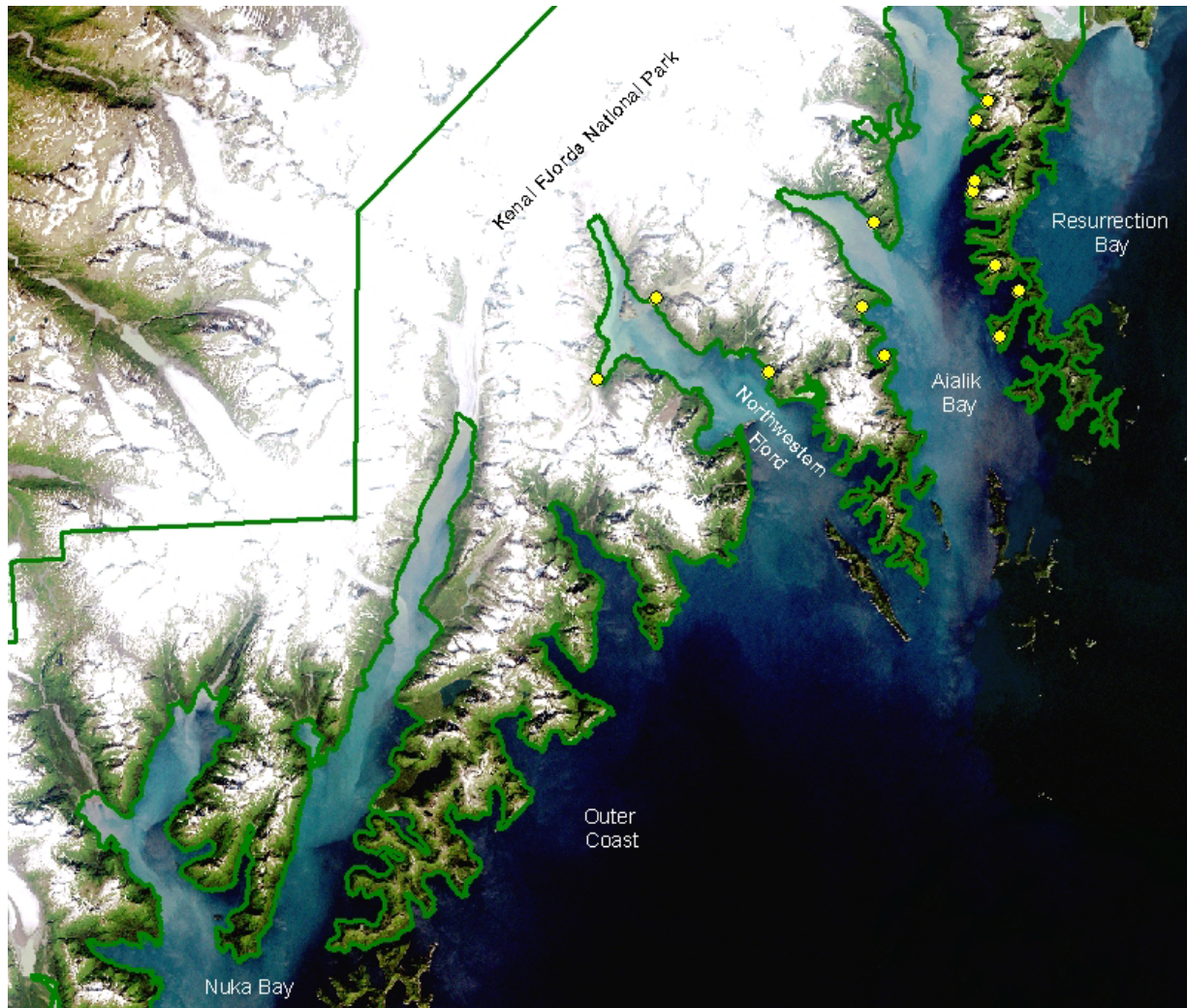
C. Beaches surveyed for campsite impacts in 1997 (n=29).

Appendix A. Continued.



D. Beaches surveyed for campsite impacts in 2001 (n=23).

Appendix A. Continued.



E. Beaches surveyed for campsite impacts in 2003 (n=13).

Appendix B. 2007 KEFJ Field Operational Plan.

Operational Update July 30 – August 3, 2007 Coastal Campsite Assessment, Kenai Fjords NP Coast

Field Contact: Meg Hahr (403), M/V Serac

Seward Contact: Mark Kansteiner (404, 224-7529)

Plan updated 7/24/2007 by Meg Hahr

Personnel:

1. Sean Brennan
2. Fritz Klasner
3. Christina Kriedeman
4. Meg Hahr
5. Heather Wetherbee
6. Evelia Hernandez

Boats:

M/V Serac

RM Zodiac (Green Hornet)

RM Naiad

Communications:

Park VHF hand-held radios

Hand-held marine VHF radio (1 for each shore crew)

Marine VHF radio on Serac

Sat Phone on Serac

EPIRB on Serac

406 MHz PLBs (one per skiff)

Meg: ADCF 08823CC0001

Serac Captain will attempt daily morning (0900 hrs.) and evening (before 2000 hrs.) check-ins via park radio or sat phone to park dispatch. Field crews will remain in contact with the Serac throughout each working day via hand-held marine and park VHF radios.

Emergency Plan:

Primary contact during work hours: Park headquarters on park VHF hand-held radio, coastal repeaters, USCG. Secondary contacts during non-work hours (after 1700):

Coastal LE Rangers 204 and 205- ABRS

Mark Kansteiner - 907 224 3589 (cell 907 362 7676)

Shelley Hall – 907 224 2470

Seward Police Dispatch – 907 224 3338

General Operations Plan and Schedule:

Monday 7/30: Leave Seward by 8:00 am and head down to Nuka Bay. Serac anchors in Shelter Cove and skiff crews survey campsites in Beauty Bay and North Arm.

Tuesday, 7/31: Serac transits to McCarty Fjord and anchors in Desire Cove. Skiff crews survey campsites throughout McCarty.

Wednesday, 8/1: Serac transits to Harris Bay while Naiad crew surveys campsites along outer coast weather permitting. Serac anchors inside Northwestern Fjord and skiff crews survey campsites in Harris Bay.

Thursday, 8/2: Serac transits to Aialik and anchors in Coleman Bay. Skiff crews survey campsites throughout Aialik.

Friday, 8/3: Skiff crews finish campsite surveys and Serac heads back to Seward arriving in the boat harbor by 3:30 pm.

Appendix C. 2008 KEFJ Field Operational Plan.

Operational Update August 26 – 29, 2008

Coastal Campsite Assessment and SWAN Vegetation Survey, Aialik Bay

Field Contacts: M/V Serac, Meg Hahr (403), Christina Kriedeman (420), Jim Ireland (201), Mark Thompson (202)

Seward Contacts: Mark Kansteiner (404), 224-7529, Friday – Tuesday (1100-2000)
Janette Chiron (203), 224-7543, Monday –Friday (0830 – 1730)

Campsite Assessment Personnel: 1. Christina Kriedeman (KEFJ) 2. Meg Hahr (KEFJ) 3. Greg Daniels (AKRO) 4. Chris Monz (Utah State University) 5. Nate Millard (Utah State University) 6. Jim Ireland (KEFJ) (8/26 – 8/27) 7. Mark Thompson (KEFJ) (8/27 – 8/29)	SWAN – KEFJ Vegetation Survey Personnel: 1. Amy Miller (SWAN) 2. Tina Boucher (AKNHP) Serac Crew: Fred Wells (Captain) Mick Sela (Deckhand)
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Boats:

M/V Serac
Serac skiff

Communications:

Park VHF hand-held radios
Hand-held marine VHF radio (1 for each shore crew)
Marine VHF radio on Serac
Sat Phone on Serac
EPIRB on Serac
406 MHz PLBs
Meg: ADCF 08823CC0001

Daily Check-In Plan: Serac Captain will check-in twice per day at the start and end of the day. Captain will check in by Park radio or satellite phone if radio does not work. Satellite phone check-in:

AM Check-In – 907-224-7500

PM Check-In – 907-224-7529 Logistics Coordinator (Mark Kansteiner) or 362-7676 (cell)

After hours – Denali Comms Center 907-683-9555

Field crews will remain in contact with the Serac throughout each working day via hand-held marine and park VHF radios.

Emergency Plan:

Primary contact during work hours: KEFJ Resource Management Logistics Coordinator (404)/Park dispatch (700) on satellite phone or Park radio.

Secondary contacts during non-work hours (after 2000):

Denali Communication Center (907-683-9555) Hours: 6am- Midnight

Incidents after hours: Shelley Hall (907) 224-2470 home

Emergency: US Coast Guard – Kodiak Station – Marine 16.

Seward Police Dispatch – (907) 224-3338

Primary contact at NPS – Alaska Regional Office, Anchorage:

Michael Shephard, SWAN, (Office 907-644-3681, Home 907-278-0637)

Kirk Desermia has emergency contacts for participants.

General Operations Plan and Schedule:

Tuesday, 8/26: Serac departs Seward for Aialik Bay at 0800. Drops Campsite crew at Holgate Beach and transits to head of Aialik Bay with SWAN Veg crew. Serac waits at head of Aialik for SWAN Veg crew (approx. 3 hrs) then returns to Holgate stopping at Tooth Cove if time allows. Serac picks up Campsite crew and drops off SWAN Veg crew at Holgate at 1700. SWAN Veg crew camps at Holgate Beach and Serac anchors nearby with Campsite crew.

Wednesday, 8/27: Serac picks up SWAN Veg crew from Holgate Beach and drops off Campsite crew. Janette Chiron (203), Shelley Hall (401), Mark Thompson (202) and Zach Babb (AKRO) make day trip to Aialik in Safeboat to work with Campsite crew at Holgate. Serac takes SWAN Veg crew to Tooth Cove area for surveys. Serac rendezvous with landing craft (Weather of Knot) between 1500 – 1600 in Bear Cove vicinity. Veg crew returns to Seward on landing craft. Serac returns to Holgate to pickup Campsite crew at 1700. Jim Ireland (201) returns to Seward on Safeboat and Mark Thompson (202) joins Campsite crew on the Serac for the remainder of the trip. Serac anchors nearby for work in Quicksand Cove the following day.

Thursday, 8/28: Campsite crew spends day working in Quicksand Cove. Serac anchors nearby.

Friday, 8/29: Campsite crew finishes work in Aialik and Serac heads back to Seward arriving in the boat harbor by 1500 pm.