IUCN Conservation Outlook Assessment 2017 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Kluane / Wrangell-St Elias / Glacier Bay / Tatshenshini-Alsek. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Kluane / Wrangell-St Elias / Glacier Bay / Tatshenshini-Alsek

SITE INFORMATION

Country:
Canada, United States of America (USA)
Inscribed in: 1979
Criteria:
(vii) (viii) (ix) (x)

Site description:
These parks comprise an impressive complex of glaciers and high peaks on both sides of the border between Canada (Yukon Territory and British Columbia) and the United States (Alaska). The spectacular natural landscapes are home to many grizzly bears, caribou and Dall's sheep. The site contains the largest non-polar icefield in the world. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

The Kluane, Tatshenshini-Alsek, Glacier Bay and Wrangell-St.Elias World heritage site protects a diversity of large, contiguous, intact ecosystems (from the highest peaks of the mountains and glaciers to the open Pacific Ocean, river systems of the Alsek River and sheltered inland fjords) that are strongly dominated by natural processes. This site is a dynamic and changing landscape. Significant concern related to the site’s ecological integrity is triggered by recent climate change-related reductions in glaciers, the potential negative effects of ocean acidification and increasing visitation. Other aspects of ecological integrity are good and the site represents a pristine system with minimal impacts.

Current state and trend of VALUES

Low Concern
Trend: Deteriorating

Key terrestrial mammals (black bears, brown bears, moose, and mountain goats) are in good condition. However, their distribution patterns are expected to change over time due to changing landscape conditions following glacial recession and vegetation succession. The exceptional aesthetic values of the site remain largely intact and its outstanding geological features remain well-preserved. However, the site's glaciers and associated processes are becoming increasingly affected by climate change. In addition, ocean acidification is a major concern.

Overall THREATS

Low Threat

Impacts of past mineral development on the area of Tatshenshini-Alsek Park, direct and indirect effects of commercial fishing in Glacier Bay, as well as increasing visitation in most of the parks and associated impacts, as well as

existing mining claims in Wrangell-St. Elias have been identified as existing threats to the site's values; however, their impact is low. Climate change represents the most significant existing and potential threat to the site’s values. Effects of climate change include retreat of glaciers and melting of permafrost soils, ocean acidification.

Overall PROTECTION and MANAGEMENT

Mostly Effective

Protection and management of individual component protected areas that make up this serial transboundary site are highly effective. However, the absence of a management body for the entire World Heritage site is of some concern.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **Area of exceptional natural beauty**
  Criterion:(vii)

  This area of exceptional natural beauty encompasses coastal and marine environments, snow-capped mountains, calving glaciers, deep river canyons, fjord-like inlets and abundant wildlife abound (Statement of Significance, 2006).

- **Outstanding examples of major ongoing geologic and glacial processes**
  Criterion:(viii)

  The site features continuous mountain building and contains outstanding examples of major ongoing geologic and glacial processes. Over 200 glaciers in the ice-covered central plateau combine to form some of the world's largest and longest glaciers, several of which stretch to the sea. The site displays a broad range of glacial processes, including world-class depositional features and classic examples of moraines, hanging valleys, and other geomorphological features (Statement of Significance, 2006). Approximately 35% of Wrangell St. Elias is covered by glaciers, making it the largest aggregation of glaciers in North America (NPS State of the Parks 2017). Glacier Bay National Park preserves one of the largest units of the national wilderness preservation system, encompassing more than 2.7 million acres of glacially influenced marine, terrestrial, and freshwater

ecosystems.

- **Rich variety of terrestrial and coastal/marine environments with complex and intricate mosaics of life at various successional stages**
  Criterion:(ix)

  The influence of glaciation at a landscape level has led to a similarly broad range of stages in ecological succession related to the dynamic movements of glaciers. Subtly different glacial environments and landforms have been concentrated within the property by the sharp temperature and precipitation variation between the coast and interior basins. There is a rich variety of terrestrial and coastal/marine environments with complex and intricate mosaics of life at various successional stages from 500 m below sea level to 5000 m above (Statement of Significance, 2006).

- **Great variety of fauna**
  Criterion:(x)

  Wildlife species common to Alaska and Northwestern Canada are well represented, some in numbers exceeded nowhere else. The marine components support a great variety of fauna including marine mammals and anadromous fish, the spawning of which is a key ecological component linking the sea to the land through the large river systems. Populations of bears, wolves, caribou, Dall sheep and mountain goats that are endangered elsewhere are self-regulating here. This is one of the few places remaining in the world where ecological processes are governed by natural stresses and the evolutionary changes in a glacial and ecological continuum (Statement of Significance, 2006).

Assessment information

Threats

Current Threats

Low Threat

Impacts of past mineral development on the area of Tatshenshini-Alsek Park, direct and indirect effects of commercial fishing in Glacier Bay, as well as increasing visitation in most of the parks and associated impacts have been identified as existing threats to the site's values; however, their impact is low. Commercial fishing conflicts and the lack of legislated cooperative fishing plan with the State of Alaska is an impediment to protection of the marine resources. Climate change represents the most significant existing and potential threat to the site’s values. Effects of climate change include retreat of glaciers and melting of permafrost soils, ocean acidification.

► Mining/ Quarrying

Low Threat
Inside site, localised(<5%)

Previous mineral development in the area of Tatshenshini-Alsek Park and a pipeline adjacent to the Haines Road have left environmental liabilities which are being monitored (Periodic Report, 2006). Abandoned Mine Lands (AML) and abandoned oil/ gas lands may have serious associated safety issues and resource impacts. Wrangell-St. Elias has 92 mine sites and 29 mine features in need of reclamation in the park (Burghardt 2014). The park is actively trying to reclaim and improve the safety of contaminated mining sites in the park and are actively trying to acquire the claims (NPS 2016).

► Temperature extremes

High Threat
Inside site, widespread(15-50%)
Outside site

Effects of climate change include retreat of glaciers and melting of permafrost soils (Periodic report, 2006; Flowers et al. 2014; Shugar et al. 2017; Krebs et al. 2014). Glacial cover has diminished over the last half century (Molina, 2007) with and estimated decrease at Wrangell St-Elias of 5% (Loso et al. 2014). Over the recent period 2000-2007, glaciers in the Wrangell Mountains have been reduced at a faster rate than the four preceding decades (Das et al. 2014). The observed impacts of a warming

climate includes declining sea ice, shrinking glaciers, thawing permafrost, changing ocean temperatures and chemistry, increased coastal erosion, and more extensive insect outbreaks and wildfire (Larsen et al. 2014, Chapin et al. 2014, Markon et al. 2012). Shugar et al. (2017) document a change in river flow from the rapidly retreating and thinning Kaskawulsh Glacier in Kluane.

► Water Pollution

Low Threat
Inside site, widespread(15-50%)
Outside site

Mercury levels in fish have found elevated levels in Wrangell-St.Elias (Eagles-Smith et al. 2014).

► Tourism/ visitors/ recreation

Low Threat
Inside site, localised(<5%)

Use of ATVs and snowmachines for access within Wrangell-St. Elias National Park and Preserve for traditional and recreational activities has the potential to negatively impact park resources and affect visitor experience. As technology advances such vehicles venture into areas of the park that haven't previously seen such use, with the potential to impact wildlife and other park resources (Periodic Report, 2006). During the past decades the Tatshenshini-Alsek Provincial Park has experienced an intensive growth in tourist use with the growing interest in rafting. Use levels on the rivers are controlled by requiring users to hold a Park Use Permit (WCMC, 2011). Glacier Bay regulates the number of cruise ships entering the bay.

► Fishing / Harvesting Aquatic Resources

Low Threat
Inside site, localised(<5%)
Outside site

In Glacier Bay, direct and indirect effects of commercial and sport fishing are likely occurring. Commercial fishing, principally for salmon, Tanner crab and halibut, removes as much as half a million pounds of biomass from Glacier Bay proper's marine waters annually. This removal of biomass has poorly known but likely important effects on marine ecosystems, including

associated nearshore and riparian habitats. Regulations affecting commercial fisheries in Glacier Bay limit the types of allowed fisheries and the number of participants. As a result of recently legislated phase out, commercial fishing within the bay is anticipated to cease within the next four decades (Periodic Report, 2006).

Potential Threats

High Threat

Climate change represents the most significant potential threat to the site's values. Effects of climate change include retreat of glaciers and melting of permafrost soils, ocean acidification.

► Ocean acidification

High Threat
Inside site, localised(<5%)
Outside site

Acidification effects can include changes in water and soil chemistry that impact ecosystem health. (Schirokauer et al. 2014). Reisdorph and Mathis (2014, 2015) confirmed that the ocean waters of Glacier Bay are acidified.

► Housing/ Urban Areas

Low Threat
Outside site

As human populations increase in the area surrounding the World Heritage Site, the development pressures will tend to increase. The four units comprising the site all work extensively with the local communities on various planning projects to minimize these impacts (Periodic Report, 2006).

► Air Pollution

Low Threat
Outside site

Lacking significant sources of air pollution, the air quality is generally good. However, air quality is currently threatened by both global industrial pollution and local sources, such as cruise ships (Geiser et al. 2010) and pollutants

transported long distances (Weiss-Penzias et al. 2016)

► Habitat Shifting/ Alteration

High Threat
Inside site, localised(<5%)

Recent permafrost modeling for Wrangell-St.Elias predicts that only 42% of the park will be covered by permafrost by the 2050s (Panda et al. (2014), Wrangell-St. Elias State of the Parks Report (2016).

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

All component protected areas which comprise this site work effectively with local communities and First Nations to ensure their involvement in the management processes. Wrangell-St.Elias collaborates with Ahtna Tribe to manage fish and wildlife resources.

► Legal framework

Mostly Effective

Kluane National Park and Reserve is managed under the authority of the Canada National Parks Act and its associated regulations, and the Parks Canada Agency Act. Tatshenshini-Alsek Park was established in 1993 by the Province of British Columbia as a Class A Park under the Park Act by an enactment of the provincial legislature. Glacier Bay National Monument was established in 1926 and redesignated as National Park in 1980. Wrangell-St.Elias National Park and Preserve was established under the Alaska Natural Interest Lands Conservation Act (ANILCA). Both US parks' designated wilderness lands and waters are also managed under the Wilderness Act. Other laws that apply to Canadian national parks include: The Fisheries Act (1985); The Canadian Environmental Assessment Act (1992); The Migratory Birds Convention Act (1994); The Species at Risk Act (2002) (Periodic Report,

2006).

► Enforcement

Mostly Effective

The Glacier and Wrangell St.Elias have substantial law enforcement capabilities to provide resource and visitor protection. Glacier and Wrangell St. Elias park rangers work hard on visitor safety, but also on proactive avoidance of visitor impacts to the resources. These parks have Visitor Use and Impacts Monitoring Program to detect and target problems impacting the outstandingly values of the park. Kluane and Wrangell-St. Elias collaborate on enforcement issues and share information.

► Integration into regional and national planning systems

Mostly Effective

Collaboration between the components of this serial site exists on various topics. Wrangell-St.Elias collaborates with Kluane National Park on fire management planning. They also collaborate on efforts to maintain caribou transboundary migration. Further collaboration between the US and Canadian parks is challenged by increased border security. Glacier Bay National Park, Wrangell-St.Elias, Kluane and Tatshenshini-Alsek cooperate on cross boundary river trips on the Alsek River.

► Management system

Some Concern

Kluane / Wrangell-St. Elias / Glacier Bay / Tatshenshini-Alsek is a transboundary serial property comprised of:
- Kluane National Park and Reserve of Canada
- Wrangell-St. Elias National Park and Reserve (USA)
- Glacier Bay National Park and Reserve (USA)
- Tatshenshini-Alsek Provincial Park (Canada)

In the United States, Glacier Bay National Park and Preserve and Wrangell-St. Elias National Park and Preserve are administered by the National Park Service. Kluane National Park Reserve is administered by Parks Canada. Tatshenshini-Alsek Provincial Park is administered by the Ministry of Water, Land and Air Protection in the British Columbia provincial government (WCMC, 2011). All component protected areas have their own management

systems. However, there is currently no management agreement in place that would guide management of the entire transboundary World Heritage site (http://www.tbpa.net/page.php?ndx=63).

▶ Management effectiveness

Some Concern

Management of the individual component protected areas appears effective; however, the absence of an overarching management body for the entire World Heritage site is of some concern.

▶ Implementation of Committee decisions and recommendations

Highly Effective

No recent Committee Decisions

▶ Boundaries

Highly Effective

The site has been significantly enlarged through a number of extensions which added new components to it (1992 and 1994 extensions, Decision CONF 002 X.C; Decision CONF 003 XI).

▶ Sustainable finance

Data Deficient

The annual operating budgets of the component protected areas were: Kluane (2006) - $3 million; Wrangell-St. Elias (2016) - $6 million USD; Glacier Bay (2017) - $4 million; Tatshenshini-Alsek (2006) - $50 000 (Periodic Report, 2006). More recent figures are unavailable.

▶ Staff training and development

Mostly Effective

Training and staff development are mostly effective.

▶ Sustainable use

Mostly Effective

Traditional use of resources continues in some of the components of the site.

Subsistence use in the Kluane National Park includes the right to hunt, fish, gather edible plants and trap furbearing animals using traditional and current methods and equipment. Currently, subsistence activities in the park are low (Kluane Management Plan, 2010).

► Education and interpretation programs

Highly Effective

A number of education and interpretation programmes exist in all component protected areas. Glacier Bay receives funding from the cruise ship companies that supports extensive interpretive programs on the natural and cultural values of the site.

► Tourism and visitation management

Mostly Effective

Visitation is increasing at the site but management is effective.

► Monitoring

Mostly Effective

Long-term ecological monitoring programmes are in place, e.g. Kluane Ecological Monitoring Project (Progress report 2016). Glacier Bay is part of the Southeastern Alaska Network of US National Parks and Wrangell-St. Elias participates in the Central Alaskan Network of Parks (https://science.nature.nps.gov/). However, there are no general environmental programmes in place or contemplated for Tatshenshini-Alsek Park. Specific environmental monitoring occurs for trails, wilderness campsites, mining sites and pipeline sites (Periodic Report, 2006).

► Research

Mostly Effective

The acquisition of new information is a priority for managers of this site. Numerous opportunities exist for scientific research and are being pursued by scientist in the individual parks and by university and research institution based scientists (Kluane Research Station, Arctic Institute of North America). Important scientific questions with the potential for major contributions to science are actively being pursued. Priorities research questions for park

managers include climate change impacts (glacial retreat and ocean acidification) and effects of increased visitation on park resources. A formal research program does not exist for this site, but ad hoc research needs are identified and funded with academic institutes and federal and provincial research centres. Glacier Bay receives funding from the cruise ship companies that supports substantial research activities.

Overall assessment of protection and management

Mostly Effective

Protection and management of individual component protected areas that make up this serial transboundary site are highly effective. However, the absence of a management body for the entire World Heritage site is of some concern.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Mostly Effective

Although the US NPS maintains a cadre of air quality specialists that works closely with the air regulatory agencies, the Park is unable to influence off-site air pollution sources. Air quality continues to be a resource concern.

▶ Best practice examples

Glacier Bay coordinates with cruise ship companies to limit the number of cruise ships entering the park. Wrangell-St. Elias collaborates with the Ahtna Tribe on the management of fish and wildlife resources.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Area of exceptional natural beauty

Good
Trend:Stable

The exceptional aesthetic values of the site have been well-preserved and remain largely intact. Glacier Bay and Tatshenshini-Alsek cooperatively manage and protect the wilderness character of the Alsek River. It provides a significant recreational opportunity and direct route through the coastal mountain range to the Pacific Ocean. The natural condition and visitor experience on the Alsek is good. Future changes in climate may negatively affect the visitor experience, but is not currently doing so.

► Outstanding examples of major ongoing geologic and glacial processes

Low Concern
Trend:Deteriorating

The outstanding geological features of the site remain well preserved. However, its glaciers and associated processes are becoming increasingly affected by climate change. A number of glaciers have already shown significant retreat, including for example Muir Glacier in Glacier Bay NP and Kaskawulsh Glacier in Kluane.

► Rich variety of terrestrial and coastal/marine environments with complex and intricate mosaics of life at various successional stages

Low Concern
Trend:Stable

The ecosystems of the site remain well preserved so far. However, significant concerns exist regarding future effects of climate change.

► Great variety of fauna

Good
Trend:Stable

Key terrestrial mammals (black bears, brown bears, moose, and mountain goats) are in good condition. Distribution patterns are expected to change over time due to changing landscape conditions following glacial recession and vegetation succession. Because of the vastness of the site the data on

abundance levels and distribution of terrestrial mammals is limited.

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**

Low Concern

Trend: Deteriorating

Key terrestrial mammals (black bears, brown bears, moose, and mountain goats) are in good condition. However, their distribution patterns are expected to change over time due to changing landscape conditions following glacial recession and vegetation succession. The exceptional aesthetic values of the site remain largely intact and its outstanding geological features remain well-preserved. However, the site's glaciers and associated processes are becoming increasingly affected by climate change. In addition, ocean acidification is a major concern.

Additional information

Benefits

Understanding Benefits

▶ **Sacred natural sites or landscapes**

This site encompasses the sacred sites and landscapes of the native tribes and continues to be part of their spiritual heritage.

▶ **Wilderness and iconic features**

In addition, this site is an outstanding area for contemplative reflection, one of the most important values of a protected area. The glaciers and valleys of this site provide the world’s most evocative scenery.

► Outdoor recreation and tourism

The hardy visitors that reach this remote World Heritage site can attest, Kluane, Tatshenshini, Glacier Bay, Wrangell-St Elias is an extremely important for recreation and tourism and contributes substantially to the local and regional economy of the gateway communities.

► Importance for research

Glacier Bay considers scientific research to one of its primary purposes. Several long-term and very valuable projects (plant and stream succession, glaciology, humpback whales, harbor seals, oceanography) have been carried on and are ongoing as a result of the park's research priority.

► Tourism-related income, Provision of jobs

2014 Cumulative benefits to local communities were estimated at $$112.1 million USD, supporting 2,000 jobs at Glacier Bay and $124.7 million USD, supporting 1.600 jobs at Wrangell-St.Elias. https://www.nature.nps.gov/socialscience/economics.cfm

► Legal subsistence hunting of wild game, Fishing areas and conservation of fish stocks

The Altsek River ecosystem provides opportunities for subsistence uses, commercial fishing activities, and hunting.

Summary of benefits

The Kluane, Tatshenshini, Glacier Bay, Wrangell St. Elias World heritage site provides many benefits for local, regional, national, and international communities. These values include nature conservation values, spiritual values, recreational values, and values related to naturally functioning ecosystems. Its international acclaim as the icon of nature conservation is uncontested. Benefits to local communities were estimated at 535 million USD, supporting 6261 jobs. (https://www.nature.nps.gov/socialscience/economics.cfm). The Altsek River ecosystem provides opportunities for subsistence uses, commercial fishing

activities, and hunting.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Glacier Bay National Park and Preserve	From: 2017	Collaborated on research projects addressing key management issues related to vessel operations in the bay with a number of outside institutions, including: vessel generated acoustic impacts on marine mammals, ship-whale interactions, vessel-based disturbance of seals and Kittlitz's Murrelets, and air emissions impacts from cruise ships.
2	Glacier Bay National Park and Preserve	From: 2017	Collaborated on research projects addressing impacts of climate change on Glacier Bay system with a number of outside institutions, including ocean acidification, glacier status and trends, hydrologic modeling, and availability of ice habitat for harbor seals.
3	Glacier Bay National Park and Preserve	From: 2017	Implemented new programs to increase communication and understanding between NPS and cruise ship pilots with the goal of protecting park resources, including: NPS staff involvement in Southeast Alaska Pilots Association meetings, distribution of whale sightings information for situational awareness (e.g., Whale Alert), shipboard observer program.

№	Organization/ individuals	Project duration	Brief description of Active Projects
4	Kluane National Park	From: 2017	Yukon Conservation Data Centre and Parks Canada, in partnership with the Kluane First Nation and Champagne and Aishihik First Nations, are hosting the Yukon's Canada 150 BioBlitz in the Kluane area, as well as in Kluane National Park and Reserve. The Kluane Bioblitz will focus on documenting the environment mainly around the south end of Kluane Lake both within and outside of the Kluane National Park and Reserve. There will be opportunities for the general public to participate and find as many species as possible within a short time, and over 47 visiting science experts professionally collecting data. In addition, there will be talks, discussions, and expert-led nature walks about this unique environment.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	Impacts of Climate Change on Glaciation	This site requires collaborative research on the long–term impacts of climate change on terrestrial and marine resources. The site would benefit from expanded research and monitoring, a research and monitoring plan that is developed jointly, and results shared annually.	From: 2018

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