



Wilderness Stewardship Program—Alaska Region

Annual Report 2012

Natural Resource Report NPS/AKSO/NRR—2013/659





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Serpentine, Bering Land Bridge National Preserve

Photograph by: Courtesy of Bering Land Bridge National Preserve

ON THE COVER

Glaciers, Wrangell-St. Elias National Park and Preserve

Photograph by: Courtesy of Glacier Bay National Park & Preserve

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The National Park Service, Natural Resource Stewardship and Science office in Fort Collins, Colorado, publishes a range of reports that address natural resource topics. These reports are of interest and applicability to a broad audience in the National Park Service and others in natural resource management, including scientists, conservation and environmental constituencies, and the public.

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Contents

	Page
Table of Figures	v
Abstract	vi
Summary of NPS Alaska Region Wilderness.....	1
2012 Activities and Accomplishments	1
Wilderness Character	1
Wilderness Character Workshops.....	2
Wilderness Character Narratives	2
Mapping Wilderness Character	2
Tracking Change in Wilderness Character	2
Wilderness Boundary Mapping and Acreage Calculations	3
Mapping Installations in Wilderness	3
Gates of the Arctic	4
Literature Cited	6
Appendix A. Wilderness Stewardship Status by Park	7
Appendix B. Wilderness Character Narrative – Lake Clark National Park and Preserve.....	8
Appendix C. Wilderness Character Narrative – Gates of the Arctic National Park and Preserve	16
Appendix D. Tracking Change in Wilderness Character – LACL	21
Appendix E: Refining Measurements of Wilderness Area in Alaska National Parks.....	29
Appendix F: Refining Measurements of Wilderness Area in Gates of the Arctic National Park and Preserve.....	47
Appendix G: Refining Measurements of Wilderness Area in Lake Clark National Park and Preserve...	49
Appendix H: Refining Measurements of Wilderness Area in Glacier Bay National Park and Preserve .	52
Appendix I: Refining Measurements of Wilderness Area in Katmai National Park and Preserve	54
Appendix J: Refining Measurements of Wilderness Area in Kobuk Valley National Park.....	56

Contents (continued)

	Page
Appendix K: Refining Measurements of Wilderness Area in Alaska National Parks: Kenai Fjords National Park	60
Appendix L. Alaska National Park Wilderness Acreage.....	63
Appendix M: Maps of Installations in Alaska National Parks	65

Figures

Page

Figure 1. Denali National Park climate monitoring station. 3

Figure 2. Current Wilderness Status in Lake Clark National Park and Preserve..... 5

Abstract

The NPS Alaska Region continues to improve its stewardship of Alaska's vast wilderness resources in an accountable and consistent manner. During 2012 progress was made in wilderness character integration, updating wilderness boundary and acreage calculations, mapping installations in wilderness, implementing the Science in Wilderness Evaluation Framework, and planning. The following park units hosted Wilderness Character Workshops: Glacier Bay, Lake Clark, Noatak, Cape Krusenstern, and Bering Land Bridge. Two units, Gates of the Arctic and Lake Clark, finalized Wilderness Character Narratives, and Glacier Bay, Noatak, and Bering Land Bridge developed final drafts. Lake Clark continued monitoring wilderness character, and Gates of the Arctic, Glacier Bay, Noatak, and Bering Land Bridge made progress on selecting measures for monitoring wilderness character. As one of four pilot test parks nationally, Denali began work on a Wilderness Character Spatial Model. More precise wilderness boundaries were mapped and wilderness acreage calculations were updated for Lake Clark, Kenai Fjords, Glacier Bay, Katmai, and Kobuk Valley. All Alaska wilderness parks improved their understanding of the location of structures and installations in wilderness. In an effort to improve consistency, objectivity, and transparency in research permitting, the Alaska Region adopted a framework for evaluating scientific proposals in wilderness. Gates of the Arctic drafted a Wilderness Study, which considers which of the park's 914,000 acres of eligible lands, if any, should be proposed for wilderness designation. Lake Clark drafted a Wilderness Eligibility Reassessment that evaluates 278,000 acres for wilderness eligibility.

Summary of NPS Alaska Region Wilderness

As of 2012, the National Wilderness Preservation System is close to 110 million acres administered by four Federal agencies—the Department of Interior’s Bureau of Land Management, Fish and Wildlife Service, and National Park Service (NPS), and the Department of Agriculture’s Forest Service. Over half of the nation’s designated wilderness lies within Alaska and over half of that is managed by the National Park Service. Approximately 95% of lands and waters within Alaska’s national parks are either designated wilderness or eligible for wilderness designation.

Most of Alaska’s wilderness was designated with the passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980, which provides special provision uses such as subsistence and motorized access not found in wilderness areas in the lower 48; however, the overarching mandate of the 1964 Wilderness Act - to preserve wilderness character - remains. The NPS Alaska Region Wilderness Stewardship Program oversees consistent implementation of the Wilderness Act and ANILCA and strives to enhance wilderness stewardship in the region.

2012 Activities and Accomplishments

Wilderness Character

Why Preserve Wilderness Character

Wilderness character is the combination of biophysical, experiential, and symbolic ideals that distinguishes wilderness from other lands. Wilderness character is composed of five qualities that directly link agency stewardship and wilderness conditions to the statutory language of the 1964 Wilderness Act and NPS policy, and apply to every wilderness regardless of size, location, agency administration, or other attribute. These qualities of wilderness character are:

- *Natural* – wilderness ecological systems are substantially free from the *effects* of modern civilization.
- *Solitude or primitive and unconfined recreation* – wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation.
- *Undeveloped* – wilderness retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation.
- *Untrammeled* – wilderness is essentially unhindered and free from the *actions* of modern human control or manipulation.
- *Other Features* – tangible features that provide scientific, educational, scenic, or historical value to the wilderness.

Preserving wilderness character improves the effectiveness of park wilderness stewardship, allows defensible stewardship decisions, is our mission by law and policy, and demonstrates NPS leadership across the National Wilderness Preservation System.

The National Park Service Wilderness Character Integration Team, established in 2010 by the WASO Park Planning and Special Studies Program and the Wilderness Stewardship Division, developed draft products to update Reference Manual 41 (*User Guide to Integrating Wilderness Character into Park*

Planning, Management and Monitoring, and *Wilderness Stewardship Planning Handbook*) for implementing Directors Order 41. The Alaska Region participated in the development of the *Handbook* and the *User Guide*, which offers practical strategies and tools to integrate wilderness character into park planning, management, and monitoring. The *User Guide* is not prescriptive but instead offers a wide range of tools and guidance that may be used by park staff in any order.

The Alaska Region continued to be a leader in implementing many of these concepts, from developing wilderness character narratives to ensuring a streamlined process for evaluating benefits and impacts of research in wilderness. The table in Appendix A illustrates the progress made in developing building blocks for wilderness character integration, wilderness training and mapping.

Wilderness Character Workshops

Dr. Peter Landres, Research Application Program Leader from the Aldo Leopold Wilderness Research Institute, visited Alaska several times in 2012 to facilitate wilderness character workshops. The following parks held workshops: Glacier Bay (GLBA), Lake Clark (LACL), Noatak (NOAT), Kobuk Valley (KOVA), Cape Krusenstern (CAKR), and Bering Land Bridge (BELA). These workshops initiate development of wilderness character narratives.

Wilderness Character Narratives

A wilderness character narrative describes what is unique and special about a specific wilderness, organized by each of the qualities of wilderness character. The narrative is a positive, affirming description of this wilderness now and into the foreseeable future, and includes a description of major influences on wilderness character. Lake Clark and Gates of the Arctic have finalized their Wilderness Character Narratives (Appendix B and C). Glacier Bay and Western Arctic's narratives are in final draft form.

Mapping Wilderness Character

A map of wilderness character is a depiction of how wilderness character varies across a wilderness. This depiction is based on the framework of four qualities and their indicators from the 2008 publication *Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System*. Spatial data from the park are combined to produce maps for each of the four qualities, which are then combined to produce an overall map depicting the condition of wilderness character at the park. Denali (DENA) worked on a Wilderness Character Spatial Model during FY12.

Tracking Change in Wilderness Character

Tracking change in wilderness character is gathering data on selected measures of wilderness character and seeing how these measures, and wilderness character, changes over time. There are many reasons for tracking change in wilderness character. Most simply, if we don't know the status and trend of a resource, we don't know if we are protecting it. This applies to the mandate of the Wilderness Act and NPS policies to "preserve wilderness character" in areas that are any category of wilderness (including designated, eligible, study, proposed, or recommended). From a practical perspective, the most important reason for tracking change in wilderness character is to provide solid information that can be used to inform management decisions and improve on-the-ground wilderness stewardship in parks. LACL is tracking change in wilderness character (Appendix D). Gates of the Arctic (GAAR), NOAT, and Bering Land Bridge (BELA) have selected measures for tracking change, and GLBA is in the process of selecting measures.

Wilderness Boundary Mapping and Acreage Calculations

Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system software the NPS is refining area calculations for Alaska NPS wilderness lands (Appendix E). This process does not change any land designations, land management strategy, or NPS policy.

During FY12 wilderness boundary maps were updated for GAAR, LACL, Kenai Fjords (KEFJ), GLBA, Katmai (KATM), and KOVA (Appendix F, G, H, I, J, K). Based on these updated maps, more precise wilderness acreages were calculated (Appendix L). Changes in wilderness acreages result from evolving land status conditions and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations.

Mapping Installations in Wilderness

The NPS Alaska Region Installations Database project involves the design, development, and population of a GIS database that standardizes the storage and management of specific geographic installation features in Alaska Region parks. This is primarily designed to promote a regionally-consistent approach to understanding the cumulative effects of installations and structures in wilderness. Staff from the Alaska Regional Office GIS team coordinated with parks to develop a regional standard for data collection and partnered in its stewardship through the use of a centralized, accessible server.

Park, Regional, and Inventory and Monitoring Network staff worked collaboratively to integrate data into the database. It was an effort of organizing existing data from multiple disparate data sets into the new installations database. This partnership will mature over time as data management responsibilities and better mechanisms for managing enterprise data are identified.

From this data, maps of structures and installations in each park were produced (Appendix M).



Figure 1. Denali National Park climate monitoring station.

Science in Wilderness

An NPS interdisciplinary working group was assigned by the Alaska regional director to address concerns about the cumulative impacts related to a growing number of facilities and installations in wilderness, address the perception that NPS was presenting an unwelcoming atmosphere for scientists, and improve decision making consistency between parks. Products and strategies were implemented in 2011 and included a one-year trial period during which all Alaska parks used a modified version of *An interagency framework to evaluate proposals for scientific activities in wilderness* (Landres et.al., 2010).

During FY12, the framework was modified further to address the magnitude and scale of wilderness resources in Alaska, the challenges of logistics and access, and the unique legal requirements and policies contained in the Alaska National Interest Lands Conservation Act of 1980 that established many of these areas. At the ALC meeting in February 2012, the ALC adopted the following recommendation from the Alaska Science in Wilderness Working Group:

Alaska parks are strongly encouraged to use the regional standard version of the Science in Wilderness Evaluation Framework. Parks may adapt the benefits/impacts worksheets to local conditions, as needed. However, if a park employs a different evaluation process that does not yield the expected benefits of transparency, objectivity, and consistency across the Alaska Region, then they may be required to use the regional standard version.

Wilderness Planning

Gates of the Arctic

With the passage of ANILCA in 1980, approximately 7,000,000 acres of Gates of the Arctic National Park and Preserve were designated as wilderness. A subsequent review appended to the original general management plan (NPS 1986) for the park identified another approximately 1 million acres as eligible wilderness (i.e., lands that have been through the Park Service's initial screening assessment to determine whether they meet the minimum criteria for inclusion in the national wilderness preservation system). The eligible wilderness includes both preserve areas except where there are subsurface rights or parcels in nonfederal ownership.

During FY12 NPS conducted a study to consider which of the eligible lands should be proposed for wilderness designation. NPS developed potential wilderness configurations for the preserves, and will be seeking public input on them as part of the study and environmental impact analysis associated with the Gates of the Arctic General Management Plan Amendment.

Lake Clark

All lands in the National Park System must be assessed to determine if they are eligible or ineligible for inclusion in the national wilderness preservation system (Alaska National Interest Lands Conservation Act (ANILCA) Section 1317, the Wilderness Act, NPS *Management Policies* 2006, Director's Order 41). To meet this requirement, Lake Clark National Park and Preserve (LACL) included a wilderness eligibility review as part of its general management plan (NPS 1984). The 1984 General Management Plan (GMP) found approximately 1.03 million acres (about 28% of the park/preserve) eligible for wilderness designation, in addition to the 2.47 million acres designated as wilderness under ANILCA in 1980. The 1984 GMP identified two areas along the eastern edge of the park as "less suited" for wilderness primarily due to Alaska Native Claims Settlement Act (ANCSA) selections and a possible land exchange. NPS 2006

Management Policies Section 6.2.1 states that lands that were assessed as ineligible for wilderness because of nonconforming or incompatible uses must be reevaluated if the nonconforming uses have been terminated or removed. In 2012, NPS drafted a Wilderness Eligibility Re-assessment that evaluates those lands for eligibility. At the end of FY12, the Re-assessment was included in the LACL General Management Plan Amendment and was sent to park and regional staff for review.

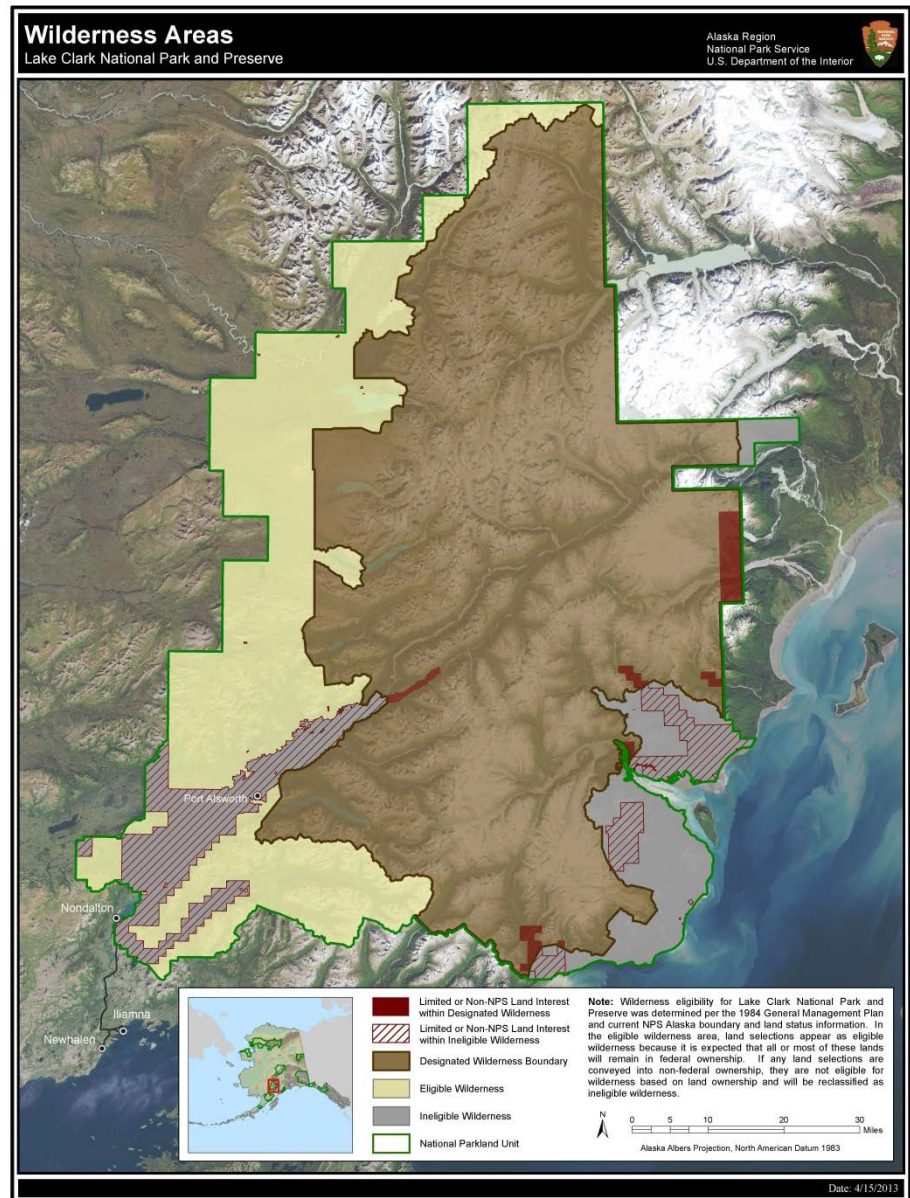


Figure 2. Current Wilderness Status in Lake Clark National Park and Preserve

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Appendix A. Wilderness Stewardship Status by Park

Park	Status	Building Blocks for Integrating Wilderness Character into Parks								Wilderness Planning	Wilderness Training			Mapping	
		Park Foundation and Wilderness			Wilderness Character Assessment			Management and Operations			Date of last unit or wilderness 101 training	Date of wilderness character workshop	Supt attended national or regional wilderness training	Current boundaries mapped and current acreage calculated	Map of installations
	Types of wilderness D=Designated E=Eligible	Understanding of enabling legislation and status of wilderness	Wilderness character narrative written	Future wilderness planning needs identified	Wilderness character measures selected	Wilderness character baseline collected	Wilderness character monitoring to track trends in WC	WC evaluated in MRAs and NEPA docs	Science in wilderness evaluation process in place	Current Wilderness Stewardship Plan					
DENA	D, E				In progress						Apr 2008				
GAAR	D, E										May 2002	Feb 2011			
GLBA	D, E				In progress						May 2008	Apr 2011			
KATM	D, E										Jan 2003				
KOVA	D, E										Mar 2006	Apr 2012			
LACL	D, E										May 2006	Feb 2011			
NOAT	D, E				In progress						Mar 2006	Apr 2012			
WRST	D, E										May 2005				
ANIA	E										Jan 2003				
BELA	E				In progress						Mar 2006	Apr 2012			
CAKR	E										Mar 2006	Apr 2012			
KEFJ	E														
YUGA	E										May 2002				



= Completed prior to 2012



= Completed in 2012

Appendix B. Wilderness Character Narrative – Lake Clark National Park and Preserve

Lake Clark Wilderness Character Narrative

A wilderness character narrative is a positive and affirming description of what is unique and special about this wilderness.

Lake Clark Wilderness is *Kijik (Qizhjah)*, a place where people gathered. First the mountains were gathered; brought north by the Pacific Plate and scraped off on the edge of the North American Plate. The colliding plates tore faults through the mountains and left weak spots where rising magma has formed a string of volcanoes. Older mountains on the western flank are eroded and rounded, becoming more recent and rugged east across the Alaska Range and ending at Cook Inlet in raw exposures of Jurassic sediments that shed fossils onto the beach.

Storms gathered over the mountains, brought to the region by North Pacific low pressure systems, cooled by Arctic highs. The mountains serve as a fulcrum for the air masses pushing and tugging each other across the park. Copious snows fill the cirques and valleys with glaciers. At least four major glacial advances have carved a cradle of lakes that form the headwaters of three major drainage systems and are the nursery for rearing the largest wild salmon run in the world.

Melting snow and rains gather to form a network of rivers flowing from the Alaska Range into three different seas. These rivers are the bloodstreams of the landscape, flowing from the first drop gathered on a leaf in the alpine, through cirques, over waterfalls, braiding through wide valleys, traversing large lakes and into arctic oceans. In return, salmon pulse upstream every summer; scarlet cells of protein, fats and nutrients that nourish the landscape, the bears and ravens, the people and the next generations of salmon.

The Dena'ina gathered and spread throughout this region as well, forming an enduring connection to what we now call the Lake Clark Wilderness. What emerged from this relationship with the land is the Dena'ina language, spirituality, identity, and cultural connection to the land.

This narrative describes five tangible and measurable qualities of wilderness character at Lake Clark Wilderness: natural, solitude or primitive and unconfined recreation, untrammelled, undeveloped, and other features. These qualities provide the setting from which a suite of wilderness values are derived. One of the most important of these values is the connection the Dena'ina have to this place and the role it's played in shaping the Dena'ina culture. An essay that recognizes and celebrates this vital connection closes this narrative.

Natural: *Wilderness maintains ecological systems that are substantially free from the effects of modern civilization*

Lake Clark Wilderness is a dynamic landscape where forces of nature continue unfettered and whole ecosystems function. The park has four major ecosystems: Boreal in the northwest, Subarctic in the western Bristol Bay basin, a Maritime fringe on the Cook Inlet coast, and the Montane spine of the park.

This rich diversity provides a framework for natural functioning of spectacular ecosystems. The park holds two active volcanoes, vast icefield and glacier systems, coastal salt marshes where brown bears gather to feed and breed. Complex riverine systems carry nutrients both up- and downstream. Ground water allows late freeze up of sloughs and facilitates salmon spawning into early winter. Bears patrol the rivers as ice closes in, taking the last few salmon before heading up the mountain to hibernate. Throughout the park, complex predator and prey webs play out their evolving adaptations and patterns. Caribou herds swell and decline and grow again. Moose and sheep populations colonize new territory and retreat with weather and predator pressures. Shorebirds and waterfowl arrive with breakup, breed, nest and return to wintering grounds. And over it all the storms sweep among the peaks, the lakes freeze and breakup and berries bloom and ripen and for thousands of years, people have gathered to harvest the returning salmon. Today, local residents continue to pursue a subsistence lifestyle dependent on resources including salmon, wildlife, berries, birch bark and spruce. There are few remaining places in the US where subsistence lifestyles are an active part of the ecological integrity.

Lake Clark's ecosystems are among the most dynamic in the world: tectonics, glaciers, volcanoes, intact wildlife and fish populations and human activities. Dynamic landscapes, by their very nature, are capable of absorbing a wide range of changes while maintaining their fundamental functionality. The problem arises when the changes exceed the ecosystem's capacity to absorb them, driving the country to a different ecological state. Often these changes are forced by human activities. Multiple human activities interact with each other and with natural systems to produce unexpected consequences that the park cannot absorb. These activities cause a cascade of impacts that exceed natural buffering in the system and often result in completely different ecosystem processes. Major threats to Lake Clark's natural character at this time include impacts from climate change and external developments.

Climate change is already changing temperature and precipitation regimes in the region, resulting in longer growing seasons, shorter ice-seasons, glacial retreat, warmer lakes, shrub and tree invasion into tundra (fewer berries and lichens), more lightening, and warmer and acidic oceans. External developments and associated activities are also changing Lake Clark ecosystems. Exploratory work brings many people and aircraft into the region; many of them flying through, and now subsisting in Lake Clark. Predator control on two sides of the park impacts the natural predator/prey systems that are a hallmark of the area. Developments will likely change streams with major impacts to salmon runs throughout the park.

Solitude or Primitive and Unconfined Recreation: *Wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation*

Unforgettably beautiful and unforgivingly rugged, Lake Clark Wilderness provides a setting where visitors can leave behind societal constraints in search of solitude, challenge, discovery, and renewal.

Largely void of recreational developments and management restrictions on visitor behavior, Lake Clark Wilderness is a place where it's possible to detach from modern life and become steeped in the timelessness of a landscape that hasn't been altered in hundreds of years. Such a place gives one's soul

a chance to experience the unencumbered freedom that often corresponds with seeing wild country expand to the horizon.

Here a person can choose from a variety of activities and modes of travel, though whether one chooses to hike, climb, boat, ski, snowmachine, hunt, fish, or camp, visitors tend to experience the wilderness on the land's terms. Rapidly changing weather, rugged topography, and abundant wildlife force us to relinquish control over the land. The immensity of the landscape (large glaciers, waves of mountains, sweeping tundra plains) makes people feel small and insignificant, which can be both a profoundly humbling and empowering experience. It is these same qualities that provide an opportunity for a heightened awareness of the senses, evoke a connection with the larger community of life, and awaken a sense of mystery.

The sense of immersion in the landscape that one feels at Lake Clark is enhanced by the physical separation of the wilderness from urban centers and the fact that, practically speaking, a person can only get there by using an airplane. Inside the Lake Clark Wilderness, the feeling of remoteness is heightened by knowing it is a great distance to assistance should a person need it. Most forms of communication aren't reliable and weather can prevent aircraft from rescue. The sense of isolation enhances the feeling of being on one's own, and while it may feel disconcerting, part of the appeal is knowing that the Lake Clark Wilderness is a place where true challenge exists.

Lake Clark Wilderness combines remoteness with harsh weather, lack of infrastructure, and rugged geography (including an extensive network of crevassed glaciers, steep mountainsides carpeted in thick vegetation, swift cold rivers); this combination creates opportunities for personal growth, self-discovery, and the self-fulfillment that comes from overcoming obstacles. Without trails, bridges, designated campsites, markers, and public use cabins, visitors must rely on themselves. There are real consequences for mistakes. The physical and mental challenge is a positive aspect that forces people to live in the moment, pay attention, and participate in their present reality in a way that often isn't easy to do in everyday life.

Visitors get the opportunity to navigate the challenges associated with protecting food from weather and wildlife, staying dry, traveling through bear country, staying warm in extreme weather, figuring out how to cross rivers, avoiding falls down cliffs or slips into crevasses, and evaluating the hazards of active volcanoes, rock fall, and avalanches. It is these challenges and the promise of the corresponding rewards that attract people to the Lake Clark Wilderness.

There are a number of things on the horizon that could degrade opportunities for solitude or primitive and unconfined recreation. Unmitigated impacts of increased visitation, and increased availability and use of technology from satellite phones to web cams to personal tracking devices, diminish solitude. Developments outside the park boundary including the prospective Pebble Mine, Chakachamna Lake Hydro Project, and Chuitna Coal Mine could degrade the feeling of remoteness.

A paradox exists with aircraft, which degrade the undeveloped quality and can be heard frequently in many parts of the wilderness. The ability to use aircraft to transport people into a remote setting is an integral part of the Alaska wilderness experience. In fact, the way people access wilderness can be part of the wilderness experience itself: the quick feeling of isolation when a plane takes off and leaves you there can enhance the feeling of intimidation and excitement of being truly alone in a vast landscape.

It may be necessary in the future for park managers to take actions that restrict visitor behavior or movement in the wilderness in order to protect natural or cultural resources or to reduce visitor conflict. Restrictions on where visitors can go and conditions on their use of the wilderness can negatively affect unconfined recreation. Similarly, visitor contacts and ranger patrols reduce the feeling of being alone and relying solely on yourself.

The park must also consider the tradeoff of recreational facilities such as trails, outhouses, and cabins that facilitate access and use of the wilderness, and/or help protect park resources, but that also diminish the self-reliant quality.

Untrammeled: *Wilderness is essentially unhindered and free from modern human actions that control or manipulate the community of life*

Lake Clark Wilderness protects a complex mosaic of landforms and ecosystems that continue to evolve from dynamic tectonic, volcanic, glacial, and climatic processes. The isolation, geography, and weather associated with the Lake Clark Wilderness make human influence difficult. If explorers from the 1800s returned to the region, they would see a similar landscape (with the exception of more vegetation and receded glaciers) and similar fish and wildlife as they did in the 1800's. It's one of the few areas in the world where ecological systems are not intentionally modified by the actions of our modern management.

The park resists wildlife manipulation, and wildlife habitat in the wilderness varies naturally based on complex interactions between recent physical (e.g., precipitation, temperature) and biological (e.g., insect outbreaks, plant disease) factors. Wildlife is free to move through the landscape and populations such as caribou that currently range outside the park are free to return and populate the area as before.

Water flows through intact ecosystems connecting mountain headwaters with tidally influenced streams. Lake Clark Wilderness protects critical habitat at the headwaters of the world's most productive red salmon fishery, which anchors the economy, ecology, culture, and history of southwest Alaska. Dynamic ecological processes continue as they have for millennia, unimpeded by park management.

There is a legacy of not taking management actions in order to maintain the untrammeled quality of wilderness character. The park's attitude in protecting magnificent landscapes from development reflects a culture of restraint and humility.

This legacy has an inspirational value to people in a larger public arena including those who may never visit but who take solace in knowing such protected places exist. It has also inspired the park's visitors who seem to quietly come in without publicizing their arrival, float rivers and pick berries and quietly leave with blueberry stains on their behinds. The legacy extends also to local residents and commercial operators who share a sense of responsibility for Lake Clark Wilderness as a land that is wild and free.

Forces largely beyond the control of park managers threaten to erode the untrammeled quality. Predator control efforts outside the park boundary threaten to manipulate natural predator/prey systems. Mining districts around the border of the park could introduce pollution to the water, air, fish and wildlife. Climate change could create higher incidences of fire and perhaps a corresponding rate of suppressing fires in order to protect private property.

Undeveloped: *Wilderness retains its primeval character and influence, and is essentially without permanent improvements or modern human occupation*

Lake Clark Wilderness has an undeveloped feel despite numerous cabins and ruins throughout the park. The 37 installations in wilderness include equipment used to improve communication, aviation safety, and to monitor the park's volcanoes, climate, and geologic dynamics. In general, developments that occur in the Lake Clark Wilderness are barely noticeable across the landscape and do not include large structures such as prominent buildings or roads. It is unlikely that visitors will find any sign of contemporary human civilization such as mechanized equipment, signs, unnatural noise aside from airplane noise, and other modern artifacts. A mental and emotional freedom emerges from such settings where visitors experience nature essentially free of the reminders of society, and can feel part of this vast landscape.

There is a sense of mystery and the unknown that comes with a lack of development and lack of assigning English names to natural features. Visitors have the opportunity to feel like the first person to ever be there. Standing on a high point a person can look to the horizon and know there are no roads, no traffic. The undeveloped quality allows people to feel released from the grip of civilization.

The park actively preserves the undeveloped quality by administering its commercial services program in a manner that allows people with an existing connection to the place to continue to work here but without adding structures or facilities. In addition, while the park continues to make significant progress acquiring inholdings, there still exist numerous parcels within the park where development could occur.

A couple of paradoxes exist within the undeveloped quality. For example, structures and installations that support scientific inquiries or park communications degrade this quality but also provide essential information for park management. The data gained from many scientific installations are often our best indicator and assessment of the Natural quality. Cultural resources like historic cabins can negatively impact one's ability to feel free from the reminders of civilization and connect to the larger community of life; however, for others, the presence of that same cabin enhances the connection to place and the meanings associated with it bolster appreciation and enjoyment of the area (see Cultural Resources section below).

Other Features: *Wilderness preserves other features that are of scientific, educational, scenic, or historical value*

Many specific features that are of exceptional cultural, historic, and scientific value are preserved because of their location within Lake Clark Wilderness.

Prehistoric sites and cultural artifacts lend a sense of timelessness to the Lake Clark Wilderness. Prehistoric sites represent past human and ecological interaction on ancient landscapes and relict lake shores. These sites contain fish and animal bones as refuse or as artifacts representing species hunted or gathered since the close of the last Ice Age. In rare cases, such as high elevation ice patch sites that are melting with global warming, organic artifacts are preserved, providing direct radiocarbon dates and a point in time for extraordinary bone and wood artifacts. Faunal remains in sites may contain proxy

climate data that can be derived from their isotopes as well as DNA possibly distinct from what exists today. Cultural sites are windows into other worlds, worlds that no longer exist, and although they are invisible, we know that ancient footsteps crisscross our wilderness. The undeveloped and untrammelled character of the Lake Clark Wilderness allows us to discover and preserve these sites and artifacts and to imagine these other worlds without the disruption of inventions of modern humans.

Historic sites like the Proenneke cabin contribute to education and understanding of the rusticator era when many people like Dick Proenneke went into the country to carve out their own personal relationship with the wilderness. The Proenneke site represents the intrepid, pioneering spirit and the courage to follow the pull of one's own inner compass to immerse oneself in a rural environment free from developments and amenities.

In general, a number of things threaten cultural resources: loss of traditional knowledge, place names, stories, and traditional practices that are practiced on the landscape; off-airport landings on exposed areas with near-surface artifact scatters; catholes excavated year after year at popular camping sites disturb vegetation cover as well as shallowly buried cultural sites; fire rings; and wildland fire and vandalism.

Specifically, over-use of the Proenneke site can break down the stream bank at the Hope Creek outlet, trample vegetation, and increase human waste. These impacts degrade the symbolic value of this important cultural site. The park will need to find the right balance of protecting this site and providing appropriate infrastructure to accommodate visitors.

A Dena'ina Perspective: Respecting *Elnena* (Land)

The legacy of unseen footprints of the Dena'ina people has sustained the place now called Lake Clark Wilderness for centuries. The Dena'ina people of the Lake Clark area believe that everything has a spirit and should be treated with respect. We call this '*K'etniyi*' meaning 'it's saying something.' This is the power of nature's voice – an ancient connection to the spirit of the Dena'ina people. This is how we define Wilderness. Our ancestors' beliefs for caring for the land has been simple – respect all living things; not taking more than you need, giving something back when you take – this can be a prayer, deep thoughtful respect or a small material item such as a safety pin. What has emerged from this relationship with the land is the Dena'ina language, spirituality, cultural connection to the land, and identity.

The land provides for us and we were taught to be respectful. This respect is not questioned and we are conscious that when we interact with nature, we are praying. We harvest our food from the land, we put up salmon every summer, we hunt for meat, and we pick berries. As we stoke the fire in the smokehouse full of drying salmon, this is prayer. As we pressure cook the meat from the black bear for canning, being careful not to waste any of the meat, this is prayer. As we pick berries this is done with prayer. The relationship with the land is filled with gratitude and respect, for we are nothing without the blessings of the land in which we were raised.

We recognize and feel the connection to weather and understand the importance of paying attention. Look to the tops of spruce trees; if there are a lot of spruce cones this means there will be a lot of snow. If there are a lot of white Hudson bay tea blossoms, this tells us that there will be a lot of salmon this summer. Just this fall before the lakes froze, a heavy fog came over the lakes – hovering over Sixmile Lake and up through Lake Clark. A Dena'ina elder watching through the window said, "A long time ago they used to say that when the fog came in over the lakes, this means that the fog is spreading the word over the lakes – the fog is sending the message that the lakes will be freezing soon."

Fish camp continues to be an important tradition of the Dena'ina people. The comparison used, when asked what fish camp is: It's like Christmas, only better. We are not paying a price for gifts or experiencing a fleeting moment of joy and celebration. We are preparing all year long for our few months of celebration. We are coming together as family and community and sharing the gratitude of putting up fish – fulfilling our spirits, minds, emotions and bodies from the same source and practices our ancestors did. It's hard to put into words the feeling - the connection that ignites the spirit when it comes time for fish camp. It is an ingrained, unconscious movement that is felt when spring turns into summer. Fish camp is a communion with every aspect of putting up fish. It's a relationship that has been created from the time of birth, sensing when summer comes, it's time to go back to fish camp, it's the smell, the slime, it's nature -connecting back to the water, bringing relatives home, it's knowing you have fish for winter not only for your family but to share at potlucks and with relatives and friends. It's a spiritual igniter that restores this underlying excitement after a long winter. It's a part of life that is not questioned, whether we go to fishcamp or not. It's done every summer. It's the contented labor of splitting fish, of stoking the smoke house fire, and of taking care and pride in putting up fish the right way. This deep-rooted way of life cannot be measured, cannot be priced, and it can be easily overlooked by an outsider, because it's beyond the visual and the spoken.

Reflecting on the idea of wilderness, Michelle Ravenmoon noted, "I have learned to appreciate even the smallest interactions between animal and land. As a child, I would watch the spiders spin webs; they put unwearied effort into their webs. I learned a respect for the work put into a web and I took great care not to destroy webs just because they were in my path. I also learned to pay attention to when spiders spun webs because spiders seem to have an ability to predict when the wind would not blow and that was web-making time. By paying attention to the spiders, I learned a technique to predict the weather. I think many people look at wilderness and think that they need to see a bear or a moose for a true experience with nature, but it is through patience and mindfulness that the true experience takes place."

To some people, the word "wilderness" conjures thoughts that we are separate from nature, that the woods are unknown, untouched, perhaps mysterious, or even dangerous. This may create feelings of fear, excitement, adventure, longing for connection to nature...but when all thoughts of the individual components dissolve and we let go of the attachment or judgments we've given them, all we see is the beauty of the natural surroundings. We feel right at home, we want to care for and not take from the land, and we realize that we are not separate from nature but part of it. The wilderness and all that it encompasses is not a mystery; it is us and it is home. It's as familiar as looking in the mirror.

Many places in the Lake Clark Wilderness have Dena'ina place names developed over time through stories, events and experiences. It was not common to name a place after a person; natural places were left with a name that came from the experience and gifts it offered – '*Dilah Vena*' – fish swim in lake; '*K'dalghek'tnu*' – scraping noise (of antlers) stream; and '*Ch'kentalqeyitnu*' – someone throws spear stream. Over two thousand place names like this are spread across the region and each place holds meaning. It is important that the Lake Clark Wilderness encompasses these meanings and that we continue to honor the footprints of culture as integral to our contemporary idea of Wilderness

Lake Clark staff who contributed to this narrative include:

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And special thanks to Peter Landres

Appendix C. Wilderness Character Narrative – Gates of the Arctic National Park and Preserve

Gates of the Arctic National Park and Preserve-Wilderness Character Narrative

In 1978 President Jimmy Carter set aside 8.22 million acres of diverse arctic ecosystems as a national monument. Two years later the Alaska National Interest Lands Conservation Act was signed into law, creating Gates of the Arctic National Park and Preserve with over 7 million acres of park wilderness and more than 1 million acres of wilderness eligible preserve land for a total of over 8.4 million acres. Gates of the Arctic National currently contains 7,167,192 million acres of designated wilderness and much of the remaining lands are eligible for designation. When combined with the wilderness of Noatak National Preserve, this area equals 12,743,329 acres and comprises the largest contiguous wilderness in National Park Service system. The ANILCA legislation effectively established the largest expanses of wilderness this country had ever seen. This unprecedented legislation set new visions for wilderness stewardship on a scale largely defined by the preservation of ecological, cultural, and historical integrity.

Gates of the Arctic has a gaunt beauty where humans do not dominate the landscape but are deeply interconnected by 12,000 years of continuous existence. The wilderness at Gates of the Arctic is a place where people are integral components of the larger landscape; it's a place where people do not live with wilderness so much as they live as part of it. This wilderness has invisible traces of nomads that lived, hunted, and traveled in the park and stories unfold of unbroken lineages of humans residing amongst the natural world. Spiritual ties to the land are still interwoven among Native Alaskans, residents and visitors alike. Visitors get the opportunity to follow in the footsteps of Robert Marshall, to stand at the "Gates" where Marshall had a revelatory experience that forever influenced the development of wilderness preservation ideals in America. Here, located completely north of the Arctic Circle, the park's natural arctic ecosystem is functional and intact. Within the park boundary is the central Brooks Range, boreal forests, huge expanses of tundra, and six designated Wild Rivers. Wandering through the rugged landscape are significant predator/prey populations, caribou migration corridors, migratory bird and fish species, and a substantial population of Dall's sheep. The vast, endless landscape is scoured yearly by extreme seasons where "winter is the reality, summer is just a lie" (Ray Bane). Existing in this harsh, wild indifference teaches us humility and the need for restraint, and serves as a reminder of what it means to be human. It is here in Gates of the Arctic where humans and nature continue to weave a story of mutual existence.

According to *Keeping it Wild*, the four qualities of wilderness are:

- *Untrammeled*: Wilderness is essentially unhindered and free from modern human control or manipulation
- *Natural*: Wilderness maintains ecological systems that are substantially free from the effects of modern civilization
- *Undeveloped*: Wilderness retains its primeval character and influence, and is essentially without permanent improvements
- *Solitude*: Wilderness provides outstanding opportunities for a primitive and unconfined type of recreation

Untrammeled Quality

The wilderness of Gates of the Arctic represents the essence of the term “untrammeled”. It is an awe-inspiring, at times harsh, landscape of a massive size and scale that over the course of time has not allowed humans to exert overt control over it. The remoteness of this wilderness from other centers of human settlement has protected its ecosystems, leaving them by and large intact and robust, predominantly under the control of natural processes and not under the control of civilization.

In contemporary times the most significant trammeling of the wilderness’s systems and processes come not from within the massive wilderness itself, but instead occurs from external locations. Populations of wildlife which frequent the wilderness are managed outside the park’s boundaries. The expansion of invasive species presents the potential need for more rigorous manipulation of the wilderness in order to protect ecosystems. Perpetuating the untrammeled quality may require great restraint on the part of managers. At times, upholding the untrammeled quality can detract from another wilderness quality, such as “naturalness,” as is the case when managers decide to not eradicate or otherwise control an invasive species.

Undeveloped Quality

Gates of the Arctic contains one of the largest wildernesses in the NPS system and it is also one of the least developed. Even the manner in which people access this wilderness highlights its undeveloped nature. There are no trailheads, there are no trails. Primary access is through airplanes, yet the park is without any developed airstrips. Except for three cabins currently retained for administrative purposes and safety, cabins and other structures are in a state of benign neglect, slowly folding back into the natural landscape. The NPS has not, in its time at Gates, increased development within the wilderness. Instead, the developed footprint has been decreased. A deliberate, conscious effort has been made to not include amenities such as designated campsites, groomed trails, and hardened access portals; instead undeveloped conditions prevail and people must rely upon only themselves for comfort, shelter, and safety.

Gates of the Arctic has an extensive history of humans and their relationship to the wild lands prior to and after its wilderness designation. This unbroken tradition of living on the land has been woven into the framework of this wilderness, where man exists as the top predator while exploring, settling, and adapting to the harsh Arctic environment.

Historical and archeological remains of camps, villages and human activities show the spiritual tie humans have to this land, water and wildlife. Ancestors of Inupiaq and Athabascan peoples hunted for migratory caribou, trapped small game, and pulled fish from these lakes and streams. They used the area’s natural resources to survive and create a subsistence lifestyle in an unparalleled wild and intact ecosystem.

Degradation in the form of the elimination of ancestral/historical stories about the land and its place names is a potential threat to the understanding of this wild lands origin. These stories add layers of depth and dimension to the meaning of this wilderness. The potential loss of discovered and

undiscovered tangible evidence in the form of artifacts and cultural landscapes decreases our educational opportunities for understanding the parks past and present relationship with the land.

Remoteness and cost has helped protect the undeveloped quality. The intense and often severe climatic and geographic conditions found within the Gates of the Arctic wilderness inhibit human activities on the landscape. Preserving the undeveloped quality of Gates can make the study of its natural and cultural resources difficult.

Even a landscape as vast and devoid of development as Gates of the Arctic still has the potential for development within its boundaries. While the park has strategically purchased as many inholdings as has been feasible since establishment, there are dozens of privately held parcels that are immersed within Gates' wilderness, and could potentially affect its undeveloped quality, over which the NPS can exert no formal influence.

Beyond the park's boundaries the future for the region is one of development and civilizing progress. Roads will be built. Mines will appear on the horizon. People on ORVs will ride to the edge of the wilderness and begin to gaze in. Technology will allow people to engage the wilderness with greater ease, flexibility, and safety. New demands on this wilderness will require proactive, responsive management of its resources to ensure they are preserved. Sometimes, protecting wilderness values may be in conflict with the mandated protection of resources.

Natural Quality

Gates of the Arctic National Park and Preserve is one of four contiguous national parks. These park units encompass peaks of the Brooks Range in the east and end at the shores of the Bering Sea. Above the Arctic Circle the vast extent of wilderness connects the rugged Brooks Range with icy blue glaciers to an intact boreal forest, tundra, geological features, complete watersheds, and six designated Wild Rivers. Ecosystem processes are intact throughout the park. Habitats are seamlessly interconnected and provide the scene for supporting wholly intact, naturally occurring species of plants as well as wildlife populations.

It is here above the Arctic Circle that many species have adapted to life on the edge. Extreme seasonal variations provide for long winters with little light. What winter light that does shine across the skies comes from hours of alpenglow and the dancing lights of the aurora borealis. Short springs give way to summers that welcome long hours of daylight and a quick fall season begins to repeat the extreme cycle again.

In a place with extreme seasonal variation, wildlife not only exists but thrives. One of the largest aggregations of caribou migrates unimpeded by human infrastructure. One of the largest populations of spawning sheefish migrates between spawning and feeding grounds. Millions of insects attract an abundance of bird species including the arctic tern, a bird known for the longest migration in the world. These species, along with the large population of Dall's sheep, moose, small mammals and other arctic whitefish provide enough food to sustain the land's top predators, wolves and grizzly bears. The

ruggedness of the landscape and movement of wildlife creates a vast natural arctic ecosystem with no sense of borders. Together, the land and wildlife play a role in creating the inescapable chorus of natural sounds.

Although seemingly remote and uninhabitable, Gates of the Arctic has supported 12,000 years of interaction between people and the landscape. Human presence and connection with the land is a natural part of the functioning healthy ecosystem. The realities of these harsh wild places make subsistence lifestyles a necessity. There are few remaining places in the US where subsistence lifestyles are an active part of the ecological integrity.

The naturalness and inaccessibility of the park has helped contribute to high air quality levels. Potential for outside influences such as mining and building of roads could have a negative impact on air quality in the future. Also, pollutants and fine particles from faraway places are being transported into the park through wind and air currents, resulting in arctic haze and deposition into soils and waters that effectively alter nutrient cycles.

The park remains one of the largest, most remote and difficult to access wilderness areas in the NPS system. Consequently, little biophysical degradation has occurred. Conducting research and effectively reporting results will help management make sound decisions about climate change and potential impacts such as loss of biodiversity, introduction and spread of exotic species, overfishing, over hunting, and looting. Results of research will help park staff inform visitors about having minimal impacts on the land. If deemed necessary at some point in the future, reintroduction of native species or extirpation of exotic species may be considered in an effort to maintain the natural integrity.

Solitude or Primitive and Unconfined Quality

Rolling out over 8.4 million acres of designated and eligible wilderness, Gates of the Arctic is a massive landscape of a scale that defies belief. The park is remote and isolated. It is miles from the nearest highway, hundreds of miles from the nearest suburb, and many thousands of miles from the nearest major metropolitan area. With the exception of a few commuter aircraft corridors and localized air tour activity, the wilderness is largely free from aircraft overflights and contrails, a condition rarely experienced in even the wildest wilderness areas in the Lower 48. The empty skies and soundscapes in Gates of the Arctic are dominated primarily by the natural sounds of wind, water, and wildlife, all melding into a peaceful chorus.

Because it is free from roads and other infrastructure it is a hard, sometimes painful journey to enter it. Other than flying into a lake or gravel bar in a bush plane or boating for days from a remote village, the only way to gain access is to walk across tundra, through forest, and across rivers before finally crossing over into the park's boundary. Even the plane ride can push visitors to the edge of their comfort zone. Few people forget the sudden drop of a bush plane as it slips over a gravel bar and the ground rushes towards you. Nor do people forget the feeling of excited adventure and looming isolation as the same plane disappears into the horizon and they find themselves absolutely alone on some remote river bank.

A landscape so raw and wild demands absolute self-reliance; this is a wilderness where there are no second chances. No mistakes are forgiven and the consequences can be grave. Every hike across the tundra or paddle down a river is an extreme experience not for the novice or ill-prepared. Recreational opportunities abound and they are the epitome of “unconfined” and “unrestrained”. Travelers to this wilderness must balance their expectations for recreational wilderness experiences with the realities of existing as part of a truly wild place.

The powerful isolation, vastness, and wildness of the Gates wilderness can be daunting, but its climate and latitude can also challenge preconceptions as well. The wilderness at Gates of the Arctic can be bathed in endless sunlight in June or see wisps of alpenglow twilight during December, either extreme removing your internal rhythms, causing disorientation but also liberation from the clock and the banality of routine.

This magnificence of solitude can be threatened by factors both internal and external. As the park becomes more well-known there is the potential for more and more people to be drawn into this wide open country, crowding the most majestic spots and eroding that strong sense of isolation and discovery. Heavy use in some areas could require the park to more tightly regulate visitor activities, thereby affecting the unconfined nature of this ultimate wilderness. Development on the plains to the north could disrupt natural viewsheds, reducing the sense of solitude and isolation from the modern world. Modern technology can close distances in the flash of satellite signal while the need to ensure safety and preserve visitor experience can necessitate burdensome regulation such as the use of bear barrels.

Appendix D. Tracking Change in Wilderness Character – LACL

What does “tracking change in wilderness character” mean?

Tracking change in wilderness character is gathering data on selected measures of wilderness character and seeing how these measures, and wilderness character, changes over time.

The methods used to track change in wilderness character are based on the strategy in the 2008 publication *Keeping it Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System*. This publication provides a relatively simple way to describe and understand what wilderness character is, and how to assess change in the measures that are selected to be locally relevant. Traditionally, wilderness character has been considered a complex mix of tangible and intangible aspects of wilderness. For assessment purposes we untangle this mix into five “qualities” of wilderness character that are tangible and directly link stewardship decisions to the language of the 1964 Wilderness Act.

These five qualities form the foundation of this monitoring, and each is further divided into monitoring questions, indicators, and measures to allow measurement of trends. Data are collected to assess whether the trend in each measure is improving, stable, or has a downward trend. These same rules are used to synthesize trends at each subsequent level to ultimately derive the trend in wilderness character.

Why track change in wilderness character?

There are many reasons for tracking change in wilderness character. Most simply, if we don’t know the status and trend of a resource, we don’t know if we are protecting it. This applies to the mandate of the Wilderness Act and NPS policies to “preserve wilderness character” in areas that are any category of wilderness (including designated, eligible, study, proposed, or recommended). From a practical perspective, the most important reason for tracking change in wilderness character is to provide solid information that can be used to inform management decisions and improve on-the-ground wilderness stewardship in parks, for example, by:

- Evaluating and documenting the short and long term effects of actions that are taken inside wilderness, as well as the effects from threats outside the wilderness, on wilderness character.
- Fostering better internal communication among different resource staffs and program areas about wilderness.
- Synthesizing data from across different resource staffs and program areas into a single, holistic assessment of change in wilderness character.
- Communicating with the public about the changes that are occurring inside the wilderness.
- Providing legacy information that will endure over time and help guard against “shifting baselines” as personnel change.

How are trends in wilderness character tracked at LACL?

In 2010 park staff from a diversity of program areas brainstormed locally-relevant measures for each of the 13 indicators listed in *Keeping It Wild*. They evaluated the quality and availability of data for potential measures and decided to only use measures for which data was already being collected. In February 2011 park staff refined the measures for each of the five qualities of wilderness character based on their significance, vulnerability, reliability, and feasibility. A list of measures that were considered but dismissed is included in Appendix A. Each year, staff compile data on measures into an annual report to the Superintendent.

How should I interpret the results of monitoring?

NPS Management Policies directly address the need for preserving wilderness character. The intent of these policies is to prevent the degradation of wilderness character from its condition at the time the area was designated as wilderness; however, sometimes a park must allow some level of impact in order to administer the park and protect the full range of park resources and values.

The assessment of improving, stable, or downward trend reflects the desire to describe the trend without declaring it to be “acceptable” or “unacceptable.” We recognize that we do many things to manage wilderness that may impact wilderness character. The purpose of reporting trends is to establish long term information on the quality of wilderness character, not to judge whether or not the level of impact is acceptable, or whether administrative actions taken by the park were necessary or not.

We must recognize that many impacts that occur in the park are the result of actions that are legal, reasonable, and often desirable. For example, projects that involve collecting specimens and collaring wildlife went through a thorough evaluation process where it was decided that the project was necessary and that the benefits outweigh the impacts to wilderness character. The knowledge the park gains from the science is reflected in the measures under the Natural quality. When we evaluate impacts and benefits of a proposal, we often justify the project in terms of its contribution to the Natural quality (our understanding of natural systems and consequently our ability to be better stewards of them). The park's goal is to permit only those projects that have clear benefits and to ultimately find ways to collect the same data by using less intrusive methods.

Other impacts may result from activities occurring outside the park boundary or on private inholdings. Things like development on inholdings, state hunting and trapping regulations, and aircraft overflights are legal activities, over which NPS has no, or only limited control or jurisdiction. But impacts, regardless of their source, still affect wilderness character and are recorded in this assessment in order to paint a complete and honest picture of changes to the quality of the LACL wilderness.

In wilderness—unlike most other resources that the NPS manages—taking action to protect one aspect of wilderness character will almost always affect another aspect. This is the difficult nature of wilderness stewardship that involves understanding the tradeoffs required in all decisions and actions. By objectively describing the overall trend in wilderness character and by understanding the individual components that affect this trend, superintendents will be in a much better position to decide whether this trend is acceptable or not and then whether any action will be taken. Tracking trend in wilderness

character fulfills the 2011 Director's Order #12 that appropriate technical and scientific studies have been conducted to provide sufficient resource information to make an informed decision.

2011 Summary of Change in Wilderness Character for LACL

Overall there is a slight downward trend in wilderness character at LACL due to a downward trend in the untrammeled and undeveloped qualities.

The Untrammeled quality is experiencing a slight downward trend due to the State of Alaska liberalizing harvest limits for intensive management of wolves and bears, and an increase in NPS issuing research permits for collaring wildlife or collecting plant, animal, or physical resources. Action is already being taken by the LACL Superintendent to restrict by Compendium the State wolf harvest liberalizations that contributed to the downward trend.

The Undeveloped quality is also seeing a downward trend. The number of structures and installations in the park is increasing, as well as the amount of NPS helicopter use. The increase in structures is balanced by NPS acquiring non-Federal lands within the park boundary, removing them from potential future development. Due to LACL's remoteness and inaccessibility, a fairly high level of aircraft use is necessary to administer the park.

As of October 2011 not enough data had been analyzed for all the measures of the Natural quality to paint a complete picture. The data we do have indicate glacial extent is decreasing, and we are seeing declines in sockeye salmon and several species of wildlife, though populations have some inherent variability and changes cannot be solely attributed to human influence.

Opportunities for solitude or primitive and unconfined recreation are increasing or stable.

We do not have enough data compiled to report a trend in Cultural Resources.

The following tables list the indicators, measures and trends for wilderness character at Lake Clark.

Untrammeled – wilderness is essentially unhindered and free from modern human control or manipulation

Indicator	Measure	How to Obtain Data	Reporting Period
Actions authorized by the NPS that manipulate the biophysical environment	Number of permits NPS issues that authorize collection of plant, animal, or physical resources, or collaring of wildlife	Research permit database	Annual
	Number of actions taken to eradicate invasive species	See FS guidance on how to count actions	Annual
Actions not authorized by the NPS that manipulate the biophysical environment	Change in harvest limit by State of AK for intensive management of wolves and bears in GMU 17B, 19B, 9B	ADFG	Annual

Natural – wilderness ecological systems are substantially free from the effects of modern civilization

Indicator	Measure	How to Obtain Data	Reporting Period
Plant and animal species and communities	Escapement of salmon on the Newhalen River	Fisheries Biologist	Annual
	Sheep population	Wildlife Biologist	Annual
	Moose population	Wildlife Biologist	Annual
	Bear population	Wildlife Biologist	Annual
	Bald eagle population	Wildlife Biologist	Annual
	Abundance, distribution, or number of invasive non-indigenous species	Plant Ecologist	Every 5 years
Physical resources	Length of growing season	I/M	Annual
	Environmental Contaminants/ POPS	I/M	Annual
	Airborne contaminants from stair step moss	I/M	Every 5 years
Biophysical processes	Extent and magnitude of climate change measured by glacial extent: area of ice or % change	Geologist	Every 10 years
Subsistence	Subsistence salmon harvest for Port Alsworth and Nondalton	ADFG	Annual

Undeveloped – wilderness character retains its primeval character and influence, and is essentially without permanent improvement or modern human occupation

Indicator	Measure	How to Obtain Data	Reporting Period
Non-recreational structures, installations, and developments	# structures, installations and developments in wilderness	GIS	Annual
	Number of criminal cases of unlawful trail building	Superintendent	Annual
Inholdings	Number of non-subsistence developments on inholdings	Rangers	Every two years
	Number of acres of non-Federal lands NPS acquires	Lands	Annual
Use of motor vehicles, motorized equipment, or mechanical transport	# hours of NPS airplane flight time per year # hours of NPS helicopter flight time per year	Admin	Annual

Solitude or Primitive and Unconfined Recreation – wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation

Indicator	Measure	How to Obtain Data	Reporting Period
Solitude: Remoteness from sights and sounds of people inside the wilderness	Amount of visitor use: Number of user days (served by CUA holders)	Commercial Services	Annual
	Number of special use waivers issued for party size	Superintendent	Annual
Solitude: Remoteness from occupied and modified areas outside the wilderness	Acres of wilderness affected by sights and sounds outside the wilderness	Superintendent	5 years
Primitive Recreation: Facilities that decrease self-reliant recreation	Number of miles of trails in Wilderness	Rangers	Annual
Unconfined Recreation: Management restrictions on visitor behavior	Number of management actions in Wilderness that restrict visitor behavior (where you can go, how many can go there)	Rangers	Annual

Other Features: This fifth quality of wilderness character directly reflects the statement from the Wilderness Act that wilderness “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.”

Indicator	Measure	How to Obtain Data	Reporting Period
Deterioration or loss of cultural resources integral to wilderness character	# of unauthorized actions that result in disturbances to cultural resources (looting, trespass activities, non-compliance with NHPA)	Citations, ARPA violations, Secretary’s Annual Report to Congress (SRC), LOOT report in SRC, ASMIS and PMDS site condition reporting	Annual
	# of authorized actions that result in disturbances to cultural resources (visitor and commercial use (catholes, trampling, hearths, aircraft landings, etc); findings of adverse effect for projects and operations)	Citations, ARPA violations, Secretary’s Annual Report to Congress (SRC), LOOT report in SRC, ASMIS and PMDS site condition reporting	Annual
	# of naturally caused disturbances (erosion, animal digging, floods, rising sea levels, fires, tree throws,..)	Citations, ARPA violations, Secretary’s Annual Report to Congress (SRC), LOOT report in SRC, ASMIS and PMDS site condition reporting	Annual

Appendix E: Refining Measurements of Wilderness Area in Alaska National Parks

1. Abstract

The NPS manages designated and eligible wilderness for the preservation of physical wilderness resources as well as wilderness character (NPS 2006 Section 6.3). The National Park Service Alaska Region manages approximately 33,250,000 acres of designated wilderness across eight park units and approximately 19,000,000 acres of eligible wilderness. Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. This report explains how wilderness boundaries and acreage were updated using GIS software. The mapping effort described in this report does not constitute an eligibility reassessment. It does not change land designations, land management strategy, or NPS policy. Adopting modern digital mapping and calculation methodologies allowed NPS Alaska to create modern maps and acreage calculations for use in NPS planning, compliance, and management efforts.

2. Introduction

Recognizing wilderness as a valued national resource for protection and preservation the 1964 Wilderness Act established the national wilderness preservation system, requiring areas of Congressionally-designated wilderness to be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness (Wilderness Act; NPS 2006). The 1980 Alaska National Interest Conservation Act (ANILCA) contributed to the implementation of the national wilderness preservation system for NPS Alaska by congressionally designating wilderness areas in eight NPS Alaska parks units: Denali National Park and Preserve, Gates Of The Arctic National Park and Preserve, Glacier Bay National Park and Preserve, Katmai National Park and Preserve, Kobuk Valley National Park, Lake Clark National Park and Preserve, Noatak National Preserve, and Wrangell – St. Elias National Park and Preserve. In addition to designating these wilderness areas, ANILCA directed wilderness eligibility¹ reviews for lands in NPS Alaska not so designated by the act. Wilderness eligibility reviews for NPS Alaska were completed in the 1980s as part of General Management Plans (GMPs). These wilderness reviews assessed lands for preservation as wilderness, defining areas of eligible wilderness for NPS Alaska. Eligible wilderness is land that possesses wilderness character and value but requires further study to determine if it is to be

¹ The term suitability is used in ANILCA and has been used in NPS policy to refer to the NPS's initial screening assessment as to whether lands meet the minimum criteria for inclusion in the national wilderness preservation system. The Wilderness Act, however, uses "suitability" to refer to the Secretary's determinations in forwarding recommendations to the President. For purposes of clarity, the NPS initial screening assessment has been renamed an "eligibility" assessment. The change from "suitability" to "eligibility" in no way lessens the protected status of these lands.

recommended for inclusion in the national wilderness preservation system. Per NPS management policy eligible wilderness areas are to be managed for the preservation of physical wilderness resources as well as wilderness character. The NPS will take no action that would diminish the wilderness eligibility of such land until the legislative process of wilderness designation has been completed (NPS 2006 Section 6.3).

GMP wilderness eligibility review determinations from the 1980s remain the basis for wilderness eligibility in NPS Alaska². However, the manner in which these wilderness eligibility determinations were reported challenge NPS Alaska today for the following reasons:

- GMP wilderness eligibility review content from the 1980s was non-digital and does not conform to modern digital workflows that utilize geospatial software for mapping or spatial analysis.
- The production scale of hardcopy GMP maps from the 1980s, including those depicting wilderness eligibility, often provide insufficient detail as a result of feature generalization.
- In some locations, the wilderness eligibility determinations are no longer representative of contemporary boundary or land status conditions due to subsequent boundary and/or land status changes.

To alleviate these issues NPS Alaska initiated the Wilderness Eligibility Mapping project, which focuses on developing digital representations of NPS Alaska wilderness area in ESRI® ArcGIS. Through this effort the spatial extent of Congressionally-designated wilderness area and eligible wilderness area are accurately mapped in a manner that translates the intent of original GMP wilderness eligibility review determinations³ to modern NPS administrative boundary and land status conditions. This process does not constitute as a wilderness reassessment. The resulting spatial wilderness data is expected to facilitate NPS Alaska wilderness preservation and management workflows, as well as enable refined measurements of wilderness area. This document outlines the general methodology of the Wilderness Eligibility Mapping process and uses Gates of the Arctic National Park as an example. Land designations, land management strategy, and NPS policy remain unchanged.

3. The NPS Alaska Wilderness Areas Model

The NPS Alaska Wilderness Areas Model (Wilderness Model) is a structured routine developed by NPS Alaska in ESRI® ArcGIS 10.0 Model Builder to support the Wilderness Eligibility Mapping project. The Wilderness Model is an automated GIS routine that uses a controlled set of source inputs, structured data queries, and geoprocessing tools executed in a set order to accomplish specific tasks for NPS Alaska wilderness mapping. Model routines such as this are advantageous for lengthy or complicated GIS workflows as they:

² For certain NPS Alaska park units GMP amendment documents exist that supersede original GMP wilderness eligibility review determinations.

³ For certain NPS Alaska park units GMP amendment documents exist that supersede original GMP wilderness eligibility review determinations. In such instances, all authoritative documentation pertaining to determinations of wilderness eligibility are properly considered in the Wilderness Eligibility Mapping process.

- Eliminate the need for redundant data maintenance by allowing source inputs to remain dynamic. This means data revisions that occur in source inputs are automatically reflected in the model's results once the routine is re-run or refreshed.
- Reduce the potential for human error in the workflow.
- Produce results using a repeatable, well-documented methodology.

The following sections describe how the Wilderness Model is used to support NPS Alaska wilderness eligibility mapping.

3.1 Obtaining Modern NPS Administrative Boundaries

GMP wilderness eligibility maps from the 1980s often depict aged NPS administrative boundaries. To modernize GMP wilderness eligibility maps the use of contemporary NPS administrative boundary data is desired. The Alaska Unit Boundary geodatabase maintained by NPS Alaska digitally portrays modern NPS Alaska administrative boundaries, and is the initial source input to the Wilderness Model. Through data query on NPS unit code values and basic geoprocessing tasks the Wilderness Model extracts the gross extent of Congressionally-designated wilderness from the ParkBnd feature class of the Alaska Unit Boundary geodatabase (if applicable) as well as the external NPS unit boundary from the ParkOutline feature class (Figure 1). The Wilderness Model then temporarily classifies all area outside the gross extent of Congressionally-designated wilderness as non-designated land. Gross acreage for Congressionally-designated wilderness is then calculated as detailed in Section 3.5.

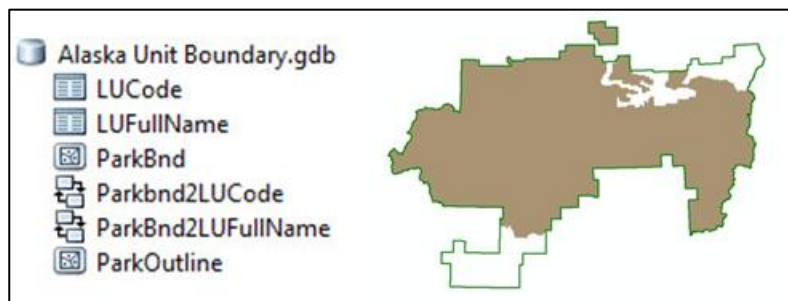


Figure 1. The Alaska Unit Boundary geodatabase consists of a series of GIS feature classes, relationship classes, and non-spatial tables (left). The Wilderness Model extracts data from this source to obtain a modern view of NPS Alaska administrative boundaries including the gross extent of Congressionally-designated wilderness (i.e. brown) and the external NPS unit boundary (i.e. green) (right).

3.2 Identifying Non-Federal and Non-Public Federal Lands in Congressionally-Designated Wilderness

Per Section 701 of ANILCA only those lands that are public lands within external wilderness unit boundaries are Congressionally-designated wilderness. Section 102(3) of ANILCA defines the term public lands as “land situated in Alaska in which, after the date of enactment of this Act, are Federal lands except –

- land selections of the State of Alaska which have been tentatively approved or validly selected under the Alaska Statehood Act and lands which have been confirmed to be validly selected by, or granted to the Territory of Alaska or the State under any other provision of Federal law;

- land selections of a Native Corporation made under the Alaska Native Claims Settlement Act (ANCSA) which have not been conveyed to a Native Corporation, unless such selection is determined to be invalid or is relinquished; and
- lands referred to in section 19(b) of the Alaska Native Claims Settlement Act.”

Therefore, an accurate measurement of Congressionally-designated wilderness area would exclude both non-federal land acreage and non-public federal land acreage. The Wilderness Model achieves this by integrating data from a second source input, the Alaska Region NPS Land Status geodatabase. The Alaska Region NPS Land Status geodatabase maintained by NPS Alaska digitally portrays modern land ownership information based on U.S. Bureau of Land Management (BLM) land status records and plats, along with subdivision plats, deeds and records from state recording offices. Figure 2 outlines the basic structure of this geodatabase, while Table 1 describes the feature class content relevant to the Wilderness Model.

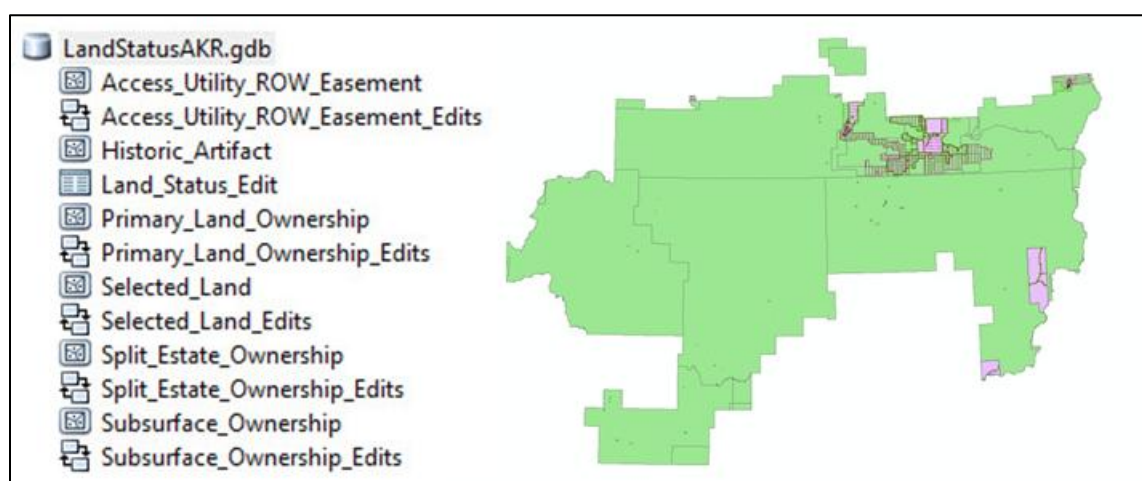


Figure 2. The Alaska Region NPS Land Status geodatabase (i.e. LandStatusAKR.gdb) consists of a series of GIS feature classes, relationship classes, and non-spatial tables (left). When viewed in ESRI® ArcGIS this geodatabase provides a modern display of land ownership interest in NPS Alaska park units (right).

Table 1. Feature class data in the Alaska Region NPS Land Status geodatabase relevant to the Wilderness Model.

LandStatusAKR.gdb Feature Class	Description
Access, Utility, ROW, Easement	Portrays ownership of easements and right-of-ways.
Selected Land	Portrays lands currently under selection by a non-federal entity.
Split Estate Ownership	Portrays lands where joint rights indicate that land owners have less than majority property rights.
Subsurface Ownership	Portrays information for the current owner of subsurface rights.
Primary Land Ownership	Portrays tracts that represent the owner with the majority of surface rights.

Through data query on land ownership values and basic geoprocessing tasks, the Wilderness Model extracts non-federal and non-public federal land records from the Alaska Region NPS Land Status geodatabase. Table 2 presents the land ownership values relevant to this process. The Wilderness Model then removes the spatial area associated with these land records from the gross extent of Congressionally-designated wilderness to produce a net area representation (Figure 3). Due to scale limitations, GMP wilderness eligibility maps from the 1980s tend to generalize property boundary features using point symbology or public land survey system (PLSS) type section blocking (Figure 4).

Current wilderness eligibility mapping per the Wilderness Model process deviates from this approach by integrating property boundary data as depicted in the Alaska Region NPS Land Status geodatabase. This process is assumed to offer a more precise representation of area related to land status.

Table 2. Land ownership values in the Alaska Region NPS Land Status geodatabase that identify non-federal or non-public federal land in Congressionally-designated wilderness.

LandStatusAKR.gdb Feature Class	Land Ownership Value
Access, Utility, ROW, Easement	Non-Federal Public; Private ANCSA Native
Selected Land	Non-Federal Public; Private ANCSA Native
Split Estate Ownership	Private; Private ANCSA Native
Subsurface Ownership	Private; Private ANCSA Native
Primary Land Ownership	Non-Federal Public ¹ ; Private; Private ANCSA Native
¹ Non-federal public primary land ownership accounts for submerged lands associated with navigable water bodies owned by the State of Alaska (Section 4).	

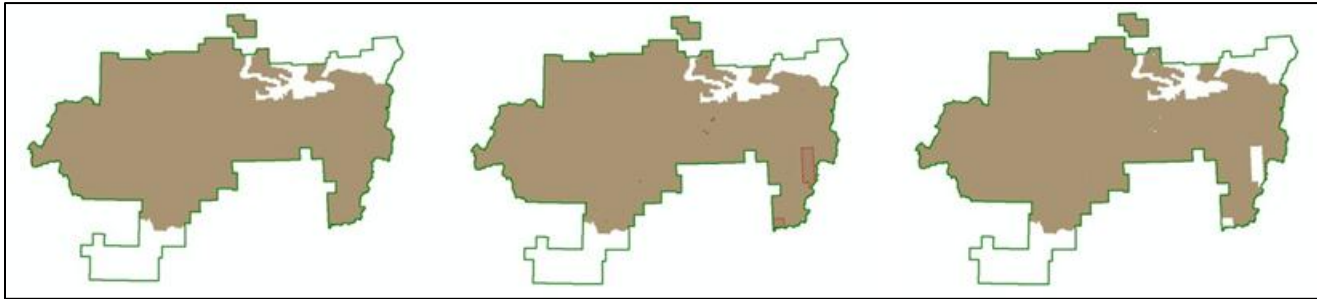


Figure 3. The gross extent of Congressionally-designated wilderness (i.e. brown) prior to the identification of non-federal and non-public federal lands (left). Overlay of non-federal and non-public federal lands (i.e. red) identified per the Alaska Region NPS Land Status geodatabase (middle). The net area representation of Congressionally-designated wilderness (right).

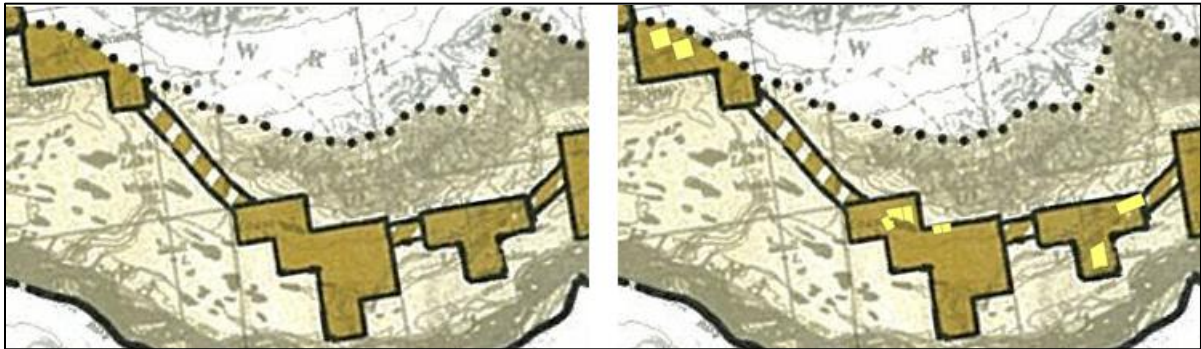


Figure 4. The left-hand image provides an example of GMP feature generalization. In the left-hand image large blocks of land are shown as ineligible for wilderness due to non-federal land, land applications, and claims (i.e. dark tan). These areas have been specified by the GMP as eligible for wilderness if retained in federal ownership. The right-hand image provides an overlay of modern land status information, in which private primary land ownership is depicted in bright yellow. Comparison of modern land status information to GMP content reveals a smaller land area affected by land status considerations.

3.3 Identifying Federal Lands with Limited NPS Land Ownership Interests in Congressionally-Designated Wilderness

In addition to the lands acknowledged in Section 3.2, the Wilderness Model further removes federal lands identified in the Alaska Region NPS Land Status geodatabase as ANCSA 17b easements, ANCSA Chugach Natives Incorporated (CNI) easements, and U.S. Department of State international boundary easements from the net area representation of Congressionally-designated wilderness. Although these federal lands satisfy the ANILCA public lands definition, NPS Alaska possesses limited land ownership interests on these lands and does not manage them as designated wilderness. Consequently, the acreage associated with these federal lands is excluded from final net area measurements generated by the Wilderness Model for Congressionally-designated wilderness. Net acreage for Congressionally-designated wilderness is calculated as detailed in Section 3.5. As mentioned in Section 3.2, this process assumes the Alaska Region NPS Land Status geodatabase offers a more precise representation of land area compared to GMP wilderness eligibility maps from the 1980s.

3.4 Reclassifying Non-Designated Land for Wilderness Eligibility

3.4.1 Rectifying GMP Wilderness Eligibility Review Determinations to Modern Land Status

Land status considerations were a standard component of assessment during GMP wilderness eligibility reviews completed in the 1980s. Table 3 outlines the correlation between land status criteria and wilderness eligibility determinations from original GMP reviews. The Wilderness Model, which aims to rectify original GMP wilderness eligibility determinations with modern land status conditions, employs a comparable approach. Table 4 presents the land status criteria used by the Wilderness Model to denote ineligible wilderness on non-designated land. Land status criteria not appearing in Table 4 denotes eligible wilderness on non-designated land.

Table 3. Correlation between land status and wilderness eligibility in original GMP wilderness eligibility reviews.

Land Status Criteria	Eligible for Wilderness	Not Eligible for Wilderness	Eligibility Pending
Federal	X		
Federal: under application or selection			X
State and private land, patented or tentatively approved		X	
Private ownership of subsurface estate		X	

Table 4. Land status criteria used by the Wilderness Model to denote ineligible wilderness on non-designated land. All land ownership information for this process is derived from the Alaska Region NPS Land Status geodatabase.

LandStatusAKR.gdb Feature Class	Land Ownership Criteria	Wilderness Eligibility Status
Access, Utility, ROW, Easement	Non-NPS Federal ¹ ; Non-Federal Public; Private ANCSA Native	Ineligible
Split Estate Ownership	Non-NPS Federal ¹ ; Private; Private ANCSA Native	Ineligible
Subsurface Ownership	Private; Private ANCSA Native	Ineligible
Primary Land Ownership	Non-NPS Federal ¹ ; Non-Federal Public ² ; Private; Private ANCSA Native	Ineligible
¹ The term Non-NPS Federal includes those federal land types defined in Section 3.3. ² Non-Federal Public primary land ownership accounts for submerged lands associated with navigable water bodies owned by the State of Alaska (Section 4).		

GMP wilderness eligibility reviews from the 1980s assign a pending eligibility to federal lands under selection by ANCSA corporations and the State of Alaska. The Wilderness Model deviates from this approach by classifying these land selection types as eligible wilderness where they exist on non-designated land. On non-designated land, land selections by ANCSA corporations and the State of Alaska are considered eligible for wilderness because it is expected that all or most of these lands will remain in federal ownership. If any of these lands are conveyed into non-federal ownership, they are no longer eligible for wilderness based on land ownership and will be reclassified as ineligible wilderness⁴. As mentioned in Section 3.2, this process assumes the Alaska Region NPS Land Status geodatabase offers a more precise representation of land area compared to GMP wilderness eligibility maps from the 1980s.

3.4.2 Accounting for Additional GMP Wilderness Eligibility Review Criteria

GMP wilderness eligibility reviews completed in the 1980s integrated more than administrative boundary and land status considerations into the assessment of non-designated lands. Original GMP wilderness eligibility reviews also accounted for criteria associated with mining development, roads and off-road vehicle (ORV) trails, air or landing strips, cabins, and land unit size. Areas specified in GMP wilderness eligibility reviews as eligible or ineligible for reasons outside of land status considerations are closely examined during modern mapping efforts. These types of features tend to have small or irregularly shaped boundaries that are often generalized on original GMP wilderness eligibility maps due to production scale constraints. These feature types present more of a mapping challenge as original GMP report text does not always clearly define their boundary extents. In such scenarios, NPS Alaska regional and park staff work collaboratively in review of original GMP content to best understand the report's intent and to define a modern boundary rationale that honors that intent. During this process amendment documents that supersede the original GMP for purposes of wilderness eligibility are taken into account. All wilderness eligibility boundaries developed from this effort are considered special park-specific boundaries and are ingested into a third, and final source dataset internal to the Wilderness Model.

Both the Alaska Unit Boundary geodatabase and the Alaska Region Land Status geodatabase are external source inputs to the Wilderness Model. This means that the Wilderness Model dynamically draws data from these sources instead of maintaining a static copy internally. This management approach eliminates redundant data maintenance. However, the third source input to the Wilderness Model which manages special park-specific boundaries is internal. This means that the Wilderness Model maintains a static copy of these data internally. This management approach was selected as these park-specific data are limited in number and less subject to change over time. Internally stored park-specific boundary data can only be manually edited by the NPS Wilderness Model steward and remains

⁴ Wilderness eligibility reclassification that results from a change in land ownership will occur after the data revision is finalized in the source input (i.e. Alaska Region NPS Land Status geodatabase) and the Wilderness Model is re-run or refreshed.

unaffected by changes that may dynamically occur to the model's external source inputs. Please refer to the following park-specific reporting sections for more information regarding these park-specific wilderness eligibility boundaries. The reclassification of non-designated land for wilderness eligibility is complete when all the source inputs to the Wilderness Model are applied. Acreage for eligible and ineligible wilderness is then calculated as detailed in Section 3.5.

3.5 Calculating Wilderness Acreage Values

Following the steps above outlined in Section 3, the Wilderness Model defines the GIS spatial extents for gross Congressionally-designated wilderness, net Congressionally-designated wilderness, eligible wilderness, and ineligible wilderness areas in NPS Alaska parks. These GIS spatial extents are represented in ERSI® ArcGIS as polygon vector data. By default ERSI® ArcGIS performs geometry calculations on all vector data developed. For polygon vector data spatial area information is captured in the ERSI® ArcGIS default attribute field Shape Area. The coordinate system applied to the polygon vector data controls the unit values presented in the Shape Area attribute field. Polygon vector data developed by the Wilderness Model is assigned the Alaska Albers Equal Area Conic projected coordinate system using the North American Datum of 1983. The Alaska Albers Equal Area Conic projection uses two standard parallels for projection instead of one, making it well-suited projection for area preservation across the State of Alaska. For this reason, record values presented in the Shape Area attribute field represent an area in square meters (m²).

To derive wilderness acreage for gross Congressionally-designated wilderness, net Congressionally-designated wilderness, eligible wilderness, and ineligible wilderness areas in NPS Alaska parks the Wilderness Model applies the following expression to the Shape Area attribute field: [Shape_Area] * 0.00024710439304662800. This expression converts the Shape Area value given in m² to U.S. survey acres using the exact conversion factor: 1 U.S. survey acre = (4046^{13,525,426}/15,499,969 m²). Full precision wilderness acreage values yielded from this conversion are then rounded in the Wilderness Model using geoprocessing tools to generate wilderness acreage approximations suitable for NPS Alaska reporting. Per this strategy wilderness acreages greater than or equal to 1,000 acres are rounded to the nearest thousand acres, and wilderness acreages less than 1,000 acres are rounded to the nearest hundred acres. While the Wilderness Model maintains both full precision and approximate wilderness acreages, acreage approximations are assumed more appropriate for NPS Alaska wilderness reporting as the applied rounding strategy is designed to absorb minor changes that may result from evolving land status or boundary line variability.

Through the Wilderness Model the methodologies involved in wilderness measurement are appropriately documented and repeatable. Furthermore, the Wilderness Model is a dynamic automated system capable of reliably generating accurate wilderness acreage following a consistent strategy on a desired NPS reporting cycle. Advancing wilderness measurement into the digital realm facilitates computer-assisted calculation, which yields precise results more rapidly compared to indirect manual methods of area measurement such as the dot-planimeter method (Figure 5). Acreages previously derived prior to computer-assisted mapping are known or assumed to be derived primarily from BLM surveys and Master Title Plats (townships and sections). However, where NPS administrative unit boundaries bisected townships and sections, such as along hydrographic divides, indirect methods of measurement were employed to calculate area. GIS based wilderness measurements eliminate the need for this.

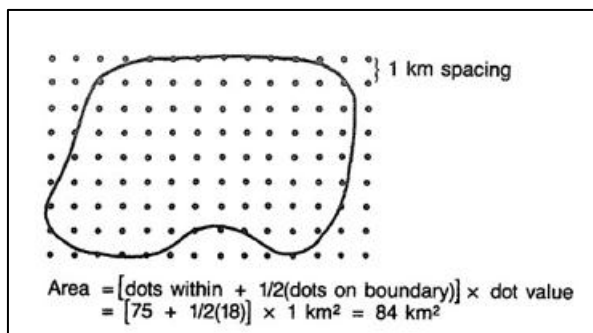


Figure 5. Example of area calculation using the dot-planimeter method of measurement.

3.6 Wilderness Model Maintenance

The Wilderness Model incorporates two external data sources (i.e. Alaska Unit Boundary geodatabase, Alaska Region NPS Land Status geodatabase) as well as one internal data source (i.e. special park-specific boundaries). To ensure data yielded by the Wilderness Model remains current, the Wilderness Model routine will be re-run or refreshed as new versions of the Alaska Unit Boundary geodatabase or the Alaska Region NPS Land Status geodatabase are published, or as modifications to internally-managed data occur.

4.0 NAVIGABLE WATER BODIES

In general, the State of Alaska owns the beds of navigable water bodies in Alaska. However, there have been very few final determinations of navigability of water bodies in Alaska. Table 5 lists the water bodies in NPS Alaska that have been determined navigable in final, binding, federal decisions. Submerged lands associated with these water bodies are owned by the State of Alaska. In addition, affirmative administrative determinations of navigability by the U.S. BLM, performed as part of fulfilling its responsibilities for land conveyances to the State of Alaska, ANCSA native corporations and others, result in showing the associated submerged lands as state owned in land status mapping for NPS Alaska. Also the submerged lands of Lake Clark (in Lake Clark National Park and Preserve) and the Yukon River (in Yukon-Charley Rivers National Preserve) are shown in NPS land status mapping as state owned. Although no final, binding navigability determinations have been made for Lake Clark or the Yukon River, it is assumed these water bodies are navigable due to their large size and history of use for navigation. All other submerged lands within NPS units in Alaska are currently shown on NPS land status mapping as federally or privately owned.

Table 5. Navigable water bodies in NPS Alaska with final, binding, federal decisions.

Water Body	Affected NPS Alaska Unit(s)	Final Navigability Determination
Alagnak River	Alagnak Wild River, Katmai National Park and Preserve	AK v USA, No. A82-201 [1985]
Kandik River	Yukon Charley Rivers National Preserve	AK v USA, No. 96-36041 [2000]
Kukaklek Lake	Katmai National Park and Preserve	AK v USA, No. A82-201 [1985]
Nation River	Yukon Charley Rivers National Preserve	AK v USA, No. 96-36041 [2000]
Nonvianuk River	Katmai National Park and Preserve	AK v USA, No. A82-201 [1985]
Nonvianuk Lake	Katmai National Park and Preserve	AK v USA, No. A82-201 [1985]

All the above-described submerged lands that are shown on NPS land status mapping as state or privately owned are excluded from NPS area calculations of Congressionally-designated or eligible wilderness.

5.0 Current NPS Alaska Wilderness Measurement

Table 6. NPS Alaska Wilderness Acreage Report

NPS Alaska Wilderness Acreage Report ¹ (As of 01/22/2013)			
	<i>Rounded² Congressionally Designated Wilderness</i> (i.e. NET acreage approximation)	<i>Rounded Eligible Wilderness</i> (i.e. acreage approximation)	<i>Rounded Ineligible Wilderness</i> (i.e. acreage approximation)
ALAG	0	0	31,000
ANIA	0	TBD	TBD
BELA	0	2,651,000	134,000
CAKR	0	TBD	TBD
DENA	2,124,000	TBD	TBD
GAAR	7,154,000	914,000	309,000
GLBA	2,659,000	46,000	577,000
KATM	3,323,000	626,000	149,000
KEFJ	0	569,000	98,000
KLGO	0	TBD	TBD
KOVA	176,000	1,541,000	28,000
LACL	2,572,000	953,000	470,000
NOAT	5,814,000	TBD	TBD
SITK	0	TBD	TBD
WRST	9,430,000	TBD	TBD
YUCH	0	TBD	TBD

¹ Reflects NPS wilderness acreage values derived from an established GIS-based wilderness model.

² Rounded wilderness acreage values represent acreage approximations for certain NPS reporting. Acreage values over 1,000 acres are rounded to the nearest 1,000 acre. Acreage values under 1,000 acres are rounded to the nearest 100 acres.

³ TBD notates a value to be determined. TBD is assigned to NPS units that have not yet completed wilderness eligibility mapping.

6.0 Gates Of The Arctic National Park And Preserve

6.1 Brief Wilderness Background

Section 701 of ANILCA designated “approximately seven million and fifty-two thousand acres” as wilderness in Gates of the Arctic National Park and Preserve (GAAR). ANILCA also directed a wilderness eligibility review be completed for lands not so designated by the act, which was completed in 1986 as part of the GAAR General Management Plan. See Figure 11 for the 1986 GAAR GMP wilderness eligibility map and Table 7 for the acreage breakdown in regards to wilderness eligibility.

The 1988 GAAR Final Environmental Impact Statement Wilderness Recommendation (1988 GAAR FEIS) which followed outlined a recommendation of additional wilderness area in GAAR for Congressional decision. However, the acreage presented for wilderness recommendation differed from 1986 GAAR GMP acreage as “subsequent to the GMP, application of uniform criteria [applied to all Alaska parks] resulted in identifying 1,052,561 acres as eligible for wilderness recommendation”(1988 FEIS). An explicit definition for uniform criteria is no longer known by NPS Alaska at this time. See Figure 12 for the 1988 GAAR FEIS study area map and Table 7 for the acreage breakdown in regards to wilderness eligibility. The 1988 GAAR FEIS was never signed by the Assistant Secretary’s Office or published in the Federal Register. The FEIS is not considered the authority for wilderness eligibility in NPS Alaska.

Following the 1988 FEIS, the Omnibus Parks and Public Lands Management Act of 1996 authorized a land exchange in GAAR that resulted in official modification of the Congressionally-designated wilderness boundary, resulting in a net loss of 17,168 acres of Congressionally-designated wilderness from the original ANILCA approximation (Table 7).

Table 7. Historic GAAR wilderness measurements

	ANILCA (approximate acres)	1986 GAAR GMP (approximate acres)	1988 GAAR FEIS (acres)	1996 Omnibus Parks and Public Lands Management Act (acres)
Congressionally-Designated Wilderness	7,052,000	7,263,215 ¹	7,167,192	7,034,832
Eligible Wilderness	N/A ²	1,009,638	1,052,561	N/A
Pending Eligible Wilderness ³	N/A	9,641	N/A	N/A
Ineligible Wilderness	N/A	190,023	N/A	N/A

¹ Assumed to represent a gross area approximation.
² Not applicable or not reported.
³ Eligible for wilderness pending resolution of land ownership.

6.2 Synopsis of Current GAAR Wilderness Eligibility Mapping

Wilderness eligibility mapping as described in Section 3 has been completed for GAAR. Figure 6 presents the resulting wilderness areas map.

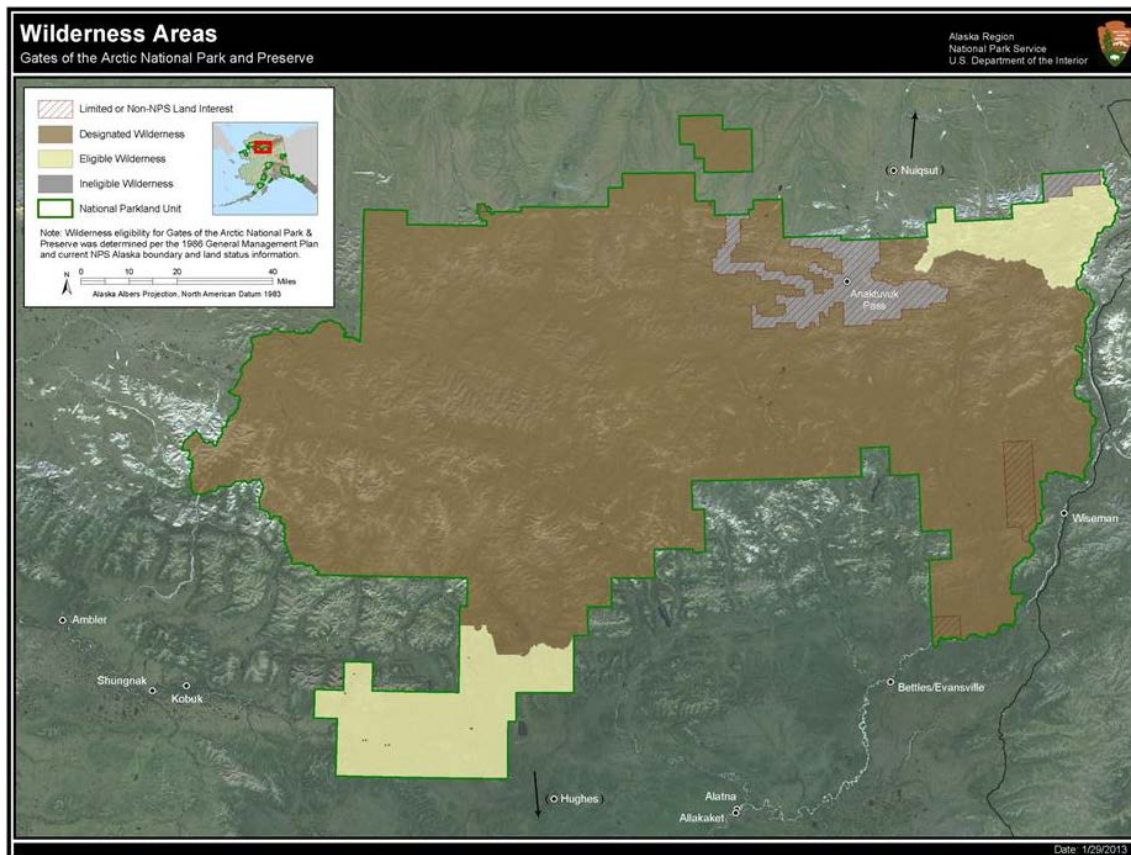


Figure 6. GAAR Wilderness Areas map. This map was generated using Wilderness Model data current as of 1/22/2013.

6.2.1 Congressionally-Designated Wilderness

The Congressionally-designated wilderness boundary depicted in the 1986 GAAR GMP is no longer valid due to land exchanges in the Anaktuvuk Pass area authorized by Omnibus Parks and Public Lands Management Act of 1996. Current wilderness eligibility mapping integrates these more recent NPS administrative boundary changes. As described in Section 3.2 through 3.3, current wilderness mapping efforts are designed to generate a net area approximation for Congressionally-designated wilderness through the removal of non-qualifying land area. For GAAR this process accounts for a scattered amount of non-federal public, private, and private ANCSA native primary ownership land tracts; a private ANCSA native subsurface land tract; and, a minor number of ANCSA 17b easements associated with a large private ANCSA native primary land tract in the southeast. No land selections or navigable water bodies (i.e. final binding federal decisions) currently exist in GAAR.

6.2.2 Anaktuvuk Pass/Chandler Lake Area

The 1986 GAAR GMP states that of the 190,023 acres deemed unsuitable for wilderness, “all, except the village of Anaktuvuk Pass, would be suitable for wilderness designation if non-conforming uses, outstanding rights, or non-federal ownership were eliminated.” However, the 1986 GAAR GMP did not define an explicit boundary for the village of Anaktuvuk Pass. For modern wilderness eligibility mapping purposes, the village of Anaktuvuk Pass is collectively represented by three primary land ownership tracts from the Alaska Region NPS Land Status geodatabase: non-federal public tracts GAAR-09-115 and GAAR-09-151, and federal tract GAAR-12-103 (Figure 7). Because these land ownership tracts represent the village of Anaktuvuk Pass, they are considered permanently ineligible for wilderness regardless of land status criteria. Current wilderness eligibility mapping reveals the majority of the Anaktuvuk Pass/Chandler Lake area remains ineligible wilderness based on land status conditions. However, small isolated federal land parcels that exist are considered eligible wilderness based on the 1986 GAAR report language above-referenced. When comparing the 1986 GAAR GMP representation of the Anaktuvuk Pass/Chandler Lake area to current wilderness mapping remember the changes subsequent to 1986 have affected the Congressionally-designated wilderness boundary in this area.

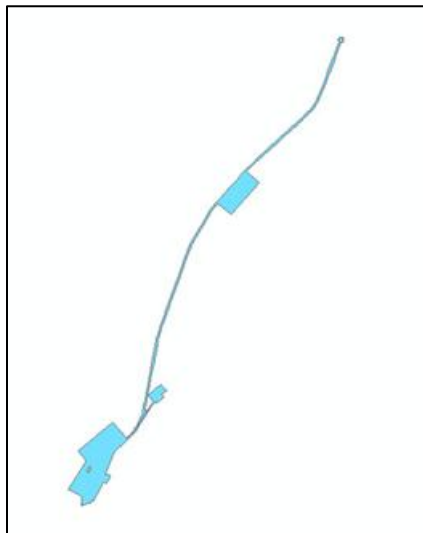


Figure 7. Spatial representation for the village of Anaktuvuk Pass derived from the Alaska Region Land Status geodatabase. This representation consists of three primary land ownership tracts, two non-federal public tracts and one federal tract.

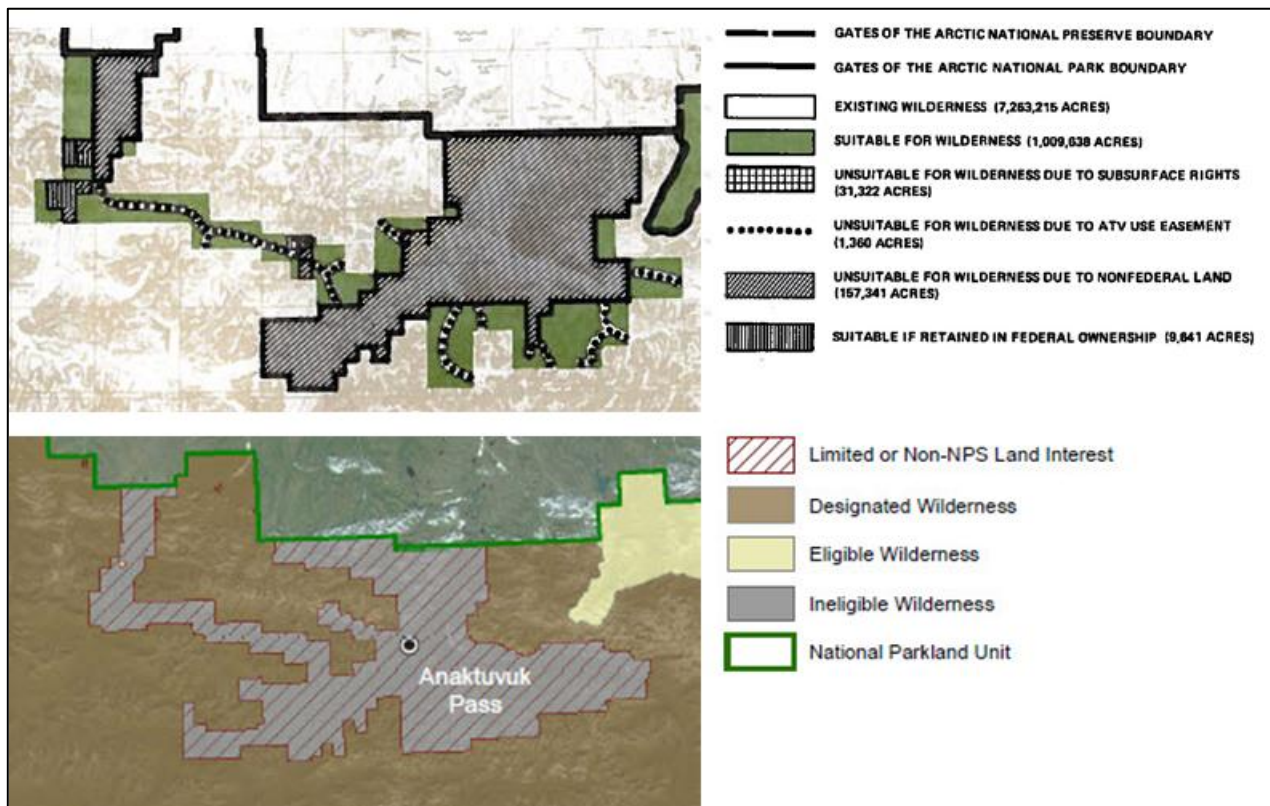


Figure 8. Comparison of wilderness eligibility in the Anaktuvuk Pass/Chandler Lake area. The top image depicts wilderness eligibility per the 1986 GAAR GMP, while the bottom image depicts current wilderness eligibility mapping.

6.2.3 Itkilik Preserve

The 1986 GAAR GMP identifies the majority of the Itkilik Preserve as eligible wilderness. However, certain lands in the Itkilik Lake vicinity and along the Congressionally-designated wilderness boundary were deemed ineligible due to land status criteria. A large ANCSA corporation selection was also assigned a pending eligibility. Current wilderness eligibility mapping concludes that lands in the Itkilik Lake vicinity and along the Congressionally-designated wilderness boundary remain ineligible for wilderness due to land status. However, the large ANCSA corporation selection no longer exists.

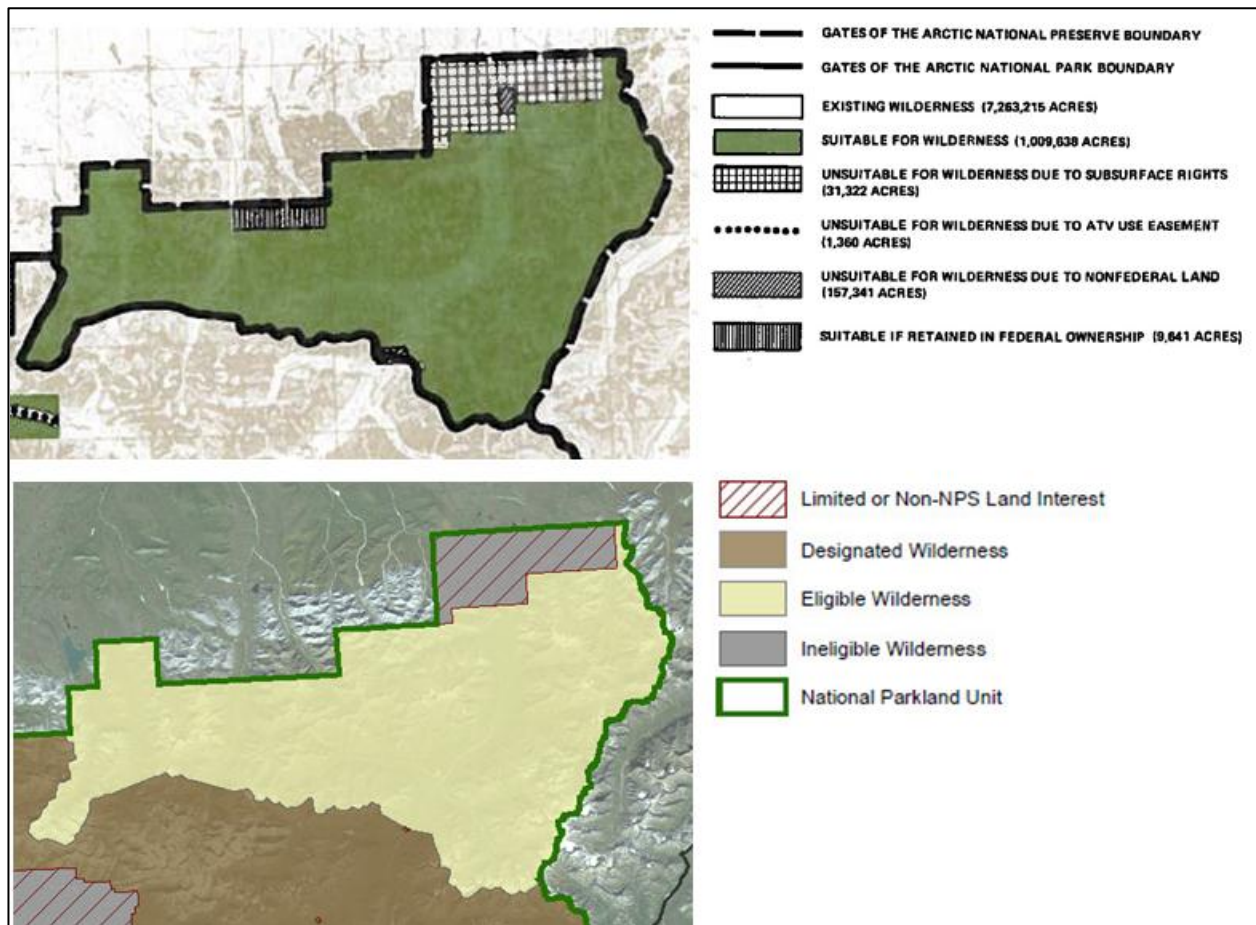


Figure 8. Comparison of wilderness eligibility in the Itkilik Preserve. The top image depicts wilderness eligibility per the 1986 GAAR GMP, while the bottom image depicts current wilderness eligibility mapping.

6.2.4 Kobuk Preserve

Excluding sixteen small tracts, the 1986 GAAR GMP identifies the majority of the Kobuk Preserve as eligible wilderness (Figure 10). The sixteen small tracts excluded represent lands conveyed or under application at the time of the 1986 assessment. Current wilderness eligibility mapping reveals that the majority of these land tracts are in federal ownership, qualifying them eligible wilderness. Tracts that have been conveyed to private ownership remain ineligible.

Section 201(4)(b)-(e) of ANICLA includes provisions for access for surface transportation across the western unit (Kobuk River) of GAAR. Any proposed wilderness designations for the Kobuk Preserve would be subject to this surface transportation route, for which the location, width, and other parameters have yet to be determined. If designated, wilderness lands along the transportation route would be deauthorized when the right-of-way is issued to ensure full and legal access.

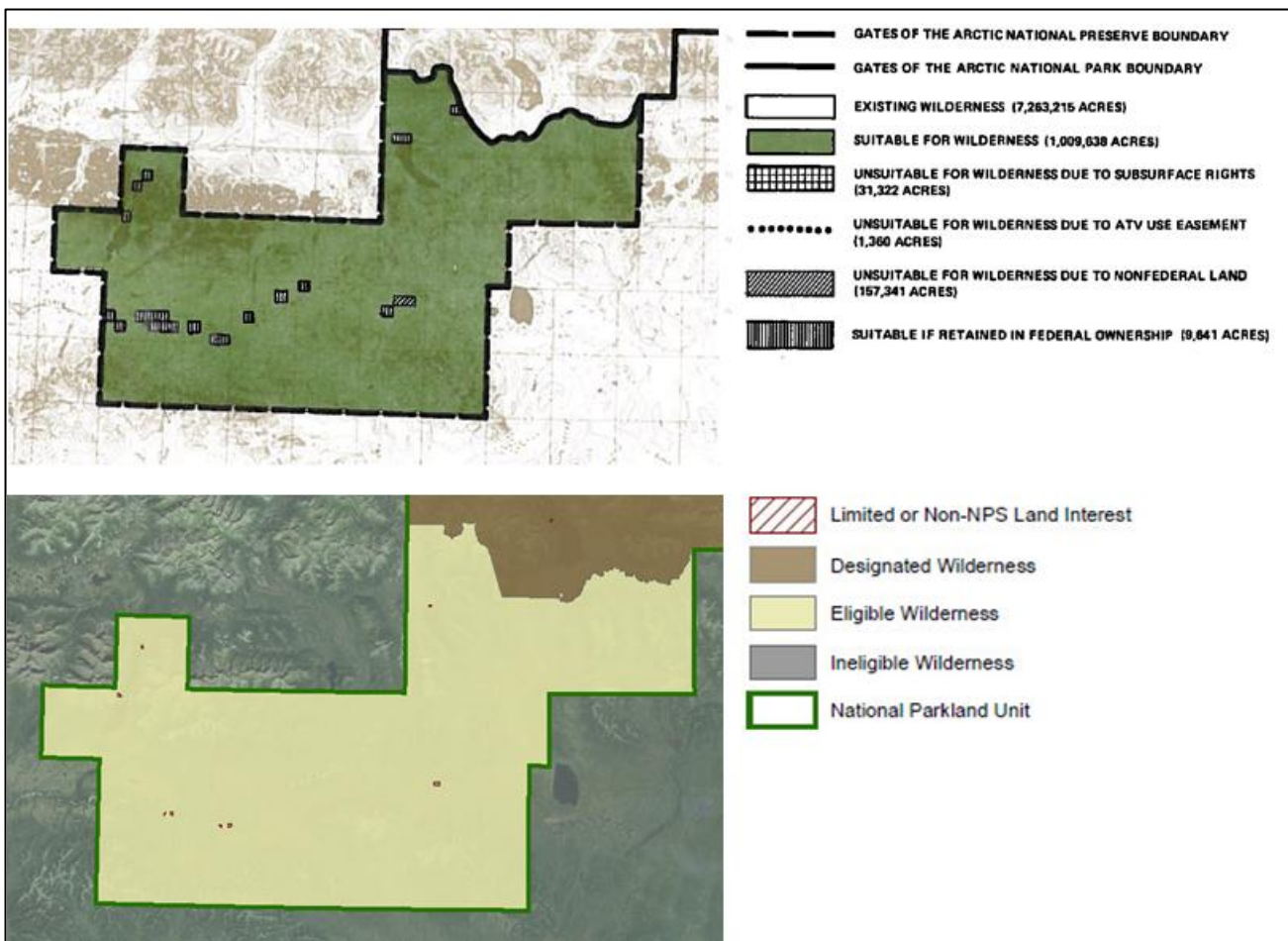


Figure 9. Comparison of wilderness eligibility in the Kobuk Preserve. The top image depicts wilderness eligibility per the 1986 GAAR GMP, while the bottom image depicts current wilderness eligibility mapping.

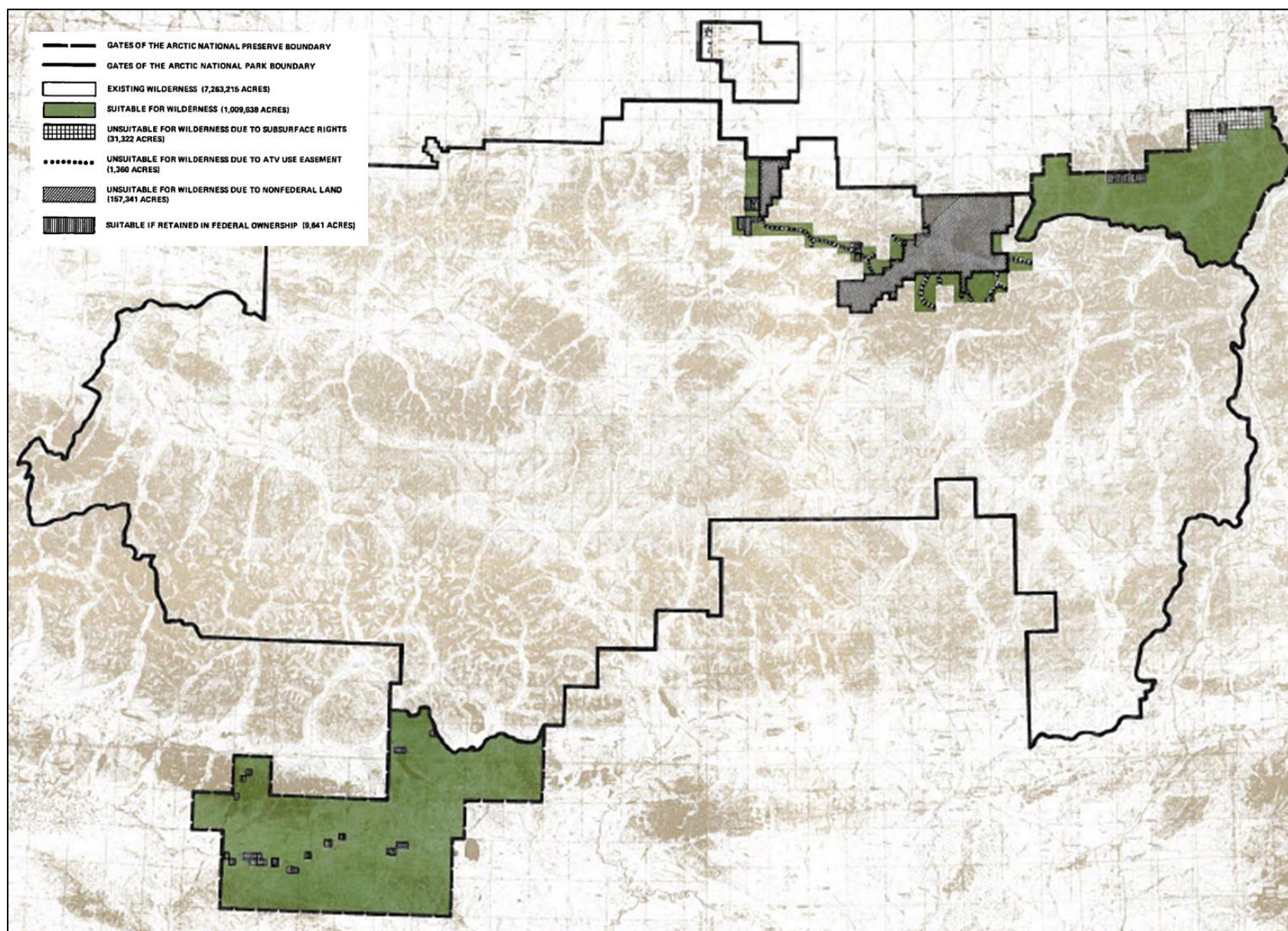


Figure 11. 1986 GAAR GMP Wilderness Eligibility Map

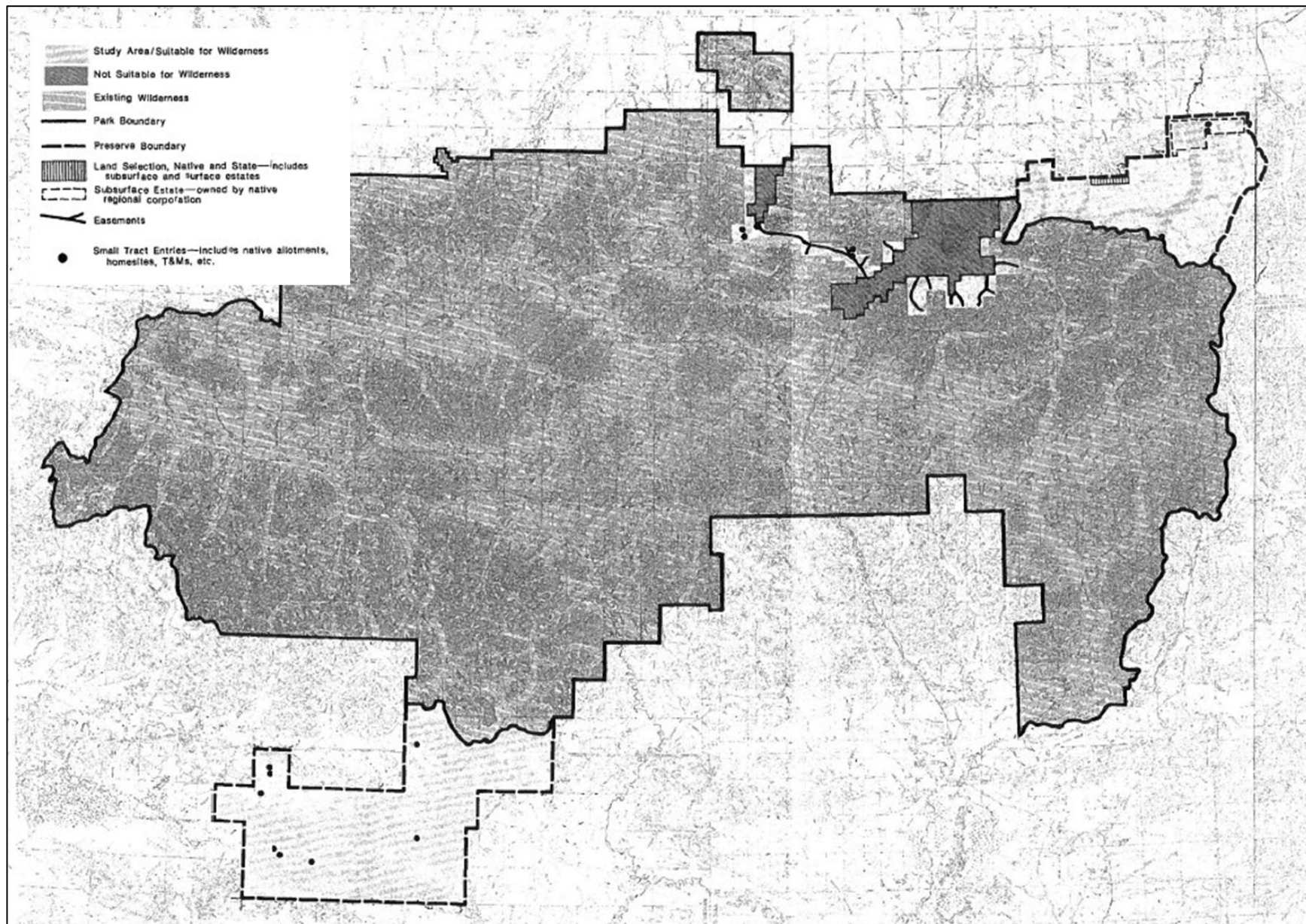


Figure 12. 1988 GAAR FEIS Wilderness Study Area Map

References

1964 Wilderness Act (Public Law 88-577)

1980 Alaska National Interest Lands Conservation Act (Public Law 96-487)

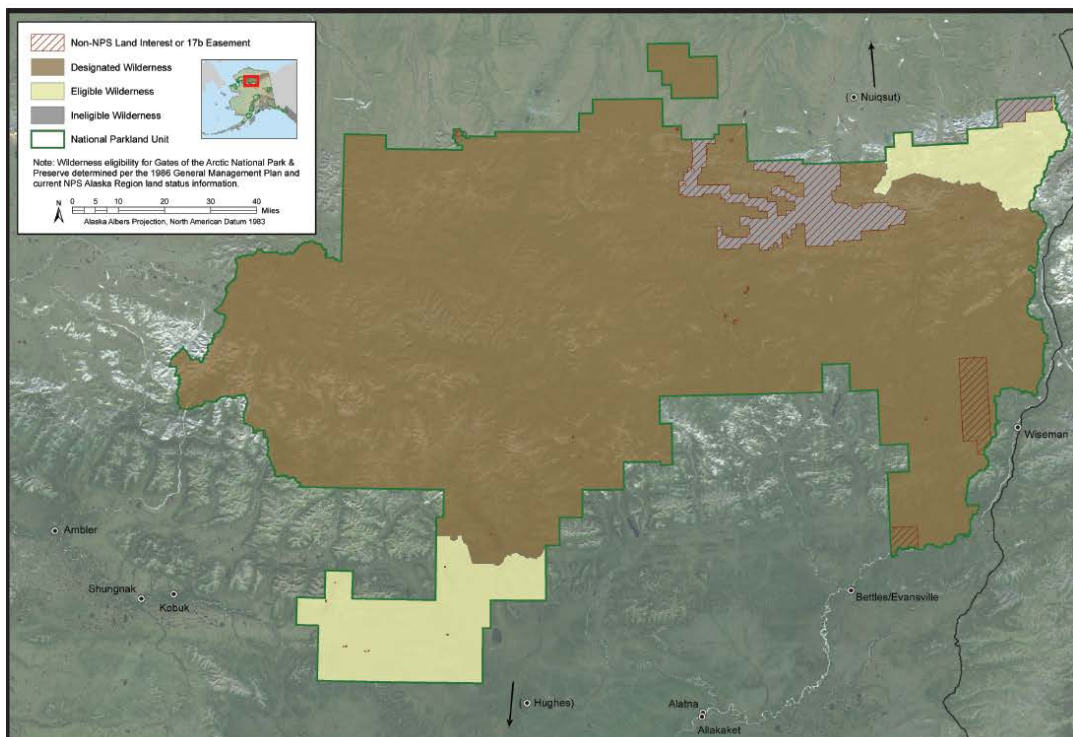
1996 Omnibus Parks and Public Lands Management Act (Public Law 104-333)

National Park Service (NPS). 1986. General Management Plan, Land Protection Plan, Wilderness Suitability Review. Gates of the Arctic National Park and Preserve, Alaska.

NPS. 1988. Final Environmental Impact Statement, Wilderness Recommendation. Gates of the Arctic National Park and Preserve, Alaska.

NPS. 2006. Management Policies 2006. U.S. Department of the Interior, National Park Service, Washington, D.C., USA.

Appendix F: Refining Measurements of Wilderness Area in Gates of the Arctic National Park and Preserve



What's New

Revised wilderness calculations for Gates of the Arctic National Park and Preserve (GAAR) show GAAR possesses approximately 7,154,000 acres of Congressionally-designated wilderness and approximately 914,000 acres of eligible wilderness. This is a reduction of approximately 13,000 acres of Congressionally-designated wilderness and a reduction of approximately 138,000 acres of eligible wilderness compared to wilderness acreages previously reported to the NPS Washington Office.

These acreage differences result from changes in land status subsequent to NPS wilderness area calculations performed for GAAR in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreages for GAAR come from?

The most recent wilderness acreages for GAAR were derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Gates of the Arctic National Park and Preserve (FEIS). While this FEIS was never signed by the Assistant Secretary's Office and was not published in the Federal Register (hence it is not considered an official or complete document), the acreage values for Congressionally-designated and eligible wilderness presented in the FEIS were considered the most accurate measurements of wilderness area for GAAR at the time.

How are wilderness acreages for GAAR now calculated?

The 1986 GAAR General Management Plan/Land Protection Plan/Wilderness Suitability Review (GMP) is the foundation document to the 1988 FEIS and remains the authority for Alaska NPS wilderness eligibility in GAAR. Using ESRI® ArcGIS software the wilderness determinations presented in the 1986 GAAR GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for GAAR are derived from this process.

Revised acreage calculations for Congressionally-designated and eligible wilderness in GAAR exclude non-Federal lands as well as Federal 17b easements. Federal 17b easements are excluded from wilderness calculations due to limited Federal ownership interests.

Why did the wilderness acreages for GAAR change?

Changes in wilderness acreages for GAAR result from evolving land status conditions subsequent to the 1986 GAAR GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations. Of these changes, the most notable is the 1992 Anaktuvuk Pass land exchange which resulted in an official modification to the Congressionally-designated wilderness boundary defined by ANILCA for GAAR.

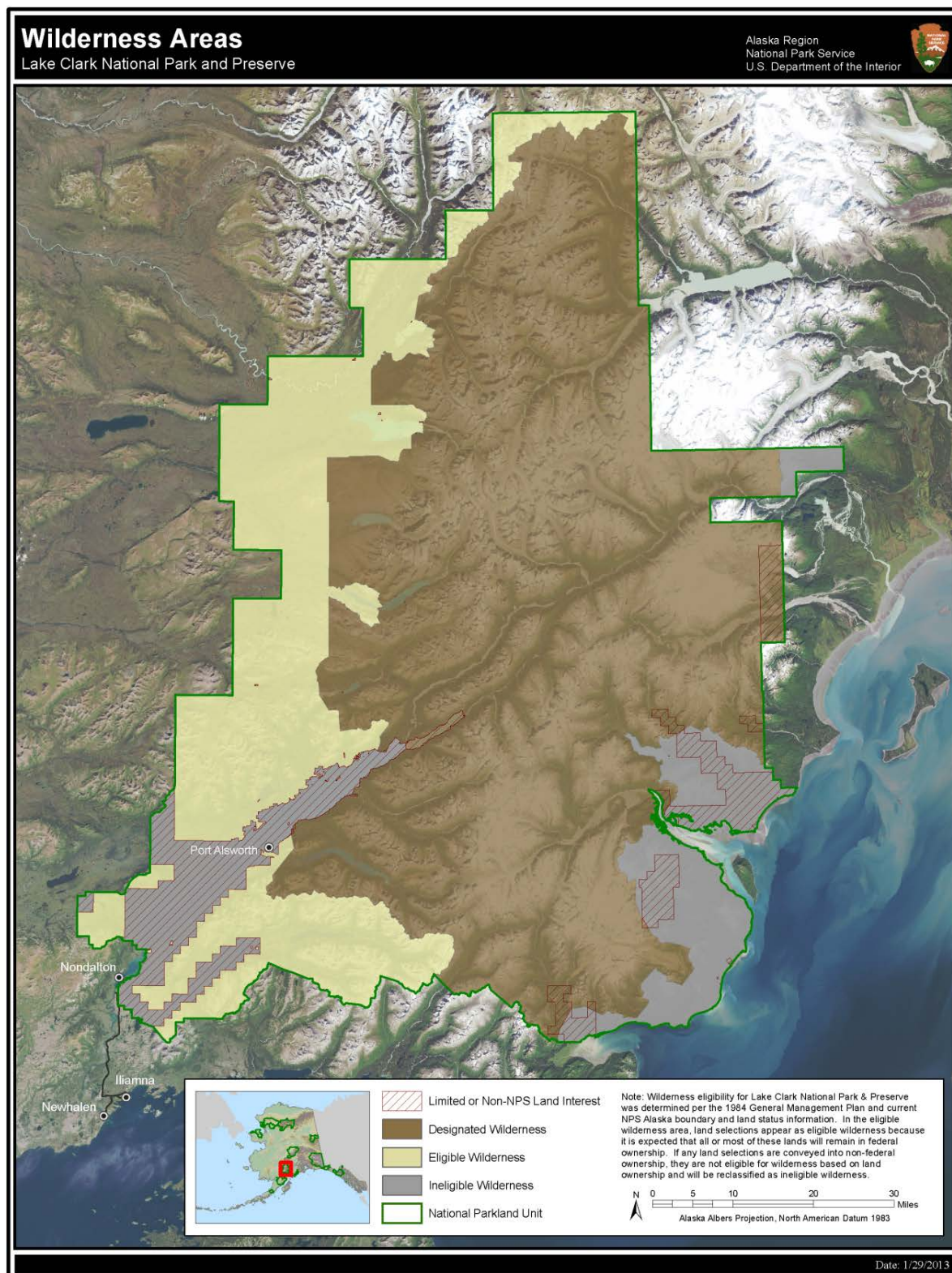
Will the wilderness acreages for GAAR continue to change?

Wilderness acreages for GAAR are not anticipated to change significantly; however, they may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreages for GAAR Congressionally-designated and eligible wilderness will be annually refreshed.

Appendix G: Refining Measurements of Wilderness Area in Lake Clark National Park and Preserve



What's New

Revised wilderness calculations for Lake Clark National Park and Preserve (LACL) show LACL possesses approximately 2,572,000 acres of Congressionally-designated wilderness and approximately 953,000 acres of eligible wilderness. This is a reduction of approximately 48,000 acres of Congressionally-designated wilderness and a reduction of approximately 287,000 acres of eligible wilderness compared to wilderness acreages previously reported to the NPS Washington Office.

These acreage differences result from changes in land status subsequent to NPS wilderness area calculations performed for LACL in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreages for LACL come from?

The most recent wilderness acreages for LACL were derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Lake Clark National Park and Preserve (FEIS). While no final action was taken in the Secretary of the Interior's office and no wilderness recommendation was ultimately conveyed to Congress, the acreage values for Congressionally-designated and eligible wilderness presented in the FEIS were considered the most accurate measurements of wilderness area for LACL at the time.

How are wilderness acreages for LACL now calculated?

The 1984 LACL General Management Plan/Land Protection Plan/Wilderness Suitability Review (GMP) remains the authority for Alaska NPS wilderness eligibility in LACL. Using ESRI® ArcGIS software, the wilderness determinations presented in the 1984 LACL GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for LACL are derived from this process.

Revised eligible wilderness calculations include ANSCA and SOA selected lands because it is expected that all or most of those lands will remain in federal ownership. If any selections are conveyed into non-federal ownership, they are not eligible for wilderness based on land ownership. The revised calculations also assume that Lake Clark is a navigable water body owned by the State of Alaska, so this acreage is subtracted out.

Revised acreage calculations for Congressionally-designated and eligible wilderness in LACL exclude non-Federal lands as well as Federal 17b easements. Federal 17b easements are excluded from wilderness calculations due to limited Federal ownership interests.

Why did the wilderness acreages for LACL change?

Changes in wilderness acreages for LACL result from evolving land status conditions subsequent to the 1984 LACL GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations.

Will the wilderness acreages for LACL continue to change?

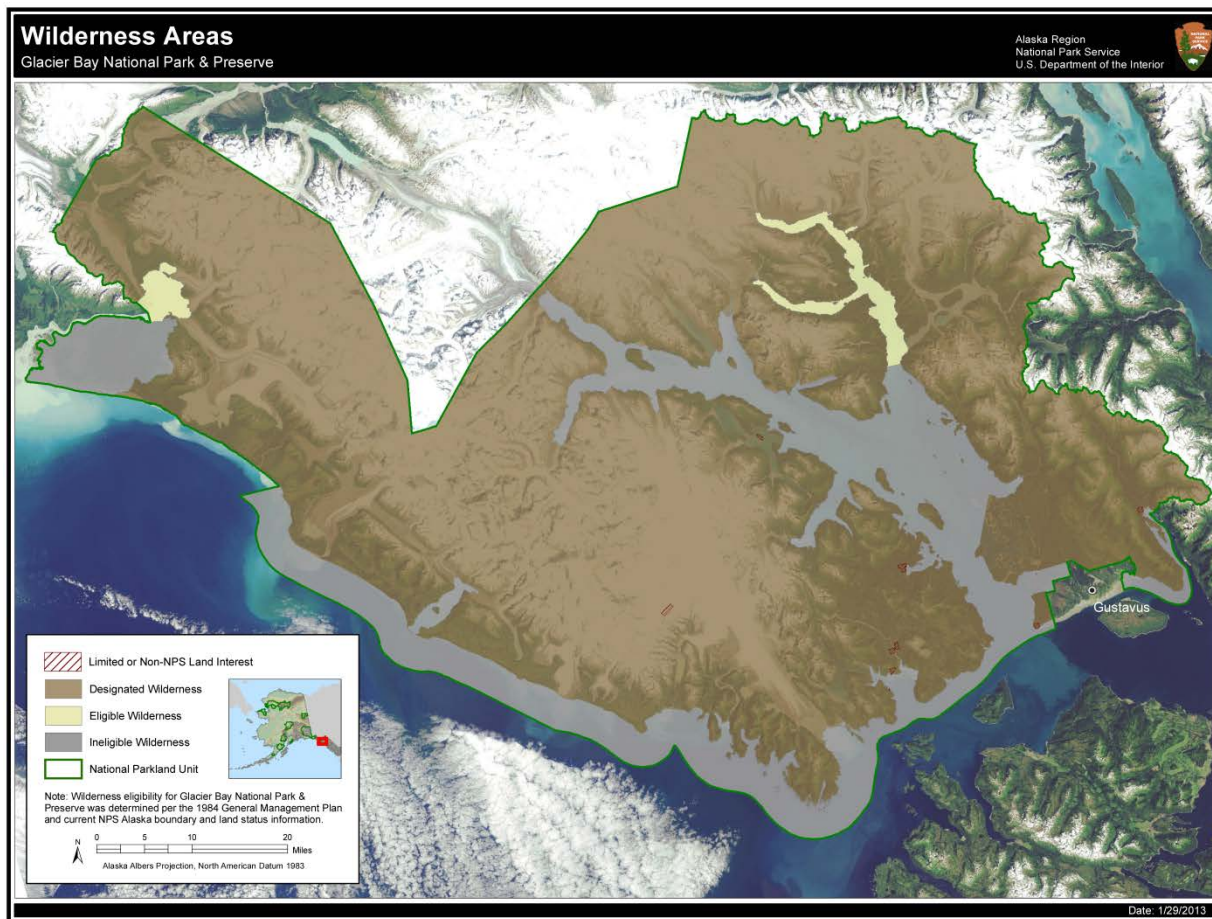
Wilderness acreages for LACL are not anticipated to change significantly; however, they may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreages for LACL Congressionally-designated and eligible wilderness will be periodically refreshed.



Appendix H: Refining Measurements of Wilderness Area in Glacier Bay National Park and Preserve



What's New

Revised wilderness calculations for Glacier Bay National Park and Preserve (GLBA) show GLBA possesses approximately 2,659,000 acres of Congressionally-designated wilderness and approximately 46,000 acres of eligible wilderness. This is a reduction of approximately 6,000 acres of Congressionally-designated wilderness and a reduction of approximately 17,000 acres of eligible wilderness compared to wilderness acreages previously reported to the NPS Washington Office.

These acreage differences result from changes in land status subsequent to NPS wilderness area calculations performed for GLBA in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and

wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreages for GLBA come from?

The most recent wilderness acreages for GLBA were derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Glacier Bay National Park and Preserve (FEIS). While no final action was taken in the Secretary of the Interior's office and no wilderness recommendation was ultimately conveyed to Congress, the acreage values for Congressionally-designated and eligible wilderness presented in the FEIS were considered the most accurate measurements of wilderness area for GLBA at the time.

How are wilderness acreages for GLBA now calculated?

The 1984 GLBA General Management Plan Wilderness Suitability Review (GMP) remains the authority for Alaska NPS wilderness eligibility in GLBA. Using ESRI® ArcGIS software, the wilderness determinations presented in the 1984 GLBA GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for GLBA are derived from this process.

Why did the wilderness acreages for GLBA change?

Changes in wilderness acreages for GLBA result from evolving land status conditions subsequent to the 1984 GLBA GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations. An additional notable change in wilderness acreage is associated with the 2004 Falls Creek Hydroelectric Project & Land Exchange Final EIS, which resulted in 3,339 additional acres of designated wilderness.

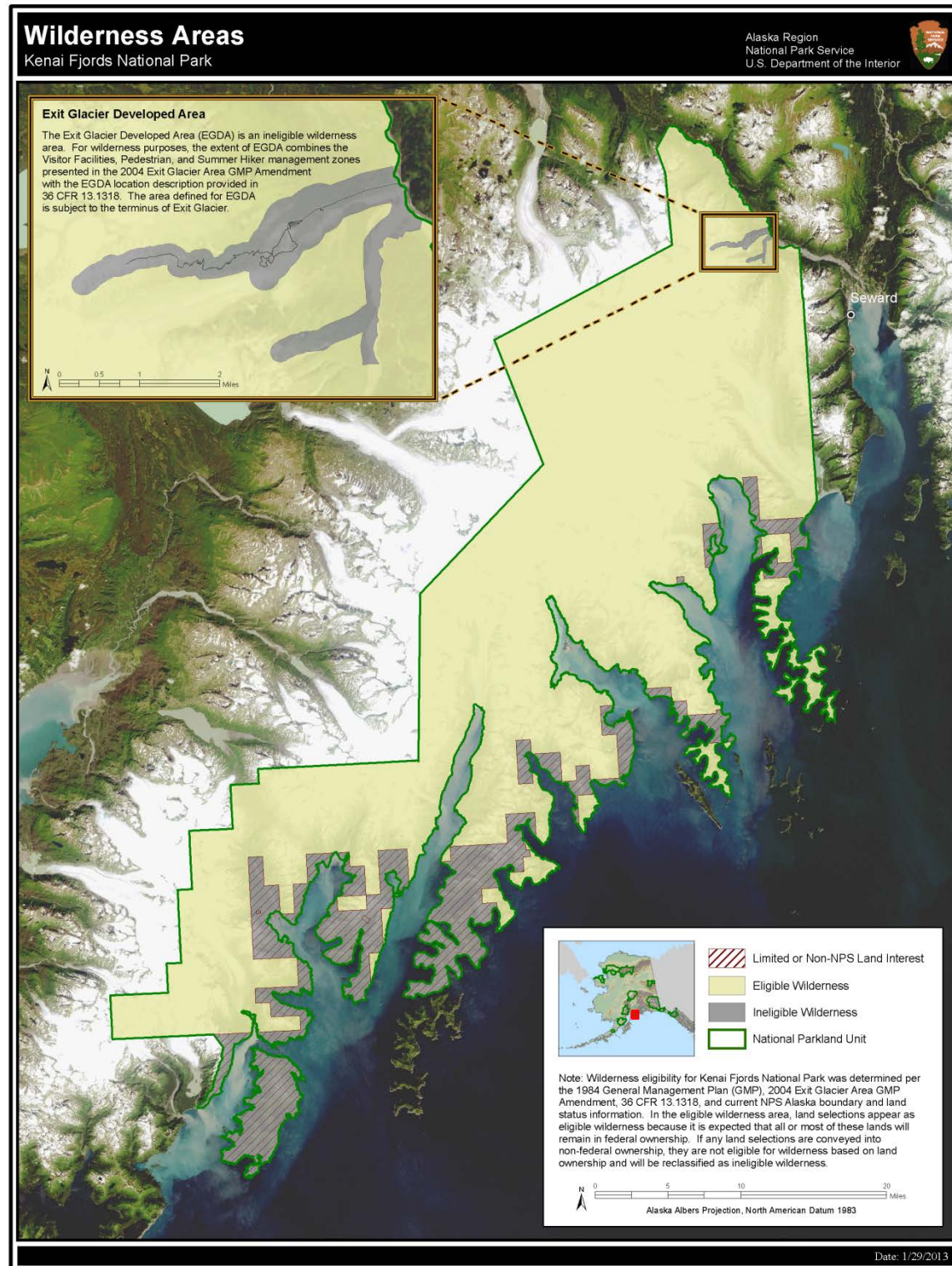
Will the wilderness acreages for GLBA continue to change?

Wilderness acreages for GLBA are not anticipated to change significantly; however, they may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreages for GLBA Congressionally-designated and eligible wilderness will be periodically refreshed.

Appendix I: Refining Measurements of Wilderness Area in Katmai National Park and Preserve



What's New

Revised wilderness calculations for Katmai National Park and Preserve (KATM) show KATM possesses approximately 3,323,000 acres of Congressionally-designated wilderness and approximately 626,000 acres of eligible wilderness. This is a reduction of approximately 61,000 acres of Congressionally-designated wilderness and a reduction of approximately 17,000 acres of eligible wilderness compared to wilderness acreages previously reported to the NPS Washington Office.

These acreage differences result from changes in land status subsequent to NPS wilderness area calculations performed for KATM in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of Congressionally-designated and eligible wilderness acreage in Alaska national parks are complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreages for KATM come from?

The most recent wilderness acreages for KATM were derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Katmai National Park and Preserve (FEIS). While no final action was taken in the Secretary of the Interior's office and no wilderness recommendation was ultimately conveyed to Congress, the acreage values for Congressionally-designated and eligible wilderness presented in the FEIS were considered the most accurate measurements of wilderness area for KATM at the time.

How are wilderness acreages for KATM now calculated?

The 1986 KATM General Management Plan Wilderness Suitability Review (GMP) remains the authority for Alaska NPS wilderness eligibility in KATM. Using ESRI® ArcGIS software, the wilderness determinations presented in the 1986 KATM GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for KATM are derived from this process.

Revised acreage calculations for Congressionally-designated and eligible wilderness in KATM exclude non-Federal lands as well as Federal 17b easements. Federal 17b easements are excluded from wilderness calculations due to limited Federal ownership interests. The following navigable water bodies are considered non-Federal lands and are excluded from wilderness: Alagnak River, Kukaklek Lake, Nonvianuk Lake, Nonvianuk River.

Why did the wilderness acreages for KATM change?

Changes in wilderness acreages for KATM result from evolving land status conditions subsequent to the 1986 KATM GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations. Of these changes, the most notable is the decrease in eligible wilderness acreage due to the exclusion of navigable water bodies.

Will the wilderness acreages for KATM continue to change?

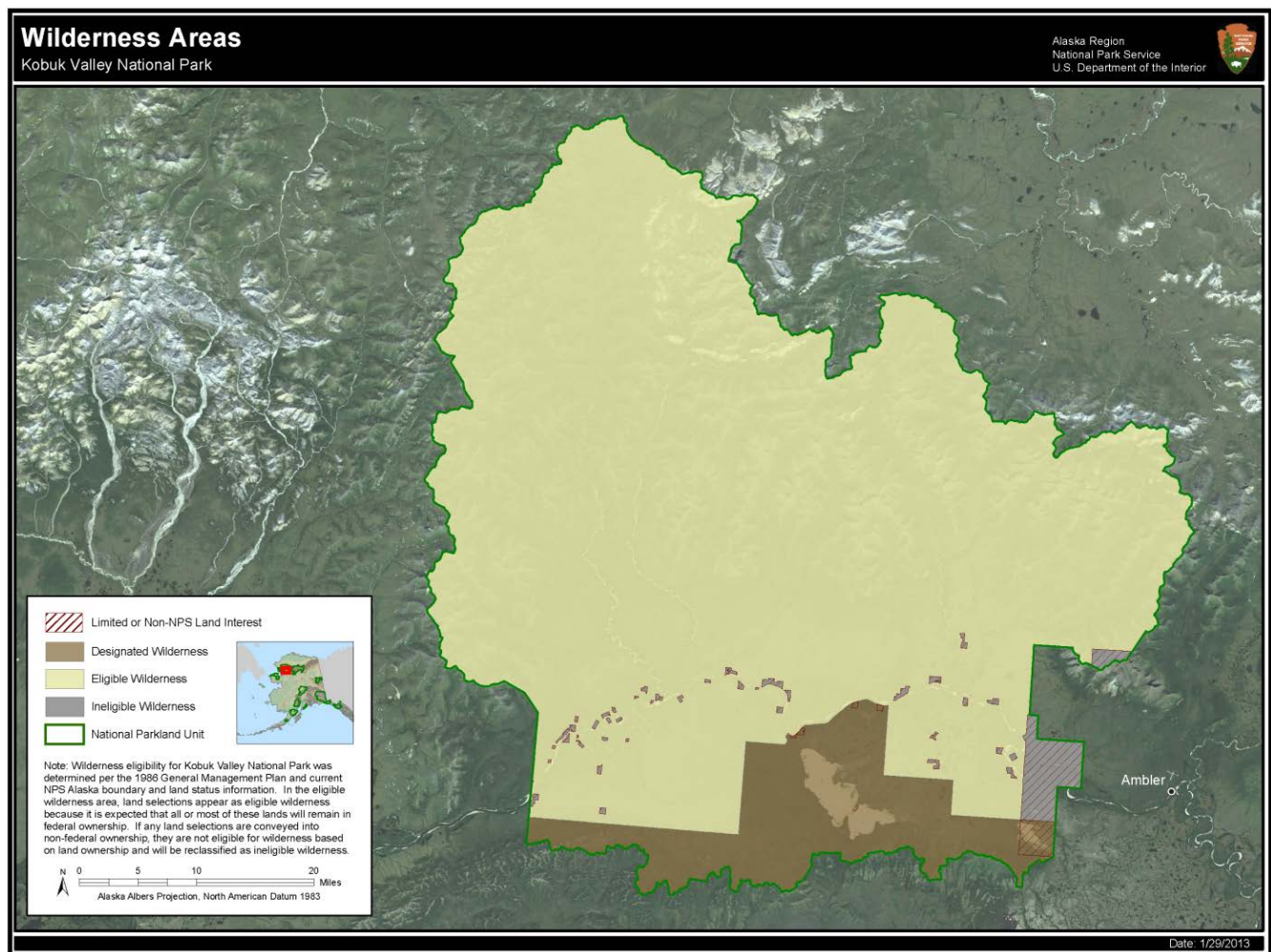
Wilderness acreages for KATM are not anticipated to change significantly; however, they may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreages for KATM Congressionally-designated and eligible wilderness will be periodically refreshed.



Appendix J: Refining Measurements of Wilderness Area in Kobuk Valley National Park



What's New

Revised wilderness calculations for Kobuk Valley National Park (KOVA) show KOVA possesses approximately 176,000 acres of designated wilderness and 1,541,000 acres of eligible wilderness. This is an increase of approximately 1,000 acres of designated wilderness and an increase of approximately 46,000 acres of eligible wilderness compared to wilderness acreage previously reported to the NPS Washington Office.

The acreage difference results from changes in land status subsequent to NPS wilderness area calculations performed for KOVA in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of eligible wilderness acreage in Alaska national parks is complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreage for KOVA come from?

The most recent wilderness acreage for KOVA was derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Kobuk Valley National Park (FEIS). While no final action was taken in the Secretary of the Interior’s office and no wilderness recommendation was ultimately conveyed to Congress, the acreage value for eligible wilderness presented in the FEIS was considered the most accurate measurement of wilderness area for KOVA at the time.

How is wilderness acreage for KOVA now calculated?

The 1986 KOVA General Management Plan Wilderness Suitability Review (GMP) remains the authority for Alaska NPS wilderness eligibility in KOVA. Using ESRI® ArcGIS software, the wilderness determinations presented in the 1986 KOVA GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for KOVA are derived from this process.

Revised acreage calculations exclude non-Federal lands as well as Federal 17b easements. Federal 17b easements are excluded from wilderness calculations due to limited Federal ownership interests.

Revised eligible wilderness calculations include ANSCA and SOA selected lands because it is expected that all or most of those lands will remain in federal ownership. If any selections are conveyed into non-federal ownership, they are not eligible for wilderness based on land ownership.

Why did the wilderness acreage for KOVA change?

Changes in wilderness acreage for KOVA result from evolving land status conditions subsequent to the 1986 KOVA GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations.

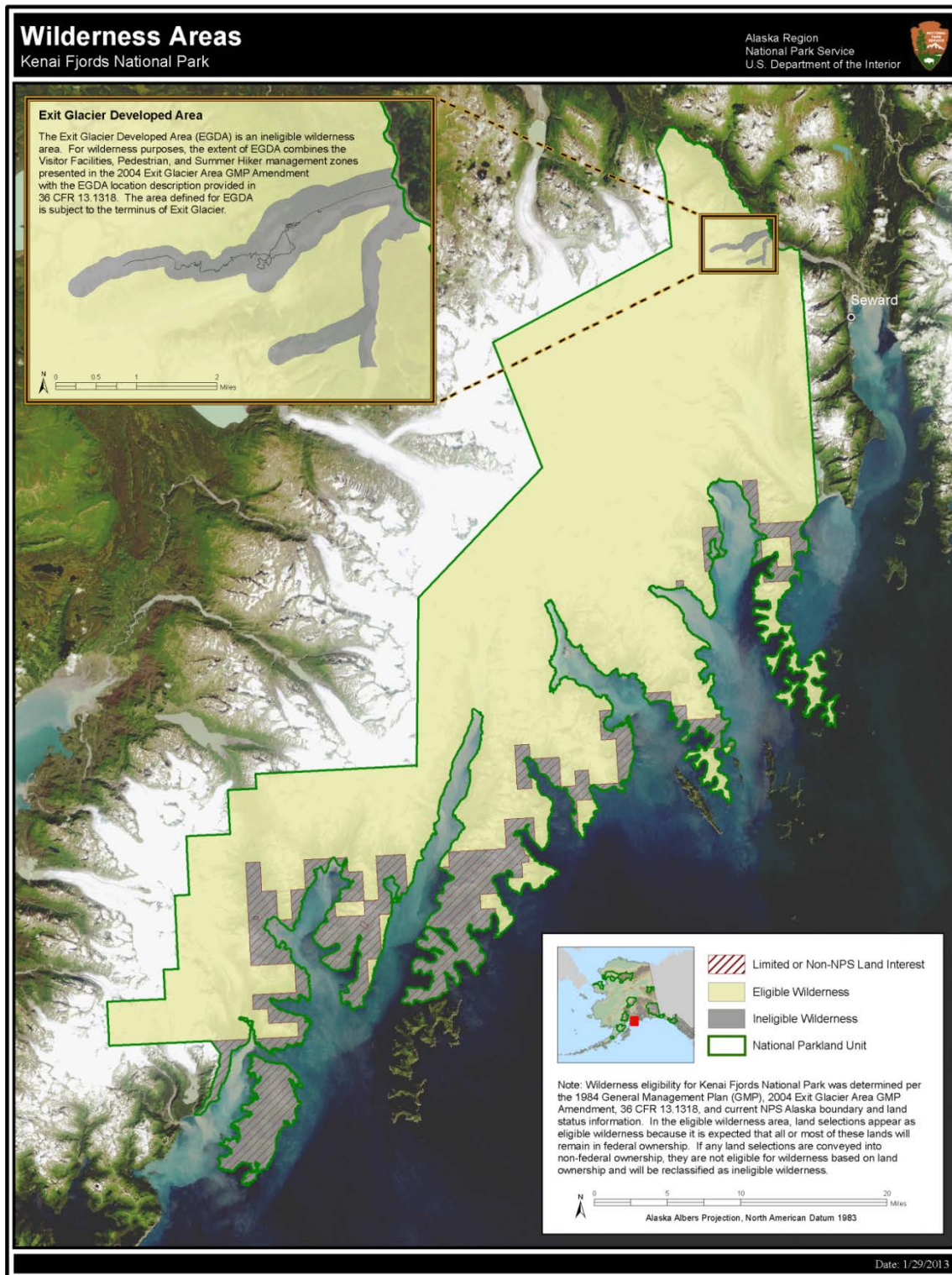
Will the wilderness acreage for KOVA continue to change?

Wilderness acreage for KOVA is not anticipated to change significantly; however, it may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreage for KOVA eligible wilderness will be periodically refreshed.

Appendix K: Refining Measurements of Wilderness Area in Alaska National Parks: Kenai Fjords National Park



What's New

Revised wilderness calculations for Kenai Fjords National Park (KEFJ) show KEFJ possesses approximately 569,000 acres of eligible wilderness. This is a reduction of approximately 99,000 acres of eligible wilderness compared to wilderness acreage previously reported to the NPS Washington Office.

The acreage difference results from changes in land status subsequent to NPS wilderness area calculations performed for KEFJ in the late 1980s, and from the adoption of modern digital mapping and calculation methodologies.

Background

The Wilderness Act, signed into law in 1964, created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” The National Park Service (NPS) works to preserve wilderness character by keeping areas of Congressionally-designated wilderness as natural and wild as possible. Eligible wilderness areas also possess characteristics that reflect the definition of wilderness but require further study to determine if they should be recommended to Congress for wilderness designation. The NPS manages eligible wilderness areas to preserve the wilderness character and value of these lands.

Precise calculations of eligible wilderness acreage in Alaska national parks is complicated by a complex land status history, but have recently been enhanced by advances in digital mapping technology. Through the use of geographic information system (GIS) software the NPS is refining area calculations for Alaska NPS wilderness lands. This process does not change any land designations, land management strategy, or NPS policy.

Where did the previous wilderness acreage for KEFJ come from?

The most recent wilderness acreage for KEFJ was derived from the 1988 Final Environmental Impact Statement Wilderness Recommendation Kenai Fjords National Park (FEIS). While no final action was taken in the Secretary of the Interior's office and no wilderness recommendation was ultimately conveyed to Congress, the acreage value for eligible wilderness presented in the FEIS was considered the most accurate measurement of wilderness area for KEFJ at the time.

How is wilderness acreage for KEFJ now calculated?

The 1984 KEFJ General Management Plan Wilderness Suitability Review (GMP) remains the authority for Alaska NPS wilderness eligibility in KEFJ. Using ESRI® ArcGIS software, the wilderness determinations presented in the 1984 KEFJ GMP have been carefully modeled in a GIS environment, and reflect modern Alaska NPS boundary and land status conditions. This process systematically transitions non-digital wilderness information into a digital realm that supports accurate computer-assisted area calculations. Revised wilderness calculations for KEFJ are derived from this process.

Revised acreage calculations exclude non-Federal lands as well as Federal 17b easements. Federal 17b easements are excluded from wilderness calculations due to limited Federal ownership interests.

Revised eligible wilderness calculations include ANSCA and SOA selected lands because it is expected that all or most of those lands will remain in federal ownership. If any selections are conveyed into non-federal ownership, they are not eligible for wilderness based on land ownership.

Why did the wilderness acreage for KEFJ change?

Changes in wilderness acreage for KEFJ result from evolving land status conditions subsequent to the 1984 KEFJ GMP and the 1988 FEIS, and from the adoption of modern digital mapping technology that supports accurate computer-assisted area calculations. Of these changes, the most notable are the changes associated with the 2004 Exit Glacier Area Plan and subsequent regulation that defined the developed area around Exit Glacier that is not eligible for wilderness designation.

Will the wilderness acreage for KEFJ continue to change?

Wilderness acreage for KEFJ is not anticipated to change significantly; however, it may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve.

NPS is reporting values rounded to the nearest 1,000 acres. These rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Acreage for KEFJ eligible wilderness will be periodically refreshed.



Appendix L. Alaska National Park Wilderness Acreage

Precise calculations of designated and eligible wilderness acreage within Alaska National Parks is complicated by a complex land status history, but has recently been enhanced by advances in mapping technology. The following table lists approximate wilderness acreage. These numbers will be updated annually.

NPS WILDERNESS ACREAGE REPORT ¹ (As of 05/31/2012)			
	<i>Rounded²Congressionally Designated Wilderness</i>	<i>Rounded Eligible Wilderness</i>	<i>Rounded Ineligible Wilderness</i>
ALAG	0	0	31,000
ANIA	0	TBD	TBD
BELA	0	TBD	TBD
CAKR	0	TBD	TBD
DENA	2,124,000	TBD	TBD
GAAR	7,154,000	914,000	309,000
GLBA	2,659,000	46,000	577,000
KATM	3,323,000	626,000	149,000
KEFJ	0	569,000	98,000
KLGO	0	TBD	TBD
KOVA	176,000	1,541,000	28,000
LACL	2,572,000	953,000	470,000
NOAT	5,814,000	TBD	TBD
SITK	0	TBD	TBD
WRST	9,428,000	TBD	TBD
YUCH	0	TBD	TBD
¹ The NPS WILDERNESS ACREAGE REPORT table reflects NPS wilderness acreage values derived from an established GIS-based wilderness model. ² Rounded wilderness acreage values represent acreage approximations for certain NPS reporting. Acreage values over 1,000 acres are rounded to the nearest 1,000 acre. Acreage values under 1,000 acres are rounded to the nearest 100 acres. ³ TBD notates a value to be determined. TBD is assigned to NPS units that have not yet completed wilderness eligibility mapping.			

How is Wilderness Acreage Calculated?

Designated Wilderness acreage is based on updated line work in GIS and subtracts non-NPS land interests such as federal lands with selections on them. Per Section 701 of ANILCA only those lands which are "public lands" and within the external boundaries of the wilderness units were designated as wilderness. The ANILCA definition of "public lands" excludes lands selected by ANCSA corporations or the State of Alaska. Designated Wilderness acreage calculations "subtract out" these selected lands from the outer boundary.

Eligible Wilderness acreage reflects land that was determined suitable by the park's General Management Plan and *includes* ANCSA and State of Alaska selected lands. Lands selected by ANCSA corporations and the State of Alaska are included because it is expected that all or most of those lands will remain in federal ownership. If any selections are conveyed into non-federal ownership, they are not eligible for wilderness based on land ownership.

Reporting Strategy

Parks are encouraged to use rounded numbers when reporting wilderness acreage since the rounded numbers are unlikely to change. Wilderness acreages are not anticipated to change significantly; however, they may be subject to minor changes as Alaska NPS boundary and/or land status conditions continue to evolve. Rounded numbers are expected to absorb minor changes in land status as well as variability in boundary lines as GIS technology continues to generate more precise values.

Rounded numbers should suffice for most planning efforts, compliance documents, education materials, public requests, etc. If there is a special circumstance that warrants using non-rounded numbers (for example, non-rounded numbers may be appropriate for land exchanges) contact Adrienne Lindholm.

When reporting total NPS unit, total park, or total preserve acreage, official MDL values are preferred over GIS values. These numbers can be obtained from the Lands Office (contact Chuck Gilbert).

Caveat

You may quickly discover that acreage values from the MDL Report (Lands Office) are official *gross* area acreage maintained by the NPS AKR Land Resources Program Center. They are not going to match the GIS acreage values produced by the wilderness model because the MDL Report includes all acres within the external park boundary. Designated wilderness acreage calculations exclude non-federal land interests. The MDL and GIS acreage differences may also be more significant for coastal parks due to coastal boundary mapping.

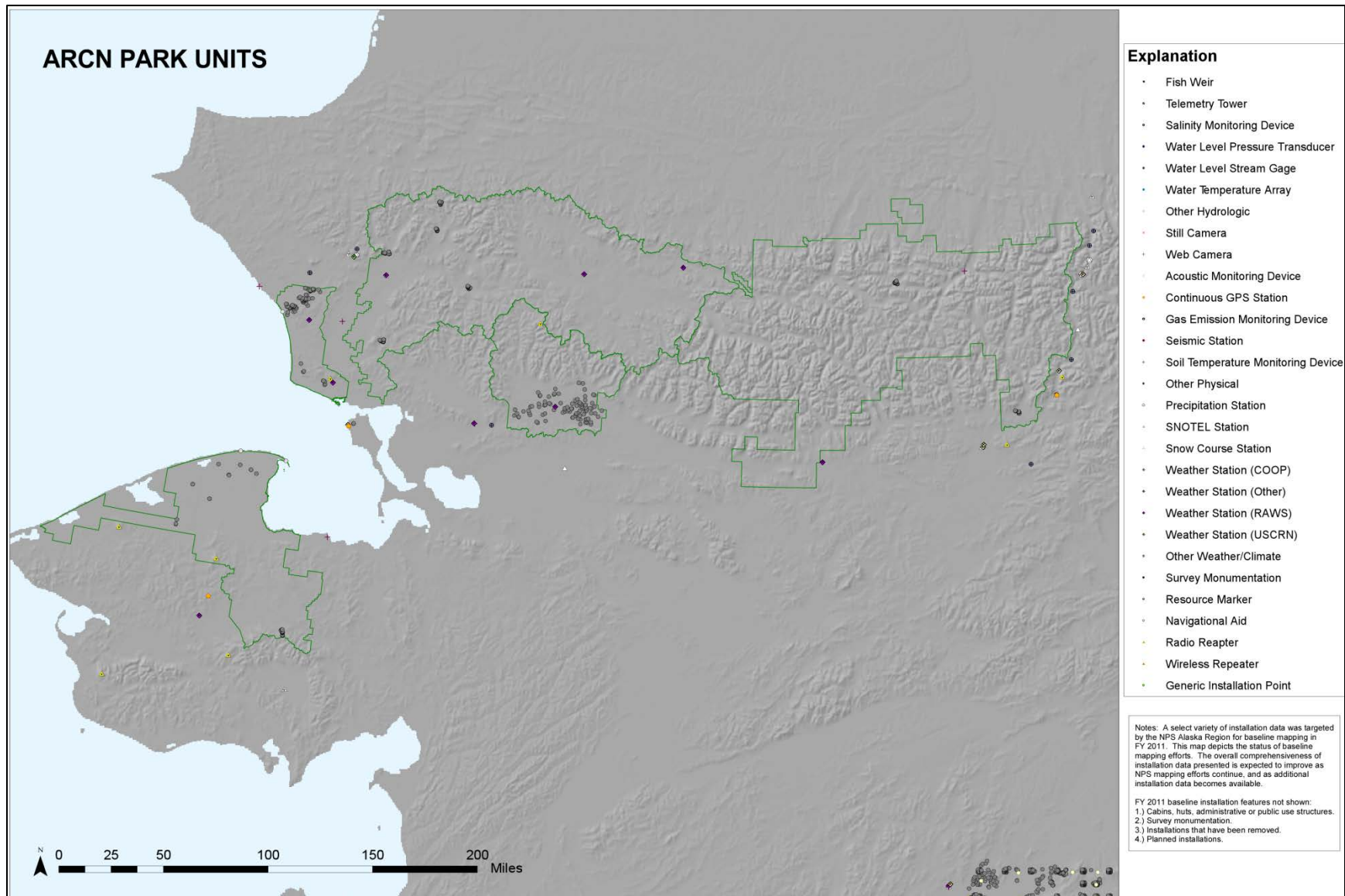
Contact Information

Contact Adrienne Lindholm, NPS AKR Wilderness Coordinator [Adrienne_Lindholm@nps.gov 907-644-3581] for exact (non-rounded) numbers.

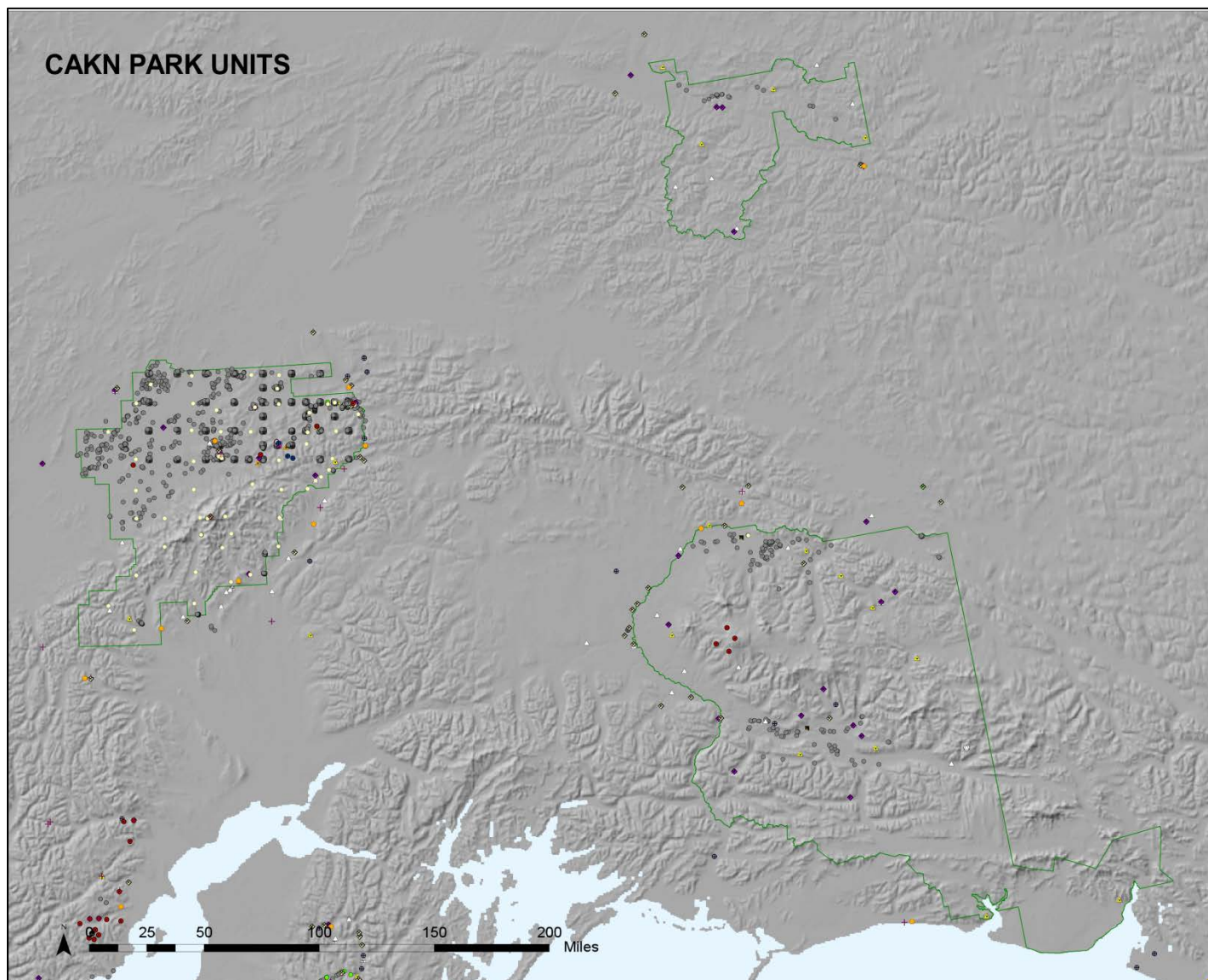
Contact Chuck Gilbert, NPS AKR Land Resources Program Center [Chuck_Gilbert@nps.gov 907-644-3426] for total unit acreage.

Appendix M: Maps of Installations in Alaska National Parks

ARCN PARK UNITS



CAKN PARK UNITS

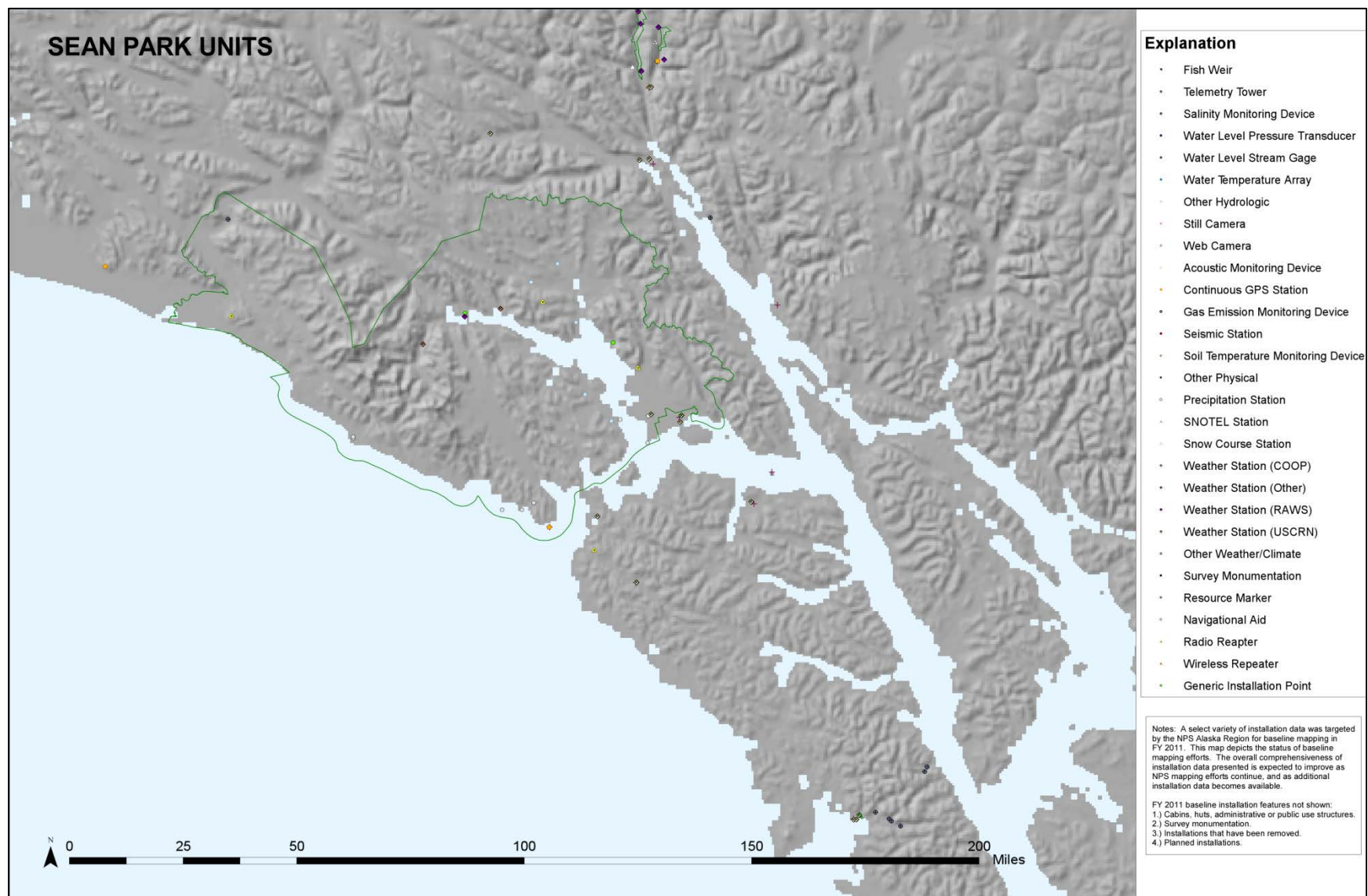


Explanation

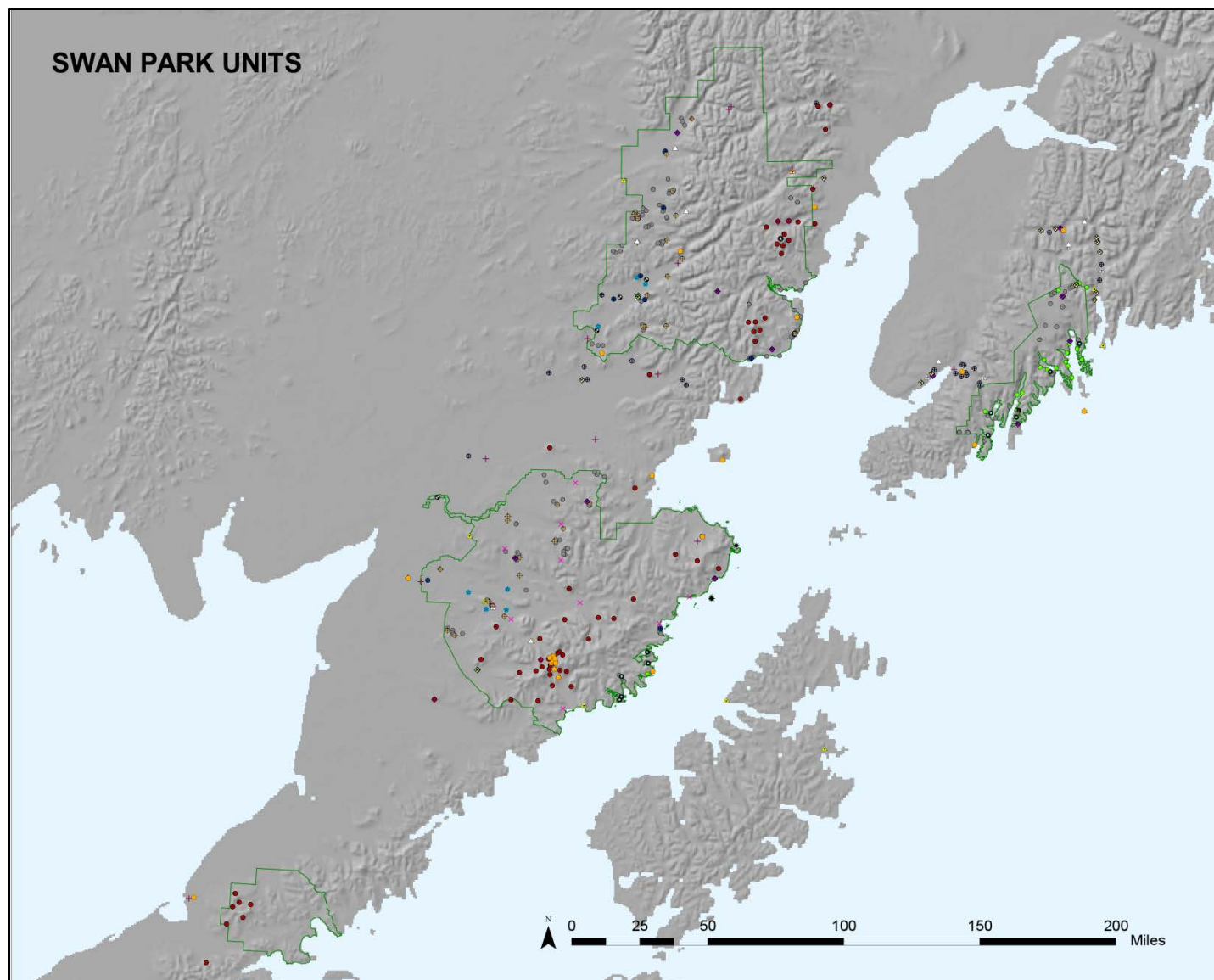
- Fish Weir
- Telemetry Tower
- Salinity Monitoring Device
- Water Level Pressure Transducer
- Water Level Stream Gage
- Water Temperature Array
- Other Hydrologic
- Still Camera
- Web Camera
- Acoustic Monitoring Device
- Continuous GPS Station
- Gas Emission Monitoring Device
- Seismic Station
- Soil Temperature Monitoring Device
- Other Physical
- Precipitation Station
- SNOTEL Station
- Snow Course Station
- Weather Station (COOP)
- Weather Station (Other)
- Weather Station (RAWS)
- Weather Station (USCRN)
- Other Weather/Climate
- Survey Monumentation
- Resource Marker
- Navigational Aid
- Radio Reapter
- Wireless Repeater
- Generic Installation Point

Notes: A select variety of installation data was targeted by the NPS Alaska Region for baseline mapping in FY 2011. This map depicts the status of baseline mapping efforts. The overall comprehensiveness of installation data presented is expected to improve as NPS mapping efforts continue, and as additional installation data becomes available.

FY 2011 baseline installation features not shown:
 1.) Cabins, huts, administrative or public use structures.
 2.) Survey monumentation.
 3.) Installations that have been removed.
 4.) Planned installations.



SWAN PARK UNITS



Explanation

- Fish Weir
- Telemetry Tower
- Salinity Monitoring Device
- Water Level Pressure Transducer
- Water Level Stream Gage
- Water Temperature Array
- Other Hydrologic
- Still Camera
- Web Camera
- Acoustic Monitoring Device
- Continuous GPS Station
- Gas Emission Monitoring Device
- Seismic Station
- Soil Temperature Monitoring Device
- Other Physical
- Precipitation Station
- SNOTEL Station
- Snow Course Station
- Weather Station (COOP)
- Weather Station (Other)
- Weather Station (RAWS)
- Weather Station (USCRN)
- Other Weather/Climate
- Survey Monumentation
- Resource Marker
- Navigational Aid
- Radio Repeater
- Wireless Repeater
- Generic Installation Point

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The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



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