IUCN Conservation Outlook Assessment 2017 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Waterton-Glacier International Peace Park. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Waterton-Glacier International Peace Park

SITE INFORMATION

Country:
Canada, United States of America (USA)
Inscribed in: 1995
Criteria:
(vii) (ix)

Site description:
In 1932 Waterton Lakes National Park (Alberta, Canada) was combined with the Glacier National Park (Montana, United States) to form the world's first International Peace Park. Situated on the border between the two countries and offering outstanding scenery, the park is exceptionally rich in plant and mammal species as well as prairie, forest, and alpine and glacial features. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

Waterton Lakes National Park (Alberta, Canada) and Glacier National Park (Montana, United States) can be exemplars for cooperation across national frontiers and offer positive examples of working together to achieve results, but there is always room for improvement. Managers at the park level work diligently to manage according to their respective countries' laws and policies applying the broader World Heritage values and goals to their actions. While there are both existing and potential threats, overall, the threats are being addressed in a manner that could be a model for other transboundary areas (including a variety of cooperative initiatives). Concerns at the landscape scale, particularly regarding wildlife security and connectivity have been addressed in part through land protection at the state and provincial level. Climate change adaptation and monitoring has become a focus of both parks, and includes ecosystem level initiatives.

Current state and trend of VALUES

Low Concern
Trend: Stable

The values for which Waterton-Glacier International Peace Park was inscribed have been well preserved and are stable, but threatened by a number of threats, particularly climate change. All threats are addressed as part of a robust management programme. Concern for species migration both by connectivity to other protected areas and vertically, in elevation, within the property have been addressed by state and provincial actions, including bans on mining in the Flathead valley, and creation of Castle Provincial Park. Climate adaption and monitoring are ongoing programmes (Bay et al., 2012; Reuling et al., 2015).

Overall THREATS

High Threat

Existing threats are moderate to high and include invasive species, glacier retreat, residential and commercial development on the boundaries and road corridors. All threats are known and actively being addressed through management action and research. However, their cumulative impacts need to be taken into account to ensure connectivity between species populations. Climate change offers the greatest potential threat and may cause significant impact to the site’s unique ecological complexes, but the effects of potential energy development could further fragment connectivity and wildlife migration across international boundaries. While there are both existing and potential threats, overall, the threats are being actively addressed through research and management action, although funding limits available resources to apply to problems.

Overall PROTECTION and MANAGEMENT

Mostly Effective

Protection and management are effective overall and provide a positive example to other transboundary sites that seek to protect Outstanding Universal Value across boundaries.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Superlative scenery**
Criterion:(vii)

Both Waterton Lakes (Canada) and Glacier (United States of America) National Parks were originally designated by their respective nations because of their superlative mountain scenery, their high topographic relief, glacial landforms, and abundant diversity of wildlife and wildflowers (World Heritage Committee, 1995).

► **Unique ecological complexes**
Criterion:(ix)

The property occupies a pivotal position in the Western Cordillera of North America resulting in the evolution of plant communities and ecological complexes that occur nowhere else in the world. Maritime weather systems unimpeded by mountain ranges to the north and south allow plants and animals characteristic of the Pacific Northwest to extend to and across the continental divide in the park. To the east, prairie communities nestle against the mountains with no intervening foothills, producing an interface of prairie, montane and alpine communities. The International Peace Park includes the headwaters of three major watersheds draining through significantly different biomes to different oceans. The biogeographical significance of this tri-ocean divide is increased by the many vegetated connections between the headwaters. The net effect is to create a unique assemblage and high diversity of flora and fauna concentrated in a small area (World Heritage

Committee, 1995).

Other important biodiversity values

► **Biodiversity & Connectivity**

The two parks sit at the centre of the 18 million acre Crown of the Continent ecosystem. Like the two parks, the Crown of the Continent ecosystem straddles the international boundary between the United States and Canada and is one of North America's iconic landscapes. Much of the Crown is still mostly in a natural undeveloped state – its spectacular landscapes are home to the entire suite of North America's endemic large carnivores and the greatest floristic and aquatic biodiversity in the Rocky Mountains. In the Crown the Great Plains meet the Rocky Mountains, and on the west side of the continental divide Pacific ecological influences are also found. At its core, in addition to Waterton-Glacier International Peace Park, is also the third largest wilderness area in the lower 48 states – the Bob Marshall Wilderness Complex. It also links with montane protected areas in Canada (Banff National Park, Kananaskis Provincial Park and other provincial protected areas).

Assessment information

Threats

Current Threats

High Threat

Existing threats are moderate to high and include invasive species, glacier retreat, climate warming, residential and commercial development on the boundaries and road corridors. All threats are known and actively addressed through management action and research. However, their cumulative impacts need to be taken into account to ensure connectivity between species

populations. Adaptation for climate change effects will also be important.

► Air Pollution

Low Threat
Inside site, scattered(5-15%)
Outside site

Shell Canada gas plant about 30 km north of the Waterton Lakes National Park raises some concerns over emissions. However, with prevailing winds from south and west, the impact is minimal. Threat from air-borne pollutants from further afield is much higher and ongoing, as some of these contaminants accumulate preferentially in colder areas of the global environment, such as high elevations, due to a process called global fractionation.

The 2010 WACAP study demonstrated the sensitivity of high elevation sites to air-borne contaminants (Landers, 2010). Snowpack in Glacier National Park showed high levels of pesticide contamination, and high levels of nitrogen and sulphur were detected in lichens. Dieldrin concentrations in fish were significantly higher than similar studies found in Canada. PAH concentrations were highest at Snyder Lake than any other site tested in the study, presumably due to the aluminium smelter that was still in operation during the study. Fish sampled in Glacier National Park also showed indication of oestrogen exposure based on vitellogenin content and presence of intersex fish. Sampled fish also tested positive for DDT, a pesticide that was banned for use in the U.S. in 1972, and chlordane (Landers, 2010).

► Housing/ Urban Areas, Tourism/ Recreation Areas

Low Threat
Inside site, scattered(5-15%)
Outside site

Development of private lands outside Glacier National Park entrances could result in increased accommodation that supports increasing visitor use (IUCN Consultation, 2017a). Currently new campgrounds are proposed in West Glacier and St. Mary. Development along Glacier National Park boundaries could impede wildlife movement between the park and the adjoining United States Forest Service lands and provide a vector for increasing populations of invasive species in the park (IUCN Consultation, 2017a). Past assessment

noted limited availability of services and accommodation and potential for development to impact park values (Peterson, 2013). In Waterton, although Nature Conservancy of Canada has protected 110 km2 on the eastern boundary (Waterton Park Front Project), new acreages continue to be built, which impedes wildlife movement and leads to increased carnivore mortality. However, there has been significant opposition by adjacent land owners to large scale recreational developments proposed for areas near the park boundary. This has led to these proposals being turned down by local municipalities.

► Fire/ Fire Suppression

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

The lands beyond Waterton and Glacier support forest harvest, and fire suppression has been a long-term management strategy to conserve timber resources. Waterton uses prescribed fire to restore grassland habitat, an early succession community of the montane ecosystem (Waterton Lakes National Park, 2017c). Prescribed fires restore a natural disturbance regime, while minimising risk to human infrastructure.

► Other Activities

Very Low Threat
Outside site

Various initiatives have aimed to reduce the potential for fragmentation due to land development. In the US portion of the Crown, the Montana Legacy Project was a partnership between public and private entities which resulted in the protection of 310,000 acres of western Montana forest land previously owned by Plum Creek Timber (IUCN Consultation, 2017a). The lands are now managed for the benefit of people, wildlife, water and working lands. In 2016, all of the oil and gas leases were retired in the Badger Two Medicine area on the east side of the continental divide in the Crown of the Continent ecosystem (IUCN Consultation, 2017a). Additionally, the Blackfeet Tribe are in the beginning stages of restoring a wild bison herd to the Blackfeet Reservation adjacent to Glacier National Park. Known as the Iinnii Initiative, this wild herd will eventually roam onto park and forest lands and into

Canada (IUCN Consultation, 2017a; Wildlife Conservation Society, 2016).

► Other Ecosystem Modifications

High Threat
Outside site

Concentrations of large carnivores and aquatic species migration (bears, wolves, salmonids) have been adversely affected over time by settlement and road corridors becoming a barrier to connectivity between species populations. Isolated populations suffer species loss and with loss of major carnivores, as umbrella species, leading to loss of species of all types (UNESCO & IUCN, 2009; Konstant et al., 2005; Locke, 2012; Proctor et al., 2015; Northrup et al., 2012; Squires et al., 2013). However, measures have been undertaken to address the issue. In 2013, Teck Resources, which operates large mines in British Columbia, purchased for conservation purposes Flathead Townsite and the Alexander Creek, two large parcels of private land which are of great significance to the integrity and connectivity of the World Heritage site. Management plans were to be prepared, but as yet have not been announced. Southern Alberta Land Trust and the Nature Conservancy of Canada have also purchased parcels or secured easements of private land along Highway 3 for connectivity purposes. However, concerns remain at the Michel Creek linkage.

Alberta’s 2014 South Saskatchewan Land Use identified connectivity across Highway 3 as a biodiversity value. In 2017, the province of Alberta established Castle Provincial Park, enhancing the linkage between the International Peace Park and Banff National Park. Bans on mining in the Flathead (CPAWS, 2017; Natural Resources Canada, 2014) have reduced the risk of fragmentation as well. Waterton Biosphere Reserve, which includes Waterton National Park, has developed a carnivore conflict management programme, working with local landowners to reduce risk factors to connectivity caused by human disturbance (Waterton Biosphere Reserve, 2017a).

► Invasive Non-Native/ Alien Species

High Threat

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

Non-native plants have established near visitor-use corridors. Glacier National Park has an active treatment and eradication programme that is budget dependent and includes a well-established native plant nursery to treat disturbed areas (IUCN Consultation, 2017a). The problem also exists outside the park, but treatment has been sporadic, uncoordinated and largely ineffective (Adams, 2009). Waterton is now working with regional partners in the South West Alberta Cooperative Weed Management Area to actively manage weedy invasive species (Waterton Biosphere Reserve, 2017c).

Waterton and Glacier are also susceptible to aquatic invasive species introduced by people who travel from infected regions, including on watercraft, fishing gear, trailers, etc. Both parks are currently prohibiting launching of motorboats on park lakes in response to the recent finding of mussels, an aquatic invasive species, just east of the Continental Divide in the US portion of the Crown of the Continent (IUCN Consultation, 2017a). Aquatic Invasive Species (AIS) are moving west from the east both in Canada and in the US. AIS are also moving up from the southwest. An active inspection and detection programme is in place in British Columbia, Alberta and Montana and in both parks (Montana Fish, Wildlife and Parks, 2018; IUCN Consultation, 2017a). To date, only Waterton and Glacier are prohibiting motorboats from launching in park waters. Non-native plants, fish, insects and pathogens are also affecting the flora and fauna of Waterton Lakes (Wells, 2009). The efficacy of a programme designed to suppress non-native lake trout in a backcountry Glacier National Park lake shows promise, and could assist in recovery efforts of the native bull trout (Fredenberg, 2014). The whitebark pine population of both parks and throughout the Crown of the Continent has been heavily impacted by blister rust, a non-native pathogen (IUCN Consultation, 2017a; Keane et al., 2017; Tomback et al., 2014). Waterton and Glacier have an active restoration programme underway (Waterton Lakes National Park, 2017c). The Crown of the Continent is developing a Strategic Plan to guide restoration.

► Temperature extremes

High Threat
Inside site, throughout(>50%)

Outside site

The Crown of the Continent is a region at great risk from climate change, and already experiencing warmer and drier weather (Bay et al., 2012; Crown Managers Partnership, n.d.). By 2030, the glaciers are predicted to no longer exist in Glacier National Park (UNESCO & IUCN, 2009; Reuling et al., 2015). More frequent rain and snow events and flooding in the fall are evident now (IUCN Consultation, 2017a).

Drying soils, increased temperatures and potential wildfire incidents will combine to modify the scale and character of subalpine forests (Harvey et al., 2016), tree species' prevalence and biome types (Hansen & Phillips, 2015; Kulakowski et al., 2013; Smith-McKenna et al., 2014; Tomback et al., 2014; Harvey, 2015). Arctic-Alpine plants, especially dicots have declined in Glacier National Park over the last two decades due to climate change. With reduced glacial stream flow and higher water temperatures, changes in native and non-native trout species (D'Angelo & Muhlfeld, 2013; Fredenberg, 2014; Muhlfeld et al., 2014; Crown Managers Partnership, n.d.), invertebrate (Giersch et al., 2014) and aquatic ecosystems in general have been observed (Slemmons et al., 2013). Wildfire, which will increase with global warming, also appears to play an important role in amphibian population health (Hossack et al., 2013a, 2013b).

Waterton Lakes-Glacier is nevertheless recognised as a 'resilient landscape' with respect to large landscape connectivity and iconic North American wildlife and the place where Canada and the United States can implement adaptation measures and actions to maintain and enhance resource resilience to assure the Crown's protection in the face of climate change. The Crown of the Continent Initiative is actively researching potential climate impacts (Bay et al., 2012; Reuling et al., 2015) and has developed (and tracks) an action plan to address climate change impacts (Nelson, 2014; Crown Managers Partnership, n.d.).

Potential Threats

Low Threat

Climate change offers the greatest potential threat and may cause significant impact to the site's unique ecological complexes. The effects of potential

energy development and further fragmentation of connectivity and wildlife migration across international boundaries has been reduced through land protection measures. Canadian federal protection of the Flathead region, as promoted by local NGOs, would help to enhance connectivity along this section of the Rocky Mountains.

► Mining/ Quarrying

Low Threat
Outside site

The Province of British Columbia banned oil and gas and mining in most of the Canadian Flathead Valley in 2010. In 2013, the Government of Canada made a policy commitment to sell the Dominion Coal Block in the Canadian Flathead to the province as protected lands (Natural Resources Canada, 2014), but the land transfer has not yet been legislated. Reciprocal action under a 2010 Memorandum of Understanding between British Columbia and Montana occurred on the US side in 2014. The US Congress approved the North Fork Watershed Protection Act (2014) that withdrew certain federal lands and interests from mining (IUCN Consultation, 2017a). These actions have reduced a major threat of fragmentation in the lands connecting the World Heritage site with other montane habitats along the Rocky Mountains.

► Tourism/ Recreation Areas

Low Threat
Inside site, scattered(5-15%)

The target set out in the current management plan of Waterton Lakes National Park is to increase visitation to the park by 2%/year for 5 years (Parks Canada, 2010). One key action to achieve this was to build a new multi-use (mainly bicycle) trail, which resulted in 7 km of new linear disturbance. However, any additional infrastructure was only to be implemented following careful and rigorous environmental review. Note that this plan, and the Waterton Community Plan (2000) have not been updated recently, and targets may need adjustment, particularly for Waterton townsite.

Visitation to Glacier National Park has increased significantly since 2012 when annual visitation was 2.1 million (IUCN Consultation, 2017a). In 2016, visitation reached 2.9 million, a more than 25% increase. Visitation at these

levels is straining the operational capacity of the park, impacting resources and resulting in congestion and delays on roads, in parking areas and on trails (IUCN Consultation, 2017a; Nickerson, 2016).

Increased visitation can lead to negative impacts associated with motorised vehicle noise levels for both wildlife and human visitors (Weinzimmer et al., 2014).

► Invasive Non-Native/ Alien Species

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

In Glacier National Park, recreational fishing is minor, but popular. Even though actively managed, fishing has the potential to introduce changes to aquatic ecosystems through introduction of aquatic invasive species (National Park Service, 1999; Missoulian, 2014). Waterton Lakes and Glacier National Park have recently implemented a ban on motorboats in response to the state of Montana detecting aquatic alien invasive species (AIS) – most notably mussels, in Tiber Reservoir and Canyon Ferry Reservoir (IUCN Consultation, 2017a). These are both outside the parks, but adjacent. The State of Montana and the provinces of Alberta and British Columbia are increasing boat inspections and Montana offers decontamination sites around the state (IUCN Consultation, 2017a). Both Glacier and Waterton are inspecting non-motorised watercraft before they are permitted to enter park waters. The Blackfeet Reservation has 3 inspection stations and is also sampling 4 lakes. Approximately 50 lakes in the US portion of the Crown are being sampled for AIS (IUCN Consultation, 2017a). AIS are one of the greatest threats to the ecosystem of the Crown of the Continent.

► Temperature extremes

High Threat
Inside site, throughout(>50%)
Outside site

Climate change offers the greatest potential threat and may cause significant impact to the site’s unique ecological complexes (Hall & Fagre, 2003; UNESCO & IUCN, 2009; Sholar, 200 4; Bay et al., 2012; Reuling et al., 2015;

Crown Managers Partnership, n.d.).

► Roads/ Railroads

Low Threat
Inside site, scattered(5-15%)
Outside site

While minor, both rail and motor traffic in this major east-west corridor can affect wildlife populations, especially grizzly bears which have been adversely affected by railroad spills of grain that becomes an attractant as an unnatural food source, resulting in accidental death from collision with road and rail traffic (National Park Service, 2008; US Department of the Interior, 2010). In Canada, national policy changes to increase visitation has led to pressure to open some park roads that are closed in winter. This has been offset by Waterton Lakes National Park being designated a ‘three season park’ with reduced services in winter. The management plan does identify as a goal pursuing modest additional winter recreational opportunities such as cross-country skiing and associated tracking, but there are no plans for these developments at this time.
Glacier National Park is working with Burlington Northern Santa Fe Railroad to address the risk of petroleum spills as a result of the increased train traffic carrying oil and gas from the Bakken Region to the east (IUCN Consultation, 2017a). Glacier National Park is also working with the railroad to address wildlife safety and crossings. New research is underway to identify those crossing locations.

► Invasive Non-Native/ Alien Species

Low Threat
Inside site, scattered(5-15%)
Outside site

Terrestrial invasive species are also present in significant numbers in the Crown and within Waterton and Glacier International Peace Park (IUCN Consultation, 2017a; Crown Managers Partnership, n.d.). Both parks have programmes in place to control weeds (Waterton Lakes National Park, 2017c) and Waterton is working with regional partners on weed management through the South West Alberta Cooperative Weed Management Area and internal initiatives (Waterton Lakes National Park, 2017b, 2017c). This continues to be significant issue for both parks and the Crown of the

Continent.

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

In Glacier National Park relationships with local people are solid, supportive and valued; but relationships with Salish-Kootenai and Blackfeet tribal officials can always be improved (Scott, 2012; Crown Managers Partnership, 2010; Wells, 2009; Craig et al., 2012; National Park Service, 1999; UNESCO & IUCN, 2009). In Canada, an External Relations section was created within the park administration around 2014, which has increased focus on stakeholder communication. Progress has been made to improve the relationship with aboriginal partners throughout Canadian National Parks, including Waterton. Waterton Biosphere Reserve works with local landowners to raise awareness on specific issues (e.g., carnivore conflict management, Waterton Biosphere Reserve, 2017a) and identified community engagement as a key strategic goal in its 2016-2021 business plan (Waterton Biosphere Reserve, 2017c).

► Legal framework

Highly Effective

The Waterton-Glacier International Peace Park comprises Waterton Lakes National Park, Alberta, Canada and Glacier National Park, Montana, USA, both of which are ranked as IUCN Category II Protected Areas. Waterton Lakes National Park was set aside as a Forest Reserve in 1895 and reclassified as a Dominion Park in 1911 and a National Park under the National Parks Act in 1930. It is Crown Land administered by Parks Canada, Gatineau, Quebec and managed from the park’s headquarters in Waterton, Alberta.
Glacier National Park was originally established as a National Park under its own legislation in 1910. It is Federal Land administered by the US Department of the Interior National Park Service, Washington, DC, and managed from the park’s headquarters in West Glacier, Montana (UNESCO & IUCN, 2009). The Peace Park was established in 1932 by parallel acts of the

United States Congress and the Canadian Parliament. It was the world's first Peace Park. Because it straddles the Canada-US border it is also governed by the Boundary Waters Treaty between Canada and the United States. The legal framework for the property is considered highly effective.

► Enforcement

Some Concern

Enforcement is affected by available staff, in turn dictated by budgets and funding, in both recent (US) and past (Canadian) park systems. Proposed 2017 budget cuts to the US Parks Service have yet to be confirmed and implications for enforcement are unclear. Waterton, like other Canadian National Parks, cut back on enforcement staff significantly, such that only a few staff are located in individual parks.

► Integration into regional and national planning systems

Highly Effective

In the USA, the integration of Glacier National Park into the national planning system is considered effective (National Park Service, 1999). In Canada, good integration is ensured through various collaborations (Crown Managers Partnership, Prairie Conservation Forum, South West Alberta Cooperative Weed Management Area, Waterton Biosphere Reserve). Through the Crown Managers Partnership and other established relationships, both parks are apprised of other planning efforts going on throughout the Crown and participate where appropriate (IUCN Consultation, 2017a).

► Management system

Mostly Effective

Collaborative management occurs between Waterton Lakes and Glacier National Parks, and also between the parks and surrounding lands in the Crown of the Continent ecosystem through an array of partnerships with stakeholders. Such arrangements include the Crown Managers Partnership, a transboundary land managers group with participation from Waterton and Glacier National Parks and Alberta, British Columbia, the State of Montana, federal and provincial governments, US tribes, Canadian First Nations and universities in the Crown of the Continent to collaborate and address shared issues and opportunities. The Crown Managers Partnership formed in 2001 to

explore partnering across international boundaries to address common ecological challenges using cooperative institutional capacity. Similarly, Waterton is part of the Waterton Biosphere Reserve, which brings together municipal, NGO, university and national and provincial park managers to address land use affecting the park and surrounding lands. These arrangements are designed to reach across traditional jurisdictional boundaries in the interest of rational approaches to management.

The emphasis of joint programmes of the two parks has been on fire management, public safety and rescue operations, management of shared wildlife populations, control or eradication of non-native weeds and pest animals, maintenance and restoration of biodiversity and ecological processes, and impacts of habitat fragmentation (UNESCO & IUCN, 2009). Work on aquatic invasive species, including bans on motor craft use have been implemented in both parks to address a current growing threat (IUCN Consultation, 2017a).

► Management effectiveness

Mostly Effective

Good, although resource management staff are always challenged with funding needs in both countries (UNESCO/IUCN, 2009; Northern Rocky Mountains Science Center, 2017; Crown Managers Partnership, 2010; Montana Fish, Wildlife and Parks, 2018; National Park Service, 2008; Wells, 2009; Spencer et al., 1991; Hall & Fagre, 2003; National Park Service, 1999; UNESCO & IUCN, 2009; US Department of the Interior, 2010).

► Implementation of Committee decisions and recommendations

Highly Effective

In 2010, the World Heritage Committee welcomed “the commitments made by the Province of British Columbia to remove mining threats from the Flathead River Basin, and the initiatives in the United States of America regarding extinction of mining licenses” and congratulated the State Parties on the successful transboundary cooperation and the signing of the new Memorandum of Understanding regarding the Flathead River Basin, but also requested the State Parties to continue working on the issues of connectivity (Decision 34COM 7B.20). As for climate change mitigation and adaptation

strategies mentioned in Decision 33COM 7B.22, in 2014, Waterton Lakes National Park helped to organise and present a conference on Climate Change Adaptation in Missoula Montana as a member of the Crown Managers Partnership (CMP). The final report of that forum and several other climate change adaptation initiatives has been compiled and is being used by both parks and the Crown Managers Partnership to guide development of adaptation strategies for fire on the landscape, native salmonids, wildlife connectivity, meso-carnivores, and terrestrial and aquatic invasive species (IUCN Consultation, 2017a). There have been no Committee decisions since 2010.

► Boundaries

Highly Effective

Sufficient and effective (UNESCO & IUCN, 2009).

► Sustainable finance

Mostly Effective

Previously considered sufficient in the USA, while recognising budget and staffing fluctuations based on national priorities and direction (UNESCO & IUCN, 2009). In Canada, the available budget decreased since 2012 as a result of federal budget cuts that resulted in significant cuts to staffing and programmes. In 2017, US federal budgets have proposed significant cuts to all federal parks. Implications have not yet realised at Glacier.

► Staff training and development

Some Concern

In both countries the parks have dedicated and well-trained staff. However, the several years of budget cuts have also resulted in a decrease in the number of staff members. In Waterton, funding has increased after a change in federal government in 2015, but staff positions cut by previous federal governments have not been fully replaced. All US parks have had dramatic budget cuts recently. In both parks, travel budget restrictions have reduced the ability to attend off-site training and to network with others (IUCN Consultation, 2017a).

► Sustainable use

Some Concern

Overall, effective; however, in Canada, a recent requirement for parks to increase visitation and revenue has been a concern in light of reduced resource staff levels. This trend showed potential to improve in 2015 with the new government, and funding has slowly increased in some park programmes. Reliance on visitation for revenue generation remains a key funding source though. No specific initiatives are currently in place related to sustainable use within the park, but a partnering organisation (Waterton Biosphere Reserve) has identified community engagement and sustainable economic activities as key initiatives within the region (Waterton Biosphere Reserve, 2017c).
Glacier National Park has a number of programmes in place to work towards carbon footprint reduction (IUCN Consultation, 2017a). The park is working with the community increase sustainable practices.

► Education and interpretation programs

Mostly Effective

Very good (although there could be greater emphasis on the World Heritage status) (UNESCO & IUCN, 2009). In Canada, the Action on the Ground project and external funding have supported the award-winning Waterton Ecosystems Investigators Camp for students throughout southern Alberta. In-park education programmes are also offered. The Crown of the Continent Ecosystem Education Consortium brings together 20 education providers across the region, coordinating resources and information (Waterton Lakes National Park, 2017b).
Both parks have recently been named as an International Dark Sky Park by the International Dark Sky Association (IUCN Consultation, 2017a). Part of achieving this status required both parks to significantly expand the education and interpretive programmes on dark skies. These programmes are attracting many visitors every summer. Approximately 800 visitors are attending The Star Parties at Logan Pass in Glacier National Park (of which there are three per season).

Researchers studying the promotion of Leave No Trace backcountry camping

practices at Glacier suggest communications that target perceived difficulty (or ease) of practising Leave No Trace as well as targeting camping party group norms would be most beneficial for promoting pro-environmental camping behaviours (Vagias et al., 2014).

► Tourism and visitation management

Mostly Effective

Tourism and interpretation programmes are very good (UNESCO & IUCN, 2009).

Investment has been directed towards innovative programmes designed to mitigate negative ecological impacts and enhance visitor experiences. Glacier and Waterton National Parks have long engaged in backcountry camping permitting programmes (Manning, 2011). Glacier National Park established the Going-to-the-Sun Road shuttle to ease congestion on this iconic highway and enhance visitor enjoyment and safety. While these goals have been achieved, the shuttle may have inadvertently added 40-60 day-long passenger vehicles parked at the Logan Pass parking lot; day hikers use this point as a convenient place to park and use the shuttle for loop day hikes (Weinberg, 2014). The parking lot at Logan Pass reaches full capacity early each day of the summer months, exacerbating visitor congestion (Nickerson, 2016).

During the 2016 visitor season, Glacier National Park’s four largest campgrounds were fully booked (with the exception of a few camp site nights) during the months of July and August (Nickerson, 2016). Ecological footprints associated with high occupancy levels need to be managed carefully.

► Monitoring

Some Concern

Previously considered good (Northern Rocky Mountains Science Center, 2017; Crown Managers Partnership, 2010; Montana Fish, Wildlife and Parks, 2018; National Park Service, 2008; IUCN Consultation, 2017b; Wells, 2009; Adams, 2009; Hauer et al., 2007; Hauer, 2007; Spencer et al., 1991; Hall & Fagre, 2003; US Department of the Interior, 2010), however, the reduction of staff and budgets has become a concern in both parks. Waterton and Glacier

now have a number of monitoring programmes in place, but funding limitations severely limit monitoring to only the species of highest concern (IUCN Consultation, 2017a). Parks are turning to citizen scientist programmes to assist with some monitoring gaps while providing educational opportunities.

► Research

Highly Effective

Good (Northern Rocky Mountains Science Center, 2017; Crown Managers Partnership, 2010; Montana Fish, Wildlife and Parks, 2018; National Park Service, 2008;; IUCN Consultation, 2017b; Wells, 2009; Adams, 2009; Hauer et al., 2007; Hauer, 2007; Spencer et al., 1991; Hall & Fagre, 2003; US Department of the Interior, 2010). Due to the relatively undisturbed setting of the national parks compared to surrounding lands, Waterton-Glacier International Peace Park is a popular location for scientists to conduct research (IUCN Consultation, 2017a; Waterton Lakes National Park, 2017a). The parks acquire some funding for priority research projects from both federal and private sources. In addition, numerous independent researchers from agencies and universities conduct research under approved permits. Topics of study include wildlife, land geomorphology, social science, vegetation, air/water quality, climate change and much more.

Overall assessment of protection and management

Mostly Effective

Protection and management are effective overall and provide a positive example to other transboundary sites that seek to protect Outstanding Universal Value across boundaries.

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

Mostly Effective

External land use threats to the parks were previously considered a major concern that improved after World Heritage listing. The extensive purchase and easement programme of low elevation prairie lands adjacent to Waterton Lakes National Park by the Nature Conservancy of Canada in the

area of the Waterton Biosphere Reserve has increased habitat available for park mammals especially in spring and fall. The Province of Alberta's South Saskatchewan Land Use Plan, 2014 created a 54,588 ha wildland park immediately adjacent to the north boundary of Waterton Lakes which enhances the World Heritage site's ecological integrity.
As mentioned, Glacier National Park and Waterton Lakes National Park together have been named as an International Dark Sky Park. They are the first transboundary park to receive this designation (IUCN Consultation, 2017a). This designation requires both parks to continue improving their exterior lighting to protect dark skies and to work with neighbouring communities. Additionally, Glacier National Park jointly manages the Flathead Wild and Scenic River with the Flathead National Forest.

► Best practice examples

World Heritage values, international transboundary cooperative management, wildlife–human interaction, natural fire regime reestablishment, International Peace Park issues, working with indigenous tribes, environmental education. Specific programmes:
• Native America Speaks; an educational and interpretive programme by the National Park Service in cooperation with the Blackfeet and Salish-Kootenai tribes and the Glacier Conservancy where American Indian tribal members present interpretive programmes for park visitors about traditional stories, practices and folkways.
• Crown Managers Partnership: a cooperative effort by managers of both Glacier and Waterton Lakes National Parks to involve adjacent land managers and political entities in a broad effort to coordinate management activities at a landscape scale.
• Reserved Water Rights Compacts: Development of formal, treaty-level compacts with both the State of Montana and adjacent Indian Tribes for water rights issues to ensure necessary water for species conservation in Glacier National Park.
• Great Northern Landscape Conservation Cooperative The GNLCC partnership is a network of US federal, Canadian provincial and federal, Tribal Nations, state, academic and conservation organisations. Working to achieve a collective landscape vision, the partnership implements a regional approach to address conservation issues across boundaries and jurisdictions by sharing data, science and capacity (IUCN Consultation, 2017a).

• South West Alberta Cooperative Weed Management Area manages noxious invasive weeds in cooperation between Waterton and local municipal governments, provincial parks and Nature Conservancy of Canada (Waterton Lakes National Park, 2017b).
• The Restoring Terrestrial Ecosystems Together (RTET) project was a major 5-year investment of funds that were external to the park budget. The tripling of on-the-ground efforts to control non-native plants and restore grasslands and threatened whitebark and limber pine forests has made tremendous progress. Unfortunately, this external funding ended in 2014 at a time of budget and staff cuts and progress has not been maintained.
• As part of RTET, a pilot initiative to bring regional school children to the park for multi-day stays and field exercises attracted a major NGO funding partner. The programme won a provincial Emerald Award.
• Working with UNESCO/IUCN to protect the North Fork drainage from mining development (IUCN Consultation, 2017a).
• Potential cooperative fisheries restoration programmes between State, US Geological Survey (USGS) and Glacier National Park, and ongoing cooperative grizzly bear monitoring and management (IUCN Consultation, 2017a).
• Flathead Community of Resource Educators (CORE) – a network of individuals and organisations working together to increase awareness and understanding about the natural, historical and cultural resources of the Flathead Region (IUCN Consultation, 2017a).
• Rocky Mountains Cooperative Ecosystem Studies Unit that facilitates science and research connections between agencies and universities (IUCN Consultation, 2017a).
• Rocky Mountain Inventory and Monitoring Program for efficiencies in inventory and monitoring (IUCN Consultation, 2017a).
• Waterton Biosphere Reserve Carnivore Working Group, public meetings with local municipalities to address wildlife conflict management and plan future action (Waterton Biosphere Reserve, 2017b).
• 2017 Multi-species Action Plan for Waterton National Park developed by Parks Canada to address management of species at risk in the park (Parks Canada Agency, 2017), and associated research programmes in the park for species reintroduction (leopard frog), non-native species reduction, and monitoring (bats, Waterton Lakes National Park, 2017a).

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Superlative scenery**

Low Concern
Trend:Stable

The values of this property have been maintained through continuing management, monitoring and research. Superlative scenic values of the site remain stable and largely intact (World Heritage Committee, 1995; National Park Service, 1999; UNESCO & IUCN, 2009; Konstant et al., 2005). Climate change is predicted to cause glacial retreat in Glacier National Park by 2030 (UNESCO & IUCN, 2009, IUCN Consultation, 2017a; Wines, 2014), which will change a key feature of the park, but not the mountain landscapes themselves. Increased wildfire activity related to climate change will alter views at an accelerated rate (Duffield et al., 2013).

▶ **Unique ecological complexes**

Low Concern
Trend:Stable

During the last five years, the values have been stable, but the loss of glaciers in the headwaters and invasion by non-native species are of some concern. Measures to address the threat posed by invasive species are being undertaken. Various climate change adaptation and monitoring activities are ongoing.

Summary of the Values

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

Low Concern

Trend: Stable

The values for which Waterton-Glacier International Peace Park was inscribed

have been well preserved and are stable, but threatened by a number of threats, particularly climate change. All threats are addressed as part of a robust management programme. Concern for species migration both by connectivity to other protected areas and vertically, in elevation, within the property have been addressed by state and provincial actions, including bans on mining in the Flathead valley, and creation of Castle Provincial Park. Climate adaption and monitoring are ongoing programmes (Bay et al., 2012; Reuling et al., 2015).

► **Assessment of the current state and trend of other important biodiversity values**

Low Concern

Trend: Improving

Aquatic invasive species and landscape level connectivity are key concerns affecting both parks. Active management on the part of state, provincial and parks managers aims to control the former, while landscape connectivity has been enhanced through recent land protection efforts (US and Canada). Ongoing lobbying of NGOs for additional protection in the Flathead valley will ensure that this issue remains in active discussion.

Additional information

Benefits

Understanding Benefits

► **Outdoor recreation and tourism**

Destination for hiking, backpacking, camping, photography, skiing/snowshoeing, fishing, boating, climbing, spiritual renewal and connection to the land. Supports a seasonal business community.

Climate change and invasive aquatic species have the potential to change the ecological character of the parks, and in the case of aquatic invasive species, have already imposed changes on recreational boating use.

► **Importance for research, Contribution to education**

Good resource for research, and for disseminating knowledge about natural processes, ecosystems and species, particularly because so much biodiversity is contained within such a small area.

Climate change is predicted to have dramatic effect on habitat, vegetation and wildlife communities over the longer term. Such changes, and adaptation planning resulting from those changes, offer research opportunity and sharing of new knowledge, given the current research interest and activity in the park.

► **Flood prevention, Water provision (importance for water quantity and quality)**

Although a small park, the Waterton-Glacier International Peace Park serves as a water tower for the Crown of the Continent Ecosystems, communities, recreational users and agricultural landowners. Climate adaptation will be important in future years, as changes in storm event frequency and flooding, and glacial retreat are predicted to change in the near to long term.

Climate change, and loss of glaciers in Glacier National Park in particular, will dramatically change the park’s role as a water source. Increased storm frequency and precipitation could affect downstream land use, beyond the park.

► **Cultural identity and sense of belonging, History and tradition, Wilderness and iconic features**

Waterton-Glacier International Peace Park preserves evidence of many generations of human use, extending back thousands of years. Early peoples looked to the region both for spiritual ceremonies and sustenance. European settlers tried homesteading, prospecting, and ultimately recreational tourism, particularly in connection with Great Northern Railway. Numerous prayer flag and vision quest sites within the Waterton Lakes National Park are actively

visited by First Nations.

Climate change is predicted to reduce or eliminate glacial features in both Glacier and Waterton, changing the park's recreational, tourism and other cultural values. Glacier National Park's fundamental identity as one of the US's glaciated national parks will soon cease to exist, transforming residents' and tourists' experiences of that place forever [Wines, 2014].

Summary of benefits

Glacier along with Waterton Lakes National Park as a World Heritage property is the oldest legislated transboundary protected area in the world. Both parks have a history of working together, both formally and informally, across national frontiers to cooperatively manage world heritage and national park values of benefit to, not only park visitors, but as an example to others in the world, to both the conservation and broader community of people. Glacier, along with Waterton Lakes National Park, together and separately, actively manage large populations of charismatic mega-fauna, particularly grizzly bears in a manner to maintain healthy and natural populations of wildlife and aquatic species while still available for the benefit and enjoyment of park visitors. These two national parks increasingly serve as positive examples of the World Heritage programme through education of visitors and resolution of joint management challenges through national laws and legislation as a means to implement the idea of world heritage in a protected area, especially for protected areas that cross national frontiers.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects

1	US National Park Service	From: 2017 To: 2017	All organisations and projects work through the park. The park's current General Management Plan guides all conservation and management activity (see National Park Service, 1999). Individual projects are funded in terms of importance as outlined in various plans and park proposals. Projects done in conjunction with outside conservation groups and park partners are part of this process. Active park planning issues can be found at: http://parkplanning.nps.gov/parkhome.cfm?parkID=61
2	Waterton Lakes & Glacier National Parks	From: 2017 To: 2017	Restoration of whitebark and limber pine forests.
3	Waterton Lakes & Glacier National Parks	From: 2017 To: 2017	Control of non-native plants.
4	Waterton Lakes & Glacier National Parks & Alberta Environment and Sustainable Resources	From: 2017 To: 2017	Population estimates of grizzly bears using hair snag from rub trees.
5	Crown Managers Partnership	From: 2017 To: 2017	Crown Managers Partnership long-term transboundary conservation initiative for Crown of the Continent area. Conservation priorities are: bull trout/westslope cutthroat, grizzle bear, whitebark pine, meso-carnivores.
6	Glacier National Park	From: 2016 To: 2017	Removal of non native lake trout and restoration of native bull trout.

7	Waterton Lakes and Glacier National Parks, Alberta Environment and Parks, BC Environment, Montana State Fish& Wildlife	From: 2016 To: 2017	Aquatic invasive species management projects, including motorized watercraft ban in the National Parks.
8	Waterton Lakes & Glacier National Park	From: 2011 To: 2017	Habituated ungulate management -e.g., use of trained dogs to manage deer in communities (Waterton).
9	Waterton Lakes National Park	From: 2016 To: 2017	Northern Leopard Frog Reintroduction Project.
10	Waterton Lakes National Park	From: 2016 To: 2017	Bat inventory, and tracking of white-nose syndrome.
11	Waterton National Park	From: 2017 To: 2017	Range assessment of grassland habitat to determine state of aspen forest and fescue grassland ecosystem.
12	Waterton Lakes National Park	From: 2016 To: 2017	Wildlife monitoring with remote cameras - examining travel through the Waterton valley.

13	Waterton Lakes National Park	From: 2016 To: 2017	Whitebark pine restoration project - protection from blister rot, seed collection and other restoration activities.
14	Waterton Lakes National Park	From: 2016 To: 2017	Tracking ticks and Lyme disease - confirming abundance of key vectors (Rocky Mountain wood tick and American dog tick) into western Canada, and investigating genetic differences in tick populations.
15	Waterton Lakes National Park	From: 2009 To: 2017	Terrestrial invertebrate biodiversity study - initiated in 2005, survey of select habitats to enhance understanding of baseline abundance and distribution of terrestrial invertebrates.
16	Waterton Lakes National Park	From: 2010 To: 2017	Prescribed fire to restore grasslands. Restores grassland habitat lost through decades of fire suppression.
17	Waterton Lakes National Park	From: 2011 To: 2017	Salamander specific virus outbreak research and monitoring in tiger salamander population in the park, examining characteristics of this emerging virus and host salamander population.
18	Crown of the Continent Conservation Initiative	From: 2014 To: 2017	Climate change adaptation gap analysis - examining preparation and adaptation across the Crown Ecosystem

19	Great Northern Landscape Conservation Cooperative	From: 2017 To: 2017	A network of US federal, Canadian provincial and federal, Tribal Nations, state, academic, and conservation organizations working to acheive a collective landscape vision. The Crown of the Continent falls within the boundaries of this cooperative.

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